CHESAPEAKE
BAY JOURNAL
MARCH 2020 VOLUME 30 NUMBER 1

VA moves to replace site for nesting seabirds, but will it fly?

≈ State steps in to create bird island after feds pull back

By Jeremy Cox

When black skimmers, royal terns and other migrating seabirds return to South Island this spring, they will be greeted by a fresh layer of pavement.

The Virginia Department of Transportation recently paved over the island to discourage the flock — more than 25,000 birds, most representing species in decline — from making their nests there. The state is claiming the space for a five-year, nearly $4 billion widening of the Interstate 64 Hampton Roads Bridge Tunnel, where the James River meets the Chesapeake Bay. The project is expected to begin later this year.

Under a new Trump administration interpretation of a century-old law, that could have been the end of the road for Virginia's largest colony of nesting seabirds. In a reversal involving one of the oldest environmental laws in the country, the federal government is no longer penalizing those who take actions that lead to the unintentional killing of birds or destruction of their nests.

But facing mounting pressure from environmental groups, Gov. Ralph Northam's administration recently stepped in and promised to find an alternative to help the birds, though details remain unclear.

Acting at the governor's direction, officials from VDOT and other state agencies vowed in February to work with the U.S. Army Corps of Engineers to "assess the feasibility" of building an artificial island for the displaced birds. In the meantime, they said they will develop temporary nesting grounds, including anchoring sand-covered barges near the birds' former summer home.

The avian drama may not pack as much suspense as a certain Alfred Hitchcock movie, but it contains about as many twists and turns. Scores of documents obtained by the *Bay Journal* from VDOT through a public records request show how the federal regulatory change blindsided the state's bridge planners. And the records reveal that while the bird-preservation effort may

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Amy Jacobs of The Nature Conservancy's Maryland/DC chapter stands in a Delmarva bay in Dorchester County, MD. Though protected in Maryland, such "remote" wetlands aren't regulated a few miles away in Delaware.

New wetlands rule imperils Bay cleanup, groups say

≈ Rollback leaves states to fend for large swaths of wetlands and streams.

By Jeremy Cox & Timothy B. Wheeler

The Trump administration's plans to remove federal oversight from some streams and wetlands will leave those waterways without protection in some of the Bay watershed states, while increasing the regulatory burden on others, officials and conservationists say.

The net result of the rule change, they say, will be another setback for the multi-state and federal effort to restore the Chesapeake Bay and the vast watershed it drains.

"When you take away the federal standard and leave that to the states to decide, then you're going to get dramatically different protection in the states, and the Chesapeake is going to suffer," said Geoff Gisler, attorney with the Southern Environmental Law Center.

In the Bay watershed, legal experts say, Maryland, Pennsylvania and Virginia have state laws and regulatory programs of their own that would — at least on paper — safeguard the wetlands and waterways being dropped under the new federal rule.

Those safety nets start to fray, though, in Delaware, New York and West Virginia.

Announcing the new rule at a National Association of Home Builders trade show on Jan. 23, U.S. Environmental Protection Agency Administrator Andrew Wheeler said the change would replace a broken bureaucratic system with "certainty and predictability." The EPA insists that federal controls remain strong and "among the best in the world."

Critics say that the removal of a federal arbiter opens wetland regulation to a hodgepodge of state-level protections. That could lead to more pollution running downstream from newly deregulated

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CHESAPEAKE BAY JOURNAL

BAY JOURNAL is published by Bay Journal Media to inform the public about ecological, scientific, historic and cultural issues and events related to the Chesapeake Bay. The BAY JOURNAL, circulation 35,000, is published monthly except in midsummer and midwinter. It is distributed free of charge. Bundles are available for distribution. Material may be reproduced, with permission and attribution. Publication is made possible by grants through the U.S. Environmental Protection Agency's Chesapeake Bay Program Office, the Campbell Foundation, the National Oceanic and Atmospheric Administration's Chesapeake Bay Office, the Sumner T. McKnight Foundation, the Rauch Foundation, the Fair Play Foundation, the Shared Earth Foundation, the Virginia Environmental Endowment, anonymous donors, and by reader contributions. Views expressed in the BAY JOURNAL do not necessarily represent those of any funding agency or organization.

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Bay Journal Media is a nonprofit 501(c)(3) organization with a mission to further public education and awareness of issues affecting the Chesapeake Bay and the mid-Atlantic environment by creating and distributing journalistic products. In addition to producing the BAY JOURNAL, Bay Journal Media operates the Bay Journal News Service, which distributes BAY JOURNAL articles and original op-eds about the Chesapeake Bay or regional environmental issues to more than 400 newspapers in the region, reaching several million readers each month.

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Editor's Note

Welcome Mark Platts, Don Luzzatto to our board

Our nonprofit news organization has a lot on its plate for the coming year. We're planning to enhance our products, increase our readership, boost outreach to younger readers — and begin planning for the 30th anniversary of the *Bay Journal* in 2021.

Fortunately, we have some help on the way. It's my pleasure to welcome two leaders who will bring a wealth of experience to Bay Journal Media's board of directors, Don Luzzatto and Mark Platts.

Don Luzzatto is vice president for civic engagement with the Hampton Roads Community Foundation. He also has an extensive background in journalism, having worked at *The Virginian-Pilot* from 2000 to 2017, including eight years managing the paper's editorial page.

Earlier in his career, he worked at *The York Dispatch* in Pennsylvania, *The News & Advance* in Lynchburg, VA, and *The Gainesville Sun* in Florida.

Don is a member of the board and former president of the Downtown Suffolk Rotary Club and serves as a board member for the Suffolk Center for Cultural Arts and Suffolk YMCA. He is a 1984 graduate of the College of William and Mary with a degree in English.

Mark Platts is president of the Susquehanna National Heritage Area, the nonprofit that serves as the coordinating entity for the nation's newest heritage area, designated by Congress last year to highlight the river's natural, historical and cultural resources as well as its recreational opportunities.

A native of Pennsylvania's York County, he gained an appreciation for the Susquehanna by exploring its surrounding lands as a youth. He holds a bachelor's degree in urban and rural studies from Shippensburg University of Pennsylvania, and a master's degree in urban and regional planning from the University of Florida.

Mark worked as a planner in Florida and the District of Columbia before returning to Pennsylvania to head the heritage area. He lives in Lancaster County.

They join other members of our board which, besides myself, include Board President Mary Barber, an environmental scientist with RTI International; Vice President Bill Eichbaum, senior fellow with the World Wildlife Fund; Donald Boesch, president emeritus of the University of Maryland Center for Environmental Science; and Kim Coble, executive director of the Maryland League of Conservation Voters.

I'd also like to express my appreciation for the years of service from two retiring board members, Frank Felbaum, retired director of Pennsylvania's Wild Resource Conservation Fund; and Tom Lewis, an attorney with Gallagher Evelius & Jones LLP in Baltimore.

We'll miss them both.

— Karl Blankenship

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Correction

The credit for the photo that ran with the Chesapeake Born column "in the January/February 2020 issue was incorrect. Scott McGill of Ecotone took the photo. The *Bay Journal* regrets the error.

From left:

Can't read enough about striped bass? See article on page 15; Chesapeake Challenge on page 21, Forum on page 32 and Bay Naturalist on the back page. (Dave Harp)

A mother and son settle into a streamside spot to enjoy the peak spring-time bloom of Virginia bluebells. See article on page 24. (Leslie Middleton)

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Dedicated effort turns James River from trashed to treasured

≈ Once labeled 'most polluted,' America's Founding River wins international acclaim

By Whitney Pipkin

For a generation, when Richmond residents said they were going "to the river," they weren't talking about the James River that bisects the heart of Virginia's capital city, roaring over hulking rocks and under bridges. They were planning a drive to the Rappahannock or Potomac, rivers that through much of the '60s and '70s were less beset by pollution than their local waterway.

But, after decades of work and regulation to clean up "America's Founding River," the stigma has begun to fade. While still in need of continued work, the river is becoming prized for its recreational offerings and resources as much as for its history. (The explorer Capt. John Smith first wrote about these waters after traversing them as far as Richmond in the 1600s, encountering native communities that had thrived along the shoreline for thousands of years.)

In 2012, when *Outside* magazine named Richmond America's best river town, it referenced residents' relationships with the James. And, late last year, the James River received its biggest accolade yet: the top Riverprize from the International River Foundation at a gala in Australia.

Over the last 20 years, the award has recognized the Danube River in Eastern Europe, the Thames River in England and the Charles River in Boston. The foundation said its decision to honor the James was a nod to its transformation "from one of the most polluted in the country to one of the most improved."

Bill Street, who received the Riverprize as CEO of the James River Association, agreed that the river he's focused on for the last 15 years has come a long way. But there's still work to be done to return it to full health — and to get local residents to fully embrace its charms.

Now, "when people say they're going to the river, we want that to be the James River," he said.

Bill Street, CEO of the James River Association, said the river's recovery from a much-polluted past has been remarkable, but work remains to be done. The association works both to improve water quality and help more people develop a personal connection to the river. (Dave Harp)

Disaster spurs action

The 348-mile-long James River is contained entirely in Virginia, winding from its headwaters in Botetourt County north of Roanoke through Lynchburg and then Richmond. The river seems in no hurry once it's left the state capital, making lazy oxbow turns south of the city that were shortened by cut-throughs carved by Union soldiers. From there, the James balloons and constricts, like a snake swallowing its prey, as it curves past Charles City, Jamestown and Williamsburg before reaching Newport News, Hampton and Norfolk and spilling into the Chesapeake Bay.

Forty-five years ago, an environmental disaster made the James River nationally synonymous with pollution.

In 1975, investigators found that an insecticide called Kepone, which had given workers troubling symptoms such as tremors, had been discharged for nearly a decade into the James River. There, state officials found the ant-killing chemical, also known as chlordecone, had been accumulating in the river's sediment and in fish tissue. Kepone was later classified as a likely carcinogen that persists in the environment for years.

The disaster, covered by Dan Rather in a 60 Minutes episode, became the local equivalent of the Cuyahoga River catching on fire in Ohio. It was a turning point for an industrial swath of the river where, as Rather said, pollution had become "a way of life" for many of the chemical companies located on its shores.

The entire tidal portion of the river — from Richmond to the Bay — was shut down to all fishing except catch-and-release.

Street, who grew up in Richmond and returned after a decade at the Chesapeake Bay Foundation's Annapolis office, said he didn't know of any other river with the kinds of restrictions the James had at the time. The fishing ban that began in the mid-1970s lasted for 13 years, costing many their livelihoods and leaving a legacy that would be hard for the river to overcome.

Rafting is now a popular way to experience the James River in Richmond. (Dave Harp)

But the national attention the Kepone disaster garnered also fueled budding environmental activism in Virginia and helped spur the passage of national legislation to regulate toxic chemicals.

"It truly was one of the most polluted rivers in the whole country," Street said. "So, it's an incredible story that, now, it's home to one of the highest concentrations of bald eagles, some of the strongest sturgeon populations and that it means what it does to the communities. It's pretty amazing."

In 1976, one year after the Kepone investigation, a group of concerned citizens formed the James River Association. Kepone was one of many reasons they organized, but not the only one. Growing environmental concerns were birthing river groups across the country in the wake of the passage of the Clean Water Act in 1972, and local action helped point the James toward a cleaner future.

45 years of change

A James River advocate from the '50s and '60s might have helped to pave the way for such legislation and the benefits it brought for the James.

Newton Ancarrow had a prominent boat-building business in Richmond, selling luxury speedboats to patrons such as the shipping tycoon Aristotle Onassis. But test-driving fancy boats on a dirty river — chemicals in the water once reportedly stripped the paint off a boat's hull — turned Ancarrow into one of the river's early champions.

At the time, Richmond's combined sewer and stormwater system routinely dumped billions of gallons of raw sewage into the river when heavy rains overwhelmed its treatment plant. To demonstrate his point that the river had become the city's dumping grounds, the *Richmond Times-Dispatch* reported, Ancarrow once appeared before the city council with a jarful of the James that included a condom and a dead rat.

Ancarrow eventually teamed up with Ralph Nader in a suit to force President Richard Nixon to release billions of dollars that had been appropriated to upgrade wastewater treatment plants.

"As I understand it, that lawsuit was one of the things that led to the passage of the Clean Water Act," Street said.

Because of population centers that drain into the James watershed, the river receives about 70% of the state's wastewater discharge, Street said. That's one of the factors that left it more soiled than others by midcentury. But it also stood to benefit more from the Clean Water Act, which established permits and standards for wastewater discharge.

But the James River still routinely

JAMES CONTINUES ON PAGE 5

James from page 4

received sewage-tainted stormwater through combined sewer systems, a costlier, more complicated problem to address. More recently, the state General Assembly has given the cities of Lynchburg and Richmond grants worth tens of millions of dollars to help overhaul those systems.

Meanwhile, groups like the James River Association — which has grown from five people when Street started to 25 full-time employees — have been chipping away at the river's recovery for the last 45 years. Five years ago, the organization established a lofty vision for its upcoming 50th anniversary in 2026: a Grade-A, swimmable, fishable river.

"There's been a renaissance of concern for the James," said Joe Maroon, executive director of the Virginia Environmental Endowment, a grant-making organization that was created with funds from a settlement after the Kepone catastrophe. "Over the last 40 years, we've seen how much people have begun to embrace the James as a connecting river rather than as something that separates. That's wonderful to see."

The endowment is managing a $15 million grant program focused on water quality improvements in the James River. So far, nearly $9 million of that fund has helped plant streamside buffers and living shorelines, reduce polluted stormwater runoff and curtail sewage discharges.

Getting there from here

Last year, the river held steady with a B-minus grade in the James River Association's biennial State of the James report. The report cited progress in reducing sediment and bacteria pollution despite record rains in 2018, when most measurements were taken. Bald eagle and smallmouth bass populations remained strong, but American shad continued to dwindle. Still, compared with the shutdown of river fisheries in the '70s, the James River's haul of more than 6 million pounds of seafood worth $21.4 million in 2018 is a dramatic improvement.

"Now, it's about how do we move from the B-minus we scored in the latest State of the James report to that A?" Street said.

As the James River turns a corner from eyesore to resource, advocates have continued changing their tack. In 2012, the river association teamed up with the Chesapeake Conservancy and National Geographic to help people Envision the James. The project, which includes a 360-degree virtual map, focused on promoting heritage tourism and getting people on and along the water.

Also in 2012, the association set a goal to get more people personally connected to the waterway.

The James and its tributaries now offer more than 250 public access points, with almost 40 of them added since 2013. And, the James River Park System that cozies up to the waterway in Richmond saw more visitors than ever, tallying nearly 1.8 million hikers, runners and bikers in 2018.

Kayakers enjoy a serene section of the James River with the dramatic backdrop of the Richmond skyline. (Dave Harp)

"I feel like we're in this interesting period of time where there's a lot of love for the river," said James Riverkeeper Jamie Brunkow. "Whereas, 50 years ago, it was where you'd see waste and pollution, today it's where people go to recreate and have fun."

Businesses in and around Richmond now see the river as an economic asset, one that brings young-and-hungry kayakers to town and into the city's bumper crop of breweries. A major cultural shift has occurred since the days when industry saw the river as the fastest way to get waste out of the city.

"What millennials expect now is good jobs in an urban environment with natural resources and clean water," Brunkow said, summarizing the change.

Now that the river is clean enough to support fishing, boating and even swimming in some areas most of the time, it's hard to keep reminding residents that there's still progress to be made.

When asked what a "Grade-A" James River looks like, Brunkow reached for a ski mask-like set of goggles.

"Right now, we're calling it the James River virtual reality experience," he said. "This is how we explain to somebody what an A river looks like if they're already happy with a B."

Putting on the goggles and pressing "play" cues an underwater tour of the river — not of its length, but of its history. It starts before colonization, a time of underwater abundance: verdant underwater grass and oyster beds, crabs, shad, flounder — and lots of sturgeon. It's an immersive experience, with fish and grasses on every side and the water's surface above.

Then the water gets murky and oyster beds and fish begin to disappear as the narrator describes a period of overharvesting and pollution.

Cue the concerned citizens, restoration efforts and pollution reductions, and the scene starts to improve. The video brings the viewer to modern times and into a future with more sparkling grass beds, abundant fish and plenty of people out taking advantage of the water.

"That's how we answer the question, 'What would the river look like?'" Street said. "We use this to cast a vision."

One creature that's deliberately missing from the vision is the nonnative blue catfish, which has become a top predator in the James River after being introduced in the mid-1970s. Taking its place is the unmistakable Atlantic sturgeon, which has become the mascot of the river's comeback. Harvested to the brink of extinction in the late 1800s, the prehistoric-looking fish has staged a fragile but steady comeback in the river where in the spring and fall, boaters can now often see them breaching.

Those sorts of comeback stories are a big reason the James landed an international award — which came with $135,000 for the James River Association to continue the work toward its resiliency.

"I think," Street said, "it was high time a Chesapeake tributary got recognized."

James Riverkeeper Jamie Brunkow collects water samples from the river in Richmond. (Dave Harp)

VA pipeline backers, opponents get their day in the Supreme Court

≈ Ruling on Dominion permit will have implications for stalled Mountain Valley project, others down the road

By Whitney Pipkin

Will a historic footpath running through Appalachia be the final barrier to an $8 billion pipeline project? The decision is now in the hands of the U.S. Supreme Court.

The country's highest court heard oral arguments on Feb. 24 about whether a federal agency has the authority to grant or deny permission for the Atlantic Coast Pipeline to be built under the Appalachian Trail. The court's decision, expected by June, could decide the fate of the long-contested project that winds across the southwest corner of the Chesapeake Bay watershed in Virginia.

Dominion Energy, the project's backer, petitioned the court to consider the case after the Fourth Circuit Court of Appeals in late 2018 revoked a permit from the U.S. Forest Service. The permit would have allowed construction to cross the Appalachian Trail and George Washington National Forest. It is one of seven federal permits related to the project that have been overturned by the courts, resulting in a construction stoppage since late 2018.

An aerial photo taken by a volunteer pilot shows construction of the Atlantic Coast Pipeline in West Virginia in 2018. Construction on the pipeline has been halted as judges have revoked or questioned key federal permits for the project. (Pipeline Compliance Surveillance Initiative)

The legal conundrum to be decided by the court is whether the U.S. Forest Service has the authority to grant the pipeline a permit to tunnel under the Appalachian Trail. The trail crosses through national forests, as well as other public and private lands, but is managed by the National Park Service.

The case is not about which agency owns the trail but rather about which agency has jurisdiction over the federally owned land that the trail travels.

The Forest Service and Park Service have different charters when it comes to allowing major infrastructure projects, such as pipelines, across federally owned lands. The Park Service seeks to "preserve unimpaired" the lands it is charged with managing, while the Forest Service grants rights of way and other energy development opportunities on its land.

Arguing on behalf of the U.S. Forest Service, Andrew Yang, assistant to the U.S. Attorney General, aimed to distinguish between the trail that traverses the surface of the land and the land under which a project would be built.

"It's a difficult distinction to wrap one's head around," said Justice Elena Kagan. "You're saying that the trail is distinct… from the land that is the trail.…Nobody makes this distinction in real life."

Justice Ruth Bader Ginsburg began with a similar line of questioning about the lawyers' efforts to draw distinctions between the agencies' authorities. But most of the judges seemed more concerned about the broader implications of a decision to uphold the Fourth Circuit's decision to revoke the Forest Service permit.

Eventually, Chief Justice John Roberts, Jr. asked whether such a decision would essentially create "an impermeable barrier" for pipelines and projects like them trying to cross the Appalachian Trail to the East Coast.

The Mountain Valley Pipeline, another natural gas pipeline being built across southern Virginia (outside the Chesapeake watershed) by a different

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Pipeline from page 6

developer is about 90% complete — but also needs a permit to cross the Appalachian Trail. Construction was halted as a result of the Fourth Circuit's decision.

The Atlantic Coast Pipeline project has begun tree clearing in Virginia but has not yet begun construction in the state.

In a preview for the SCOTUS blog, attorney Noah Sachs noted that siding with the pipeline's opponents could prevent the agencies from granting a right-of-way for pipelines under any portion of the Appalachian Trail that runs through federal land.

"Because more than 80% of the trail is on federal land (the remainder is on state and private land), this case has major implications for where pipelines and other energy infrastructure can cross from the Midwest to population centers on the East Coast," Sachs wrote.

Dominion, in a statement released after oral arguments, pointed to the existence of more than 50 pipeline projects under the trail already as evidence that the work would not disturb public use of the trail.

"We're avoiding any impacts to the trail by installing the pipeline more than 700 feet below the surface," the statement said, adding feet to the 600-foot-below number that attorneys used during their arguments. Through horizontal drilling, the company said construction would only impact land more than a half-mile from each side of the trail. "People hiking by the crossing will not see, hear or even know the pipeline is there."

Lines formed for the U.S. Supreme Court hearing on Feb. 24, 2020, when the court heard arguments as to whether the U.S. Forest Service could issue a permit to allow a natural gas pipeline to tunnel beneath the Appalachian Trail. (Whitney Pipkin)

Greg Buppert, a senior attorney with the Southern Environmental Law Center, said after the arguments that the depth at which the pipeline would cross under the trail is still "unresolved" and that the pipeline could end up being built much closer to the surface.

Either way, analysts and Dominion's attorneys have said that, unless the Supreme Court allows the Forest Service to reissue the permit, the 605-mile-long natural gas pipeline is unlikely to go forward.

"If [it] cannot cross 600 feet below the trail then the whole enterprise is done. We're done. They have to start over," Yang said during his argument.

In a statement, Dominion officials said they were "hopeful" the Supreme Court would decide in the pipeline's favor and that the company could resume construction as early as this summer.

Environmental groups were less forthcoming with predictions after the Supreme Court's complex legal discussion.

"It's so hard to read what the justices are thinking, and I make it a policy not to try to predict," said David Sligh, conservation director of Wild Virginia, after observing the arguments. Still, he said in a statement that the pipeline "poses serious environmental and safety risks in its attempt to cut across Appalachia. Simply put, they could not have chosen a worse place" to construct it.

If the Supreme Court reverses the lower court's decision and allows the Forest Service to reissue a permit, the pipeline project would still face a handful of unresolved permitting issues, many of them put on hold while this case made its way through the courts. Lawsuits challenging the permit from the Federal Energy Regulatory Commission, which center on whether demand for the project is justified, are still in court.

Climate study predicts extent of heavier rains on Eastern Shore

≈ MD communities planning future infrastructure to withstand change

By Jeremy Cox

Climate change will fuel heavier downpours and deeper floodwaters on Maryland's Eastern Shore, according to one of the first detailed looks at changing rainfall patterns at the local level in the mid-Atlantic.

The new report, a collaboration between the University of Maryland and Eastern Shore Land Conservancy, estimates rainfall totals and intensity for five towns on the Mid and Upper shores. It predicts that by the 2040s, a 100-year storm will dump an additional 0.5-inch to 1.5-inches of rainfall over 24 hours, depending on the location.

That might not sound like much of a difference. But when it comes to planning for new roads, drainage ditches and other types of infrastructure, it is, said Jim Bass, manager of the conservancy's coastal resilience program.

"This was a great opportunity to bring some specificity to this phenomenon that everyone agrees is going on," he said. "You can't plan for what you don't know."

Many coastal communities across the country are struggling to get ready for rising seas, greater storm frequency and other climate-related impacts. The rural towns represented in the Eastern Shore study face a bigger challenge, Bass said, because their public works staffs and budgets are smaller than most of their counterparts.

In anticipation, his organization formed the Eastern Shore Climate Adaptation Partnership in 2016. The network's six participating counties and three municipalities work to share costs and resources as they plan for climate change. Their goal, according to the partnership's website, is to create "America's Most Resilient Region."

The rainfall study, funded by a $60,000 grant from the New York-based Rauch Foundation, brings a level of scientific understanding to those communities that many larger cities still don't have, its backers say.

Climate scientists typically use broad brush strokes when predicting rainfall patterns decades into the future, said Kaye Brubaker, a University of Maryland researcher who co-authored the report. Even with the aid of supercomputers, they can only pin down results to square-shaped blobs with boundary lines stretching more than 30 miles apart.

Brubaker and her team took just such information from the North American Regional Climate Change Assessment Program and used a statistical process called "downscaling" to make forecasts at a more-precise scale.

Jim Bass, of the Eastern Shore Land Conservancy's coastal resilience program, stands in the rain at the conservancy's office in Easton, MD. He said that the rural towns represented in a new Eastern Shore study face a bigger challenge, than most because their public works staffs and budgets are smaller than most of their counterparts. (Dave Harp)

"It's almost like zooming in onto an image," she said. "As you zoom out, you see very coarse pixels, and when you zoom in the pixels get finer and finer."

The study forecasts rainfall for the period between 2041 and 2070, assuming a scenario in which relatively little is done to combat global greenhouse gas emissions. For a 100-year storm — the sort with a 1% chance of occurring during any given year — the study foresees the following rainfall totals over a 24-hour period:

- Elkton: 9.3 inches (1.6 inches greater than the National Oceanic and Atmospheric Administration currently charts for such storms in that community)
- Denton: 9.9 inches (1.2 inches greater)
- Cambridge: 10.1 inches (1 inch greater)
- Easton: 10 inches (1 inch greater)
- Centreville: 9.2 inches (0.5-inch greater)

Brubaker said the labels used to describe storms can be misleading. A 100-year storm can strike more than once every 100 years; to say it only has a 1% chance of arising per year is better, but it's still possible for such ferocious storms to pop up once every few years or even within days of each other.

"It's like you're rolling a 100-sided die. Your probability of coming up with a 1 is one in 100. But there is a possibility that you could roll it two times in a row and a 1 would come up," Brubaker said.

Those labels, though, are critical for engineers trying to decide how high to build bridges and how wide to dig stormwater ponds. If the calculations for a newly constructed highway don't account for the shifting definition of a 100-year storm, it may be in danger of flooding more often in the future, Brubaker said.

"If the rain falls slowly, it can trickle off somewhere," she said. But "if the rain falls intensely very fast, where's it going to go? It's going to pile up in your pipes and on your street."

Another symptom of climate change — rising seas — could complicate things for local planners, Brubaker said. If coastal areas become inundated by higher tides, it will be more difficult for rainfall-driven flooding to drain away.

Brian Lightner, the zoning administrator for Cecil County in the state's northeast corner, said the new rainfall totals will help his department develop even more localized computer models, which he hopes to use to plan stormwater projects.

"Local governments are always thinking about where we can do stormwater retrofits," he said. "With our flood vulnerabilities being predicted, [we'll be] looking where we can try to do some restoration to reduce some of that impact."

Climate scientists generally agree that rainfall will continue increasing in the Chesapeake Bay region, but projections at the local level have only begun to trickle in. The Maryland Commission on Climate Change said in a 2008 report, for example, that winter rainfall amounts could increase up to 12% by 2090, but that information applied statewide.

A 2015 analysis compiled for the District of Columbia's Department of Energy and Environment looked at a variety of storm scenarios, finding greater intensity and frequency with each. For instance, it showed that the number of days per year with 1 inch of rainfall would increase from an average of 10 to 13 by the 2080s.

In Virginia Beach, a 2018 study suggested that 100-year storms would typically produce 13.3 inches of rainfall over the span of 24 hours by 2075, up from the historical average of 9.4 inches. Such results prompted the report's author, the Dewberry consulting firm, to recommend that the city increase rainfall intensities by 20% in its design calculations.

In its report, the Eastern Shore Land Conservancy lays out several policy recommendations of its own, emphasizing the use of "green infrastructure," such as rain gardens and wetlands, to absorb additional water.

It is the second climate change report produced by the organization in as many years. Its sea-level rise study last year estimated a 6-foot increase on the Shore, a swell that would put nearly 6,000 buildings at risk of becoming flooded.

Brubaker said that her use of a higher-emissions scenario was a feature of the study, not a fault. It is better to plan for a worse scenario and wind up with dry roads than to hope for the best and end up under water, she said.

"I think we all need to pay attention to what we're doing to the planet," she added. "This [analysis] is a hint of what global-scale change might be bringing to our neighborhood."

Lawsuits loom as states, CBF are fed up with PA TMDL shortfalls

≈ Litigation a 'last resort' to force EPA, state to put more action, funds into cleanup

By Karl Blankenship

A winter of discontent over Chesapeake Bay cleanup progress appears likely to turn into a spring of lawsuits, as states, environmental groups and the U.S. Environmental Protection Agency increasingly point fingers at one another.

At issue is whether the federal agency is doing enough to prod Pennsylvania, which is the largest source of water-fouling nutrient pollution to the Bay, to accelerate its efforts.

The Chesapeake Bay Foundation, the region's largest environmental group, announced in January that it and other groups would soon file a formal "notice of intent" to sue the EPA for failing to enforce the Clean Water Act. Such a filing is required as the first step to formally file a suit against the agency.

"For CBF, litigation is a last resort," said Jon Mueller, the foundation's vice president for litigation. "However, with Bay restoration and clean water for future generations at risk, we have no alternative due to EPA's failure to act. We must hold EPA accountable now if we are going to save the Bay."

Maryland Gov. Larry Hogan has also called for his state attorney general to initiate legal action against Pennsylvania and the EPA. Virginia Gov. Ralph Northam has said his state may take action, too.

Bass fishermen head back to the ramp at Conodoguinet Creek, across the Susquehanna River from Harrisburg. Pennsylvania submitted an updated cleanup plan in 2019 that fell 25% short of its pollution reduction goal for nitrogen and $324 million a year short in funding. (Dave Harp)

While Pennsylvania trails only Virginia in the amount of nitrogen it has controlled since the Bay "pollution diet," or Total Maximum Daily Load, was implemented in 2010, it remains far off-track for meeting 2025 cleanup goals. Because it contributes so many nutrients to the Bay, and its shortfall is so large, Pennsylvania's failure ensures the Chesapeake would not achieve water quality goals aimed at clearing its algae-filled waters and eliminating its oxygen-starved "dead zone."

Those concerns spiked after the state submitted an updated cleanup plan last summer that fell 25% short of its pollution reduction goal for nitrogen and $324 million a year short in funding.

An EPA review released in December acknowledged the shortfalls, but the agency declined to take any of the regulatory actions it had repeatedly threatened, such as ratcheting down on the discharges allowed by industries and wastewater plants.

At a meeting of senior state and federal environmental officials in late January, Cosmo Servidio, administrator of EPA Region III, which includes most of the Bay watershed, told state officials that, "we are fully committed to working with this partnership to meet the goals of 2025. Nothing has changed."

He noted that the EPA has taken actions against Pennsylvania, including the recent rerouting of $4 million of unspent money away from the state Department of Environmental Protection to other agencies and organizations that were better able to get projects implemented.

Servidio also said the EPA is committed to providing more money and technical assistance to help control runoff from the state. But, he said, the EPA would not discuss any other potential actions in public.

Maryland Environment Secretary Grumbles acknowledged the federal agency would want "some degree of confidentiality" when considering enforcement. But, he said, other states — which have invested huge sums to meet cleanup goals and committed more in the future — need assurance that the EPA will take tougher regulatory actions against Pennsylvania.

"The gist of it is really trying to get specificity and enforceability for an intervention," Grumbles said.

Some have hoped that the threat of litigation would spur Pennsylvania's legislature to provide more money, but Pat McDonnell, secretary of the state Department of Environmental Protection, said the threats of legal action could have the opposite impact.

"We have a number of legislators who have been very actively trying to work to get funding," he said. "This conversation has not been helpful."

Opposition to solar project near Gettysburg heats up

≈ Some say panels would hurt agro-tourism while others cite benefits for farmers and local environment

By Ad Crable

Pennsylvania, like other states in the Chesapeake Bay region, wants to combat climate change with more renewable energy. But, as happened with some recent solar proposals in Maryland and Virginia, going green has some people seeing red.

Such is the case near the Civil War mecca of Gettysburg, where a proposal to build Pennsylvania's largest solar project across nearly 1,000 acres of farmland has been met with detractors. The project would include 530 acres of swiveling solar panels — 275,000 of them, in 12-foot high arrays — on 18 farms.

An initial hearing on the proposed Brookview Solar Energy Center on Jan. 15 drew more than 300 people to a fire hall. A second hearing on Feb. 12 by Mount Joy Township's Board of Supervisors did not even finish the testimony or cross-examination of the applicant's first witness. Three more hearings are scheduled through March 25.

Part of the proposed project is in an agriculture conservation zone where solar projects are allowed. But some of it lies in a special mixed-use zone, bordering a highway where solar projects can be permitted with conditions attached. After the hearings, the board of supervisors will decide if that will happen.

A day before the first hearing, Mount Joy Township's advisory planning commission recommended rejecting the permit, citing its scope and scale.

The proposal from NextEra Energy Resources to build a solar energy site near Gettysburg, PA, has met with controversy. If built, the solar project would apparently be Pennsylvania's largest, eclipsing a 500-acre site that is scheduled to open this summer in Franklin County. The company opened this solar farm in South Carolina in fall 2019. (NextEra Energy Resources)

> *"I grew up in this area. Farmland should be kept farmland and for the animals, not solar,"*
>
> — Petition signer

NextEra Energy Resources, a Florida-based company that builds solar and wind energy projects, touts the $90 million project as a benign win-win for the environment and the community.

"The time is ripe for solar energy in our country and that is absolutely true in Pennsylvania as well," said Bryan Garner, a NextEra spokesman. "Solar energy makes a good neighbor."

But some people who live near the proposed project and elsewhere in Adams County have decried the solar farm, saying it will harm property values, ruin prime farmland, alter the flavor of open land surrounding Gettysburg National Military Park, which lies just 3 miles away, and deal economic blows to the area's agri-tourism industry.

"This is not the right project, the scope and scale for Mount Joy Township," said Nathan Wolf, an attorney representing about 20 landowners who live adjacent to the site. "You have a lot of very frightened people who don't know what to expect and are looking to their township to protect them."

The 18 farm families would be paid $16 million to lease their crop fields for up to 35 years. During that time, the noiseless, unlit (except for a substation), nontraffic-generating, odorless solar panels would quietly generate up to 75 megawatts of power. According to NextEra, that's enough to power 15,800 homes and delivers a pollution reduction equivalent to taking 26,000 cars off the road. Forest clearing would be "minimal," it said, but gave no figures. Native grasses would be planted below the solar panels.

Electricity would go into a regional power grid used by multiple states.

The project, if built, would apparently be Pennsylvania's largest, eclipsing a 500-acre site for a 150,000-panel, 70-megawatt solar farm that is scheduled to open this summer in adjacent Franklin County. Penn State University is buying the power that will be generated there.

The solar installations in the Brookview project would be screened by more than 20 miles of trees and vegetative buffers that would add wildlife habitat to the landscape, NextEra said.

The company also said it would pay up to $10 million in local taxes over the course of the project, and the township would not have to provide public water or other infrastructure services to support it.

And when the solar project comes to the end of its life, after about 25 years, all materials would be removed. Solar panels would be recycled, and farm soils would be restored to the crop-enhancing nutrient levels found at the beginning of the project.

The project application cited studies that suggest the solar project would not lower property values to the 114 adjoining homes or produce glare problems. Wolf takes issue with those studies because the research was done around solar farms in the Midwest.

> *"It's a tough time to be a farmer in America. Many farmers decide that dedicating all or some of their land to solar energy for a time is a great way to diversify to keep their farm going for the next generation."*
>
> — NextEra Energy Resource spokesperson

NextEra has made a $1,500 donation to a local food bank and promised to budget $300,000 over the course of the project for community needs.

The application included signatures from each of the farm families on form letters from NextEra stating that the project "will benefit our community greatly" and contribute to "Pennsylvania's clean energy future."

PennFuture, one of the state's largest environmental groups, endorsed the plan.

But some residents are adamantly opposed to it. One letter-writer to the local paper argued against "making an area rich in history and agriculture an industrial zone in one meeting."

Though the solar farm would be 3 miles from Gettysburg National Military Park, some say hundreds of acres of glass panels glinting in the sun is not a suitable frame for the famous historic site.

"Part of what draws visitors to the battlefield and other tourist destinations time and again is that bucolic traverse from all directions to reach the jewel of national battlefield parks that is Gettysburg," Britt Isenberg, an Adams County resident, said in a letter to the editor to the local newspaper.

"Now replace that visual aesthetic on the drive in with thousands of solar panels. The possible detrimental economic impact to history and agri-tourism needs to be fully explored, comprehended and documented."

Wolf added, "Tourism is such a driver of the local economy. Gettysburg is one of the most visited sites in the country. Will it have an impact on people who come to the area and spend money? Our proximity to the battlefield is not so far and we should look at those impacts."

A petition circulated by Responsible Solar Citizens of Mount Joy Township in an effort to stop the solar project has garnered 1,213 signatures. "I grew up in this area. Farmland should be kept farmland and for the animals, not solar," wrote one woman who signed the petition.

But NextEra's Garner maintains that the extra income local farmers would get actually strengthens the chances of ag land staying in production.

"It's a tough time to be a farmer in America," he said "Many farmers decide that dedicating all or some of their land to solar energy for a time is a great way to diversify to keep their farm going for the next generation."

Others said they couldn't support sacrificing farmland to an industrial-size solar project when the power produced would be used by customers in other states, not to generate less-polluting energy for the area. As part of the regional electricity grid, the power could be used anywhere among 13 states and the District of Columbia.

"Understandably, in today's environment, sharing resources is vital," Isenberg said. "But does the benefit outweigh the cost of permanently destroying hundreds of acres of pristine agricultural landscape?"

PA, fed up with chronic litter, organizes for new attack

≈ New report cites cost to environment, taxpayers

By Ad Crable

Just how big is Pennsylvania's littering problem?

At any given time, there are more than half a billion cigarette butts, plastic packaging from mostly fast-food restaurants, plastic bottles and sundry other items lying along the state's 124,000 miles of roads.

That's about 2,018 unwanted items for every mile of road, according to a first-ever statewide litter study released in February by two state agencies and the nonprofit group Keep Pennsylvania Beautiful.

The study concludes that litter in Pennsylvania is chronic and accelerating. It affects economic development, the environment and human health — and cleanups are costing taxpayers a lot of money.

After a "litter summit" attended by 124 people from state and local governments, citizens groups and industries, the state Department of Environmental Protection, Department of Transportation and Keep Pennsylvania Beautiful announced they would use the data to launch a new statewide plan to combat litter.

Volunteers pick up litter along a Pennsylvania street. (Keep Pennsylvania Beautiful)

"Pennsylvania has a littering problem that cleanup efforts alone can't solve," said DEP Secretary Patrick McDonnell in a press release. "Litter undercuts our quality of life and the health of our waters and soil. It shortchanges community improvements and economic development as funds that could otherwise be spent more productively instead go to trash cleanup."

The study found that 37% of all pieces of litter were the filters of cigarette butts, about 186 million of them at any given time. Most cigarette butts are made up of cellulose acetate, a plastic that can take a decade or more to decompose.

Plastic film is the next most ubiquitous form of litter, most of that from food packaging and plastic beverage containers. On a typical day, more than 40 million beverage containers and fast-food products line Pennsylvania roadways of all types.

To demonstrate the cost to taxpayers, the study looked at how nine cities in the state deal with litter.

Lancaster, Allentown, Altoona, Reading, Philadelphia, Erie, Harrisburg, Pittsburgh and Scranton collectively spend nearly $69 million annually on litter and illegal dumping cleanups, street sweeping, unclogging grates, extra trash and recycling receptacles, anti-littering education and enforcement.

Approximately 80% of that money is spent on cleanups, rather than prevention.

That money could be used for more useful community projects, the study noted. For example, the $14 million PennDOT annually spends cleaning up trash from roadsides is money that could be used to improve roads and bridges.

The study recommends increased public outreach, more funding for cleanups and litter awareness, better enforcement of litter laws and more accessible trash receptacles and disposal sites.

Shannon Reiter, president of Keep Pennsylvania Beautiful, agrees with that plan. The group has been fighting litter since 1990, organizing nearly 80,000 community cleanups in which nearly 2.5 million volunteers have removed 141 million pounds of trash.

Ultimately, she thinks society needs to move away from its throwaway economy. "It's a disposable society, and we need to get by that," she said.

But in the meantime, she wants people to see littering as the harmful act it is and have receptacles in plain sight.

"We need to be outraged that we're spending millions and millions of dollars cleaning up litter and illegal dumping."

Ultimately, she thinks the solution is society moving away from its throwaway economy. "It's a disposable society, and we need to get by that," she said.

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have surmounted a Trump administration roadblock, it still faces several critical obstacles.

Traffic on the 3.5-mile bridge and its two parallel tunnels is notoriously bad. Backups around Hampton on the north shore and Norfolk on the south can stretch up to 6 miles during commuting periods. Summer's peak season brings more than 100,000 vehicles across it per day.

The state's strategy to alleviate the bottleneck at the existing two tunnels largely rests on digging a third beneath the river. The finished subterranean highway will grow from four to eight lanes.

The bird flap centers on about 5 acres of dredge spoil constructed in 1957 as the southern landing spot for the tunnel portion of the crossing.

Where it wasn't paved, the piece of land known as South Island was covered in sand. Jetty stones ring the perimeter. And, from the 1980s to last year, it was alive with thousands of adult birds and their nests from April to August.

None of the South Island species are listed as federally endangered or threatened, although one of the inhabitants, the gull-billed tern, is considered threatened at the state level. Because of their status as migratory birds, though, they are protected under one of the earliest environmental laws in the country: the Migratory Bird Treaty Act of 1918.

Congress passed the law at a time when the biggest threat to the birds was ladies' hats. The plume trade has long since diminished, but new threats have emerged. Today, ornithologists say, migratory birds face a deadly mixture of pressures, including an expanding population of animal predators as well as habitat loss to development and sea level rise.

Scientists estimate that Virginia's seabird population has plummeted 36% since the early 1990s. Certain species, including black skimmers and common terns, have seen declines of more than 50%.

A colony of royal terns once found nesting grounds on this sandy spit in the Chesapeake Bay, which is now dominated by pelicans. Terns lay eggs in open sandy or gravelly areas and need a landscape free from raccoons, foxes and other predators. In Virginia, an island built from dredged sediment had become their last stronghold until it was paved in preparation to expand the Hampton Roads Bridge Tunnel. (Dave Harp/2004)

Seabirds once nested across coastal Virginia. But as their habitat dwindled elsewhere, the flock continued to grow at South Island. In recent years, it had become their last "stronghold" in the state, said Sarah Karpanty, a Virginia Tech bird researcher who has studied the colony.

To be successful, a seabird colony requires a ready supply of fish for feeding, sandy or gravelly terrain for nesting and a landscape free from raccoons, foxes and other predators.

"South Island has all those things," Karpanty said.

To complete the third tunnel, though, engineers say they needed to develop the rest of the island.

In 2017, VDOT commissioned Karpanty and her colleagues to analyze the colony and evaluate nearby alternative nesting sites that could be transformed into South Island's replacement. State officials knew it would probably be a costly commitment to save the birds; other states have paid nearly $10 million to create islands for preservation purposes.

At the beginning, the bridge project's leadership made it clear that their motivation wasn't driven by sheer altruism but by the mandates of the migratory bird act.

"We cannot take the position that the agreed upon conservation measures (or mitigation) are 'voluntary,'" an official in VDOT environmental office implored in an email to colleagues in September 2017 as the South Island bird plan was taking shape.

But soon, the state would have to do just that if it was going to preserve the colony at all.

The migratory bird law makes it illegal to kill any migratory bird or destroy its nest. Such intentional bird deaths, though, are rare. Far more are wiped out unintentionally by oil spills, wind turbines and other industrial activities. For decades, one administration after another interpreted such "incidental takes" as criminal violations of the law unless they were allowed by a permit.

In December 2017, the Interior Department's legal counsel decriminalized that category of bird deaths, declaring that its application "hangs the sword of Damocles over a host of otherwise lawful and productive actions."

Within months, the U.S. Fish and Wildlife Service, the agency charged with enforcing the act, notified VDOT officials that any "continued conservation efforts" for migratory birds on their part would be "purely voluntary."

The new federal interpretation hamstrung the state by removing "some of our ability to force certain behaviors and took our ability to fund those in some circumstances," said Josh Saks, deputy secretary of Natural Resources. Without a federal mandate hanging over their heads — like a certain sword — state officials found their hands tied when it came to spending money for habitat construction.

It appears that the state shelved any large-scale conservation efforts after receiving that all-clear. But after a December 2019 *New York Times*

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article highlighted the about-face in southeastern Virginia, Northam's administration emerged two months later with its own proposal.

"This plan demonstrates that infrastructure and development can and must be compatible with wildlife conservation," Northam said. "It also shows that Virginia is stepping up when federal policies change environmental protections."

Environmental groups lauded the state for going forward with the conservation work, even though it was no longer federally required.

"We're very pleased to see the [state] administration taking leadership and taking care of what is in many ways an external threat" from Washington, said Christy Everett, the Hampton Roads regional director for the Chesapeake Bay Foundation.

For his part, Mike Parr, president of the American Bird Conservancy, said that he is relieved that state officials have had an apparent change of heart.

"They came up with a lot of things in a fairly tight timeline on this," he said. "There may be a slight loss [in bird numbers] in the short term, but they're taking steps they can take."

Still, if the challenges that loomed during the earlier round of planning are any indication, those steps may not be easy.

The Virginia Tech report recommended expanding South Island or creating a standalone island for birds. The state is pursuing that idea again, according to the governor's office.

But the National Oceanic and Atmospheric Administration quashed the state's previous island-making plans in their infancy. The federal agency is charged with protecting "essential fish habitat." NOAA argued that filling in nearly 7 acres of the river's bottom adjacent to South Island, as the state had proposed, may not be necessary when other options on existing dry land might be available.

The state will likely need to find acceptable trade-offs to overcome the quandary, Saks said.

"Obviously, if we're going to build an island, there are a lot of equities we'll need to balance," he noted.

When it became apparent that creating new land wasn't feasible because of concerns over the loss of fish habitat, the state considered transforming a small peninsula called Willoughby Spit into bird habitat. VDOT had bought a portion of the spit as a staging area for the construction project.

VDOT asked Fish and Wildlife early that year to give its opinion on the site, calling it "the most biologically effective option." But before federal biologists could respond, VDOT called off the plan over new concerns raised by the Navy.

The new location was 1.5 miles closer to Naval Station Norfolk. The birds could become a flight hazard for passing jets and helicopters, the Navy said.

"You have an aircraft flying at a high rate of speed. An impact with even a small bird can lead to significant damage to an aircraft," the Navy's Steve Jones said in an interview. "Life comes first."

After moving on from Willoughby Spit, VDOT advised Fish and Wildlife that all other land options "were fully evaluated and vetted" but ultimately "eliminated from further review." That list included Fort Wool, a peninsula connected to South Island by a strand of jetty stones, but was rejected because the presence of a decommissioned military building on the site was likely to repel certain birds.

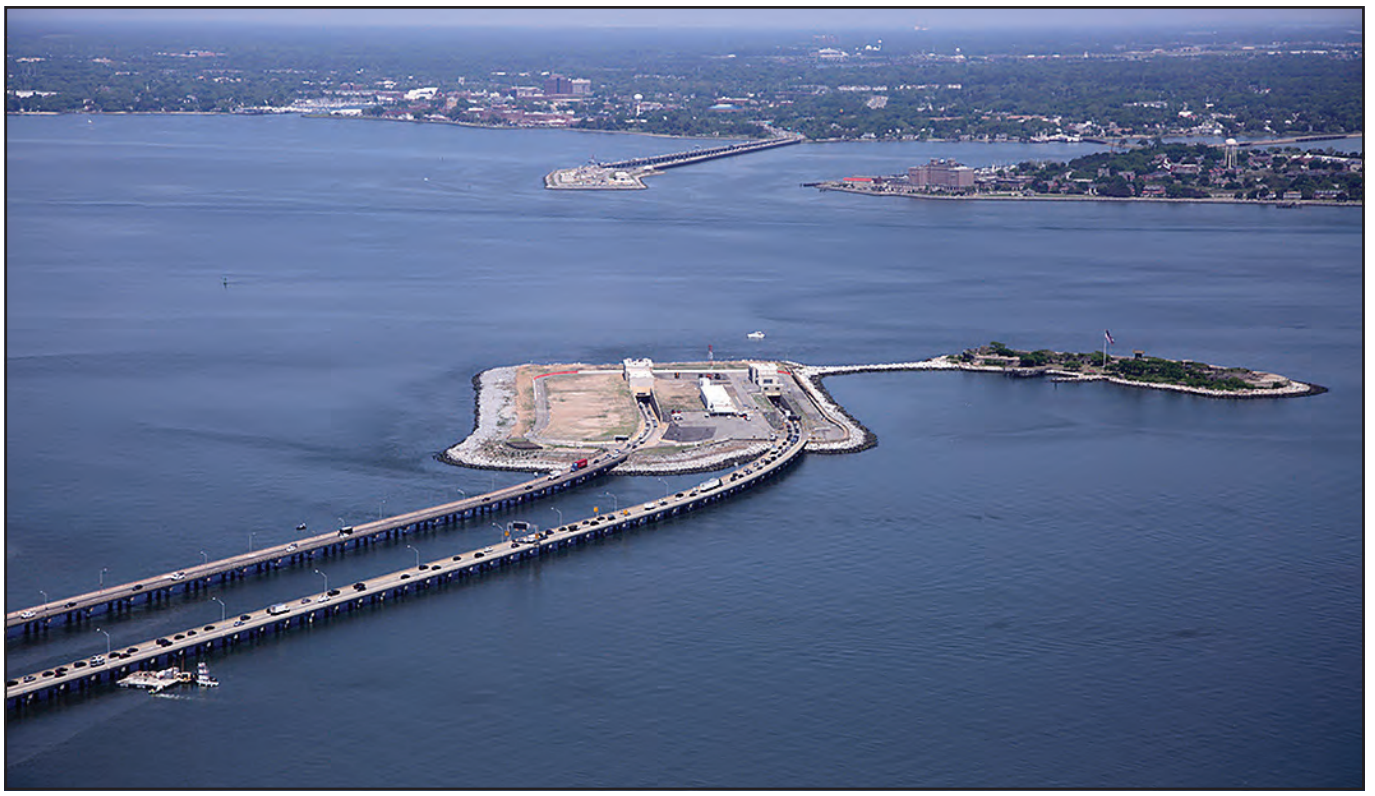
But that small piece of land is now being developed into a short-term nesting ground for the colony. Although her report dismissed Fort Wool as a permanent home for the birds, Karpanty said she supports the plan in combination with the other proposed measures, such as the barges.

When it comes to preserving the colony, she added, "all efforts should be made."

In January, the Trump administration moved to solidify the migratory bird opinion into a regulation, making it more difficult for future administrations to undo.

Virginia leaders, meanwhile, are moving in a different direction.In his February announcement, Northam said that the Department of Game and Inland Fisheries has begun developing a state-level "incidental take" regulation for the birds.

A draft of the state rule is expected to be released in coming weeks.



Aerial view high above the Interstate 64 Hampton Roads Bridge Tunnel shows in the middle South Island and, connected by a jetty, Fort Wool to the right. (Virginia Department of Transportation)

MD's consensus-based oyster management off to rocky start

≈ Initial meeting turns into debate over more proposed changes

By Timothy B. Wheeler

Lewis Carter culls oysters he tonged from Maryland's Broad Creek in 2013. The state's new oyster management law aims to create policies by building greater consensus between watermen and environmentalists. (Dave Harp)

Sen. Sarah Elfreth, D-Anne Arundel County, one of the new oyster management law's chief sponsors, said "a new approach was needed" with oysters languishing at historic lows and chronic conflict between environmentalists and watermen. (Dave Harp)

With an override of a veto by Gov. Larry Hogan, Maryland lawmakers in January ordered a fresh, consensus-based approach to the state's fractious management of oysters.

But the new approach looked a lot like the old one when the reconstituted Oyster Advisory Commission of the Department of Natural Resources convened in early February.

The panel, expanded to 28 members, had been called together to discuss how it would proceed under the new law. But the meeting, in a classroom at Anne Arundel Community College, quickly veered off into an argument between watermen and environmentalists over more changes in oyster management that lawmakers are considering.

"They're not even giving the [commission] they created a chance to work," said Kent County Commissioner Ron Fithian, a former waterman. "We haven't even had one full meeting yet."

The new law is the latest round in a years-long tug of war between the Hogan administration and legislators over oyster management. It directs the DNR to work with scientists, mediators and an expanded roster of stakeholders to seek agreement where little has existed to date on how to increase the abundance and sustainability of the Chesapeake Bay's keystone species.

Hogan had complained that lawmakers were making an "end run" on his administration's efforts to forge "thoughtful and science-based" oyster management policies. He noted it would block the DNR from acting on a rare agreement reached in 2018 between watermen and environmentalists over tweaking oyster management in the Choptank River and its tributaries.

But environmentalists contended that the administration has favored watermen's interests, particularly in seeking to open the state's extensive oyster sanctuaries to harvest. They also argued that the DNR was not moving forcefully enough to end the overfishing found in a 2018 scientific assessment.

Sen. Sarah Elfreth, D-Anne Arundel County, one of the law's chief sponsors, said "a new approach was needed" with oysters languishing at historic lows and the chronic conflict between environmentalists and watermen.

The law requires the DNR to expand and reorganize its Oyster Advisory Commission, with nearly 60% of the members from the seafood industry. Some of the new commission members are veterans of the old panel, but many are new.

The DNR is directed to work with the panel and the University of Maryland Center for Environmental Science to come up with a set of "consensus" recommendations for increasing oyster abundance while achieving a sustainable harvest. To bridge the rift between watermen and environmentalists, the plan would have to be approved by 75% of the members.

The legislature ordered the DNR commission to submit a final report of its recommendations by July 1, 2021, with interim progress reports along the way.

The Feb. 10 meeting of the Oyster Advisory Commission started calmly, with James McKitrick, the DNR's legislative director, explaining the new law.

> *"There is zero trust coming out of this room"*
>
> — Robert Newberry
> Delmarva Fisheries Association

But then Robert T. Brown, a commission member and president of the Maryland Watermen's Association, pointed out that other legislation had been introduced to limit the number of oystering licenses the DNR could issue.

"This undermines everything that we'd be trying to do," Brown complained. He called for a vote to ask the bill's sponsor, Sen. Paul Pinsky, D-Prince George's County, to withdraw it so the commission could consider whether that or other oyster management changes are needed.

Commission member Allison Colden, a fisheries scientist with the Chesapeake Bay Foundation, countered that the panel should also consider asking for another bill to be withdrawn that would open some sanctuaries for the removal and replanting of any juvenile oysters spawned in them.

Jeff Harrison, a commission member who is president of the Talbot Watermen's Association, also pointed out that recreational anglers and environmentalists are pushing a bill to bar the state from dredging any old oyster shells from Man O' War Shoals, a moribund reef at the mouth of the Patapsco River. The old DNR advisory commission debated that issue repeatedly, with watermen insisting oysters need shells to grow on and conservationists opposing the disturbance of the reef.

Harrison said he thought the purpose of the new oyster management law was "about building trust" between watermen and environmentalists. "We're not starting off on the right foot," he said.

Though not mentioned, yet another bill has been introduced that would tweak the new oyster management law. It revises the dates by which the commission must file its reports and removes a provision allowing it to meet behind closed doors.

Environmentalists on the commission said the panel wasn't set up to comment on legislation, but rather to advise the secretary of natural resources. Others pointed out that the new group hadn't even established ground rules yet for how it would operate or take votes.

"To start off like this is a mistake," said David Sikorski, executive director of the Coastal Conservation Association Maryland, which represents conservation-minded sports anglers.

Chris Judy, the DNR's shellfish program director, said that although it was "just not organizationally possible to vote" at that time, he pointed out that DNR Secretary Jeannie Haddaway-Riccio and other DNR officials were there and had heard their concerns about the legislation. "Consider DNR well-informed and notified," he said.

With the meeting's final minutes opened to comments from the audience, Robert Newberry, head of the Delmarva Fisheries Association, a watermen's group, complained about the way in which he contended oyster management has been politicized.

"We always had a smidgen, or a glimmer or a little flicker of light, of hope," he said. "With this group here ... we ain't got nothing."

With legislation pending that would affect the industry and the commission unable or unwilling to ask that it be shelved, Newberry said, "there is zero trust coming out of this room."

Quinn Fowler, one of two mediators hired by the DNR to try to guide the group to consensus, acknowledged the frustration expressed by some commission members. She pledged to bring a set of proposed operating procedures to the next scheduled meeting March 9 for the commission's approval.

"We will continue the path forward," she vowed. "Trust us, because we do know what we're doing."

After that, Keith Busick, a Baltimore County waterman and a newcomer to the commission, asked: "If we're not doing anything, why are we here?"

With that, the meeting ended after barely an hour.

Striped bass fishing cuts leave Chesapeake anglers fuming

≈ Critics question the effectiveness of MD plan for ending overfishing

By Timothy B. Wheeler

Anglers in the Chesapeake Bay and its tributaries will be limited to landing just one striped bass a day under new rules approved in February by East Coast fishery managers.

The only exception is in Maryland, where state officials plan to let those who can afford to pay for charter fishing trips bring home two of the highly prized rockfish, as they are known in the Bay. That's upsetting to a lot of anglers, who complain it's not fair.

But that's not the only controversy over Maryland's plan to stem the slide of the East Coast's most popular finfish. The state has shortened but not closed its spring "trophy season," when anglers can go after the biggest of the species, even though those happen to be the most productive spawners. It's also planning to crack down on anglers who "target" rockfish for catch-and-release during times when it's illegal to keep them.

On Feb. 4, the Atlantic States Marine Fisheries Commission, which regulates fishing for migratory species in near-shore waters, authorized a patchwork of catch restrictions to be imposed along the coast and in the Bay aimed at halting a troubling decline in the species. They did so only after a lengthy and at-times querulous debate about the efficacy and fairness of states' varied rules.

Maryland's proposed catch restrictions came in for particular scrutiny from critics who questioned the science behind the proposal and whether it would actually meet the commission's requirements.

The catch curbs come a year after scientists warned that the Atlantic striped bass population was overfished, with the number of spawning age females at a worrisome low.

In response, the commission last fall called for an 18% reduction in the coastwide catch of striped bass, as well as in their deaths after being caught and released. Fish returned to the water because they are too small to legally keep or are caught out of season often die anyway. In fact, scientists estimate that in 2017, more died coastwide after being released than were kept.

The panel proposed that all anglers be limited to catching one fish a day. It also set uniform size limits for keeping fish caught along the Atlantic coast and in the Bay, a major spawning and nursery ground for the species.

States were permitted, however, to deviate from those cutbacks, as long as their rules reduced overall fish losses by the same amount.

The new harvest limits for Atlantic striped bass come a year after scientists warned that the population was overfished, with the number of spawning age females at a worrisome low. (Dave Harp)

Most of the states from Maine to North Carolina took advantage of that "conservation equivalency" provision, submitting dozens of varied options for regulating recreational fishing in their waters.

Fishery managers in Maryland and Virginia proposed curtailing the recreational catch more than the commercial harvest, even though the commission had called for both sectors to be cut back by equal proportions.

In Maryland and in the Potomac River, regulators proposed shaving the commercial harvest by only 1.8%, while aiming for a recreational catch 20.6 % below 2017 levels. The Virginia Marine Resources Commission, meanwhile, acted last year to reduce the commercial catch in the Bay by nearly 8%, while going for a 24% overall reduction in recreational losses in both the ocean and the Bay.

Michael Luisi, the Maryland Department of Natural Resource's director of fishery monitoring and assessment, defended requiring a greater reduction from anglers than watermen. About 90% of the striped bass mortality coastwide occurs in the recreational fishery, he noted.

Now, because the commercial harvest was cut 20.5% five years ago and has remained well below its mandated quota, ratcheting down the catch limit by just 1.8% in Maryland would actually allow for a slight increase in landings by the state's watermen. That bothers some anglers, but many more seem upset with how recreational fishing is being curtailed.

Under the DNR plan, Maryland's trophy season remains in place, though it will be delayed to May 1 and shortened. There would be a roughly two-week closure in late August when no striped bass may be kept, and the fall season would close for the year five days early in December.

Anglers also will be forbidden to "target" striped bass for catch-and-release during the late summer closure and throughout April, just before the trophy season starts on May 1.

The interstate commissions technical experts questioned the enforceability of Maryland's plan to ban catch-and-release at certain times of year. But Luisi pointed out that the state has had a no-targeting rule for years in part of the Bay and has cited anglers for violating it.

Others question allowing the trophy season to continue targeting large spawning striped bass, and the preferential treatment given to charter fishing parties.

David Sikorski, executive director of the Coastal Conservation Association Maryland, complained that the DNR, by allowing charter fishing clients to keep more fish than private anglers, "pits portions of the recreational fishery against each other."

Virginia, in comparison, eliminated its spring trophy season for striped bass last year shortly after the scientists' warning came out. The state commission also adopted recreational rules last summer limiting all anglers, including charter customers, to one fish per day year-round, down from two before.

Sikorski questioned the overall adequacy of the DNR plan, particularly its proposal to close the fishery for two weeks in late August, rather than for a longer period in July, when the DNR's own data show fish are more likely to die even if released.

"You've got to close during the time you're killing the most to have the most positive conservation impact," Sikorski said.

He also complained that it doesn't really help the striped bass population by outlawing catch-and-release fishing in April, when better conditions mean that few fish die after being returned to the water.

The DNR's Luisi acknowledged there's little release mortality in April, but he said officials wanted to minimize disruption of striped bass on their way up the Bay to spawn.

At the same time, he defended not completely shutting down the state's spring trophy season. That's the only opportunity Maryland anglers have to catch the really large fish that leave the Bay after spawning and can be caught the rest of the year up and down the coast, he explained.

Lastly, DNR officials decided to help out the state's 600 licensed charter captains after they complained "very aggressively," Luisi said, that they'd be put out of business if forced to limit their clients to one striped bass a day. Charter customers pay hundreds of dollars each for half- or full-day fishing trips, and many captains warned that no one would do that if they are only able to bring home one fish.

"The one fish [limit], it would have been a death sentence for us," said Ken Jeffries, acting president of the Maryland Charter Boat Association.

The Maryland DNR has already set the rules for the spring season, which runs until May 16. But the DNR is about to begin taking comments on its plan for summer and fall. Luisi said officials will weigh the feedback it gets when deciding whether to go ahead as proposed or shift a few things around, including the summertime closure.

"The private anglers are upset, and I understand why they are," he said. "If we just went to one fish for everyone, we would have no summertime closures, no adjustments needed. But that's probably not the right thing to do either."

DC reveals plan to clean up toxic sediment in the Anacostia

≈ 12 locations targeted for capping, dredging and monitoring.

By Whitney Pipkin

After eight years of investigating what lies beneath the water's surface, the District of Columbia now has a plan for treating and removing "hot spots" of toxic contamination from the Anacostia River. The effort is one of several under way to make the river running through suburban Maryland and the nation's capital a safe place to swim and fish in coming years.

The District's "early action" plan calls for a combination of capping, dredging and monitoring contaminated sediment at nearly a dozen locations along a highly urban and historically industrial 9-mile stretch of the river.

Decades of activity along the Anacostia's shores have left a suite of toxic chemicals accumulating in the river bottom. Efforts to reduce the amount of pollution entering the waterway — including a $2.7 billion project to curtail the city's sewage overflows — can only go so far if sediment continues to leach pollutants into the water and to wildlife.

People are mainly exposed to these contaminants by wading or swimming in the river or fishing and eating contaminated fish tissue. It is currently illegal to swim in District waters except during special events. Anglers are advised to limit their consumption of locally caught fish, especially bottom feeders from some portions of the river. But a 2013 report found that many residents consume significant amounts of fish caught in the Anacostia. Fish, aquatic insects and other wildlife are also impacted by the chemicals in the river's sediment, which can become resuspended in the water when the bottom is stirred up.

That's why, in 2012, the District began investigating the possibility of removing, capping and otherwise treating the pollutants that are there. The information that underlies the plan came from around 4,000 samples looking for the presence of toxins in sediment, surface water and living organisms taken between 2015 and 2018, said Richard Jackson, a senior deputy director at the District Department of Energy and Environment.

Based on those studies, the department's proposed plan maps out 11 priority areas in the river's main stem, as well as Kingman Lake and Washington Channel, where sediments containing toxic contaminants will be removed, capped or treated with activated carbon.

"We have a large elephant," Jackson explained at a public meeting in January, "and the way you eat elephants is one bite at a time. So we've broken this work up into sections."

Signs warn anglers on the Anacostia River to limit their consumption of locally caught fish, especially bottom-feeders from some portions of the river. Many residents eat what they catch anyway. The District hopes cleaning up the river sediment will make the fish safe to eat. (Dave Harp, 2013)

These priority areas contain the highest concentration levels of polychlorinated biphenyls (PCBs), now-banned chemicals once widely used as coolants or insulators in electrical equipment, that are now associated with cancer and other health effects. Other toxics of concern found in the sediment include polycyclic aromatic hydrocarbons (PAHs), dioxins and pesticides.

Agencies involved in what will likely be a years-long cleanup effort will monitor how water quality and fish health respond to determine whether more action is needed. The plan predicts the work in these hot spots will yield a 90% reduction in people's risk of exposure to PCBs from eating contaminated fish.

"The idea here is that if we clean up the most contaminated areas, the presumption is you're reducing the overall risk," said Dev Murali, remedial project manager with the District.

The work laid out in the plan, which is subject to public comment, is estimated to cost about $30 million. The District is funding the first steps of the sediment cleanup and will seek to recover costs from companies and federal agencies that contributed to the pollution.

Many of the advocacy groups that have been keeping close tabs on the cleanup effort had not yet waded through the plan enough to comment on its details.

The DC Appleseed Center for Law and Justice received a grant to comb through the District's plan for remediating sediment and to provide comments on behalf of several groups. In letters to the DOEE during the comment period, DC Appleseed representatives expressed concern over some vague aspects of the cleanup timeline and asked the agency to further explain its methodology for determining cleanup standards.

"There's so much modeling and so many assumptions being made at different steps. I need to sit down with the feasibility study longer," said Trey Sherard, interim Anacostia Riverkeeper, at a public meeting in January.

Sherard also sits on community groups that have been overseeing the beginnings of land-based cleanups at industrial sites along Anacostia's shores. About a dozen such sites along the river are the subject of their own environmental cleanups based on historical contamination of groundwater or river sediment. These include the Washington Gas Light Company's former coal-gasification plant and the Washington Navy Yard, located on either side of the 11th Street Bridge, a demolished Pepco plant on Benning Road and federal sites like the Bureau of Engraving and Printing.

Tommy Wells, director of the DOEE, said at a meeting that the proposed plan "does not trump" the actions going on at those other sites but is "intended to harmonize with those other efforts."

The DOEE said it will issue by September an interim record of decision regarding how the work will proceed. The agency plans to hire contractors to begin the work sometime this year.

The most intensive work would take place in the river's main stem, where a combination of dredging and capping in a half-dozen areas — totaling 44 acres — would reduce the impact of contaminated sediment. That effort would require federal authority to reduce the depth of the river's main channel to make dredging and capping more feasible. At the meeting, DOEE officials responding to questions from recreational boaters about how the depth would be impacted assured them that it would still be sufficient for the river's current uses.

In Kingman Lake, where the water is much shallower and flows at a slower pace, the plan calls for applying activated carbon to about 6 acres of contaminated sediment. The process, called "enhanced monitored natural recovery," should reduce pollutants in the sediment while avoiding the need for removal.

"The way I look at it, the river is naturally healing itself and has gotten better since we started this process," the DOEE's Jackson said. "The key is, how do we help it heal itself?"

In the Washington Channel, the plan calls for capping contaminated sediment in areas totaling 28 acres. The DOEE's Murali said at the meeting that a cap placed decades ago in another part of the river has weathered the elements well, adding that the department is confident the cap design would "do its job."

The work will not take place all at once, leaving the majority of the waterway open at any time to regular access. The cleanup would begin in Kingman Lake, where construction is more easily staged away from more populous areas.

When asked how the Anacostia's cleanup compares with similar efforts in other industrial or urban rivers — such as the Elizabeth River in Virginia or the Hudson River in New York — Wells said his department has looked to those projects for inspiration. An ongoing cleanup effort in an 8-mile stretch of New Jersey's Passaic River, for example, has a lot of parallels to the Anacostia, he said.

"We have used [those river cleanups] as best we can as models in trying to understand how to set standards," Wells said. "What should the standard be in an urban setting? What's the expectation of speed in a cleanup? And then, each area has its own particular challenges."

Find documents related to the Anacostia River Sediment Project at anacostiasedimentproject.com/library.

In-river pool idea floated to encourage swimming in Anacostia

≈ Protected section could help public to reclaim river and adjacent shore for recreation

By Whitney Pipkin

An idea to make the Anacostia River swimmable — by putting a pool in it — is far from dead in the water. But that doesn't mean residents will be diving in right away, either.

A 78-page feasibility study, completed by the consultant SmithGroup in 2018, demonstrated the in-river pool concept could be a fit for a number of locations along the nearly 9-mile stretch of the Anacostia in the District of Columbia, where government workers and river advocates first started huddling over the idea a few years ago. A protected swim area in the river could be set off by floating docks or enclosed with a lined bottom to protect swimmers from sediment and detritus.

In Copenhagen, Zurich and Paris, in-river pools have cropped up as a way of reclaiming long-polluted waterways for recreation. Typically, a protected section of river is opened when the water quality is safe for swimming. Adjacent amenities, such as boardwalks or beach areas can be added. New York, Boston, Melbourne and London also have proposed in-river pools in recent years, some of which would use filtration methods to further clean the water.

In the Anacostia, the main goal would be to access the river's increasingly improved water while protecting swimmers from the still-contaminated sediment. Regular monitoring in the Anacostia shows that water quality already meets safe swimming standards on some days. But at present, it is not legal to swim in District waterways except during special events.

The city also has spent millions of dollars to curtail polluted sewage, stormwater overflows and litter, all toward a goal of making the Anacostia fully fishable and swimmable by 2032. The Anacostia Watershed Society gave the river its first passing grade in 2018 and would like to see the waterway made swimmable a few years earlier, by 2025.

This 'bath' in Copenhagen, Denmark, is an example of what a river pool in the Anacostia River might look like. (Merrill St. Leger, SmithGroup)

The designs of some river pools incorporate floating walkways, like this one in Copenhagen, Denmark. Others have beach areas or boardwalks as adjacent amenities. (Merrill St. Leger, SmithGroup)

"We're getting there with water quality, so it's time to start thinking about the future and envisioning what we want for it," said Erin Garnaas-Holmes, an ambassador for the Anacostia Watershed Urban Waters Partnership at the Clean Water Fund.

Garnaas-Holmes worked on a similar pool concept in Boston's Charles River as an urban designer and planner until 2017. When he arrived in the District to join the now-defunct Anacostia Waterfront Trust, he kept the concept in his back pocket.

Gretchen Mikeska, Anacostia coordinator for the District Department of Energy and Environment, also was interested in the idea, and the two asked the SmithGroup, a consulting firm whose local branch has interests in the Anacostia waterfront, to donate a feasibility study. After several months, the firm found that, yes, such a pool is possible and could take several forms.

For Garnaas-Holmes, having a pool in the Anacostia River — not next to it or nearby — is as important as it is symbolic.

"The idea is that we've invested a lot in cleaning up our river and, because of that, we get to jump in," he said. "River swimming is different than pool swimming because it's a natural waterbody, just like summer camp on a lake is different than swimming at a rec center."

Being able to swim in the Anacostia River is also an environmental justice issue, advocates say. Included in the feasibility report is the story of Dennis Chestnut, a longtime river advocate who learned to swim in the Anacostia while growing up in the District during an era of segregated pools in the 1950s and '60s.

The quality of life for residents who live near the river "is directly impacted by the condition of the natural environment," he said in the report, and having it accessible to all people opens up new recreational opportunities.

In a survey conducted by the District in 2019, 92% of respondents said they would swim in the Anacostia River if it were made safe and accessible.

Concepts initially floated for an Anacostia pool include surrounding a swimming area with floating docks, creating a boardwalk-like border around a wading or swimming area on the shore or building a portable pool perimeter that could pop up in different parts of the river. A living shoreline that helps filter water in a pool along the shore is also an option being considered for one of the nine river locations detailed in the feasibility study.

Mikeska, who is active in the District's effort to clean up toxic sediment in the river, thinks there could be synergy between that cleanup effort and the pool concept. The cleanup will likely involve dredging at several locations in the river, which is shallow in places, and the pool probably would, too.

One of the strongest contenders for a location is near Kingman Lake, where a local events organization could be interested in running with the concept. The feasibility report doesn't specifically address the pool's potential cost, which would vary based on scope and location, but Garnaas-Holmes said it could cost a few million dollars to make the project a reality.

"My goal is to bring this to fruition," Garnaas-Holmes said. The pool "is something I feel very attached to and have carried with me, so I hope we can continue moving it forward one way or another."

See renderings and the feasibility study at AnacostiaRiverPool.com.

Small PA communities say no to stormwater mandate

≈ Municipalities say they are being asked to do more than is required – and well beyond what they can afford to pay for

BY AD CRABLE

This is the way the 4,000 residents in the small borough of Greencastle, PA, figure it: They occupy a mere 1.6 square miles. They have a state-of-the-art sewage plant. There are no farms in the town. Almost all of the housing developments have rain-catching basins. A street sweeper cleanses streets frequently.

They say they are not sending a lot of polluted stormwater into the lone small stream that runs through town, later joining the Potomac River and, ultimately, the Chesapeake Bay. The stream, Moss Spring, trickles less than a mile through the town, and half of it moves underground through protected pipes.

Yet, as part of the Bay cleanup effort, they have been ordered by the state to cut 94,000 pounds of sediment from area streams by 2023 to make up for the town's contribution to stormwater runoff.

"Ninety-four thousand pounds," scoffed Lorraine Hohl, Greencastle's manager. "We would be sinking if it was that amount of sediment."

Town officials estimate it would cost nearly $2 million to accomplish the reductions, and the municipal budget would soar by 90%.

Already, angry officials say, they are spending more on stormwater controls than police and other public services. Churches, schools, the Little League, residents, seniors and people on fixed incomes — even a homeowner with a shed on the lawn — are facing significant stormwater fees based on impervious surfaces. And most of that, they say, is going to engineering consultants and attorneys.

The state and federal government's stormwater requirements on nearly 1,000 municipalities in Pennsylvania are an unfunded mandate that simply is not sustainable, they say.

So, they're not going to do it.

On Nov. 20, after their request to meet with state officials to discuss a more "common sense" approach fell on deaf ears, officials from Greencastle and surrounding Antrim Township pulled the plug on their work.

At a joint public meeting, officials agreed to suspend paying for engineering and bidding work on a planned joint $2.3 million stormwater project until state environmental officials, as well as Gov. Tom Wolf, answer questions. They also urged the six other townships and boroughs in Franklin County to join the mini revolt.

Greencastle suspended its collection of stormwater fees, and Antrim Township delayed its planned fee collection.

"We don't like to waste money," said Brad Graham, Antrim Township administrator. The township must reduce sediment by 245,000 pounds. It had requested a waiver from the state, but it was denied.

Lorraine Hohl, manager for the borough of Greencastle, PA, stands along Moss Spring, the town's lone stream. Local officials are fighting a state stormwater program that requires them to reduce sediment pollution to the stream by 94,000 pounds. They estimate it would cost nearly $2 million and cause the municipal budget to soar by 90%. (Ad Crable)

Graham said the decision to stop work on the stormwater project wasn't made flippantly, and officials realize they could be found in noncompliance.

Seeking better solutions

The requirements are part of a state permitting process that applies to some towns and cities that discharge stormwater runoff into local streams and rivers. The MS4 permits — for municipal separate storm sewer systems — regulate the discharges and can set conditions that jurisdictions must meet to help protect water quality from pollution.

"We're not saying we're not contributing. We want to do the right things. We just need to have a reality check and make sure it's done on a firm scientific basis," said Steve Miller, president of Greencastle Borough Council. "Right now, I see a plan based on hope."

Some state legislators are cheering their stance.

"I applaud them for that," said state Rep. Dan Moul, who derisively refers to MS4 as a "rain tax. This is one of the most flawed regulations that [PA Department of Environmental Protection] has ever put forward. I have no desire to see communities piss their money away like that, and that's what they are doing."

"I thought it was a very reasonable thing for those municipalities to do," added state Rep. Paul Schemel, whose district includes Greencastle and Antrim Township. "It's appropriate for municipalities who are forced to implement this to hit the pause button so we can catch up and make sure we are not doing more than is required."

State Sen. Doug Mastriano said bluntly, "I tell them to resist. It's a bunch of baloney. Impervious surface is not included in the Clean Water Act. It was added in Harrisburg by bureaucrats. And I say no, this is out of line."

Added James Wheeler of the Pennsylvania Association of Township Supervisors, "We're not encouraging resistance, but it is happening. It may be what's needed to bring attention to EPA that they are being a little hard-headed. We have to back off, and let's come up with another solution."

Outcries against one of the nation's toughest stormwater regulations are not just over busted budgets.

There is widespread suspicion about the computer modeling that is used to estimate the amount of sediment and nutrient pollution generated by different parts of the Bay watershed. In the case of stormwater runoff from developed areas, the model uses satellite views of impervious surface, soil conditions, landscape features and estimates of annual rainfall. They do not include before-and-after sampling of water quality from local streams and rivers.

Also, officials feel they are being forced to underwrite a costly conservation initiative that will, in the end, not significantly help Pennsylvania meet its huge nutrient-reduction pollution commitments made under the Chesapeake Bay cleanup agreement.

And many believe that Pennsylvania is forcing municipalities to do more than is actually required under federal law.

The MS4 initiative under the federal Clean Water Act has applied to cities in Bay drainage states since 1997 and to smaller municipalities since 2003. Any municipality with an "urban area" with separate storm sewer systems has to comply.

A costly problem

When rain and snowmelt flow over asphalt, roofs, parking lots, roads and other hard surfaces, it whisks trash, dirt, oil, pet waste, lawn fertilizer and other pollutants into local waterways, degrading water quality and eroding banks. In addition, runoff from farm fields and lawns carries nutrients, one of the biggest problems affecting the Bay.

Housing developments and suburbs have made stormwater a significant source of pollution in some rivers and in the Chesapeake Bay. Stormwater is the only source of Bay pollutants that is still on the rise, according to the state-federal Bay Program partnership.

Far from the days when stormwater control meant shunting it to the nearest ditch, communities with systems that manage stormwater and sewage separately must reduce the overall amount of stormwater runoff and improve its quality.

Each must manage stormwater in new developments, have public education about stormwater, detect and eliminate illicit discharges, control runoff from construction sites and prevent runoff from municipal operations.

But in 2018, after a settlement with a state environmental group, and under pressure from the U.S. Environmental Protection Agency, Pennsylvania added a Chesapeake Bay Pollution Reduction Plan that, for the first time, required municipalities to reduce a specific amount of sediment.

DEP said the new permits would better clean up local streams and help the state gain ground in its large shortfall to reduce nutrients flowing into the Bay.

Municipalities now have to calculate their sediment loads, then reduce discharges by 10% over five years. Popular measures include stream restorations

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that repair eroding banks and restore floodplains as well as retrofits for old flood control ponds to make the water infiltrate into the ground.

But, even if achieved, those reductions will only result in a 1% decrease in the state's nitrogen goal, according to the Pennsylvania State Association of Township Supervisors.

"What I'm afraid of is we are spending billions of dollars to treat a small part of the problem," said state Sen. Gene Yaw, who is one of Pennsylvania's representatives on the Chesapeake Bay Commission, a body of legislators from across the Bay region.

DEP acknowledges that MS4 requirements won't resolve the state's considerable nutrient runoff problem. But, said DEP spokeswoman Elizabeth Rementer, "The principal reason for the MS4 program is to address local water quality improvements."

That means 962 communities in the Bay drainage area of Pennsylvania will have to spend an estimated $74 million annually to reach the 10% reduction. The supervisors association warned that it would bankrupt communities and shut down economic growth. DEP said the average cost per municipality is $683,585.

To date, 92 municipalities without urbanized areas have been granted waivers to the regulations. Others, such as Antrim Township, have been denied.

Frustration & concerns

The two upstart Pennsylvania communities have been the squeaky wheel for a while.

In September, the state Senate Environmental Committee came to Antrim Township to hold a public hearing on statewide MS4 complaints. The hearing filled a church.

Local business owners, residents, officials and legislators criticized the program nearly nonstop for more than three hours, pressing two DEP representatives for answers and change.

Brad Graham, administrator of Antrim Township, PA, looks over a stream that the township and adjacent town of Greencastle had eyed for restoration as part of state requirements to reduce sediment pollution from stormwater. The municipalities dropped the project to protest the requirements that officials say are too expensive, unjustified and not based on water quality sampling. (Ad Crable)

Using computer models to estimate sediment loadings rather than sampling the water quality in local streams was roundly attacked.

"Impaired waters are not in our municipality," said Sylvia House, zoning officer for Antrim Township. "We are using formulas and modeling software programs to give us assumed data. We cannot show progress if we do not know what our starting point is. We need to know what the value and quality of the water is with real analytical testing so we have a baseline to work with."

When an official from another county in Pennsylvania testified that they sampled a stream above and below a restoration site before beginning to document progress, Rep. Moul leaned into the microphone and said, "God, that makes common sense. Pass that on to the DEP guy in back. That's the way we should be doing it, to isolate the problem and attack the problem rather than just spending money throughout the state."

DEP defends sediment load computer modeling, saying isolated stream samples don't give a clear picture of a stream's health over time. Instead, approved models take into account the variability in water quality and downstream bank erosion from flooding. Instream monitoring is used to calibrate computer modeling, the agency said.

Greencastle, PA, population 4,000, occupies just 1.6 square miles, has a state-of-the-art sewage plant, no farms in the town and rain-catching basins for almost all of its housing developments. Residents say they are not sending a lot of polluted stormwater into the lone small stream that runs through town. (Ad Crable)

A Greencastle business owner talked about how an unexpected $18,000 stormwater fee rocked the company, not to mention the share levied on his home, another small business he owns and an anticipated hike in school taxes.

"I feel like I'm being quadrupledbit," lamented Brian Harbaugh, owner of Precision Manufacturing & Engineering Co. "I have no problem with saving the Bay. But what determined that a small borough like Greencastle should be classified as a MS4 district?

"Drive the back roads and see where the sediment comes from," added Harbaugh, referring to farmland.

Echoing the sentiment often expressed at the hearing, Harbaugh said, "I believe most townships and boroughs don't have the ability to decipher what is being asked of them. No instructions are passed to them from EPA or DEP on what to fix and how to fix it. They just pass this mandate down along the line and leave it to municipalities. Please ease the financial burden that you are creating."

Summed up Rep. Moul: "The common denominators that I've heard today are: too vague, too costly, no empirical data and calculations based on assumptions."

"There needs to be some kind of final decision on how much, how fast," said Wheeler supervisors association. "Our guys are saying it's too much, too fast."

In response to the criticisms, DEP's Ramez Ziadeh said the department was implementing a federal mandate from EPA. He said DEP has fought for and gained more flexibility from EPA, such as allowing larger MS4 projects and allowing them to be outside municipal boundaries.

But at another state committee hearing on MS4 problems in December in Franklin County, the barrage of criticism continued.

Mike Ross, president of the Franklin County Area Development Corp., warned legislators that the "extreme" stormwater regulations "could cause companies to relocate out of the area."

Schemel, who has met with regional EPA officials about the pushback and raised questions with DEP, said that he hopes the state will request an extension for implementing the tougher MS4 regulations "and set a time to work out the kinks and make these municipalities part of it."

Asked about the widespread criticism of the MS4 program, an EPA spokesman said the agency has met with local officials and legislators over the last two years "to address their concerns and clear up misunderstandings regarding stormwater fees.

"EPA helped DEP develop a Frequently Asked Questions document to answer questions by the regulated community and offered technical assistance as well as support to DEP to train inspectors and hold forums for the regulated community to understand permit obligations," said spokesman Chad Nitsch.

Because MS4 is an unfunded mandate, municipalities have had little help in financing projects other than forcing fees on property owners. Just before Christmas, Congress approved $24 million to be spent on grants to communities for stormwater control and other programs in states in the Chesapeake Bay region.

Some Pennsylvania municipalities have joined together to form regional municipal authorities to reduce costs. And increasingly, adjoining municipalities have undertaken joint stream restoration projects in shared watersheds. DEP has been encouraging both strategies.

State legislators said they have asked DEP and EPA to shut down the implementation of MS4 permitting until relief can be found for financial and implementation burdens.

But DEP says it won't. "DEP continues to listen to the concerns of legislators and their municipalities, but there is no plan to halt the requirements of the current permit," said spokeswoman Rementer. "Lessons learned from this permit term, however, will inform the next permit, which begins in 2023."

Thirst for protecting water supplies drives WV partnership

≈ Panhandle coalition using easements to conserve prime farm properties

By Jeremy Cox

Jan. 9, 2014, was a watershed day in West Virginia history.

That's when 10,000 gallons of chemicals used in processing coal spilled from a storage tank into the Elk River, the drinking water source for 300,000 residents in a nine-county region, including Charleston, the state's capital and largest city. The contamination forced the temporary closure of schools, businesses and the state's highest court.

Six years later, the spill and the uproar it caused have dissipated. But in a far corner of the state that was spared from the incident's effects, an environmental group is trying to make sure that what happened to the Elk River doesn't repeat itself elsewhere.

The West Virginia Rivers Coalition is testing an approach that involves protecting farms from converting to new roads, subdivisions and industrial parks. And, all of that work is taking place in the Eastern Panhandle, one of the fastest-growing parts of the state and the Chesapeake Bay region.

The group has brought together land trusts, local governments and conservation groups to identify prime parcels for conservation easements. A conservation easement is a voluntary agreement attached to the deed of a property. The easement limits certain kinds of activities or land use, with terms that vary depending on the landowner's goals. In some cases, governments and other organizations offer payments as an incentive for establishing an easement.

The West Virginia transactions would allow farmers to voluntarily sell the development rights to their land while retaining the property for growing crops, raising livestock and other agricultural uses.

Tanner Haid, the Rivers Coalition's local field coordinator, said he hopes that preserving farmland will ward off pollution emergencies like the 2014 incident and ensure that everyday stormwater runoff is safe for municipal water supplies.

"It shouldn't solely be on water utilities to make sure our water resources are clean and safe," he said.

But that is largely the case. Within weeks of the Elk River spill, state lawmakers passed a law requiring 125 public water systems that rely on surface waters — those most vulnerable to contamination — to overhaul their source water protection plans. Among other things, the new plans had to catalog potential contamination sources and draft response protocols in the event of future spills.

Fog begins to lift on a West Virginia farm where suburban sprawl is prohibited because its owners sold the development rights to the Berkeley County Farmland Protection Board. (Michael Whalton)

The law set a 2016 deadline for utilities to update their plans. The West Virginia Rivers Coalition, a group formed by outdoors enthusiasts three decades ago, didn't want the momentum to stop there.

In 2017, the coalition began turning the plans into action in select parts of the state. Most of its efforts have centered on Berkeley and Jefferson counties, which jut out from the state's eastern flank between Maryland to the north and Virginia to the south.

The westward march of the Baltimore and Washington, DC, metro area has transformed the Eastern Panhandle's cornfields into hot real estate, Haid said.

"That's where we're seeing the growth and development happening," he said. "That's where our land use is changing the fastest from agriculture and forest fields to roads, buildings, highways and other impervious surfaces."

Since 2010, Berkeley County has experienced the fastest population growth among the state's 55 counties, rising 12% to more than 117,000 residents, according to a *Bay Journal* analysis of U.S. Census Bureau data. Jefferson was the third-fastest growing, adding 6% to reach more than 56,000 residents.

The Eastern Panhandle's evolution from a sleepy farming outpost to a bustling suburb is even more profound when viewed at ground level.

Research conducted by the Cacapon Institute, a West Virginia-based conservation group, estimates that the three-state metro area that includes the Panhandle saw its development spread at a faster rate than anywhere in the Bay watershed from 2000–2010.

The region's developed area grew from 77 square miles to 133 square miles during that span, the report found. Because the metro's developed territory expanded at a higher rate than its population growth — 74% urban land expansion versus 52% more people — the result was urban sprawl.

'It's not only that you see this rapid development," said Mark Schiavone, executive director of the Berkeley County Farmland Protection Board. "It just sprawls."

The frequent earth-turning affects local water supplies, said Barbara Humes, a Harpers Ferry councilwoman and representative on the local water system's advisory panel. Sediment often clogs the machinery at the water treatment plant, creating a costly and time-consuming cleanup.

"We find at the water utility [that] what happens upstream has a definite impact on the downstream cleansing at the water works," Humes said. "You have to use more chemicals and manpower to keep the pumps operating and running smoothly."

As Haid and his colleagues saw it, the Panhandle would be a good laboratory for enhanced land conservation because it already had success in the field. In just less than 20 years, the state farmland protection boards in the two counties have spent $34 million to purchase more than 10,000 acres of easements from farmers. That adds up to about 7% of the farmland in the two counties.

It's a start, conservationists say, but much more land needs to be saved to benefit water resources.

The counties also have the advantage of being outside West Virginia's vast coal country. Properties that have severed mineral rights are disqualified from receiving federal cost-share payments for easements, making their acquisition far more difficult, Schiavone said.

What the Panhandle's land trusts and farmland protection boards lacked, though, was coordination with each other and the area's water suppliers, Haid said.

Fast forward to 2017, when the Rivers Coalition first assembled a network of Eastern Panhandle community partners. Dubbed the Safe Water Conservation Collaborative, the membership consists of more than 20 entities, including five of the area's six water utilities.

In 2019, the initiative received $30,000 from the Land Trust Alliance and Chesapeake Bay Funders Network. The funding is aimed at helping the collaborative compile an inventory of properties whose preservation is most critical for protecting drinking water. They also hope to develop a five-year action plan by the time the grant expires in April.

The collaborative doesn't have enough money to buy conservation easements itself. For now, the members are measuring progress by the number of conversations they have with landowners. But a possible early sign of success is that Berkeley's Farmland Protection Board has received 22 easement applications this year alone. Going back to its founding in 2001, the board had only acquired 55 easements.

Haid said he hopes that other entities will use the land inventory developed by the collaborative to guide their easement purchases.

The effort also includes contacting farm owners who have already sold easements about the best ways to maintain their properties for the protection of water sources.

Susan and Michael Whalton moved from Key West, FL, to a sprawling farm along the Back Creek about 20 years ago. They were looking for a rural paradise, and they found it, Susan Whalton said. Not long after, they agreed to put their 147-acre property under a conservation easement.

"For us, it was a desire to protect something we found so extraordinary," she said. "We just couldn't believe they would offer you money to purchase your easement and protect it forever. For us, it was you can really have your cake and eat it, too."

But she soon learned that not all of her neighbors shared that sentiment. They were uneasy about the government or anyone else having control of their land.

Whalton decided to become a member of the collaborative's education workgroup to help protect her modern-day Eden beyond her fence line. "We all are united by a watershed," she said.

Earn your stripes doing this rockfish quiz!

Striped bass or rockfish? Call 'em what you want, this fish is delish! Sink your teeth into this quiz. Answers are on page 33.

Striped Bass (Dave Harp)

1. Once striped bass reach adulthood, they are too large for most predators (humans are an exception) to prey on. Which of these prey on juvenile striped bass?
   A. Bluefish
   B. Dolphin
   C. Larger rockfish
   D. Osprey
   E. All of the above

2. When can you find striped bass in the Bay?
   A. Fall & Winter
   B. Spring
   C. Summer
   D. Year-round

3. The striped bass is the state fish of one Bay State and the state saltwater fish of two others. Which states are which?
   A. Delaware
   B. Maryland
   C. New York
   D. Virginia

4. More Atlantic striped bass spawn in the Chesapeake than anywhere else. What percentage of the fish's Atlantic population use the Bay as a nursery?
   A. 50–70%
   B. 65–85%
   C. 70–90%
   D. 75–95%

5. As a rule, adult striped bass are 2–3 feet long and weigh 10–30 pounds. The record for the Chesapeake was set in 1995 off Bloody Point in Maryland. How much did this fish weigh?
   A. 52.3 pounds
   B. 67.5 pounds
   C. 84.7 pounds
   D. 106.9 pounds

6. Weight and length vary widely among striped bass and are not reliable indicators of the fish's age. What is the best way to tell how old the fish is?
   A. Count the stripes on its sides, multiply by 3
   B. Count the rings on its scales
   C. Count its teeth
   D. Count the dorsal spines

7. Striped bass, as a rule, hunt prey from dusk to dawn, but head for deeper waters during the day. Why?
   A. They have learned to avoid boat motors.
   B. They follow their prey, which also seek deeper water in the day.

   C. They have no eyelids and must avoid the sun's glare.
   D. They get sunburned in shallow water or water near the surface.

8. Striped bass get their name from the dark stripes running along its side. How many stripes do they have?
   A. 6–7
   B. 7–8
   C. 8–9
   D. 9–10

9. Female striped bass can spawn more than once in a season. The older the fish, the more eggs she lays. How many eggs can an older female lay?
   A. 1.5 million
   B. 2 million
   C. 2.5 million
   D. 3 million

10. Striped bass eat all of the fish listed below. Which one is their primary prey along the coast?
   A. Atlantic menhaden
   B. Eels
   C. Herring
   C. Mummichogs

11. Striped bass often ambush their prey. Why?
   A. They don't swim very fast.
   B. They like being sneaky.
   C. Turbulence makes prey taste better.
   D. Scientists aren't sure.

12. Which of these are a threat to striped bass in the Bay?
   A. Lack of habitat & prey
   B. Disease
   C. Hypoxia & pollution
   D. All of the above

— Kathleen A. Gaskell

Bay Buddies
Anadromous!

Striped bass live most of the year in the ocean, but migrate to freshwater to spawn. The word used to describe these fish is anadromous. Other anadromous species found in the Chesapeake region include the alewife, American shad and Atlantic sturgeon. Can you match these fish with their descriptions? Answers are on page 33.

1. This fish has been around for more than 120 million years – when dinosaurs roamed the Earth. It can grow more than 14 feet long and weigh more than 800 pounds, making it the largest fish native to the Chesapeake. One of the amazing things about this fish is its ability to leap totally out of the water. Early settlers regarded this fish a navigational hazard because they sometimes landed on a boat, occasionally injuring or killing a person in it. This fish may stick around in the river it was born in for as long as six years, not to return to spawn until it matures 15 years (female) or 20 years (male) later. When this happens, every three to five years, the female will lay approximately 2 million eggs or more.

2. The species part of this fish's scientific name is *sapidissima*, which means "most delicious." At least 8,000 years ago, the appearance of serviceberry flowers alerted Chesapeake's native people that this fish's spring spawning run was near. This led to another name for the serviceberry: shadbush. George Washington's fishery operation on the Potomac River captured more than 11,000 of these species in 1772. In 1789, a new community at Otsego Lake at Cooperstown, NY, was saved from near starvation when an early spawning run by this fish and/or its cousin, the river herring, swam up 444 miles to their settlement at the river's headwaters.

3. Theis thin fish with a chubby belly shares its name with a 15th-century plump tavernkeeper. This fish is silvery with a grayish green back except when it spawns. At that time, it can become darker or lighter to blend in with the bed of the river where it spawns.

4. The Chesapeake's anadromous fish populations are near historic lows. This is due to:
   A. The construction of dams, which prevent them from reaching spawning habitat
   B. Overfishing
   C. Pollution
   D. All of the above

5. Fish that live in freshwater but must return to the ocean to spawn are catadromous. North America's only catadromous species is found in the Bay watershed. It is the…
   A. American eel
   B. Cownose ray
   C. Oyster toadfish
   D. Yellow perch

— Kathleen A. Gaskell

WETLANDS FROM PAGE 1

wetlands and streams.

"Not all waters end at state borders," said Roger Adams, a top wetlands official with the Pennsylvania Department of Environmental Protection. The federal regulation had served as a "common denominator" that standardized the level of protection for interstate waters, he said. Now, he added, "There could be more disparity between us and our neighbors."

Under the change, protections remain in place for the Chesapeake Bay, the permanent streams that feed into it and the wetlands bordering those waters. But it strips away protections for wetlands visibly cut off from navigable waterways, as well as "ephemeral" streams, which are dry most of the time and only get their water from rainfall or snowmelt.

The rulemaking reversed an Obama era rule that clearly included those water bodies under federal authority.

The federal government's retrenchment comes as the Chesapeake Bay's cleanup struggles to reach its 2025 cleanup goals and wetland restoration targets. Wetlands play a critical role in filtering nutrients, which have triggered oxygen-starved "dead zones" for decades.

According to various estimates, the region has lost half of its wetlands since colonial times. The state-federal Bay Program has sought to increase wetland acreage to both help clean the Bay and provide crucial habitat for species that depend on them. Since 2010, though, the program has only created or restored about 9,000 acres of wetlands, far short of its goal of 85,000 new acres by 2025.

"That number holds only assuming we don't lose a whole bunch of wetlands," said Amy Jacobs, formerly the lead scientist of Delaware's wetlands assessment program. "Now that we're at risk of losing wetlands, it will only make our job harder."

Spencer Rowe, a wetlands consultant based near Ocean City, MD, says the rule change gives states the opportunity to enact stronger controls on their own. (Jeremy Cox)

Feds, deer disagree on definition

It doesn't look like much, but the shallow grassy swale skirting Terraset Elementary School in suburban Reston, VA, marks one of the headwaters of Snakeden Branch, which empties into a tributary of the Potomac River.

The furrow in the ground gradually deepens as it wends its way downhill through a patch of woods. Though it is clear that it has carried water at some point, judging from the sand and debris in the channel, it's bone-dry in late February. This is what scientists call an "ephemeral" stream.

"Every stream has these,'' said Steve Moyer, a nearby resident and vice president of government relations for Trout Unlimited, the conservation-minded anglers' group. "They're really not that remarkable. But collectively, they do a lot of good."

Nearly 80% of a river is typically made up of headwaters. Such off-and-on waterways drain more than 70% of the land area in a typical watershed. They also supply water to one-third of the U.S. population, according to 2009 information from the EPA.

Perhaps because it doesn't regularly carry water, the dry streambed Moyer walked down doesn't appear on Google Maps.

Still, he said, "we know they're here." So do browsing deer, which have left hoof prints in the sandy bed.

Biologists, ecologists and many other scientists warn that if those ephemeral streams and remote wetlands in the Bay watershed are damaged or destroyed, waters downstream will suffer.

"Generally, these waters are located in upland, headwater areas," said Marla Stelk, executive director of Association of State Wetland Managers. "So, those resources are critical for the benefits they provide in terms of water filtration and pulling out nutrients like nitrogen and phosphorus before they reach the downstream drinking water systems."

Legal questions

The Trump rule is expected to unleash a flurry of lawsuits once it's published in the *Federal Register* later this year. At the heart of the legal issue is how to define "Waters of the United States," the term employed by 1972's Clean Water Act to describe all water bodies falling under federal oversight.

In response to a series of conflicting court rulings, the Obama administration sought to clarify the WOTUS definition. Its rule, finalized in 2015, outraged farmers, home builders and energy companies who contended it overly expanded the reach of the federal government. The new administration rule would significantly narrow the scope of federal oversight.

A 2017 presentation by the EPA and Army Corps of Engineers, the two federal agencies that regulate waterways, suggested that 18% of streams and just more than half of the nation's wetlands would lose protection under the new rule. EPA leaders later walked back those estimates, saying that no accurate surveys exist that would quantify the scope.

It's unclear how many streams and acres of wetlands would lose federal protection in the Chesapeake Bay's 64,000-square-mile watershed.

Under the new interpretation, "the key is [the waterways] contribute surface water to a jurisdictional water during a typical year," the EPA's Mindy Eisenberg told listeners during a Feb. 13 webinar.

The agency's own scientific advisory panel declared that the new definition "neglects established science." Limiting protection to only certain surface waters ignores recent research showing how even remote wetlands and occasionally wet streams are connected to other water bodies through ground seepage, the panel said.

Farming interests and industry groups applauded the administration's move.

"As a whole, the agricultural industry was asking for some clarity," said Jamie Tiralla, a member of the Maryland Farm Bureau's board and a livestock farmer in Calvert County. "The new rule does make it clearer for us."

States are better at regulating at the local level, and Maryland's wetlands program is proof of that, she said, adding that "this is an opportunity for other states to step up and look to Maryland at what we can achieve."

Spencer Rowe, a wetlands consultant based near Ocean City, MD, said backers of the Obama era rule were asking too much of the Clean Water Act and its underlying constitutional authority. As the WOTUS definition kept expanding over the years, it became harder to legally justify protection of those newly added types of waters, he said.

"It needs to be based on a clear-eyed view of what's going on" to avoid further litigation, Rowe said, echoing one of the EPA's arguments for the change.

Abigail Jones, a lawyer with the environmental group PennFuture, said she and many others who supported the Obama administration's rule believe that the Trump administration has not clarified anything.

"They have not created a bright line rule on what is or what is not a water of the United States," Jones said. "A farmer cannot look [at his land] and know if that water running through his back field is ephemeral or intermittent. You're still going to need to pay attorneys and experts whether you're a farmer or a big developer or someone just looking at their backyard."

Watershed protections lifted

There is no reliable inventory of the kinds of streams and wetlands that would be dropped from federal protection, experts say.

The authoritative U.S. Geological Survey National Hydrography Dataset maps only 5.8 miles of ephemeral streams in the Bay watershed, said Kurt Fesenmyer, a scientist at Trout Unlimited.

But the conservation group did its own "back-of-the-envelope" estimate, finding 111,000 miles of ephemeral streams in the watershed. The group estimates that 47% of them would lose protection under the new rule.

The proposed Atlantic Coast Pipeline, for example, would cross 23 tributaries to the headwaters of Back Creek, a wild brook trout stream in the Blue Ridge Mountains of Virginia. Five ephemeral streams would be left without federal protection, the group says, although they deliver water downstream into Back Creek after rainstorms.

States step into the void

With the federal government pulling back from regulating certain wetlands and streams, their protection falls to the states.

Overall, officials in Virginia, Maryland and Pennsylvania say they have laws and regulatory programs that will still protect their states' waterways and wetlands. But in Delaware, West Virginia

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and New York, regulations range from less stringent to nonexistent.

Not to be overlooked: Wetlands on federal lands, which account for 7.8% of the Bay's watershed, could lose protection in states that don't have permitting authority over such properties, land use experts say.

Here's a look at how each Bay-region state is affected:

Delaware

Delaware is the only state in the mid-Atlantic without its own law to protect freshwater wetlands, so those losing federal oversight will be vulnerable to damage or loss.

Shawn Garvin, secretary of the Delaware Department of Natural Resources and Environmental Control, said his agency is considering reviving efforts to implement a state-level freshwater permitting program.

"We're considering if that's an effort we need to take another look at," Garvin said. "We often describe wetlands as nature's kidneys. It's how Mother Nature addresses water quality."

Marla Stelk, with the Association of State Wetland Managers, warned that Delaware is in danger of losing up to 20,000 acres of headwater protection under the new rule.

"The state is going to have to pick up the slack there," she said. "There's the potential those areas could be developed until Delaware steps up and gets its programs in place."

Delaware is part of the Delmarva Peninsula, which is home to a unique water feature known as a Delmarva bay. There are nearly 5,000 of these inland shallow depressions scattered across the tri-state region, and many stand to lose federal protection because they are fed by rainwater alone.

Amy Jacobs, the former Delaware state biologist, tromped into the sodden center of one of the largest Delmarva bays recently. The 10-acre property is owned by her employer, The Nature Conservancy's Maryland/DC chapter, but she said it represents what could be lost under the new rule: the chirp of chorus frogs, the deer footprints, the waving stalks of yellow-eyed grass and maidencane.

"I find it hard to believe there are any truly isolated wetlands," Jacobs said. "Our water systems between the surface water and the shallow groundwater are intimately connected."

An aerial shows one of the largest Delmarva bays, a unique feature to the peninsula that stands to lose federal protection because it lacks a surface connection to a "navigable" waterway. (Dave Harp)

Steve Moyer visits the ephemeral headwaters of Snakeden Branch near his home in Reston, VA. (Dave Harp)

Pennsylvania

Pennsylvania's Clean Streams Law covers all surface waters, even those that appear to be cut off from navigable waterways. It also protects groundwater, which the federal government didn't do, even before the new rule.

State and federal regulators regularly share information and cooperate in reviewing permit applications. So, practically speaking, there shouldn't be any hiccups in the protection of waterways in Pennsylvania, said Andy Klinger, chief of the Pennsylvania Department of Environmental Protection's wetlands encroachment and training division.

But federal regulation has also served as a backstop against states like Pennsylvania weakening their own laws and regulations, said Jones, the PennFuture attorney.

"We've seen bills recently that are trying to limit DEP's authority to review permits, to hamstring them," Jones said.

Virginia

Virginia's nontidal wetlands law, enacted in 2000, gives the state authority to regulate wetlands that lack a surface connection to navigable waterways. And ephemeral streams are covered as long as they flow often enough to create a high-water mark along their banks.

"The rollbacks of the federal position will not be evident here in Virginia," said Dave Davis, Virginia Department of Environmental Quality's wetlands program director.

Some environmentalists, though, worry whether the state will have the staff and resources to provide same level of protection.

Maryland

Maryland officials say they have laws and programs to protect the waters dropped from federal oversight.

A Maryland Department of the Environment analysis, though, contends it could lead to more nutrient pollution flowing into the Bay from the Susquehanna River from upstream states just by the change in defining what wetlands would be federally protected. The report estimated it would yield an additional 2.3 million pounds of nitrogen per year and up to an additional 57,000 pounds of phosphorus per year.

Over 20 years, that pollution could cost Maryland $1 billion to treat, said Ben Grumbles, Maryland's environment secretary.

Maryland officials also project that up to 36% of the Delaware wetlands that help reduce flooding and nutrient pollution in the Nanticoke River, which winds from Delaware through Maryland into the Bay, would be left unprotected.

The change also will pose "logistical challenges" and impose costs for the state because the state now reviews wetland and waterway permit applications jointly with the Corps of Engineers, Grumbles added.

West Virginia

A 2013 study by the Environmental Law Institute found that West Virginia law contains a broad definition of "waters of the state," so that regulators there can require permits or approvals on a case-by-case basis for disturbance or the discharge of pollutants.

But Jim McElfish, senior attorney with the institute, said that West Virginia has not been routinely requiring state permits for activities affecting those wetlands and headwater streams that now may fall outside the new federal rule.

"There is the need for the state to say, 'Yes, this time we'll require an application and a permit from someone because we think it may affect our waters,' and then to do so," McElfish said.

Terry Fletcher, acting communications director for the West Virginia Department of Environmental Protection, said that the agency "will develop a path forward" once the final rule is published in the *Federal Register*.

New York

New York only protects streams that are used for drinking water or designated clean enough for swimming. It regulates the disturbance of wetlands, but only those that are at least 12.4 acres in size — and only if they have been officially mapped.

Legislation moving through New York's legislature would expand the stream protection to cover those waters that support fisheries or are clean enough for boating or wading. That measure recently passed the State Assembly. It still needs the approval of the Senate, but passage is considered likely, said Maureen Cunningham, clean water director with Environmental Advocates of New York.

Bills have also been introduced in the state legislature that would greatly expand protection to all wetlands of at least one acre. But lawmakers have yet to act on those, Cunningham said.

In the meantime, Gov. Andrew Cuomo has proposed regulating all wetlands larger than 12.4 acres, not just those identified on outdated maps. That alone would protect an additional 1 million acres, according to the governor's office.

Virginia riverside trails a rhapsody of bluebells

Virginia bluebells bloom along the Stone Bridge at Manassas Battlefield Park in Northern Virginia. (Brian Gorsira / National Park Service)

By Leslie Middleton

At Bull Run Regional Park in Northern Virginia, the staff starts fielding questions in February. "When will the bluebells peak?" "What if I come next Thursday morning?"

It's impossible to predict that far out, said park manager Megan Schuster. But it's safe to say that sometime in the last week of March or the first two weeks of April, millions of bluebells *(Mertensia virginica)* will be coming into full bloom at the park and paint the floodplains of its streams a luminescent blue.

While the bluebells' deep purple leaves are pushing up through the warming soil, Schuster and her staff prepare, posting updates on the park's FaceBook page and on signs directing visitors through the Bluebell Trail loop along Bull Run.

When the bluebells peak, the people will come. And on a lovely April morning, so did I.

I headed toward the creek on a wooden boardwalk that weaves through the moist and messy wetlands, searching for the blanket of blue.

The bright spring light illuminated the furrows of ash and willow. The understory was a palette of pale pink dogwood flowers and tiny green maple leaves.

While the foliage had just begun to emerge, the delicate white blush of spring beauties *(Clayton virginica)* brightened the dark winter duff and tangle of brown leaves on the forest floor. Their blooms are among the earliest — and longest lasting — of the spring ephemerals. These native flowering plants race to grow, flower and reproduce before the sunlight is dappled, then shaded, by forest canopy.

The boardwalk gives way to a wide, hard-packed trail of river silt, where I traveled the path through the tangle of tree limbs left akimbo by floodwaters, long past and more recent. Here and there, I saw patches of blue flowers, but as the trail approached Bull Run, the clumps thickened into the blue fairyland I'd been expecting.

The water level in the river was low, weaving its way between coarse sandbars with small chutes rippling over coarse gravel.

Signs along the path urge visitors to stay on the trail but, like the river, the paths are braided, as though visitors might have wandered absently, intoxicated by the blue. But in truth, the repeated river flooding makes the task of designating and maintaining just one path nearly impossible.

Those winter and spring floods leave behind the layers of moist, rich silt that help the bluebells thrive.

I knelt for a close look at the inch-long, trumpet-shaped flowers, hanging in clusters from 1– to 2-foot stems that rise from small, oblong leaves. The blue flowers first emerge as pink buds, whose petals unfold and fuse into trumpet-shaped blooms that resemble little bells.

From a distance, the flowers appear sky-blue, but they actually range from pink to purple to indigo, darkening as they mature, and returning to pink once pollinated. The most common color of the mature flower, though, is blue.

Park manager Schuster said, "Part of the fun, for me, is to see how many different colors I can find."

Bumblebees, honeybees and butterflies feast on bluebells' fragrant blossoms, and the plant — whose stamen and pistil are spaced too far apart for self-fertilization— relies on these pollinating insects. Most common are the butterflies and butterfly moths that perch on the edges of the flowers while dipping deep into the funnel-shaped centers.

Bluebells, members of the borage plant family, propagate by small seeds that fall to the ground before the plant goes dormant in late May. Seed-spreading ants help with the final cultivation — but bluebells also spread via thick rhizomes that trap stream sediments.

The trail here forms a 2-mile loop. Here and there, the acres of blue flowers are interrupted by patches of other spring ephemerals — the cheerful yellow-blossoming trout lily and the white pendulous flowers of Dutchman's breeches.

I also spotted a mother and her son sitting on the stream bank in a dense stand of bluebells. I passed another

Mature Virginia bluebells are usually blue, but the color of the flowers ranges from pink to purple to indigo, darkening as they mature, and returning to pink once pollinated. (Leslie Middleton)

The spring peak of bluebells draws many visitors to Bull Run Regional Park and the nearby Manassas National Battlefield. (Leslie Middleton)

hiker, who nodded and murmured, "Pretty amazing." The beauty of the cloudless morning had merged with the acres of blue flowers and the timeless sense of spring.

The Bull Run–Occoquan Trail follows Bull Run and the Occoquan Reservoir downstream to Fountainhead Regional Park, and bluebells can be found all along this trail as it weaves through neighborhoods and smaller stream corridor parks that enjoy wide local use, local protection and habitat restoration efforts. Many of these trail sections are part of the Virginia Birding and Wildlife Trail system.

Keith Freeborn, an amateur photographer, lives between the Bull Run tributaries of Cub Run and Big Rocky Run in Centerville, VA. As a member of the Cub Run Stream Valley Volunteer Team, he's on the trail system multiple times a week, documenting the domestic lives of resident barred and great horned owls and capturing on film river otters, snakes and multiple bird species.

The volunteer team's FaceBook page is flush with Freeborn photos, which burst with activity in the early spring. Palm warblers, chipping sparrows and other early spring migrants show up just as the bluebells are starting to flower.

As the days become longer, wildlife activity changes. Goldfinches' drab winter plumage brightens and turtles emerge, basking photogenically above the water on sun-drenched logs.

"But when the bluebells start to peak, that becomes my priority for about a week, and that's what I focus on," Freeborn said. After one outing, he went home to inspect his shots and saw in one of his images a water snake, just inches from his hand, that he didn't see while taking the photo.

Just upstream from Bull Run Regional Park, the Manassas National Battlefield Park offers easy access to more floodplain trails — and bluebells. Some come to the park, just off Virginia Route 29, to recollect the first major battle of the Civil War in July 1861, when Confederate soldiers sent Union forces in chaotic retreat toward nearby Washington, DC, dashing Northern hopes for a quick victory over the South. Here, too, northern and southern forces met a second time in 1862. A temporary bridge over Bull Run was destroyed by Union forces once again in retreat. Today, the replica stone arch over Bull Run leads to a boardwalk through the floodplain full of flowering bluebells in season.

Bill and Jeanette Linkons have a clump of bluebells in their garden in Springfield, VA. "They usually bloom a bit before the ones here at Bull Run," Jeanette said, which is their clue that it's time for their yearly ritual of visiting the battlefield.

"We come mainly for the bluebells," Jeanette said. "And it's just so peaceful here."

Indeed, the former battlegrounds are peaceful and, at this time of year, reliably blue. The path winds upriver, bluebell clumps snugged next to tree carcasses stranded from another year's flood. Budding spicebush and redbud trees race the flowering dogwood to bloom. Across Bull Run, the floodplain is a phosphorescent sea of bluebells. Canadian geese honk their way upstream before settling in the shallows, as hikers slowly make their way upriver, heads pivoting up and down for close-ups of the flowers and wide views of the masses.

Forty-five minutes by car to the northeast, David Garcia, naturalist for the Northern Virginia Park System, climbs the ridge at Ball's Bluff Battlefield Regional Park. Stalking bluebells, he says, is "not always about hiking and covering a lot of ground," though plenty of folks along this section of the Potomac Heritage Trail may do just that, unaware of the magic unfolding at river's edge.

On the ridge overlooking Hutchinson Island, a sliver of land that slices the Potomac in two, Garcia comes for a whole different perspective. From his perch above the floodplains, he sees the bluebells below, but he's also at eye level with the treetops and the raptors soaring the updrafts from the river. This lends itself, he says, to some wonderful, quiet moments along a trail that is never very crowded. "I'm in no rush to go anywhere, I'm just captivated by the quiet and the sound of the wind and the river."

The leaves of Virginia bluebells turn yellow soon after the flowers have finished blooming and are gone by late June, so you'll need some advance planning and flexibility to witness the showy peak of these springtime blossoms.

Though the loss of wildlife species and their habitat can overtake one's sense of optimism for our natural world, visiting an extravagant expanse of bluebells offers a perfect antidote.

Resources

- Bull Run Regional Park: facebook.com/BullRunRegionalPark
- Bull Run-Occoquan Trail: novaparks.com/parks/bull-run-occoquan-trail
- Trail map at Manassas National Battlefield: nps.gov/mana/planyourvisit/maps.htm
- Ball's Bluff Battlefield Regional Park: novaparks.com/parks/balls-bluff-battlefield-regional-park

Virginia bluebells thrive in the floodplain of Bull Run, a tributary of the Occoquan River in Northern Virginia that flows into the Potomac River. (Leslie Middleton)

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Naturalist Nick Carter points out some of the insects that live in a rotting log to Finn Falk, 8, center and his 4-year-old cousin Cullen Bailine, during a hike on Wye Island, MD. (Dave Harp)

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An osprey returns to its nest on Raccoon Island in Maryland's Choptank River. Ospreys generally return from their southern wintering grounds to the Chesapeake Bay region in March. (Dave Harp)

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The water is on the wrong side of this canoe left upright at the James River Association's Turkey Island Creek landing in Virginia. (Dave Harp)

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Graves of former inhabitants of Holland Island in the Chesapeake Bay are askew after one of the last viable hackberry trees fell on them in late 2019. The once prosperous community on the island is long gone and the island, eaten away by persistent erosion, is overwashed during a high tide. (Dave Harp)

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Commentary • Letters • Perspectives

MD's proposed concessions to Exelon bad for Susquehanna, Bay

By Nick DiPasquale

Exelon is seeking to renew its license to operate Conowingo Dam on the Susquehanna River. With a 50-year license, the next chance to influence the terms of the license will be in 2070. (Dave Harp)

Ever since the federal license allowing it to operate the Conowingo Dam expired in 2014, Exelon Corp. has fought updated permit requirements that would better protect affected waterways and aquatic life for the next 50 years.

Initially, Maryland fought back against the utility that owns the hydroelectric dam. As the Chesapeake Bay cleanup plan entered its final phase, the state asked Exelon to contribute its share to reduce the 6 million additional pounds of nitrogen and 260,000 pounds of additional phosphorus and associated sediment estimated to come through the dam annually since its reservoir became filled and lost its trapping capacity.

But Maryland has now inexplicably conceded on critical clean water requirements, funding and legal assurances in a proposed settlement with Exelon. The state's local, state and federal representatives; conservation organizations; and affected communities upstream and downstream strenuously objected and voiced their concerns during the public comment period that ended Jan. 19.

This seriously flawed deal falls far short of protecting Maryland's waterways or providing Pennsylvania with the pollution-reduction help it needs. Probably of greatest concern for clean water legal experts is that, as part of this settlement, Maryland would waive its right under the federal Clean Water Act to require an enforceable water quality certification for the dam, forfeiting its power to ensure compliance with water quality standards. Such a certification is normally issued before the Federal Energy Regulatory Commission would approve a new multi-decade license to operate the dam.

The settlement also provides grossly insufficient funds to deal with the risks that the dam's operations pose to the Susquehanna River and Chesapeake Bay — primarily from moderate and large storms that will cause the 94-foot-high structure to allow nutrients, debris and millions of tons of sediment trapped behind it to flow into the Chesapeake.

The total settlement would require about $4 million per year from Exelon for environmental remediation, when vetted studies show that amount should be closer to $35 million a year. This includes a mere $500,000 for addressing the trapped sediment. Only $19 million of the $200 million settlement, or a paltry $380,000 annually, would go to forest buffers, agricultural cover crops, stormwater controls and other practices proven to reduce pollution. The water quality certification originally proposed by Maryland, and challenged by Exelon, would have required the company to provide $127 million a year for pollution controls.

In a "trust me" kind of handshake deal, the settlement includes non-binding statements of intent that the initiatives and actions under the agreement will actually be accomplished; there are no stipulated timelines for completion of the work.

It also denies the public any ability to ensure the settlement terms are fulfilled in a sufficient manner, leaving enforcement entirely up to Maryland. No other parties would have standing to hold the state or Exelon accountable.

Numerous organizations provided comments on the proposed settlement agreement. Bills have been introduced in both the Maryland Senate and House of Delegates that would prevent the state from waiving its authority to issue a water quality certification for this project.

With a 50-year license, the next chance we'll get to do right by the Susquehanna will be in 2070. How many of us will still be around? What shape will the Susquehanna's mussels or eels be in then? How healthy will the Susquehanna flats underwater grasses be? What about Maryland's oysters, crabs and the Chesapeake Bay's economy? How resilient will we be to the increasing climate change impacts we will be experiencing?

Exelon must do much more to reduce pollution from the Conowingo Dam. In addition to the other provisions in the proposed settlement, Exelon should provide at least $35 million per year for nutrient and sediment pollution control measures. This funding should be administered and managed by the independent third party recently selected by the state-federal Chesapeake Bay Program to write and implement a pollution control plan for the dam as part of the overall Bay cleanup effort. That third-party should be solely responsible for selecting the type and location of the pollution control practices implemented.

The settlement also should include a detailed schedule for accomplishing the activities and providing associated funding, as well as stipulated penalties for failure to perform. Finally, the agreement should include conservation and advocacy organizations as parties with full standing to enforce terms of the agreement.

The Susquehanna River is a public resource, and Exelon profits substantially from its use. This public resource should not be sold off to a private company for exclusive use without ensuring that the public, our environment and our economy are adequately protected.

The new 50-year license is our only insurance policy that the Conowingo Dam and Susquehanna will be healthy and productive for a long time to come. For the benefit of Maryland and Pennsylvania, for our children and future generations, we've got to get it right.

Nick DiPasquale is the former director of the U.S. Environmental Protection Agency's Chesapeake Bay Program Office.

Let Us Know

The Bay Journal welcomes letters pertaining to Chesapeake Bay issues. Letters should be no more than 400 words. Send letters to: Editor, Bay Journal, 619 Oakwood Drive, Seven Valleys, PA 17360-9395. E-mail letters to: bayjournal@earthlink.net

Letter writers should include a phone number where they can be reached. Longer commentaries should be arranged in advance with the editor. Call: 717-428-2819.

Views expressed are those of the writers and do not necessarily reflect those of the Bay Journal or Bay Journal Media.

Forum

Commentary • Letters • Perspectives

As Earth Day turns 50, it's time to recycle that initial enthusiasm

By Tom Horton

"We know that our high-technology society is handling our environment in a way that will be lethal for us. What we don't know — and had better make haste to test — is whether a high-technology society can achieve a safe, durable and improving relationship with its environment."

That statement haunts me, for it is timely — but written 50 years ago, in an extraordinary issue of *Fortune* magazine, a leading journal of American capitalism. *Fortune*'s February 1970 issue, just before the first Earth Day that April, recognized a "national movement bursting with energy, indignation and new members." Environmentalism.

We're 50 years out from Earth Day One now, and it's been 42 years since we began a study of Chesapeake Bay's systemic decline that led to today's way-unfinished business of restoring it.

I recommend finding that old *Fortune*. It's a chuckle to read the slick ads of the time: A full page, gorgeous sunset silhouetting a bathing beauty on a beach, with text, WE DIG JAMAICA. It's an ad for Anaconda Aluminum, bragging about expanding its Caribbean ore pits.

And a sweet union-buster ad from Virginia's government — "Working is a privilege. Not a backache. I've worked in Virginia ever since Anne and I got married, and I've never been involved in anything like a strike."

Also, the latest in fashion from *"McCalls, the Magazine for Desirable Women."*

But the issue's text, in article after article on the environment, is anything but dated, even after half a century:

The automobile is a "major menace" to the environment, from human health to suburban sprawl, to the quality of urban life. Public transit needs attention.

Coal burning is going to make us sorry and unhealthy. Taxing pollution is worth considering. Sewage treatment plants had better start removing nitrogen and phosphorus that are sliming our waterways with algae. Agricultural runoff of the same nutrients is a well-recognized spoiler of Midwest waterways.

Business leaders see a need for stronger federal leadership on pollution control. (The U.S. Environmental Protection Agency would soon be formed.) Pollution control was good for the economy if one looked beyond short-term profit.

Chesapeake Born

The issue featured side-by-side pro-environment statements from President Nixon and Edmund Muskie, who would author the powerful Clean Water Act of 1972 and run against Nixon. Nixon had been advised not to let Muskie "outgreen" him.

Nixon would soon appoint a blue-ribbon Commission on Population Growth and the American Future, which would conclude that the U.S. population might stabilize around 226 million, and that would be a good thing. (It is at 326 million and climbing toward half a billion, and apparently that is now a good thing.)

Coincidentally, plant geneticist Norman Borlaug in 1970 was awarded the Nobel Prize for the Green Revolution, which did a lot to feed the world's hungry.

Those who tout his achievement as proof we can "invent" our way out of crises forget the caution of his Nobel acceptance speech: Higher-yielding crops had bought some breathing room, but unless agencies working on feeding us began to work with those trying to control population, we would not be sustainable.

So you look back and you think, how did environmentalism not better deliver on such a promising beginning? How did we blow Chesapeake cleanup deadlines in 2000 and 2010 and quite likely in 2025?

There was a lot of pushback by a lot of powerful and monied interests, from the fossil fuel industry to agriculture (the latter was mostly exempted from clean water laws). A politics that was bipartisan on environment has bitterly split now.

President Trump, with his seemingly pathological need to repeal environmental protections, is the deserving bogeyman of the moment. But I'd be writing this column even with "President Hillary Clinton" in the White House.

And there have been plenty of successes. Nationally, the air and water are cleaner. Around the Chesapeake, sewage pollution plummeted even as the population doubled. Crabs and rockfish are managed sustainably, and close to 10 million acres of the 41-million-acre Bay watershed is protected.

Where we have succeeded, common ingredients include leadership, good science that translated into accountability, enforcement and adequate funding. Where these lagged — well, think oysters, shad, agriculture, Pennsylvania.

Some days, I'm tempted to say we have about the environment we deserve, the Bay we deserve, though that sounds harsh.

But we vastly favor cure over prevention, treating symptoms rather than dealing with root causes. *Fortune* in 1970 said pay more attention to the environmental impacts of new technologies and products before bringing them to market. Say it again, Sam.

Similarly, it is considered enough to focus on the impacts of people already on the planet while ignoring and even encouraging population growth.

Or is our problem rooted in capitalism itself? Looking back at the 1970s, the enthusiasm, the wide buy-in, the good economy, the passage of strong laws, you can understand why environmentalists believed they could get where they wanted by working within the system. Certainly, the editors of Fortune believed that devoutly.

I think capitalism as now practiced in the United States, with its powerful "endless growth" bias and our outgunned environmental regulators, will not likely produce a healthy Chesapeake. I also think environmentalists are in denial about how radical a shift is needed to co-exist durably, safely, "improvingly" with the rest of nature — and to embrace limits.

So we go on, endeavoring earnestly to return a Bay with 18 million citizens back to something like the water quality and abundance it enjoyed with 8 million people — even as we push toward 24 million.

In an essay some 40 years ago, called *Saving the Bay*, I wrote this: "Will we save the Bay? I know we will always be trying, but 'saving the bay' can become almost a state of grace, like tithing, allowing us to proceed comfortably with business as usual in the rest of our lives."

I guess you could do worse. I still hope we can do better.

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.

Forum
Commentary • Letters • Perspectives

It's time to account for menhaden's role in the ecosystem

By Chris Moore

There's no question Atlantic striped bass are in trouble. Stock assessments show the fish, known locally as rockfish, are being overfished, and East Coast states have agreed to implement measures by April 1 that will cut the coastwide harvest 18% this year.

We can take another step to help striped bass recover. Protect their food.

A small, oily fish called Atlantic menhaden is a key prey species for striped bass and many other top predators in the Chesapeake Bay ecosystem, including osprey and whales. Menhaden are prized by humans, too. They support one of the largest and oldest commercial fisheries in the United States, with more than 170,000 metric tons harvested each year for use in products like fish oil and animal feed or as bait.

Management of the menhaden fishery does not currently take into account its critical role as a food source for other species. We now have the data and scientific models to do better.

At its February meeting, the Atlantic States Marine Fisheries Commission, the interstate body that sets fishing limits and rules along the East Coast, heard the results of a three-year, peer-reviewed effort to develop what are known as ecological reference points for menhaden. Ecological reference points essentially reflect how changes in the menhaden population affect populations of the fish that eat it — including striped bass, bluefish, weakfish and spiny dogfish — based on scientific models.

In other words, instead of relying on a best guess, we can now quantitatively say how many menhaden are needed to feed and sustain our desired populations of striped bass, bluefish and so forth.

Of all the predators studied, striped bass were shown to be the most sensitive to changes in the menhaden population. Therefore, adopting ecological reference points that protect striped bass will also protect other predator species that rely less on menhaden, above. (Dave Harp)

My colleague, Allison Colden, who serves on ASMFC's Menhaden Management Board, introduced a motion at the February meeting to set ecological reference points for menhaden that would sustain the striped bass fishery. The board postponed a decision until it reconvenes in May.

When it does, it should adopt ecological reference points without delay. Doing so will not recover the striped bass population on its own, but it will make sure the rockfish out there have enough to eat.

And while there is still much more work ahead to develop a truly holistic ecosystem approach to management that accounts for the interactions of multiple predator and prey species — beyond striped bass and menhaden alone — this is a reasonable first step.

Striped bass, of all the predators studied, were shown to be the most sensitive to changes in the menhaden population. Therefore, adopting ecological reference points that protect striped bass will also protect other predator species that rely less on menhaden.

It is also important to note that adopting the new ecological reference points would not cause any changes in the current harvest quota for menhaden, though it would lower the threshold for overfishing.

Furthermore, ASMFC received more than 150,000 public comments on the current management plan for menhaden, which was approved in 2017. An overwhelming majority called for the use of ecological reference points to manage the fishery.

Adopting these reference points allows the commission to take action now to support the striped bass population, while it continues to work on bringing more species into the equation.

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

Letter to the Editor

Offshore wind turbines more beneficial than harmful

The proposal to develop an offshore wind energy project in the Atlantic Ocean off Ocean City could have significantly more benefits to the town of Ocean City than drawbacks.

At 17 miles offshore, the 30 wind turbines will barely be discernible from the beach, especially during warm summer months when moisture-saturated air substantially limits distance viewing. Of far greater concern for Ocean City are the long-term impacts of sea level rise.

With passions running high, it is important to take a broader and more balanced approach to this form of clean energy. The transition off fossil fuels is becoming increasingly urgent as sea level rise, driven by climate change, is already being felt by the resort, especially on its beleaguered bayside flank.

Already having risen nearly a foot through the 20th century in coastal Maryland, sea level is projected to rise 2.5–4 feet by the end of the century as temperatures continue to increase. Our actions now can mitigate the severity of that rise.

The National Audubon Society's recent report, *Survival by Degrees*, finds that two-thirds of America's birds are threatened with extinction from climate change, but offers reason for hope for 76% of these birds if we can limit global temperature increases to 2.7 F. Research shows that most coastal birds forage and migrate over waters much closer to shore than 17 miles. There will be some bird impacts from offshore turbines at this distance, but we must face the fact that a rapidly warming climate is a far greater threat — to birds and people.

Moreover, the prospect of significant blue– and white-collar jobs and a boon to the recreational fishery makes this ethical move forward even more appealing. Ocean City should be lauded for its opposition to offshore drilling but mindful that the fossil fuel industry has consistently spread disinformation campaigns against offshore wind power.

Visitors to Ocean City enjoy a high-quality beach experience combined with an intensely developed resort that offers the excitement of lively bars, restaurants, arcades, racy boardwalk T-shirt shops and high-rise hotels. While mostly invisible wind turbines will cause little variance to this blend of beach and bustle, they could ultimately extend the majesty of this wonderful town to future generations.

Kathy Phillips
Executive director
Assateague COASTKEEPER
Assateague Coastal Trust

David Curson
Director of bird conservation
Interim executive director
Audubon Maryland-DC

Forum

Commentary • Letters • Perspectives

Technology puts future of conservation in all of our hands

By Joel Dunn

Most of us are deeply concerned by the recent news of dramatic changes involving the Amazon rainforest, Greenland ice sheets, loss of bird species and massive population declines in bees. We wake up to headlines about massive fires in Australia and weather extremes.

Here in the Chesapeake Bay region, where we have seen good progress in our efforts to restore our ecosystem, we continue to face daunting issues like sea level rise, pollution, land use change and invasive species.

Fortunately, the future of the conservation movement and use of technology provides great hope that we can address these issues and save the planet.

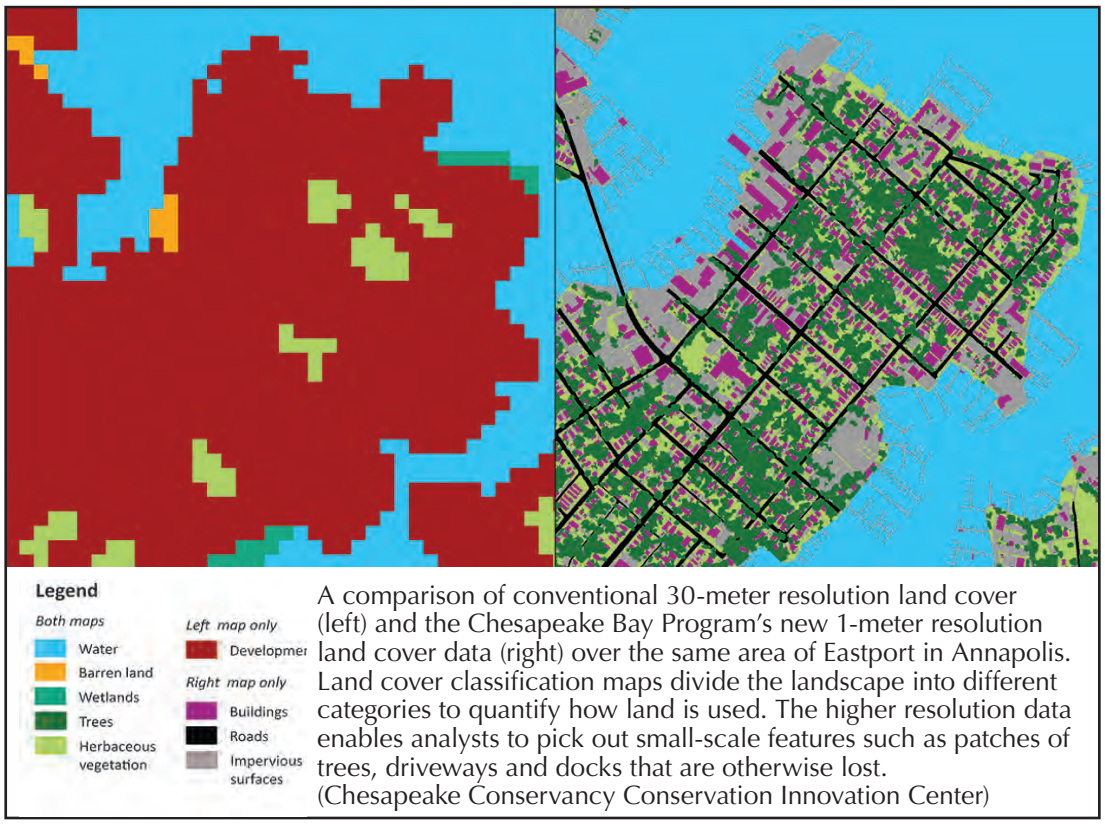
How can I possibly say that with all of this terrible news? Because I have seen how technology is democratizing conservation and empowering people to act.

Take for example a remarkable project from the Amazon rainforest: A study released by Rainforest Foundation US and its partners shows how near-real time deforestation data empowered indigenous community members to report threats quickly and achieve "measurable reduction of deforestation." The alerts were delivered by the University of Maryland's Global Land Analysis and Discovery Group using a field application from Global Forest Watch.

This is the democratization of conservation, empowering people everywhere to protect the environment where they live. It is literally up to us now — you and me.

The Internet, satellites, aerial imagery, smartphones, Geographic Information Systems (GIS) and Artificial Intelligence (AI) are putting the power to protect the environment into the hands of everyone. These tools provide high-resolution, near-real time information about what is happening on the ground and in the water.

This technology is having a profound impact on efforts to protect natural systems. And, it has effectively leveled the playing field of knowledge for individual landowners, indigenous peoples, nonprofit organizations, corporations and government agencies.



A comparison of conventional 30-meter resolution land cover (left) and the Chesapeake Bay Program's new 1-meter resolution land cover data (right) over the same area of Eastport in Annapolis. Land cover classification maps divide the landscape into different categories to quantify how land is used. The higher resolution data enables analysts to pick out small-scale features such as patches of trees, driveways and docks that are otherwise lost. (Chesapeake Conservancy Conservation Innovation Center)

Scientists have known for decades how land use change and deforestation negatively impact animals, plants and ecosystems. But until relatively recently, the tools by which scientists could monitor natural areas and inform the public about their observations were limited.

Vitally important data, such as the National Land Cover Dataset, was collected by government agencies and their corporate contractors to be released every five to seven years. By the time we could identify a priority, such as a large contiguous forest that connected previously protected areas, it had already been destroyed for the purpose of development, resulting in the loss of biological diversity and ecosystem function.

Now, the public can quickly obtain recent, highly accurate observation data and analyze it to great effect.

Conservationists can swiftly provide striking evidence to advance their cause, a quantum leap for defenders of the environment.

The Chesapeake Conservancy, where I work, has been relentlessly leveraging this opportunity in the Chesapeake Bay watershed. Our Conservation Innovation Center recently analyzed the change in tree canopy for Anne Arundel County, MD, with 1-meter resolution aerial imagery from 2007 to 2017 — and it showed a startling 5,500-acre loss of trees. With this analysis and strong public support (81% of county residents, according to a poll by the Arundel Rivers Federation), County Executive Steuart Pittman worked with the County Council to pass a major revision in their forest conservation law. Howard County quickly followed suit with even tougher changes.

The famed conservationist Aldo Leopold once remarked that "one of the penalties of an ecological education is that one lives alone in a world of wounds. Much of the damage inflicted on land is quite invisible to laymen."

Fortunately, as a result of new technology, this is changing. It comes just in time, as there is widespread recognition of detrimental changes that are happening to the entire planet as a result of human activity.

As a first step to address the climate and biodiversity crisis, U.S. Sen. Tom Udall (D-NM) and U.S. Rep. Debra Haaland (D-NM) have introduced resolutions to protect 30% of our nation's land and ocean by 2030, which have been co-sponsored by Sen. Chris Van Hollen (D-MD) and others.

To achieve this admirable and ambitious result, data from individual drones and global monitoring efforts, such as those of Global Forest Watch or Microsoft's forthcoming planetary computer, will be used to democratize conservation.

When this knowledge is put in the hands of individuals, nonprofits and governments, it will save the planet.

Joel Dunn is president and CEO of the Chesapeake Conservancy.

Chesapeake Challenge

Answers to
Earn your stripes doing this rockfish quiz!
on page 21.

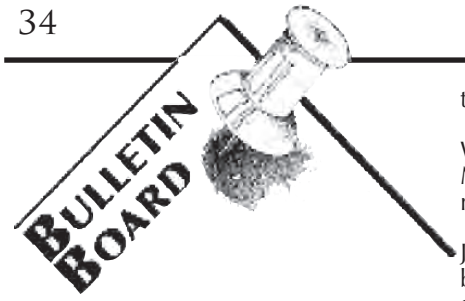
1. E 2. D 3. State fish: Maryland, State saltwater fish: New York & Virginia 4. C 5. B 6. B 7. C 8. B 9. D 10. A 11. A 12. D

Bay Buddies

Answers to Anadromous! on page 21.

1. Atlantic sturgeon
2. American shad 3. Alewife
4. D. 5. A

Striped Bass (Dave Harp)



VOLUNTEER OPPORTUNITIES

Waynesboro, PA, tree planting

Help the Antietam Watershed Association and Waynesboro (PA) Fish & Game Protective Association plant 2,000 trees, shrubs 8 a.m.–3 p.m. May 2, rain or shine, at Waynesboro Fish & Game Association. Gloves, drinks, lunch provided. Children must have adult supervision. This is a *PA Chesapeake Bay 10 Million Trees* project. Register/info: antietamws@gmail.com, rfgoldman@comcast.net, antietamws.org/events.

Bread & Cheese Creek cleanups

Volunteers of all abilities are needed to clean up Bread and Cheese Creek in Dundalk, MD. Help to haul trash out of waterways; run water, tools to creek workers; sort recyclables; set up/take down; take photographs, videos. Events:

≋ *Berkshire Area to North Point Road*: 8 a.m.–2 p.m. April 4. Register at 2408 Plainfield Road.

≋ *Bear Creek & Chalesmont Park Shoreline:* 8 a.m.–2 p.m. April 25. This shoreline is where British and American troops set up defensive positions in the War of 1812's Battle of North Point. Register at tents near intersection of Park Haven and Gray Haven Road.

Cleanups are rain or shine. Lunch, snacks, gloves provided. A few tools are available; participants are asked to bring their own, if possible. Community service and service learning hours available. Info: info@BreadandCheeseCreek.org, 410-285-1202, BreadandCheeseCreek.org.

Project Clean Stream

Be part of the Alliance for the Chesapeake Bay's *Project Clean Stream*. Every spring, thousands of volunteers in all 6 Bay states and the district pick up trash in waterways, parks using supplies (trash bags, gloves) provided by the Alliance. Residents, local businesses, environmental organizations, local governments, community groups, houses of worship, schools, universities invited. Info: chesapeakenetwork.org/groups/project-clean-stream/ projectcleanstream@allianceforthebay.org.

Kings Gap bird box volunteers

Kings Gap Environmental Education Center in Carlisle, PA, will train *Bird Box Volunteers* 1–4 p.m. March 29. Volunteers check, record activity at assigned boxes during nesting season, as part of *PA State Park Cavity Nesting Program*, which provides habitat for declining cavity-nesting populations. Volunteers record data on eggs, young, nest building. Data sheets, guidance provided. Info: ra-nrspkingees@pa.gov, 717-486-3799.

Severn River Association

Volunteer opportunities with Severn River Association include:

≋ *Project Clean Stream:* 9 a.m.–12 p.m. Saturdays, around Earth Day. Pick up trash, plant trees, remove invasive species.

≋ *Water Quality Monitoring:* April–October. Crew needed to conduct weekly boat tours to monitor Severn's health.

≋ *Water Quality Crew:* 4-hour tour Wednesday, Thursday or Friday morning. Morning river cruise collects scientific data, monitors wildlife habitat. Training provided.

≋ *Join the SAV Navy!* Set your own hours June–September. Use kayak, canoe, small boat to map SAV beds, identify submerged aquatic vegetation. Paddlers of all skill levels welcome. Training, gear supplied.

≋ *GEMS Expedition:* Explorers, naturalists, foresters needed for a land-based expedition to map 500 ecological features throughout Severn watershed: wetlands, trees, ferns, plants, wildlife, creeks, historical & cultural features to create GIS map of watershed's ecology.

≋ *Tell Severn's Story?* Writers, photographers, reporters, memoirists needed to record story of river's wildlife, people, forests, history, culture, sailing. SRA can create internships for budding journalists of all ages who want to tell a story, cover meetings, take pictures, build up their clip file. Info: Info@severnriver.org.

Stream monitoring training

Goose Creek Association is training stream monitors 9 a.m.–3 p.m. April 4 at 119 The Plains Road, Suite 200, Middleburg, VA. Workshop includes training in classroom & field, lunch. Free. Info: info@goosecreek.org.

Chemical monitoring team

Prince William Soil and Water Conservation District needs volunteers for its new chemical monitoring program to supply the VA Department of Environmental Quality with data. Contact: www.pwswcd.org, waterquality@pwswcd.orgwaterquality@pwswcd.org.

Anita Leight Estuary Center

Anita C. Leight Estuary Center in Abingdon, MD, needs volunteers for:

≋ *Marsh Bloom Time Monitoring:* 2–4 p.m. March 21. Ages 14+ Assist with *Marsh Plant Phenology Monitoring Trail*. Track the timing of plant stages to help study climate change. Volunteers must be able to safely paddle a canoe. All monitoring is by boat. Training provided.

≋ *Invasinators:* 1–3 p.m. March 22. Ages 14+ Learn about nonnative invasive plants, removal & restoration strategies. Wear sturdy shoes, long sleeves, work gloves.

≋ *29th Annual Marsh Cleanup at Bosely Conservancy:* 9 a.m.–12 p.m. March 28. Ages 8+ Meet at conservancy entrance. Clean up Otter Point Creek Marsh. Wear old shoes/ boots, gloves. Drinks provided. Rain or shine. Groups welcome. Volunteer hours for schools, organizations documented. Great for community service credit.

Ages 12 & younger must be supervised by an adult at all events. Registration required for all events: 410-612-1688, 410-879-2000 x1688, otterpointcreek.org.

Mount Harmon Plantation

Help Mount Harmon Plantation in Earleville, MD, with school programs: manor house student tours, colonial crafts, hearth cooking, guided nature walks. Special event volunteers assist with manor house tours, admission/ ticket sales, gift shop, and auction & raffle fundraisers. Lead nature walks, work in herb garden. Training provided. Docents are asked to commit to 8 hours of service per month during tour season: 10–3 p.m. Thursdays–Sundays, May–October. Info: 410-275-8819, info@mountharmon.org.

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.

Bull Run stream cleanup

Join Merrimac Farm Master Naturalists, Friends of the Square, Keep Prince William Beautiful, Prince William County businesses and partners as they clean up the Bull Run stream corridor near Costco in the Bull Run Shopping Center in Manassas, VA, 9 a.m.–12 p.m. March 14. Info, registration/search engine: costco manassas bull run cleanup.

Occoquan River Cleanup

Support Potomac Watershed cleanup initiatives by joining Friends of Occoquan, Prince William Trails & Streams Coalition 9 a.m.–12 p.m. April 18 at any of these sites: Town of Occoquan, VA; Bull Run Marina, Clifton, VA; Fountainhead Park, Fairfax Station, VA; and Occoquan Regional Park in Lorton, VA. Info: friendsoftheoccoquan.org, pwtsc.org.

32nd Annual Potomac Cleanup

The *32nd Annual Potomac River Watershed Cleanup* with Alice Ferguson Foundation is registering Prince William County, VA, workdays. Pick any time or date for a nearby cleanup event; register the site (under the county) with the foundation; pick up cleanup supplies at Prince William Soil and Conservation District office. Info: 301-292-5665, waterquality@pwswcd.org, potomacrivercleanup@fergusonfoundation.org.

Howard County Conservancy

The Howard County Conservancy in Woodstock and Elkridge, MD, needs adult volunteers to help lead elementary/secondary school students on hikes and/or with hands-on activities. Elementary volunteers arrive at 9:15 a.m. Secondary volunteers at 7:30 a.m. Both leave in early afternoon Monday–Friday. Elementary training runs 9 a.m.–1:30 p.m. March 10 in Elkridge and 9 a.m.– 12:30 March 19 & 26 in Woodstock. Secondary sessions run 9 a.m.–12:30 p.m. March 17 & 24 in Woodbridge. Attendance at all sessions not necessary. Preregistration recommended. Info: volunteer@howardnature.org, 410-465-8877, or Carole Veihmeyer at 410-465-8877 x121, carole.veihmeyer@howardnature.org, volunteer@howardnature.org.

Patuxent Research Refuge

The Wildlife Images Bookstore at the National Wildlife Visitor Center of the U.S. Fish and Wildlife Service's Patuxent Research Refuge in Laurel, MD, needs volunteers to open and close the store, operate point-of-sale register, help customers select merchandise. Training provided. Info: 301-497-5771, lindaleechilds@hotmail.com.

Oregon Ridge Nature Center

The Oregon Ridge Nature Center in Cockeysville, MD, is offering *MD Master Naturalist Volunteer Training:* 9 a.m.–3:30 p.m. Mondays, March 16–May 18. Adult participants complete 60 hours of hands-on training in natural history, environmental interpretation, conservation stewardship. Final certification awarded after 40 hours of volunteer service at Oregon Ridge. Applications are at nature center or extension.umd.edu/masternaturalist (Use Piedmont Region link) and will be accepted until class is full. Fee: $250 upon acceptance into program. Info: 410-887-1815, info@OregonRidgeNatureCenter.org.

Paradise Park

Paradise Park in Portsmouth, VA, needs volunteers, ages 12+ (12–16 w/adult) for service days 9–11 a.m. March 7 & 14. Tasks include weeding, planting, cleaning, pruning, light maintenance. Bring work gloves, water bottle. Registration required: paradisecreek.elizabethriver.org.

Cromwell Valley Park

Opportunities at Cromwell Valley Park in Parkville, MD, include:

≋ *Habitat Restoration Team / Weed Warrior Days:* 2–4 p.m. March 21; April 4, 25. All ages (12 & younger w/adult) Remove invasive species, install native ones, maintain habitat. Service hours available. Meet at Sherwood House parking lot. Registration required: Laurie Taylor-Mitchell at Ltmitchell4@comcast.net.

≋ *Trail Guide Training:* 10 a.m.–1 p.m. March 25 (*Marshy Point*); March 26 (*Cromwell Valley*); March 27 (*Fort McHenry*) Adults. Learn techniques, topics to help with programs, special events, animal care, as well as ecology of Cromwell Valley, Marshy Point. Breakfast, snacks, coffee provided. New guides pay $5. Info: cromwellvalleypark.org, 410-887-2503, info@cromwellvalleypark.org.

≋ *Drop in Gardening:* 9 a.m.–12 p.m. March 28. Meet at Children's Garden. Ages 13+ Gloves, tools, water provided. Bring hat, sunscreen. No registration.

York County, PA, parks

Volunteer opportunities at York County (PA) parks include:

≋ *Exploration Forest:* Nature Play Area at Nixon Park Nature Center near Jacobus needs to be monitored regularly for hazards such as thorny plants, poison ivy. Info: 717-428-1961.

≋ *Project FeederWatch:* 9 a.m.–4 p.m. Tuesdays and Wednesdays through April. Nixon Park near Jacobus. Project FeederWatch's volunteer citizen scientists identify, count bird species visiting center's feeders. Data is forwarded to Cornell Laboratory of Ornithology as part of a nationwide effort tracking winter bird population trends. Beginners welcome. Volunteers are asked to commit to one hour every other week. Info: 717-428-1961.

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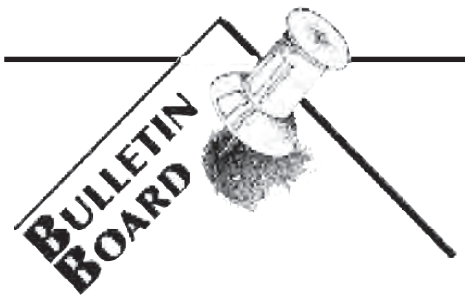

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MD Volunteer Angler Survey

Become a citizen scientist. Help the MD Department of Natural Resources collect data using its *Volunteer Angler Survey*. Anglers use smart phones to record information from their catch such as species, location, size. Biologists use data to develop, implement management strategies. The artificial reef initiative, blue crab, freshwater fisheries, muskie, shad and striped bass programs now have upgraded mobile-friendly methods, too. Participants can win quarterly prizes. Info: dnr.maryland.gov/Fisheries/Pages/survey/index.aspx.

Irvine Nature Center

Opportunities at Irvine Nature Center in Owings Mills, MD, include:

- *Trail Trekker Training:* 9–12 p.m. March 25. Adults. Learn to lead educational outreaches for the general public. Trail walks, natural history, teaching techniques covered. No experience necessary. Participants are expected to lead future trail walks. Info: Stephanie Holzman at 443-738-9221, ExploreNature.org.
- *Weekend Weed Warriors:* 10 a.m.–12 p.m. March 21, May 2 & 30. Ages 14+ Remove oriental bittersweet, multiflora rose in/around Woodland Garden, Native American sites. Training, tools provided. Wear sturdy shoes that can get muddy, bring water, nonrefrigerated snack/lunch. Info: Ben Fertig at fertigb@explorenature.org.
- *Project Clean Stream:* 9 a.m.–12 p.m. April 18. Irvine's focus is on Garrison Forest Road area. Info (including volunteering for an event closer to home or to lead a cleanup): Ben Ferti at fertigb@explorenature.org.
- *Naturalist Training:* 9 a.m.–12 p.m. March 10, 12, 17 & 9 a.m.–2 p.m. March 19. Adults. Learn to lead educational events for students at their school. Themes, natural history, teaching techniques covered. No experience needed. Participants are expected to lead field trips in spring semester. Info: Stephanie Holzman at 443-738-9221 or ExploreNature.org.

CBL Visitor Center

Volunteers, 16 & older, are needed at the Chesapeake Biological Laboratory's Visitor Center on Solomons Island, MD. They must commit to a minimum of two, 3– to 4-hour shifts each month in the spring, summer and fall. Training sessions are required. Info: brzezins@umces.edu.

Ladew Topiary Gardens

Opportunities at Ladew Topiary Gardens in Monkton, MD, include:

- *Volunteer Open House:* 9–11 a.m. March 20 & 21. Meet Ladew staff, volunteers to match your talents, interests with Ladew's needs. For new, current volunteers. Info: Sophie Wittelsberger at swittelsberger@LadewGardens.com, 410-557-9570, x216.
- *Training / Teach Children about Nature:* 9 a.m.–12:30 p.m. April 7, 9, 14, 16 & 21. Learn to lead school field trips. Plants & animals of the gardens, general ecology concepts, outdoor teaching techniques. Registration, background checks required. Fee: $20. Info: Sheryl Pedrick at 410-557-9570, x226, spedrick@LadewGardens.com.

Ruth Swann Park

Help the Maryland Native Plant Society, Sierra Club and Chapman Forest Foundation 10 a.m. to 4 p.m. the second Saturday in March, April, May remove invasive plants at Ruth Swann Park in Bryans Road. Meet at the 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 the Sierra Club MD Chapter office at 9 a.m. and return at 5 p.m. Carpool contact: 301-277-7111.

Creek Critters app

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

Little Paint Branch Park

Help the Maryland-National Capital Park and Planning Commission remove invasive species 11 a.m.–3 p.m. the last Saturday in March, April, at Little Paint Branch Park in Beltsville. Sign in for a safety orientation. Gloves, tools provided. Info: 301-442-5657, Marc.Imlay@pgparks.com.

Become a VA Master Naturalist

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

Bilingual educator resources

Educational programs are available in English and Spanish from the Interstate Commission on the Potomac River Basin. Info: potomacriver.org/resources/educator.

Adopt-a-Stream or Pond

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

American Chestnut Land Trust

The American Chestnut Land Trust in Prince Frederick, MD, needs volunteers for invasive plant removal workdays 9–11 a.m. Thursdays and 10 a.m. to 12 p.m. Wednesdays. All ages (16 & younger w/adult) welcome. Tools, water provided. Registration required. Info: 410-414-3400, acltweb.org, landmanager@acltweb.org.

Magruder Woods

Help Friends of Magruder Woods 9 a.m.–1 p.m. the third Saturday in March, April, May remove invasive plants in the forested swamp in Hyattsville, MD. Meet at farthest end of parking lot. Info: Marc.Imlay@pgparks.com, 301-283-0808, (301-442-5657 the day of event); or Colleen Aistis at 301-985-5057.

Submission Guidelines

The *Bay Journal* regrets it is not always able to print every notice it receives because of space limitations. Priority is given to events or programs that most closely relate to the preservation and appreciation of the Bay, its watershed and resources. Items published in *Bulletin Board* are posted on the online calendar; unpublished items are posted online if staffing permits. Guidelines:

- **Send notices to kgaskell@bayjournal.com.** Items sent to other addresses are not always forwarded before the deadline.
- *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 month. Deadlines run at least two months in advance. See below.
- Submissions to *Bulletin Board* must be sent either as a Word or Pages document, or as simple text in the body of an e-mail. PDFs, newsletters or other formats may be considered if there is space and if information can be easily extracted.
- Programs must contain all of the following information: a phone number (include the area code) or e-mail address of a contact person; the title, time (online calendar requires an end time as well as a start time), date and place of the event or program. Submissions must state if the program is free, requires a fee, has age requirements, has a registration deadline or welcomes drop-ins.
- **April issue: March 11**
- **May issue: April 11**

Resources

Track Severn River's health

Check the health of the Severn River online at cmc.vims.edu/#/home. All of the water quality data collected from the Severn River Association's network of 41 monitoring stations, from Indian Landing near the headwaters to Lake Ogleton and the creeks of Whitehall Bay, are posted on Data Explorer, a data-sharing platform run by the Chesapeake Monitoring Cooperative. The site also contains SRA's water quality monitoring data for 2018 and 2019 and fecal bacteria levels collected by Operation Clearwater, run by Professor Tammy Domansky at Anne Arundel Community College. Anne Arundel County's bacteria reports are also posted.

Severn River video library

The Severn River Association's John Wright Speaker Series presentations are available online. Some of the titles include *Oyster Farming in St. Jerome's Creek, The Demise of Our Yellow Perch Fishery, Land Preservation: How Does it Work?* and *Will Butterflies and Bees Survive?* These, and other titles, are available at severnriver.org/category/speaker-series.

Wetlands Work website

The Chesapeake Bay Program's website, *Wetlands Work*, at wetlandswork.org, helps to connect agricultural landowners with people and programs that can support wetland development and restoration on their land.

Boating safety instruction

Boating safety classes are required for operators of recreational boats in Virginia, Maryland, the District of Columbia and most other states. Online opportunities include:

- Virginians: boat-ed.com/virginia
- Marylanders: boatus.org/maryland
- DC residents & nonresidents: boat-ed.com/districtofcolumbia
- Comprehensive list of training options: uscgboating.org/recreational-boaters/boating-safety-courses.php
- Free boating safety tools & materials from the Coast Guard Auxiliary: Info/search engine: recreational boating safety outreach.

Watershed education capsules

Prince William (VA) Soil and Water Conservation District's Watershed Capsules, which teach students about the important functions of watersheds, are available, first-come, first-served. Info: pwswcd.org/capsules.

Learn if your yard is BayWise

Master Gardeners in Prince George's County, MD, are part of Bay-Wise, a program offering free consultations on environmental practices to help county residents certify their landscapes as Bay-Wise. Those who demonstrate healthy lawn maintenance, efficient watering, pest control, creating habitat for native trees and plants for wildlife receive Bay-Wise signs. Homeowners can evaluate their property online using the MD Yardstick, which tallies pollution-reducing gardening and landscaping practices. To be certified, though, a landscape must be visited and evaluated by a Master Gardener. Info: Esther Mitchell at estherm@umd.edu, extension.umd.edu/baywise/program-certification. Click on "download the yardstick" to evaluate a landscape and/or vegetable garden online.

Marine debris toolkit

The National Oceanic and Atmospheric Administration's offices of National Marine Sanctuaries and Marine Debris Program have developed a toolkit for students and educators in coastal and inland areas to learn about marine debris, monitor their local waterways. The toolkit supports efforts to reduce impacts on marine ecosystems through hands-on citizen science, education, community outreach. Info/search engine: marine debris monitoring toolkit for educators.

Turf / lawn programs

To learn about the Prince William (VA) Cooperative Extension's *12 Steps to a Greener Lawn / Building Environmental Sustainable Turf BEST Lawns* low-cost, research-based programs for lawn education, contact: bestlawns@pwcgov.org, 703-792-4037.

Floatable monitoring program

The Prince William Soil & Water Conservation District in Manassas, VA, needs volunteers to help assess, trace trash in streams to reduce nonpoint source pollutants in urbanized, industrialized areas in relation to the County's Municipal Separate

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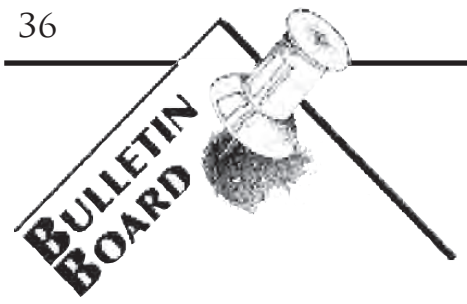

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Storm Sewers (MS4) permit. Cleanup supplies provided. Info: waterquality@pwswcd.org.

Baltimore Biodiversity Toolkit

To help meet habitat needs of native plants, animals and people, the Baltimore Biodiversity Toolkit identifies species that represent habitats within and historic to a community. It shows how to support specific wildlife needs; helps citizen scientists monitor, collect data; develops a culture of conservation and stewardship. The toolkit contains 20 ambassador species from four habitats. Its multi-platform format helps to prioritize community greening projects based on representative species, citizen science data and spatial analysis that includes social, economic and ecological indicators. Info: fws.gov.

Wildlife education trunks

MD Department of Natural Resources *Wildlife Education Trunks* are available to teachers, home-school educators and naturalists. Free, interdisciplinary tools are designed to interest students in local wildlife while building on art, language arts, math, physical education, science, social studies skills. Trunk contains an educator guide, lesson plans, hands-on K–12 activities, as well as supplies, books, furs, replica tracks, videos, other hands-on items. Subjects include aquatic invasive species, bats, black bears, furbearers, white-tailed deer, wild turkeys. Trunks can be borrowed on a first-come, first-served basis for up to two weeks. Info/search engine: Wildlife Education Trunks.

Forums / Workshops

Project Learning Tree

Moraine State Park in Prospect, PA, invites educators, naturalists, scout leaders to a *Project Learning Tree Educator Worksho*p 8:30 a.m.–3 p.m. March 21. This environmental curriculum is designed for grades preschool through eighth. Participants receive the PLT Environmental Education Activity Guide, earn six Act 48 hours. Fee: $20. Register by March 15. Info: Morainesp@pa.gov, 724 368-8811.

Events / Programs

Learn to grow oysters

Phillips Wharf Environmental Center on Tilghman Island, MD, is offering a course on growing oysters from one's dock 10 a.m.–3 p.m. March 21. The course will cover oyster history, biology and regulations; gardening and equipment options and sources; seed types; processing and harvesting techniques; ways to safely shuck an oyster. Fee of $99 includes a shuck-your-own lunch of a dozen oysters. Preregistration required. To register, send a check made out to PWEC, phone number, email & postal addresses to: PWEC Oyster Gardening Class, 6129 Tilghman Island Road, Tilghman, MD 21671.
Info: phillipswharf.org.

Boating safety classes

The U.S. Coast Guard Auxiliary Flotilla 25-08 (Mount Vernon) is offering one-day boating safety classes 7:30 a.m.–5 p.m. March 21, April 18, May 16, June 20 & July 18 at the Washington Farm United Methodist Church in Alexandria, VA. Virginia, Maryland and many other states as well as the District of Columbia require some form of certified boating safety training for operators of most powered boats and personal water craft (jet skis). Seasoned boaters who took the class years ago are also welcome to refresh themselves on boat handling and regulations, nautical rules of the road, required equipment, tips, practices to help prevent accidents. Info: Ted Caliga at johnbielli2@gmail.com.

Manada Native Plant Sale

Manada Conservancy's *20th Annual Spring Native Plant Sale* takes place 10 a.m.–3 p.m. May 2 at Boro (Schaffner) Park, in Hummelstown, PA. View the perennials, trees, shrubs for sale, or shop online through April 15 for pickup on May 2 at manada.org/native-plants/spring-native-plant-sale. Event also includes art & food vendors, children's activities, live music, gardening-for-nature consultant. Free. Rain or shine. Info: office@manada.org or 717-566-4122.

Dinosaur eggs & babies

The Virginia Living Museum in Newport News invites the public to *Tiny Titans: Dinosaur Eggs & Babies* through May 3. The hands-on exhibit features authentic eggs and nests and includes a presentation about the discovery of "Baby Louie," a nearly complete skeleton of a dinosaur embryo. Children can dig for eggs, dress up like a parent dinosaur to brood their nest, feel the texture of dinosaur eggs. Related programs include:

≋ *A Family of Titans:* 12, 1 & 2 p.m. Saturdays till May 2. Live animal program addresses *What makes a family?* Learn about different dinosaur families, meet live animals related to dinosaurs! Included w/admission.

≋ *Zula Patrol - Down to Earth:* 12:30 p.m. daily till May 3. Abbitt Planetarium. Travel back in time to learn about the Earth's formation and development. Fee: $4 plus museum admission.

Museum admission: $20/ages 13+; $15/ages 3–12. Info: thevlm.org, 757-595-1900.

Davidsonville Green Expo

The Davidsonville Area Civic Association's 11th Annual Green Expo takes place 11 a.m.–3 p.m. March 21 at Homestead Gardens in Davidsonville, MD. The Expo shows how to live a sustainable life, as well as protect, preserve the environment, waterways and the Chesapeake. At least 40 exhibitors will demonstrate environmental programs and projects: good gardening, watershed preservation, energy saving techniques for more sustainable living, seminars on selected topics. Free admission, tree seedling giveaway.

Mason-Dixon Line markers

The MD Geological Survey, a unit of the state's Department of Natural Resources, is leading professional surveying societies of MD and PA in a survey of original Mason-Dixon Line monuments. Property owners are asked to allow access to site — all surveyors will have DNR identification and documentation. Surveyors will document, photograph remaining monuments with the intent of entering them in the National Registry of Historic Places. The DNR is also interested in recording stories about the monuments. This will be the first complete survey in 40 years of the line, which was marked in a 1760s survey to defined the states' border. The project is slated to continue through August 2021.

Ladew Topiary Gardens

Ladew Topiary Gardens in Monkton, MD, as part of its spring lecture series, is presenting *Exploring Native Wildflowers & Their Habitats* with plant expert and conservationist Alan Weakley 10:30 a.m. March 25. He will show photos of plants in natural habitats, demonstrate a plant identification app, update progress on plant conservation issues. His book, *Wildflowers of the Atlantic Southeast,* will be for sale at the talk. Tickets are $40 and include coffee, danish (10 a.m.). Preregistration, prepayment required. Tickets are sent via email or smartphone. Info: Kathy Baker-Brosh at KBaker-brosh@ladewgardens.com, 410-557-9570 x261.

Kings Gap Education Center

Events at Kings Gap Environmental Education Center in Carlisle, PA, include:

≋ *What's in the Woods Hike:* 2–3 p.m. March 15. Meet at Kings Gap Hollow Day Use Area. Take a 1.5–2-mile hike on uneven terrain (wear appropriate footwear) to look for signs of spring. Hike location subject to change. Bring water. Free.

≋ *Welcome Spring Hike:* 2–3:30 p.m. March 21. Meet at Kings Gap Hollow Day Use Area. 2-mile hike. Bring water, wear appropriate footwear. Friendly, leashed dogs welcome. Free. No registration.

≋ *Birds & Beverages / Project FeederWatch:* 9–11 a.m. March 14, 28. Drink hot tea, cocoa, coffee while watching bird feeders, collecting count data. Free. No registration required.

Road/weather conditions may change or cancel any of these events. Check on center's Facebook before coming. Info: ra-nrspkingees@pa.gov, 717-486-3799.

MD DNR careers camp

The MD Department of Natural Resources invites students entering grades 9–12 next year who are interested in forestry, fisheries, wildlife, parks management to attend *Natural Resources Careers Camp,* July 19–25 at the Hickory Environmental Education Center in Garrett County. Students participate in hands-on classroom/field activities in forestry, wildlife, ecology, fisheries, watershed management, natural resources management, conservation taught by industry professionals. Campers use GIS Mapping, GPS, computer simulation, field tools used in natural resources careers. Space is limited. Application deadline is March 31. The $450 tuition fee includes lodging, meals for the week. Tuition assistance is available for MD students. Applications/info: marylandforestryboards.org/nrcc.cfm.

Maryland Day

Celebrate the founding of Maryland – the first landing of the colonists on St. Clement's Island – during *Maryland Day* 10 a.m.–4 p.m. March 25 at St. Clement's Island Museum in Colton's Point. The event includes free admission to the museum, free water taxi rides, activities. Info: 301-769-2222.

Drayden Schoolhouse open house

The Drayden African American Schoolhouse in Drayden, MD, invites the public to attend one of its open houses 11 a.m.–2 p.m. April 4, May 2, June 6, 20 & 21. Visit one of the nation's best-preserved one-room African American schoolhouses and learn about its importance in St. Mary's County. Staff will be available to answer questions. Info: 301-994-1471, Facebook.com/DraydenSchool.

Maple sugaring

Learn how maple syrup is made 2 p.m. March 14, 15, 21, 22, 28 & 29 at Parker Dam State Park in Penfield, PA. Learn how it was made years ago, identify the right trees to tap, where to tap, how to gather sap. Taste a free sample. Meet at the Sugar Shack, near Pavilion 7, just past Cabin Road. Info: 814-744-8407.

Birds homeschool class

Little Buffalo State Park in Newport, PA, invites all homeschool students, especially ages 5–8, to *Beautiful Birds* 10 a.m.–12 p.m. March 25. Learn about state's birds: characteristics, migration, how to protect them. Take a short walk to look for birds, weather permitting. Free. All students must be registered by March 23. Info / search engine: Little Buffalo State Park homeschool; click "buy tickets" link. Adverse weather may cancel program, call 717-567-9255.

Winter eagles / homeschool

Homeschool students, ages 7–17, are invited to *Winter Eagle Life* 10 a.m.–12 p.m. March 23 at Codorus State Park in Hanover, PA. Discover what's going on in the eagle nest. Preregistration required. Do *not* include parents in the registration. Dress to go outside. Info: Renae Weidner at 717-637-3454.

Cook Forest State Park

Cook Forest State Park in Cooksburg, PA, invites the public to watch eagles 8:30 a.m.–12:30 p.m. March 28. This is the prime time to view bald eagles on their nests. Bring binoculars and spotting scopes to the park office for a driving tour to eagle hotspots along the National Wild & Scenic Clarion River. Expect a long car pool and aggressive hike to some of the better areas. Hot chocolate, coffee provided. Info: 814-744-8407.

Canoe Creek State Park

Upcoming events at Canoe Creek State Park's Wentz Education Center in Hollidaysburg, PA, include:

≋ *Woodpecker Wander:* 10–11 a.m. March 14. Learn about woodpecker diversity, seasonal habits while looking, listening for them on hike.

≋ *Animal Adaptations:* 2:30–3:30 p.m. March 14. Learn about PA animals' weird survival adaptations.

≋ *Vernal Pool Hike:* 10–11:30 a.m. March 21. Take a muddy walk to investigate pools where salamanders, frogs breed. Learn about their food, communication, survival habits. Wear boots.

≋ *Vulture Verses:* 2:30–3:30 p.m. March 21. Listen to verses about vultures, then write poetry about your favorite PA animal.

All events are free. Info: visitPAparks.com

Oyster roast & sock burning

Gather around a bonfire 12–4 p.m. March 21 at the Annapolis Maritime Museum's *10th Annual Annapolis Oyster Roast & Sock Burning,* which celebrates maritime culture, all things Chesapeake and the start of boating season. Activities include oyster shuck-

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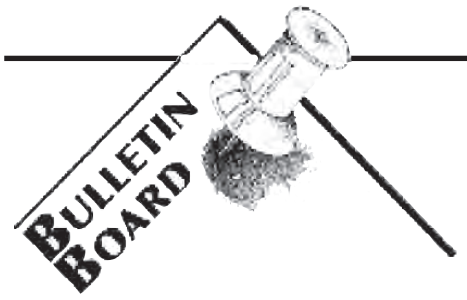

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ing contest, electric boat tours of Back Creek, unlimited raw and roasted oysters, music by the Eastport Oyster Boys and Naptown Brass Brand. Advance general admission tickets: $30. ($35 at door if event hasn't sold out). Ages 3–12 / $15. People's Choice tickets ($85) include two drink tickets, 10 food tickets and admission to a private reception featuring Best Oyster Dish competition. Sample offerings from the area chefs; then vote for the winner. Choice tickets for ages 3–12 ($35) include five food tickets, plus all general admission activities. Tickets are sold at whatsuptix.com/events/annapolis-oyster-roast-sock-burning. All proceeds benefit the museum's education programs. Information: amaritime.org.

Paradise Park

Upcoming free events at Paradise Park in Portsmouth, VA, include:

Power Walk: 8–9 a.m. March 28. All ages. Walk at a brisk pace for approximately 1 mile on the nature trails. Wear comfortable shoes.

Family Nature Walk: 14. Learn about native plants, wildlife. Look for signs of wildlife. Wear comfortable shoes.

Winter Bird Walk: 8:30–10 a.m. March 28. Dress for weather.

Children must be supervised by adults at all events. Registration is required for all events: paradisecreek.elizabethriver.org.

Anita Leight Estuary Center

Upcoming programs at the Anita C. Leight Estuary Center in Abingdon, MD, include:

iNaturalist Trek: 10:30–11:30 a.m. March 14. All ages. Use *iNaturalist* app while searching for plants, animals to include in center's biodiversity data. Free.

Owl Prowl: 7–8:30 p.m. March 14. Ages 8+ (16 & younger w/adult). Meet at Bosely Conservancy. Listen, look for owls. Fee: $5.

Drop-in Tails & Tots: 1 p.m. March 15. Ages 0 –6 w/adult. Learn about nature through stories, songs, movement. Free.

To Catch a Leprechaun: 3–4:30 p.m. March 15. Ages 6+ Build a garden. Fee of $8 includes all materials.

Drop-in Program / Critter Dinner Time: 1:30 p.m. March 21. All ages. Learn about turtles, fish, snakes while watching them eat.

Spring Equinox Campfire: 6:30—8 p.m. March 21. All ages. Meet at Pontoon Pier. Listen to stories about plants, animals; eat s'mores. Bring blanket, camp chairs. Fee: $4.

Promoting Pollinators: 2:30–4 p.m. March 22. Ages 5+ Learn about pollinators, how to help them, create a bee house, sample sweet snacks. Fee: $7/project.

Osprey Adventure: 1–2:30 p.m. March 29. Ages 8+ Hike to spy on park's osprey couple, their nest. Fee: $4.

Ages 12 & younger must be accompanied by an adult at all programs. Events meet at the center and require registration unless otherwise noted. Payment is due at time of registration. Info: 410-612-1688, 410-879-2000 x1688, otterpointcreek.org.

Hills Creek State Park

Hills Creek State Park in Wellsboro, PA, invites the public to its *Maple Weekend Open House* 10 a.m.–3 p.m. March 21. In about 45-minutes, participants learn how to identify maple trees, tap them to collect sap. Discover how pure maple syrup is processed from tree to table, taste a sample. Free. Large groups are asked to contact the park to schedule a private tour. The event takes place in conjunction with the Potter/Tioga Maple Producers annual maple weekend. Info: 570-724-4246.

Patuxent Research Refuge

Upcoming programs at the Patuxent Research Refuge's North Tract [T] and National Wildlife Visitors Center [C] in Laurel, MD, include:

Night Hike: 8–9 p.m. March 13 & 14 [C] Ages 5+ Explore the forest, learn how to help nocturnal animals.

Owl & Kestrel: 12:15–12:45 p.m. March 14 & 21 [C] All ages. Learn about acrobatic American kestrel, stealthy eastern screech owl. No registration.

Tiny Tots: 10:30–11:15 a.m. March 15 & 16 [C] Ages 16 months–4 years w/parent participation. Learn about wildlife through songs, stories, activities.

Nature Tots / Spring Has Sprung: 10:30–11:15 a.m. March 17 [C] Ages 3–4. Take a hike.

Bird Walk: 8:15–10:30 a.m. March 21 [T] All ages. Various habitats. Binoculars recommended.

Family Fun / Habitats & Adaptations: Drop-in program 10 a.m.–1 p.m. March 27 & 10 a.m.–3 p.m. March 28 [C] All ages. Learn how refuge's animals adapted in various habitats. Activities, games for all ages. No registration.

Spring Wildlife Festival: 10 a.m.–3 p.m. March 28 [C] Activities for all ages include beginner archery, children's crafts, *Nature Songs with Stina/ Bird is the W.O.R.D.* (12–12:45 p.m.), tram tours, Rodney's Raptors, story time. Info: https://bit.ly/3b0YWFO.

Raptors Reign: 1–3 p.m. March 28 [C] All ages. Licensed falconer Rodney Stotts, will discuss, share close encounters with birds of prey. No registration.

Nature Photography Workshop: Two-day class meets 1–4 p.m. March 28 & 8–11 a.m. April 4 [T] Ages 14+ Local photographer Mark Seaver will cover composition, offer individual advice in the field. Participants will use early light to explore the land, spring wildflowers, then have their photographs reviewed.

Bicycle Ride: 10 a.m.–12:30 p.m. March. 29 [T] All ages. Take in the natural area's wildlife, plants, historical sites on 12-mile guided tour. Bring a bike, snack, water bottle, helmet. Ride is weather-dependent.

All programs are free, donations are welcome. Except where noted, events require registration. Programs are designed for individuals and/or families. Let the refuge know if there are any disability-related needs that can be accommodated. Info: 301-497-5887, fws.gov/refuge/Patuxent/visit/PublicPrograms.html.

Oregon Ridge Nature Center

Upcoming events at Oregon Ridge Nature Center in Cockeysville, MD, include:

Morning Bird Walk: 8–9:30 a.m. March 13 & April 10. Adults. Bring binoculars or borrow a pair from center. Free.

Awesome Amphibians: 10 a.m.–12 p.m. March 14 & 15. All ages. Search for amphibians. Craft, learn frog calls, meet amphibians up close. Fee: $3.

ORNC Council Speaker Series / Old Growth Forests: A Journey to Preserve & Protect: 7–8:30 p.m. March 16. Adults. Forest preservation activist Joan Maloof will discuss history of this nation's forests, obstacles of forest preservation. Her books will be available for sale, signing. Free. No registration.

Amphibian Walk: 2–3 p.m. March 17. Ages 10+ Listen to, identify calling frogs, toads. Learn about center's FrogWatchUSA monitoring efforts. Free.

Shoots & Letters: 10–11 a.m. March 19 (*Signs of Spring*); March 26 (Frogs); April 2 (Salamanders); April 9 (*Baby Animals*). Ages 3+ Indoor, outdoor adventures. Fee: $2 per child. No registration.

Senior Stroll: 10:30 a.m. March 21, April 4. Guided stroll on paved Marble Quarry Loop trail. Stay for guided reflection activity and/or extension of hike on unpaved but non-strenuous trail. Free.

Spring Night Hike & Campfire: 6–8 p.m. March 21. Ages 5+ Fee: $5.

A Walk in the Park: 11 a.m.–12 p.m. March 22. All ages. Easy/moderate hike. Free.

Critter Scene Investigation Hike: 10 a.m.–12 p.m. March 28 & 29. Ages 5+ Become a nature detective. Learn to identify animal tracks, scat. Making edible "poo." Fee: $5.

Nature Book Club / The Genius of Birds: 7–8 p.m. March 30. Adults. Award-winning science writer Jennifer Ackerman tours the globe to reveal what makes birds capable of extraordinary feats of mental prowess. Explore what it means to be intelligent. Free.

Bookworm Story Time: 11–11:45 a.m. April 3. Toddler to age 6. Nature story, activity, outdoor experience. Free. No registration.

Frog Songs Night Hike: 7–9 p.m. April 4. Ages 5+ Listen to frog trills & peeps, learn why they're calling. Fee: $4

Garlic Mustard Pull & Pesto: 10 a.m.–12 p.m. April 11. Ages 6+ Remove invasive garlic mustard at park, return to center to use it make some pesto (contains nuts) to take home. Fee: $5.

Events take place rain or shine. Ages 15 & younger must be with an adult. Donations welcome for free programs. Programs require preregistration unless otherwise noted: info@OregonRidgeNatureCenter.org, 410-887-1815. Programs are for individuals & immediate families. Groups must schedule programs. For disability-related accommodations, call 410-887-1815, 401-887-5370 or 410-887-5319 (TTD/Deaf).

Cromwell Valley Park

Upcoming programs at Cromwell Valley Park's Willow Grove Nature Center in Parkville, MD, include:

Night Out with Nature / Falconry - Hunters of the Sky: 7–9 p.m. March 13. Meet at Sherwood House. Adults. Learn what it takes to become a falconer, how to train a bird of prey. Dessert. Fee: $10.

Plan Bee: 1–2:30 p.m. March 14. Ages 5+ Learn about bees, how to support these low-maintenance insects by creating a nesting can for your yard. Fee: $5.

Tour the Sherwood House: 1–2:30 p.m. March 21. Adults. Get a behind-the-scenes look at this home built in 1935. Fee: $4.

A Walk in the Park & Nature Quest Hike: 11 a.m. March 22. All ages. Hike to *Nature Quest* markers. *Quest Booklets* are available on site. Free. No registration.

Saturday Morning Bird Walks: 8–10 a.m. March 28 through May 30. Meet at sign in Willow Grove Farm Gravel Parking Lot. Free. No registration.

Fish Traps: 1–3 p.m. March 28. Meet at Primitive Technology Lab. Ages 13+ Learn about these fishing devices while creating a simple basket-style trap using vine, local natural materials. Fee: $5.

Scrambled Eggs: 1–2:30 p.m. March 29. Ages 5–10. Search for egg masses in the ponds. Wear waterproof boots. Fee: $4.

Amazing Amphibians Night Hike: 7–8:30 p.m. April 3. Ages 8+ Learn who is singing, who is egg-laying. Fee: $4.

Night Out with Nature / Native People of the Chesapeake: 7–9 p.m. April 10. Meet at Sherwood House. Adults. Learn about the native people who populated the Bay's tidewater region from prehistory to colonial times. Dessert. Fee: $10.

Children's Garden Club: 9:30–11 a.m. April 11 to Oct. 17. Meet at Children's Garden. Ages 5–13 w/adult. Explore natural world while growing vegetables, flowers, & herbs. Club meets about twice a month. Only registered children attend - *no siblings!* Fee: $50 for all sessions in the 2020 season. Registration for this program is only available online.

Ages 12 & younger must be accompanied by an adult. Except where noted, programs are free, require registration. Info: 410-887-2503, cromwellvalleypark.org, info@cromwellvalleypark.org. Online registration: cromwellvalleypark.campbrainregistration.com. For disability-related accommodations, call 410-887-5370 or 410-887-5319 (TTY/deaf), giving as much notice as possible.

Irvine Nature Center

Irvine Nature Center in Owings Mills, MD, invites the public to:

Tales & Tails: 10–11 a.m. every Friday. All ages. Story, songs, puppet show, animal. Free.

Naturally Creative: 10 a.m.–12 p.m. March 14. Ages 5–10. Paint with a possum, create edible art. Fee: $25.

Eat, Drink & Learn / Urban Birds & Bourbons Stirred: 6:30–9 p.m. March 19. Susie Creamer, director of Patterson Park Audubon Center, will discuss diversity of bird species in Baltimore. $60 fee includes dinner, drinks.

Birding 101: Drop-in 10 a.m.–12 p.m. March 21. All ages. Self-guided activities. Free.

Animal Architects: 10 a.m.–12 p.m. March 28, April 11, May 31, June 7. Ages 5-10. Learn how animals construct their homes. Fee: $25/session; $70/whole series.

Day Off Camps: 8:30 a.m.–4 p.m. April 6 (*Bugs, Bugs, Bugs*); April 7 (*Raging Reptiles*); April 8 (*Scales & Tails*); April 9 (*Feathered Friends*); April 10 (*MD Mammals*); April 13 (*Animal Caretakers*). No school? Students, ages 5–7 & 8–10 can expect trail walks, nature games, crafts, stories, animal encounters, going outdoors. Wear nature-friendly, weather-appropriate clothing, bring lunch. Fee: $85. Aftercare (4–6 p.m.) is an extra fee.

Owl Prowl: 7:30–9 p.m. April 10. All ages. Search for owls on trails. Meet one of Irvine's owls. Fee: $10.

Info: Stephanie Holzman at 443-738-9221, ExploreNature.org.

Project Clean Stream: A great way to rally local action

By Lucy Heller

Spring marks the beginning of Project Clean Stream — the Alliance for the Chesapeake Bay's annual stream cleanup program. It's a time when the Alliance offers hands-on opportunities through our partnerships with residents, businesses, environmental organizations, local governments, community groups, houses of worship, schools and universities to help restore local streams, creeks and rivers.

Project Clean Stream started more than 10 years ago as a one-day event with a couple of cleanups. Today, it brings together thousands of volunteers across the watershed for an entire season of events.

John Long, from the community group Clean Bread and Cheese Creek, has participated in Project Clean Stream and led cleanups along Bread and Cheese Creek since 2008. He got involved after purchasing his grandparents' house, located on the creek in Baltimore's Dundalk neighborhood. "I was dismayed at how horribly polluted the stream had gotten since I was a child," he said. "I used to play with frogs in it and chase tadpoles, and there was no trash in the stream back then."

When John led his first cleanup in fall 2008, he and a couple of friends used trash bags left over from the Alliance's spring events. They picked up trash along the first mile of the 4-mile creek. They filled an entire 40-yard dumpster with trash just from that one mile.

The next spring, John and his friends joined Project Clean Stream and have continued to lead cleanups each year. "Each time we would pick a new section until the stream became much more manageable," John said.

Doug Stanley from Dundalk, MD, helps to clean up a stream. (Alexander Kellum)

"When we were first starting, we were pulling out tires and refrigerators…it was just insane. Fast forward to now, we mostly find fast food debris."

As his group of volunteers expanded, they added a Bear Creek cleanup. "There is a playground and the Bear Creek Elementary near Bear Creek, and you just can't have all that trash near those kids," John said. "We also started working on Stansbury Park, which was also in really bad shape. Every year, it just feels like we are adding more and more sites."

Since 2008, John has recruited

Members of a Girl Scout troop from Dundalk, MD, show off some of the trash they collected in a stream cleanup. (Alexander Kellum)

Steward's Corner

6,045 volunteers at 80 cleanup events and collected 286.13 tons of trash!

John said he believes in making the most out of his events by providing an enjoyable experience.

"My whole thing is that if I am the spokesperson for it, I have to make what can be a nasty job enjoyable," he said. "For example, a couch that has been sitting in a stream all through the summer and smells like death — you just have to laugh about it, and once people see you laugh about it, they will help."

John said that it is all about a team of volunteers coming together, getting to know one another and having fun. He said it's important to keep the group joking and laughing so that they'll come back. One way he does this is through a contest at every cleanup to see who can find the weirdest piece of debris. "We take [those items] up to registration, take pictures, post on our Facebook page and laugh about it."

He also emphasized the importance of how one treats volunteers. "Treat people well and they will keep coming back. Treat them like family and friends and everything is more enjoyable that way."

Clean Bread and Cheese Creek has grown so much that people across the country want to know how he runs the events. "It all comes down to making the job happy and fun," he said. "Thank people and show your appreciation. They don't have to be there, and they don't get a paycheck."

When I talked with John, his passion for the work was clear. "My favorite part is either how streams or parks look after we leave or it's the kids. It's a toss-up. I mean, I love seeing the kids when you get kids that are enthusiastic. 'Oh my God, I found this and I found that!' They are just so happy to be cleaning up. Both of those are just incredible."

John's advice for starting a local cleanup is simple: Just get started. "Even if it's just you. When people see what you're doing they will join, it will trickle."

Project Clean Stream is just one of the resources to help get started. John said people just need to start leading the way in their own neighborhoods.

People often call, asking when he will bring cleanups to their communities. John explains that their volunteer effort doesn't have the resources and, more importantly, local leadership matters. "I tell them, 'I can tell you where to get resources and where you can get supplies and advertise on our Facebook page for you. But I am not going to do it for you.' …we learned a long time ago that if you do it for somebody, then in a couple weeks it will go back to the way it was before. But if you get the community involved in it, and they are pulling trash out on a hot day or rainy day, then they are not going to let it happen again."

This year's season kicks off April 4 and runs through June. To join a cleanup or register a site in your neighborhood, visit allianceforthebay.org/pcs.

Lucy Heller is communications and Maryland outreach coordinator for the Alliance for the Chesapeake Bay.

Atlas helps birders move beyond naming a bird to knowing it

By Mike Burke

Thanks to data collected through eBird for the Breeding Bird Atlas, we now know that the tufted titmouse is expanding its range northward, edging into southern Canada. (Laura Perlick / U.S. Fish and Wildlife Service)

March is a funny month. Sometimes spring seems here to stay. Then, a cold blast barrels through, and mud puddles turn icy and warm coats are needed.

It was late March 2019, and the weather couldn't make up its mind. It started dreary and damp, but the clouds were clearing and the temperature was rising. We took advantage of the brightening skies to take a walk around a local park.

"Peter-peter-peter." The melodic whistle was coming from the budding trees on our left, but we were having trouble finding the bird Apparently, it understood our dilemma, because it kept singing until I sang out, "Found him!" For a birder like me, birdsong seals the deal: It's spring!

The tufted titmouse (*Baeolophus bicolor*) is a common and widespread songbird of the Eastern United States.

Starting in early spring and continuing well into summer, titmice sing often and loudly. The males sing to define their territory and attract mates, and then to tell others, "This space is taken. Move on."

Pewter gray on top and pearl white below, the titmouse has a relatively large head with a jaunty crest and thick neck. It has big, round black eyes and a pronounced black patch on its forehead. Along its sides and toward the undertail, the bird has peach-to-rusty colored feathers. The sexes look alike.

A bird singing in the spring is a good sign that it's on its breeding territory. And determining where birds breed is immensely important to ornithologists and backyard birders alike. The data are used to inform public policy, identify birds at risk and even track climate change.

Amazingly, most of this information is gathered by citizen scientists under the careful guidance of professionals. Right now a new, 5-year-old effort is under way in Maryland and the District of Columbia to collect breeding bird data from every corner of the state and district.

Observations will be recorded in a *Breeding Bird Atlas*. This is the third such effort here and is often referred to as *BBA3*.

The Maryland Ornithological Society initiated the process in January 2019. In collaboration with the state's Department of Natural Resources, a steering committee was formed, consisting primarily of working scientists.

The group designated a person to serve as county/city leader for every jurisdiction. They further divided each county into more than 1,300, 3– to 5-square-mile blocks. The atlas will rely on hundreds

of volunteers to gather the data.

For the first time, this year the data will be submitted through the hugely popular eBird computer app. I use this app on my cellphone when birding. It automatically tracks my location, distance traveled and time. Last March, for example, I entered one tufted titmouse. At the end of my trip, I had a complete record of every bird I was able to identify during our quarter mile, 25-minute walk.

The atlas has a special portal for eBird entries. It operates normally, but now my data goes into the atlas, which will pinpoint my "block" as well as my species counts and the breeding behaviors I observe.

Gabriel Foley, atlas coordinator, told me that he hopes birders will use the app. During the last effort, the atlas was based on a bit less than 200,000 paper records. The ease and ubiquity of using eBird should lead to more than a million data points for the atlas. Such "big data" is vital to understanding abundance, distribution and timing of breeding.

We now know that the tufted titmouse is expanding its range northward, edging into southern Canada. Anecdotal evidence suggests that Maryland's state bird, the Baltimore oriole, may also be moving north in response to climate change. The atlas should give us a clearer picture.

Birders who would like to help ("We need you!" Foley said.) should contact their county/city coordinator. For a complete list of coordinators, maps, breeding codes and much more, visit eBird.org/atlasmddc/.

Most birds in the Chesapeake breed during April and May (and a few into June). But there are a number of early breeders. Eagles and owls start breeding in winter. All of our woodpeckers start breeding as early as mid-March, as well as the tufted titmouse we saw. Chickadees and Carolina wrens may even start by March 1.

The singing titmouse last March was establishing his territory. Titmice are cavity nesters, so he was looking for an abandoned woodpecker hole, a natural cavity in a tree or a birdhouse. He was also trying to attract a mate.

Once they pair off, the female does all of the work of building the nest. Papa is busy bringing his mate food while she incubates the eggs and protects the nestlings, a process that takes more than a month. When the young fledge, most will begin to disperse. Occasionally, one young bird will stick with its parents the following year and may help feed the next generation of chicks.

Birding at its best is more than simply seeing a titmouse. A closer look, revealing mating behavior, nest building, feeding and interactions, turns individual birds into fully realized living creatures. They have their own rich lives, personalities and quirks.

The atlas will add immeasurably to our knowledge of the 220 or so species that breed in Maryland. It will also lead inquisitive birders to look more closely and understand more deeply the lives of these wonderful creatures. That's a great benefit to birds and birders alike.

So, when you're done reading the *Bay Journal*, grab your binoculars, put on your citizen-scientist hat, and head out birding. The *Breeding Bird Atlas* and more importantly, the birds need you. And you just may discover that you benefit as much as they do.

Mike Burke, an amateur naturalist, lives in Mitchellville, MD.

Migratory fish often face one dam barrier after another

By Kathy Reshetiloff

These photos show Clifford Branch in Frederick County, MD, before and after a culvert was removed in 2017. A dam, 2 miles downstream, was removed in 2012. The two projects will allow brook trout and other native fish passage on the waterway. (Mark Secrist / U.S. Fish and Wildlife Service)

Warmer, longer days, spring flowers and the chorus of frogs and songbirds lure me outside to get moving. And for fish it is no different. Early spring is when many fish species are on the move, migrating to other areas to spawn.

The Chesapeake Bay watershed, a kind of watery interstate, is a vital corridor for migrating fish. Resident fish, like yellow perch, move up and down the same river. Anadromous fish journey from oceans to freshwater rivers and creeks to reproduce. Anadromous fish known for their spring spawning runs include blueback herring, alewife, hickory shad and American shad. Conversely, catadromous fish, like American eels, swim downstream from freshwater to saltwater to spawn.

In the last 200 years, though, populations of these species have decreased drastically. Other river species are in decline as well. For example, freshwater mussels, which require a host fish to complete their life cycle, are imperiled throughout their range.

One important factor in these declines is due to dams, undersize culverts and other barriers that prevent fish, mussels and other aquatic wildlife from moving to areas to complete their life cycle.

These barriers also impede natural river flows and function. Sediments, once carried by rivers to coastal wetlands, are trapped in reservoirs and pools above dammed rivers. The trapped sediments no longer replenish coastal marshes, which adversely affects seafood nurseries and bird habitats along shores and estuaries.

Free-flowing rivers are crucial to sustaining healthy fish populations. And, they enable mussels, reptiles and amphibians to reach important breeding, wintering and feeding habitats. Free-flowing rivers sustain important natural processes such as cycling nutrients, distributing sediments and maintaining appropriate water temperature and oxygen levels.

In addition to barriers, some rivers have been altered to the point that they are no longer connected to their floodplains. By reconnecting rivers to their natural floodplains, floodwater can be dissipated and slowly absorbed. This improves the resilience of land to storms and reduces damage from floods. Floodplains also provide critical habitat for small mammals, birds, reptiles and amphibians.

Natural, healthy free-flowing river systems are essential to the health and livelihood of all Americans by improving water quality, recreational and commercial fishing prospects and

providing outdoors recreational opportunities. Removing or replacing barriers and undersize culverts can also improve public safety while reducing maintenance costs and liability to the owners. Redesigning infrastructure also provides skilled jobs in engineering and construction fields.

Luckily, there are numerous ways to improve or re-establish "aquatic connectivity" for fish and other wildlife. Many partners at the local, state and federal levels — including conservation groups and private landowners — are working together on such projects. They have installed structures that get fish and eel up and around dams, removed obsolete barriers such as unneeded mill dams and upgraded and replaced obsolete infrastructure like culverts that block fish movements. Enter "Recent Fish Passage News" and "A Year of Clearing the Way For Communities and Wildlife" into your search engine to learn more.

Kathy Reshetiloff is with the U.S. Fish and Wildlife Service Chesapeake Bay Field Office in Annapolis.

This eelway, installed in 2019, will help immature American eels get past Dam #5 near Falling Waters, WV, on the Potomac River. (David Sutherland / U.S. Fish and Wildlife Service)