CHESAPEAKE
BAY JOURNAL
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Coronavirus hinders Bay restoration efforts, seafood industry

≈ Cleanup and planting projects, farm visits put on hold; groups worry about funding for future

By Bay Journal Staff

Watermen have no restaurants that can buy their catches. Help for farmers who want to install runoff controls has been sharply curtailed. Streams throughout the region are missing their annual spring cleaning. And many students are losing their chance to experience the Chesapeake Bay firsthand.

The impact of the new coronavirus, barely on the radar only a few months ago, is rippling through the Chesapeake Bay region, with impacts felt from Pennsylvania farm fields to Eastern Shore oyster grounds. While some impacts are minor, such as the postponement of meetings and cleanup events, others could become significant if the COVID-19 crisis lingers, potentially creating another setback for Bay pollution control initiatives.

While some point to slivers of positive news — air pollution is down — the near-shutdown of business activity is likely to slam state budgets in coming months, and possibly years, at a time when they had hoped to significantly increase spending on the Bay cleanup.

"There's obviously going to be a delay in any new plans and conservation work," said Lindsay Thompson, executive director of the Maryland Association of Conservation Districts. In a sentiment reflected by many, she added, "Right now, it's really just [about] trying to keep the wheels rolling and keep everyone safe."

Delays & cancellations

Tree plantings, school field trips, citizen oyster restoration activities and the region's largest litter cleanup event are all being postponed or altered as environmental groups struggle with the sweeping disruptions.

"We're in uncharted territory," said Willy Agee, vice president of the Chesapeake Bay Foundation. His his group, as well as the Alliance for the Chesapeake Bay, have been forced to delay environmental field work.

The immobilizing of construction contractors as a

SEE VIRUS ON PAGE 22

Brendan Burke, president of the Maritime Heritage Chapter of the Archaeological Society of Virginia, walks by the ribs of one of the Nansemond's ghost ships.(Tamara Dietrich)

Bones of 'ghost fleet' haunt Nansemond

≈ After the Civil War, Suffolk, VA, became a maritime industrial powerhouse

By Tamara Dietrich

In a muddy bend of the Nansemond River, hidden amid Suffolk's bustling business district, lie the rotting remains of old wooden boats.

From bugeyes to barges, logboats to tugboats, canoes to crabbing skiffs, these vessels helped to resurrect this Virginia city after the ruinous Civil War. They hauled oysters and scallops up and down the mid-Atlantic, supplying hotels and restaurants from Chicago to New Orleans, all the while transforming Suffolk into an industrial powerhouse of maritime trade.

In time, though, as railroads began to supplant traditional riverine shipping lanes, these vessels were abandoned near the wharfs they once serviced. They sank beneath the surface and settled onto the river bottom — lost to living memory.

Until now.

Local history buffs exploring the riverbank stumbled across the submerged wrecks a few years ago during an

SEE BOATS ON PAGE 20

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Corrections

A March article about the Trump administration's rollback of protections for wetlands and waterways garbled Trout Unlimited's estimate of how much of the Bay watershed would be affected. The group figures that there are 111,000 miles of ephemeral streams, or 47 percent of all stream mileage in the six-state watershed, that would lose federal protection. The *Bay Journal* regrets the error.

Chesapeake Challenge learned that an answer in the March quiz, *Earn your stripes doing this rockfish quiz!,* is now outdated. The way to determine the age of a striped bass is to count the wide growth rings (called annuli) on the fish's ear bone (otolith). The *Bay Journal* thanks John Odenkirk, fisheries biologist the Virginia Department of Game & Inland Fisheries for pointing this out.

Editor's Note

The Bay Journal is here for you

Little has been more shocking than how much has changed since we wrapped up the previous edition of the *Bay Journal* just four weeks ago.

Who would have thought, a month ago, that toilet paper would become a prized commodity, or Zoom meetings would become a part of daily life for many people as they were increasingly sequestered at home?

Here at the *Bay Journal*, the impact has been less severe. Our staff already works from home offices, so we didn't have to shift our operations, though certainly we're all traveling a lot less.

We know many people have been affected to a far greater extent, and financial challenges have impacted nearly everyone. So we recognize that when you receive our 2020 Annual Fund appeal in the next few days, not everyone will be able to help support our work. But if you are able to make a donation, we truly appreciate it.

The *Bay Journal* is, and will remain, *free*.

We operate with the belief that an informed public is essential for decision making in general, for the Bay cleanup in particular, and even for democracy as a whole.

If you can give, we are very grateful, especially in these uncertain times. If you cannot, we understand.

Building an informed, engaged and caring public is a community effort — one where everyone has a role to play, even if it cannot be financial. You can always help by introducing the *Bay Journal* to a friend!

In the meantime, stay safe and healthy.

Stuck at home? Stream our films

If you're feeling homebound during the coronavirus crisis and need a nature "fix," you can try a virtual outing.

Our four Chesapeake Bay documentaries are available for streaming on our website (bayjournal.com): *Nassawango Legacy, An Island Out of Time, High Tide in Dorchester* and *Beautiful Swimmers.* All were produced by the award winning team of Tom Horton, Dave Harp and Sandy Cannon-Brown.

For more ideas of creative things you can do at home, and help the environment at the same time, visit this month's *Chesapeake Challenge* and *Bay Buddies* on page 33.

Bay Journal bundles available

Bundles of *Bay Journal*s are normally available for regular distribution at many libraries, nature centers, sporting stores, schools and restaurants. But because many of those outlets were closed when we went to press, with no indication of when they may reopen, many of those shipments did not go out.

We will have a limited supply of the April edition available. Places that did not receive their regular shipment which reopen can contact me, and we will send extra copies while supplies last.

— Karl Blankenship

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Far left: Nassawango Preserve in Maryland was the setting for an early spring field test of plant ID apps for mobile phones.

Fire ants are marching northward as rising temperatures make areas once too cold for them attractive. See article on page 13. (U.S. Department of Agriculture)

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Decline of ruffed grouse linked to loss of young forest habitat

≈ Warmer temperatures, West Nile Virus also taking their toll on game bird

BY AD CRABLE

Ruffed grouse, a strikingly beautiful bird that symbolizes wildness, is in trouble across its native range, including states in the Chesapeake Bay drainage.

The decline is growing in Pennsylvania, New York, Maryland, Virginia and West Virginia, and biologists point to two main causes: widespread loss of young forest habitat and deaths from the mosquito-borne West Nile Virus.

Warmer winters aren't helping matters either, because grouse burrow into snow banks for protection from predators and the cold.

They are a game bird associated with engraved shotguns and days spent walking mountains with dogs and friends, and concern over their unrelenting decline has prompted sportsmen's groups and states to shift timbering priorities and take other steps as part of a nascent conservation movement to save the bird.

"A grouse sighting shouldn't become a rare bird alert on birdwatcher lists," said Linda Ordiway, a wildlife biologist in Pennsylvania with the Ruffed Grouse Society.

A 2017 assessment by Northeast game managers found that the grouse population declined by at least 30% in Bay states over the last three decades.

According to both biologists and hunters, some localized populations are winking out entirely.

The New York Department of Environmental Conservation says its grouse population has declined by an alarming 80% since the 1960s, and the Pennsylvania Game Commission estimates the state has lost 20–30% of its grouse population in the last 4 years alone.

Eighteen of the 38 states where ruffed grouse are native now list it as a species of concern.

In Pennsylvania, Maryland and Virginia, grouse is listed as a species of greatest conservation need. Pennsylvania, where the ruffed grouse is the state bird, cut its grouse hunting season by more than half in 2017 with the hope of stemming the decline.

Other states have taken action, too. Indiana in 2019 placed the once-common ruffed grouse on its endangered species list after populations declined by 99% in the last 40 years. New Jersey, in the same year, canceled its grouse hunting season and is considering adding the bird to its endangered species list.

But advocates say more aggressive steps are needed. The Ruffed Grouse Society, a 59-year-old nonprofit conservation group with 17,000 members, thinks grouse may well be on their way to endangered status nationwide unless there is a concentrated effort to protect and expand their habitat.

Check it out, ladies! A ruffed grouse, in full display, struts his stuff in the snow. (Jason Wood)

"Until we have large-scale habitat management, the population is not going to come back up, to be brutally honest," said Chris Ryan, a biologist with the West Virginia Division of Natural Resources.

Some even question whether recovery is possible. The 2017 game managers' report concluded, "It is possible that the quantity of high-quality habitat on the landscape has declined below some threshold to the point where the ability of grouse populations to recover has been suppressed."

'King of Thunder'

Ruffed grouse are round, plump birds slightly larger than pigeons. They are elusive birds — many people have never seen one, even though grouse is the most widely distributed game bird in North America. Estimating populations is difficult, and state resource managers often rely on hunters for help.

Grouse plumage consists of an intricate blend of browns, blacks and grays that match the forest floor where they spend most of their lives. The birds' fan-shaped tails and ruffed neck feathers are especially admired. Many paintings of grouse feature the pose of males when they puff up and fan out their tail feathers and neck "ruffs" to attract females or defend territories.

Grouse spend most of their time on the ground or in small trees eating buds and do not migrate. They live out their lives within a few acres of woods, which is why new efforts to improve habitat pivot on doing the work where remaining grouse are located. Young grouse hens, though, may fly up to 15 miles looking for the place they may spend the rest of their lives.

One of their most identifiable behaviors is when the males "drum" in the spring, climbing on a log to beat their wings rapidly, creating a vacuum and a noise similar to what happens when lightning creates thunder. It is accurately compared to the sound of a distant tractor starting up. The sound of spring drumming is another aid in conducting population surveys.

In much of their native range, snow is part of a grouse's existence. They depend on burrowing into snow to hide from predators and withstand the cold. In the fall, they grow fleshy bristles along their toes that act like snowshoes. It is one of the great sights in nature to see a grouse dive into a snow bank for the night.

Grouse are one of the most revered and challenging of game birds. They flush in a burst known to freeze a hunter into inaction and are sometimes called the "King of Thunder." Once flushed, they zigzag through trees and thick cover.

"There's a lot of laughter and stupidity that happens out there," said grouse hunter Geoff Smith of Pennsylvania, describing hunters so startled by an explosive flush that errant shots strike nearby trees. "Lots of trees have lost their lives," he joked.

Smith loves to walk the mountains and watch his trained dog work to flush a grouse. That happens, on good days, about twice an outing. Last year, he didn't even take a shot, but he says that doesn't diminish his passion for grouse hunting.

Bagging one rewards a hunter with delectable game meat.

Lack of young forests

The main reason for the loss of grouse is clear: declining habitat — not from development, but the paucity of young forests and brushy areas that grouse need to survive.

Those areas are disappearing as abandoned farmland and areas targeted for massive clearcutting a century ago grow into mature forests.

Though grouse use all age classes of forests, they cannot do without thick stands of young forests 5–25 years old for cover, food, brood rearing and courting. Other species, such as turkeys, woodcock, rabbits and migrating warblers, also rely on such landscape.

"Grouse aren't alone. It has other brothers and sisters out there in the landscape that are suffering," said Gary Norman of the Virginia Department of Game and Inland Fisheries.

Part of the challenge in cultivating young forest habitat is public resistance to tree-cutting. Fears of destructive clearcutting and sometimes any degree of timbering can bring lawsuits and howls

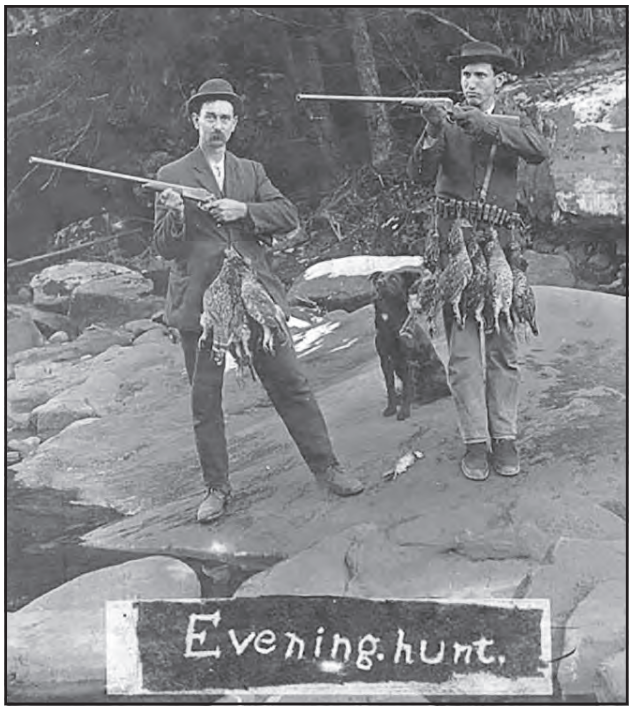
GROUSE CONTINUES ON PAGE 5

Grouse from page 4

of protests. That has held back tree-cutting on national forests in particular. The result is that forests get older but less diversified, and thus less resilient, say wildlife managers from Bay states and the Ruffed Grouse Society.

There's also less fire on the forested landscape. For centuries, forest growth often was disturbed by fires caused by lightning strikes or intentionally set by Native Americans or settlers, leading to young-forest habitat with the stands of seedlings and saplings that allowed grouse to thrive.

"You can love your forest to death," said Lisa Williams, the Pennsylvania Game Commission's ruffed grouse biologist. "I always say that I am a tree hugger too, but, at the same time, I realize that baby trees need hugs, too. We have several dozen species that are in trouble because they need these young forests."



Grouse hunting long ago often meant a full game bag. Today, hunters are advocates for the bird. They were the first to alert scientists about the population decline, and many have cut back or stopped hunting altogether until their numbers rebound. (Historic photo / PA Game Commission)

It's no coincidence that two major young-forest habitat projects that the Ruffed Grouse Society is spearheading in Pennsylvania include the American Bird Conservancy and National Audubon Society as partners.

In Pennsylvania, only about 8% of public and private forests are made up of young forests – a 70-year-low.

West Nile Virus

If the habitat woes for grouse weren't bad enough, it's now been established that West Nile Virus has been killing grouse in Pennsylvania, and almost certainly in other Bay drainage states, since the early 2000s.

"For grouse, the virus became the straw that broke the camel's back in many areas of the state," said Williams, who did the pioneering research on the virus in Pennsylvania. "Many populations that had hung on as they lost habitat winked out after [it] hit."

She decided to look into the problem after veteran grouse hunters started calling her in 2013, insisting that places where they had hunted reliably for years were suddenly grouseless.

She calls grouse hunters "unsung heroes" for alerting scientists to the new threat. "Hunters certainly are the biggest advocates for grouse," she said, noting that many have voluntarily cut back on hunting or stopped altogether until grouse numbers rebound.

Research has shown that the species of mosquitoes that affect grouse are less prevalent at higher altitudes, perhaps pointing the way for targeted habitat work.

Diverse, healthy forests may be the best way to help grouse withstand the virus as studies have shown that their populations rebound faster from virus-related mortality in good habitat as opposed to marginal cover.

Climate change effects

Scientists fear that more frequent rainfall and warming temperatures from climate change will mean more breeding mosquitoes that worsen the effects of West Nile Virus on grouse.

Other effects of climate change have wildlife agencies worried as well.

The National Audubon Society predicts that if temperatures rise as much as projected, grouse will leave Pennsylvania altogether and not be found south of New York within 20 years — a prediction that many wildlife managers think is exaggerated.

It's feared that reduced snowfall will deplete winter cover and knock down populations in some states. And grouse won't tolerate an area if it gets too warm in summer.

If early springs cause insects to emerge sooner, they may not be as plentiful for grouse chicks that depend on that high-protein source for nourishment. Grouse chicks are also vulnerable to the chilling effects of a cold spring rain; they are notorious for freezing to death in even moderately cool rain.

Rescue attempts

In New York, a worried Department of Environmental Conservation launched a Young Forest Initiative in 2015 to adjust timbering procedures in a way that will allow the regrowth of 12,000 acres into a stage of woods that features tree seedlings, saplings, woody vines, shrubs, grasses and flowering plants.

The Pennsylvania Game Commission increased by 50% the acreage of woods on state game lands that are cut to create emerging forest habitat. The agency also has hired more people to work with owners of private forests, which account for 71% of all woodland in the state.

A new online tool in the state, called Grouse Priority Area Siting Tool, flags areas for ideal grouse habitat and invites private landowners to seek free technical support to make habitat improvements.

In Virginia, the Department of Game and Inland Fisheries has five biologists who work full-time with private landowners on forest management, including creating early successional woods.

An increase in the controlled burning of natural areas could also help grouse recover, as it increasingly becomes a tool in Bay states to boost plant life on the forest floor.

In West Virginia, resource managers are establishing early successional forest habitat along gas and power line rights-of-way and around field edges on state lands.

State wildlife managers and sportsmen's groups are united in their belief that the best hope of getting grouse to rebound to viable numbers is creating that critical young forest habitat.

"Those birds don't move. They don't migrate. They die within 2 or 3 miles from where they hatch," said Williams of the Pennsylvania Game Commission. "We have to worry about those birds finding each other to reproduce. We have got to get active in creating habitat."

And it has to be done on a landscape level, not isolated projects, for grouse to find each other, stressed Mike Schiavone, game section leader for the New York Department of Environmental Conservation.

It won't be easy. Timbering costs money. The commercial logging market is down. Most woods are privately owned. And improvements have to be done in the right places.

"Many species you can save by just preserving an area and stopping hunting," said Bob Long, upland game bird biologist with the Maryland Department of Natural Resources. "It's a totally different type of effort that you have when you're trying to restore a species that depends on human disturbance. It's not a popular thing. The public at large doesn't like cutting trees."

Still, as *Field & Stream*'s Phil Bourjaily wrote recently, "We have to roll up our sleeves, fire up our chainsaws, raise our voices and work to make sure we aren't witnessing the great entertainer's final curtain call."

Though in serious decline, ruffed grouse are the most widespread game bird in North America. (Pierre Gloutnay)

MD officials zap electric ferry proposal for Chesapeake crossing

≈ Report says idea won't work as standalone option but state says it could be considered 'in combination with other alternatives'

BY JEREMY COX

A new state-sponsored study argues that a car-carrying ferry service would not by itself alleviate traffic on Maryland's Chesapeake Bay Bridge. It would also cost billions of dollars to build and operate.

The 43-page report by the Maryland Transportation Authority and state Department of Transportation concludes that a ferry service wouldn't resolve traffic woes "as a standalone option." At least one conservation group is skeptical of the state's findings, saying it's too early in the process to discount a ferry or any other option.

For their part, state transportation officials say that they'll keep the idea simmering, though on the back burner. Ferries could be considered "in combination with other alternatives" if the process to construct a third span across the Bay moves forward, the agencies said in the report.

Gov. Larry Hogan announced in 2016 that the state would conduct a $5 million National Environmental Policy Act study to decide where a new Bay Bridge should be built. Backers say a new bridge is needed to ease gridlock during weekday rush hours and summer weekends. The backups are expected to worsen as the region's population grows.

The Bay Bridge is part of U.S. Routes 50/301. It is the only Bay vehicular crossing in Maryland. (Dave Harp)

The Bay Bridge is part of U.S. Routes 50/301. It is the only Bay vehicular crossing in Maryland.

Last August, the MdTA, which owns and operates the Bay Bridge, proposed three possible routes for a new crossing as well as a "no-build" option. The agency plans to release a draft of the study and recommend a single preferred alternative by the end of this year.

The ferry study was quietly released in January in response to a Maryland General Assembly order. The state House and Senate budget committees jointly asked the administration last year to study the possibility of launching a ferry service.

The legislative committees acknowledged in their written instructions to the administration that several previous studies cast doubt on its feasibility. But those reports, they added, didn't consider new technological developments, noting that all-electric ferries "have become more realistic alternatives." By substituting electricity for diesel fuel, such operations are greener and can sidestep seesawing fuel prices, advocates say.

The last ferry operation in Maryland that transported vehicles across the Bay closed in 1952 with the opening of the first bridge between Annapolis and Kent Island. The bridge and ferry followed similar routes. A second, parallel span opened in 1973.

The MDOT and MdTA report lays out the pros and cons of restarting a ferry service.

Improvements in battery capacity and life have made electricity a more viable option than ever for ferries, according to the report.

Around the globe, a handful of systems have begun adopting the technology in recent years. Those include the EF Ellen, a Danish ferry with a 26-mile range that began operating in

FERRY CONTINUES ON PAGE 7

Ferry from page 6

early 2019; the Amherst Island ferry in Canada, which is expected to launch an electric watercraft this year; and the Washington State Ferries system, which has begun converting its fleet from diesels to hybrids.

The state staff who authored the new report sought to find out whether adding a ferry service could be the sole solution for maintaining the Bay Bridge's current level of service despite heavier travel between the shores. Looking forward to the year 2040, that translates into removing nearly 900 vehicles from the span when traffic is expected to be at its worst, the agencies wrote.

The only way a ferry system could come within striking distance of that figure would be to have it run near the existing bridge, according to the report. To operate efficiently, the system would require three large vessels as well as a fourth for backup.

Each would have to be roomy enough to carry 400 vehicles. No electric ferries of that size exist. A hybrid ferry operating in Scandinavia, though, currently carries up to 460 vehicles.

Depending on the type of battery selected, it would take at least 10 minutes to charge the ferry either once every trip or every round trip. That could be done while vehicles are rolling on and off. Overall, including sailing time and boarding, the 4-mile trip is estimated to take 50 minutes.

The Olympic Class ferry, shown here in Elliott Bay off Seattle's Discovery Park, was the type of vessel considered for the Chesapeake crossing. (Washington State Department of Transportation)

The fare amount would depend on the service's popularity. If it runs at full capacity, travelers could expect to pay $37; if it runs at 25% capacity, the price tag soars to $150.

The service also would require more infrastructure on both sides of the shore, including new approach roads, docking facilities, fare collection stations and administration buildings. The channel would likely need to be dredged to accommodate the ferries.

And there probably would be service disruptions because Port of Baltimore vessels would be given priority over passage, the report states.

The Bay Bridge itself could serve as a barrier to the service's success, the transportation officials argue. As long as the structure stands, it will compete with the ferry for vehicles. Typically, ferries operate where no other options exist.

When considering all the costs, ranging from the $780 million for the ferries to compensation for the 45-person crew, the endeavor would cost about $3.4 billion over 40 years. In contrast, earlier reports have pegged the cost of a new Bay Bridge at up to $10 billion.

The transportation agencies ultimately rebuffed the ferry proposal, writing: "A MdTA-operated ferry service utilizing all-electric ferries is not a feasible alternative to a third crossing of the Chesapeake Bay. .... There are currently no existing all-electric vessels in operation that would provide the capacity needs identified above and the service would be cost prohibitive from the user and operator standpoints."

The MDOT and MdTA declined to elaborate on the contents of the report for this article. "We have been swamped with coronavirus prep and response," MDOT spokeswoman Erin Henson said.

Jim Campbell, vice president of the Queen Anne's Conservation Association, said he hopes the state keeps a ferry service on the table as part of an array of possible strategies to combat bridge traffic. His group worries that the construction of a third Bay Bridge will lead to more urban development on the Eastern Shore.

"That's just one arrow in the quiver at most," Campbell said of the ferry. The group has hired its own consulting firm to analyze the traffic problem, and it plans to publicly release the report later this year, he added.

As climate changes, longleaf pines move north – with help

≈ Nature Conservancy tries 'assisted migration' on former MD farmland

By Timothy B. Wheeler

On Maryland's Eastern Shore, an evergreen forest that's never ventured so far north is slowly gaining a toehold in fields where until recently corn and soybeans grew.

Spurred along by intentionally set but carefully controlled brush fires, hundreds of longleaf pines are now reaching for the sky along Plum Creek, a meandering tributary of the Nanticoke River.

It's all part of an experiment in "assisted migration" being conducted by The Nature Conservancy. The nonprofit conservation group wants to see if human intervention can help an ecologically important forest ecosystem adapt as climate change alters its range.

Longleaf pine once blanketed the Southeast, covering an estimated 90 million acres from Florida to southeastern Virginia and west to Texas. Unlike dense hardwood forests, longleaf pines grew more widely spaced in parklike grasslands, which were also home to a diverse array of plants and wildlife.

The trees' straight trunks and tough wood proved valuable, though, in early shipbuilding and the construction of homes and businesses. Centuries of harvesting and development have since shrunk longleaf pine's extent to just 3.4 million acres — less than 5% of its historic range.

With the forest's decline, some of the wildlife that once frequented its savanna-like habitat also are threatened or endangered, such as the red-cockaded woodpecker. The cardinal-size bird has a distinctive black cap and white cheeks, with the male sporting a barely visible red speck, or cockade. It nests in cavities dug out of the soft heartwood of mature pine trees, which are in short supply these days.

In an attempt to reverse those trends, The Nature Conservancy has been working with government and other nonprofit groups to restore longleaf pines throughout the South. In Virginia, until now the northern edge of the trees' range, the conservancy is recreating a longleaf pine forest on the 3,200-acre Piney Grove Preserve it acquired in 1998 in Sussex County.

But changing climate conditions are posing a challenge for sustaining longleaf pine forests and the wildlife that occupy those ecological niches. With temperatures rising at an unprecedented clip, researchers have projected that plants in general could have to migrate up to 3 miles a year to survive. That's many times the movement rate of many species, particularly trees like longleaf pines.

Dry grasses are deliberately set on fire to encourage the growth of longleaf pine at Plum Creek Preserve in Maryland. Controlled burns help maintain grasses and spur longleaf pines' growth. (Dave Harp)

Bringing longleaf forest to Maryland might also help to re-establish the red-cockaded woodpecker. (James Hanula / USDA Forest Service)

"It's no longer a static ecosystem," said Deborah Landau, a concervancy ecologist. "We can't just buy it and protect it and hope for the best. The times are changing, the climate is changing. We have to try different things."

Since 2013, the conservancy has been working with volunteers to establish a longleaf pine forest on a portion of its Plum Creek Preserve, 300 acres of former croplands near Sharptown. They planted about 1,000 long-needled seedlings that year. In 2015, they put in another 500, followed by 600 more on Feb. 27 of this year.

In between plantings, the conservancy and its partners intentionally torch the fields. Longleaf pines can survive such blazes and, in fact, need them to outcompete other vegetation and trigger a growth spurt.

"It opens up the site and dries it out," Landau explained, adding that "by pushing fire across the landscape, you encourage germination of a lot of native species."

The fires also help warm-season grasses that the conservancy has planted to replace the crops once cultivated there, species like arrowfeather three-awn, splitbeard bluestem and purple lovegrass.

Before civilization encroached, wide-ranging brushfires sparked by lightning strikes used to be a regular occurrence, sustaining the pines and the grasses that grow on the forest floor. Now, human help is needed.

So, on a chilly, cloudy January morning, conservancy staff and teams of state and federal agency personnel gathered at Plum Creek Preserve to administer another dose of fire to the fledgling forest. The burn was carefully orchestrated, with a firefighting water tanker truck from Blackwater National Wildlife Refuge on hand to douse any errant flames.

Yellow-garbed team members used "drip torches" to start the fire on one 10-acre patch by pouring a thin stream of flaming diesel gas along the edge of the field. Flames spread quickly through the tall dry grass, producing a chorus of crackling as grayish smoke billowed skyward on a gentle breeze.

The fire burned itself out in short order, leaving the ground covered with white ash and blackened stems of vines. But the pine seedlings and saplings remained standing, green and seemingly unaffected. The crew moved on to administer similar treatment to other patches.

Longleaf pine seedlings don't grow much at first, as they start out by extending a long taproot underground. But after a few years, and with the heat of the fire triggering germination, they grow from clumps of grass-like needles to stubby saplings resembling a green bottle brush. As they continue to grow, they finally begin to produce uneven branches that arc upward.

The conservancy and its partners hope this experiment will give the trees a head start on relocating north to Maryland.

"What we're hoping to learn is how these more southerly species do as temperatures increase, as we get more extreme weather events," Landau explained. Longleaf pines can handle extended periods of drought and rainfall, she noted, and their deep taproots help them withstand the strong winds of hurricanes.

They also hope it might ultimately help re-establish red-cockaded woodpeckers in Maryland. The birds also nest in mature loblolly pine forests, which once covered the Coastal Plain area in the state but have been lost to commercial timbering over the years.

"We had them in Cambridge," Landau said of the birds, "and in the late 1960s, the last population of red-cockaded woodpeckers was lost when the stand of loblolly pines that they were in was cut down. So perhaps one day we'll be able to bring red-cockaded woodpeckers back into Maryland."

It may seem incongruous for a conservation group to introduce a tree not native

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Forest from page 8

to Maryland. But Landau said it isn't really a stretch. After the Ice Age, she explained, longleaf pines slowly extended their range northward from Florida. They had reached the James River in Virginia about 400 years ago, when English settlers arrived and began cutting them down. If that hadn't happened, she argued, they may very well have found their way to the Delmarva Peninsula, as other southern pines did.

Even so, it takes longleaf pines a century or more grow to their full height. The conservancy isn't waiting that long to try re-establishing the endangered woodpeckers, though. In another preserve along nearby Nassawango Creek, the group is also managing a stand of native loblolly pines. That forest has been thinned and burned periodically for the last 16 years, she said, to cultivate a similar savanna with big old trees like the ones where the birds once nested.

"Our hope is that in a few years we'll have suitable habitat at Nassawango for red-cockaded woodpeckers," Landau said.

But longleaf pines have shown themselves to be so resilient to extreme weather and storms, she added, they may be better adapted to handling the changing climate. "So, we're hedging our bets," Landau said.

This experiment in assisted migration hasn't always gone smoothly. Many of the seedlings planted in fall 2015 succumbed to a hard freeze soon afterward that heaved them out of the ground. "It's very much of a learning curve," she said.

Kate Tully, (far left) a Nature Conservancy volunteer from Cockeysville, pauses with her dibble, a tree-planting device, and a handful of seedlings during a planting at the Plum Creek Preserve in Cockeysville, MD. Nick Sparacino of the Chesapeake Conservation Corps, measures a longleaf pine tree planted about 5 years ago. It was 80 inches tall. (Photos / Dave Harp)

On that smoky day in January, though, the progress to date was evident. Looking at a 6-foot sapling, Landau figured it was planted in 2013. It has been burned three times now. After each fire, she said, "they really just kind of shoot up….The effects just speak for themselves. They're just so satisfying."

Smart ponds making a splash in controlling stormwater runoff

≈ Runoff retention sites adjust levels when rain is forecast

BY TIMOTHY B. WHEELER

One of the oldest methods for capturing runoff, the stormwater pond, is getting a digital makeover. It no longer simply collects rainfall washing off pavement and lawns. The new version anticipates precipitation before it begins and adjusts itself to reduce downstream pollution and flooding.

Welcome to the dawn of "smart" stormwater management.

A few dozen runoff collection ponds that were built years ago in the Chesapeake Bay watershed have already been retrofitted to "smarten" them up. Equipped with real-time sensors and cloud-based controls, they remotely release or retain stormwater in response to online weather reports. More — likely many more — are on the way.

"I think we're on the cusp of a great transformation," said David Rubinstein, chief executive officer of Opti, who said his Massachusetts-based company has built 150 smart ponds in 20 states. It has 18 so far in the Bay watershed, most of them in Maryland.

Others are more cautious, but still optimistic about the promise of the new technology.

"It's somewhat of a revolution," said Tom Schueler, executive director of the Maryland-based nonprofit Chesapeake Stormwater Network.

For the last 30–40 years, Schueler said, engineers have been relying on gravity alone to capture and treat runoff, mainly to control flooding and stream erosion. Dry and wet stormwater ponds pepper the landscape across the Bay watershed, where they passively collect and hold runoff whenever it rains.

But just as the "internet of things" has transformed daily life in other ways, from smartphones to smart appliances, web-based technology is offering a new way to deal with stormwater, one of the leading sources of pollution in the Chesapeake.

Runoff carries dirt, fertilizer, pet waste, oil, chemical contaminants and litter into nearby streams. It accounts for 16% of the nitrogen, 18% of the phosphorus and 24% of the sediment fouling the Bay, according to the state-federal Chesapeake Bay Program. Reducing stormwater pollution has proven to be difficult, as development spreads more runoff-inducing rooftops and pavement.

Local and state agencies have turned increasingly to restoring eroding stream banks in an attempt to reduce the flow of sediment and nutrients washing into the Bay from existing development. Those projects have proven to be costly and varied in effectiveness.

"A lot of the money we're spending now is to fix the sins of the past," said Bob Bathurst, a principal with Century Engineering, a Hunt Valley, MD, firm that also works on smart ponds. "The stream channel erosion that's ongoing, unless we control the runoff rate, we're going to continue to have it."

Engineer Bob Bathurst overlooks a stormwater pond that his company retrofitted in suburban Windsor Mill west of Baltimore. "This is going to do wonderful things," he said of smart-pond technology, especially for existing stormwater facilities "that are out there, already paid for and underperforming." (Dave Harp)

Schueler said he sees wired, actively managed smart ponds as complements to stream restoration projects. They can curb the surge of runoff that erodes stream banks, he said, and can enhance the pollution-trapping performance of old stormwater basins 25–50%. They can also reduce the frequency or severity of downstream flooding from intense rainstorms.

> *"So then, when it rains, other parts of the watershed are contributing to downstream erosion and flooding," engineer Bob Bathurst said, while the smart pond "acts like a receiving vessel." [It holds onto its runoff rather than adding to the flooding and the rush of polluted water downstream.]*

"You have potentially tens of thousands of older stormwater ponds in the upland areas where this treatment can take place," Schueler said.

It doesn't take a lot to convert an old pond into a smart one. A sensor placed on the bottom monitors the water level, while an electronically activated "actuator" is used to open or close a butterfly valve installed in the pond's water release outlet. A microcomputer connected to the internet collects water-level and weather forecast data and manipulates the release valve.

"It's all automatic," Bathurst explained as he surveyed a large pond his firm converted a couple years ago in the suburban Windsor Mill area west of Baltimore.

When heavy rain is forecast, Bathurst said, the control system calculates the amount of runoff that's expected to flow into the pond. A signal is sent over the internet to open a valve at the pond up to 48 hours in advance of the precipitation. The pond level drops as the water is gradually released into a nearby tributary of the Gwynns Falls, until there is enough storage created in the basin to accommodate the projected accumulation without overflowing.

"So then, when it rains, other parts of the watershed are contributing to downstream erosion and flooding," Bathurst said, while the smart pond "acts like a receiving vessel." It holds onto its runoff rather than adding to the flooding and the rush of polluted water downstream.

Once the storm has passed, Bathurst added, the pond can hold onto the water for as long as it takes — or at least until the next deluge approaches — to settle out as much sediment and nutrient pollution as possible.

The status of the pond is monitored on a digital dashboard that Bathurst can access with his smartphone. "You can see it's in a retaining status right now — we're not discharging," he said, holding up his phone screen. Should anything go wrong, like a stuck valve, he said, the system sends an alert, so a repair crew can be dispatched.

The pond control system also adapts to seasonal conditions. In winter, when a deep freeze is forecast, the water depth is lowered to 2 feet or less for safety reasons. Though the ponds are fenced off, it's all too easy for someone to sneak in. But with the water drained down, there's less chance a trespasser could break through the ice and drown. Likewise, in summer, pond levels can be manipulated in an attempt to limit mosquito populations.

Wired or not, the ponds still serve as neighborhood wildlife refuges. "I saw my first wood duck after we retrofitted a pond," Bathurst said.

Smart pond technology was developed six or seven years ago, according to Stuart Schwartz, a senior research scientist at the University of Maryland, Baltimore County. He said it's a natural extension of internet-connected systems that have been developed to operate wastewater treatment plants and water reservoirs.

Even so, he cautioned that smart-pond technology is no cookie-cutter panacea for curbing polluted runoff. Not every stormwater pond is a candidate for retrofitting, and there are other logistical, legal and political complexities that have held back a rush to install it.

"Every pond has a different drainage area and runoff potential and storage," he said. Their effectiveness also depends on the reliability of weather forecasts. It's a question, he concluded, of finding that "sweet spot" where a pond is big enough or can be manipulated enough to provide significant stormwater retention, even in intense downpours.

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Ponds from page 10

Smart ponds have other challenges, which are relatively easy to deal with. If the power goes out or the internet goes down, the gear is pre-programmed to keep the valve closed, and the pond performs much like an old passive detention basin. Most ponds are solar-powered, though, with batteries on site to provide electricity during the night and on cloudy days. There is also the risk of vandalism, which could impair their activities.

The other hurdles to rapid deployment are more systemic. There are 65,000 privately owned stormwater ponds in the Bay watershed, by the U.S. Environmental Protection Agency's estimate. But private landowners often have no incentive to upgrade passive ponds, and government traditionally shies away from investing public funds to enhance private property.

Nonetheless, the Maryland Department of Transportation sees great potential in the new technology, said Sandy Hertz, assistant director of the department's office of environment. Her agency owns about 800 ponds that could be retrofitted, but it has been waiting for state regulators to verify the technology's effectiveness before taking the plunge with its own facilities.

The department announced a public-private partnership in November, though, where it pledged to pay $4 million to facilitate smart stormwater ponds at four Wal-Mart and Sam's Club stores across Maryland. Opti, the Massachusetts-based company, forged a partnership with The Nature Conservancy to make the retrofits and oversee the facilities' operations for 20 years.

Smart stormwater ponds can be monitored and even manually operated remotely. Engineer Bob Bathurst shows a graph on his phone screen depicting how water level in one pond had been lowered in advance of a deep freeze to reduce the risk of drowning if someone stepped onto the ice and it broke. (Dave Harp)

The department won't actually be financing the retrofits directly. Instead, it will be buying credits from the partners that will help it meet its regulatory requirements to treat stormwater runoff from thousands of acres of highway pavement. Transportation officials said they'll be saving money that way. The credits will cost about $37,500 per acre, one-fourth of the $150,000 per acre the state has paid to put in runoff infiltration swales, bioretention cells and stormwater ponds.

"Stormwater is one of the biggest problems facing the Chesapeake Bay right now," noted Mark Bryer, Chesapeake Bay Program director for The Nature Conservancy. "It's the only source of pollution that's increasing, and this partnership is an opportunity to reverse that and actually save money at the same time."

When the deal was announced last fall, Ben Grumbles, Maryland's secretary of the Department of the Environment, called it "a sneak peek into the future, the future of stormwater management around the country." Diana Esher, the EPA's deputy mid-Atlantic regional administrator, echoed that, describing the arrangement as a national model the federal agency hopes to see spread.

Bathurst said that he envisions a time when all the stormwater ponds in a stream watershed are wired in a network, and their retention and release is coordinated to minimize water-quality impacts. Opti's Rubinstein said his company is exploring a beta version of that now with a municipality elsewhere in the country.

"I would never dare say this is the only solution," Bathurst said. "It's just that this is going to do wonderful things, particularly as it relates to existing stormwater ponds that are out there, already paid for and underperforming."

Advocates press for more federal funding to help reach Bay goals

≈ Congress asked to fully fund conservation programs in 2018 Farm Bill

BY KARL BLANKENSHIP

Fresh off successful efforts to bolster Chesapeake Bay-related funding for this year, advocates are hoping to secure even greater federal support for cleanup and restoration work next year.

Many Bay efforts — from oyster restoration to environmental education and the region's cornerstone nutrient reduction objectives — face challenges in meeting their goals, but advocates hope an infusion of funding will help push them over the finish line.

"With multiple deadlines approaching, federal investment has never been needed more," said Ann Swanson, executive director of the Chesapeake Bay Commission, which represents state legislatures.

"[Funding] must continue and be strategically enhanced to better address agriculture and land conservation — both vital to successfully achieving our shared goal of clean water by 2025."

The commission unveiled its funding requests for nearly a dozen federal programs earlier this year.

On March 4, more than 100 members of the Choose Clean Water Coalition, which represents more than 250 nonprofit organizations in the Bay watershed, descended on the Capital to make the case for continued Bay support.

Recent efforts have been successful in warding off cuts proposed by the Trump administration that would have slashed funding for many programs affecting the Bay. For instance, the administration each year has proposed either eliminating or making a 90% percent funding cut for the U.S. Environmental Protection Agency Chesapeake Bay Program Office. Instead, Congress — which makes final spending decisions — increased its funding for this year to $85 million, up from $73 million.

The office provides overall support and coordination for the state-federal Bay restoration effort. About two-thirds of its money goes toward grants that support pollution control projects by states, local governments, nonprofit groups and others.

Groups are asking the U.S. Army Corps of Engineers to allocate $5 million for oyster restoration next year and the National Oceanic and Atmospheric Administration to chip in another $4 million. (Dave Harp)

The administration has again proposed a 90% cut for the 2021 fiscal year, which begins Oct. 1, but Bay advocates are hoping to instead boost Bay Program funding again. They are seeking $90.5 million, with the increase going to grant programs that support on-the-ground water quality improvement work.

The Bay region is off track to meet its 2025 nutrient reduction goals aimed at cleaning its murky water and eliminating its oxygen-starved "dead zone." With much of the remaining reductions needing to come from the agricultural sector, the groups are calling on Congress to fully fund conservation programs in the 2018 Farm Bill, which provide most of the financial assistance to the region's farmers for implementing runoff controls.

Among their requests is $1.8 billion nationally for the U.S. Department of Agriculture's Environmental Quality Incentives Program and $300 million for its Regional Conservation Partnership Program, which provides additional support in areas of special needs, such as the Bay region.

"As these Farm Bill programs are implemented, it's vital that limited conservation dollars go to the areas of greatest need and impact, including South Central Pennsylvania where many farmers are working to take important steps for clean water but need financial and technical assistance," Choose Clean Water said in letters to lawmakers presented during their visits. "These types of high priority areas have tremendous downstream impacts."

The groups also asked for increased support for technical assistance programs that support farmers' conservation projects.

The Bay Program is also behind schedule for its goal of restoring oyster habitat and populations in 10 rivers by 2025. Oyster reefs were once one of the Bay's most defining features — Chesapeake means "great shellfish bay" in Algonquin — but their population is at 1% of historic levels.

To help, the groups are asking the U.S. Army Corps of Engineers to allocate $5 million for oyster restoration next year and the National Oceanic and Atmospheric Administration to chip in another $4 million.

They also want $1 million to support fisheries science grants by the NOAA Chesapeake Bay Office, up from $240,000 this year. The office is the major source of funding for much of the Bay-specific fisheries research that supports such economically important species as blue crabs and striped bass.

The groups also are seeking $3 million for the National Park Service's Chesapeake Bay Gateways and Trails program, a network of sites that highlight the Bay region's natural, historic and cultural heritage, up from the $2 million allocated for this year. Most of the funding is used for grants to the parks, museums, natural areas and historic sites that are in the network to help them improve public access and explain how those places fit into the broader Bay story.

The U.S. Geological Survey coordinates much of the river and stream monitoring in the region. It also supports research on fish and wildlife in the watershed, as well as investigations into the impacts of toxic contaminants. Funding for its Chesapeake Ecosystem Science and Monitoring program was increased to $14.85 million this year, and the groups are seeking to maintain that level next year.

They have also requested $105 million for the Department of Defense's Readiness and Environmental Protection Program, which funds conservation easements on lands that serve as buffers around military bases across the nation. The easements are intended to prevent land use conflicts in areas used for activities such as training flights and have become a major source of land preservation funding around the Bay. Fourteen bases around the Chesapeake participate in the program, and last year they received $8.4 million for easements, though $23.4 million was requested.

Other highlights of funding requests included:

- ≈ $3.5 million for NOAA's Bay Watershed Education and Training Program, which provides grants to support outdoor education programs for students. That would be an increase from $2.7 million allotted this year.
- ≈ $1 million for NOAA's Chesapeake Bay Interpretive Buoy System, which provides real-time data on water quality and Bay conditions and is used by boaters and scientists.
- ≈ $14.5 million for continued construction of Poplar Island by the Corps of Engineers, which uses material dredged from shipping channels to rebuild the island and its wetland habitats.

VA getting more antsy as climate change marches on

≈ Fire ants spreading northward as temperatures climb

By Jeremy Cox

In Virginia, climate change is about as welcome as ants at a picnic. But across a portion of the state's southeast, ants are part of the problem.

Since 1960, the annual average temperature in Virginia Beach, the region's most populated city, has risen about 3 degrees, according to the National Oceanic and Atmospheric Administration. That warming trend has opened the door for fire ants — normally living in more southerly areas — to gain a stubborn foothold in the state, Virginia agricultural officials say.

And it's growing larger.

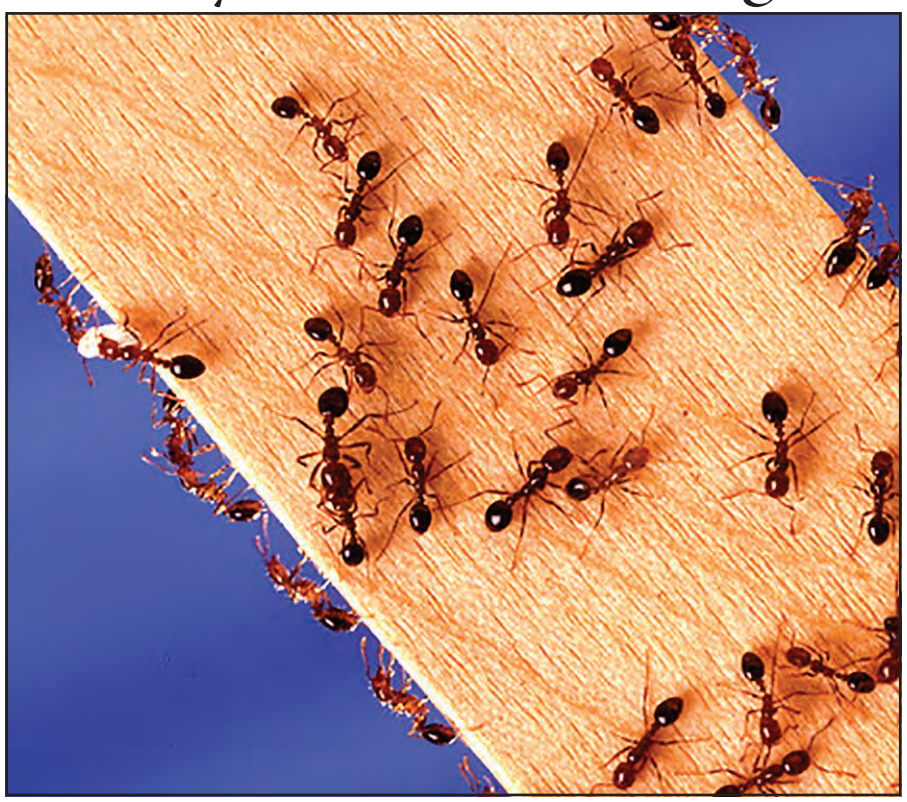
"It's an unfortunate side effect" of climate change, said Eric Day, a Virginia Tech extension entomologist. "We have warmer winters and warmer summers, so it certainly makes for good conditions for fire ants."

The Virginia Department of Agriculture and Consumer Services announced in December that it was expanding its fire ant quarantine to five new counties and two separate cities. With the addition, the quarantine now spans one or two counties deep along the North Carolina border from just west of Interstate 95 east to the Atlantic Ocean, an area nearly the size of Connecticut.

The quarantine applies to both the black and red fire ant varieties, but the red is more commonly seen in Virginia, officials say. Both damage crops and deliver a nasty sting.

Since their accidental transmittal from South America to the United States in the 1930s, red fire ants have spread across most of the Southeast from the marshy tip of Florida to the windswept plains of Oklahoma.

When the first fire ant infestation was discovered in Virginia in 1989, agricultural officials blamed the interstate trade of plants and sod. They grew so widespread that by 2009 the state announced its first quarantine in the Hampton Roads region.



Fire ants, above, resemble garden-variety ants, making them difficult to spot, experts say. (U.S. Department of Agriculture)

Fire Ants in VA

2009 quarantine areas: Counties of James City and York; cities of Chesapeake, Hampton, Newport News, Norfolk, Poquoson, Portsmouth, Suffolk, Virginia Beach, Williamsburg

2019 quarantine areas: In addition to those listed in 2009, the counties of Brunswick, Isle of Wight, Greensville, Mecklenburg, Southampton; cities of Emporia and Franklin

It has become clear with their continued spread westward along the state's southern border in recent years that colonies are now marching up from the South on their own, Day said. That shift points for the first time away from humans as a cause for their proliferation in the state and toward a new climate reality, he added.

Fire ants resemble garden-variety ants, making them difficult to spot, experts say. Tell-tale signs of their presence are their mounds, which can reach up to 2 feet high and damage farm equipment. The ants themselves prey on corn, soybeans and other crops, causing further headaches for farmers.

Their sting, though, may be their defining attribute. Anyone who unwittingly wanders into a nest typically emerges with a foot or leg stippled with burning welts that turn into itchy, white pimples that last for days. In extremely rare cases, the victim can suffer deadly anaphylactic shock.

Christopher Brown, who works in purchasing and product development for the Lancaster Farms plant nursery in Suffolk, knows the sensation all too well.

"It's not like getting stung by a bee where it's one sting and that's it," he said. "When you get bitten by a fire ant, you're going to get bit five to 10 times depending on how long it takes you to realize you stepped on a fire ant mound."

Suffolk was one of the first areas to be quarantined in 2009. The designation prohibits transporting anything that can carry fire ants out of the area unless it is certified as ant-free. Regulated items include gardening soil, plants, sod, used farm equipment and freshly cut timber.

At Lancaster Farms, workers blend an insecticide called Talstar into their pine bark potting material to kill any ants that may be there, Brown said. It takes a few cents' worth of the chemical to treat each pot, he estimated; a 15-gallon pot includes about 10-cents' worth. That expense adds up quickly because the nursery churns out hundreds of thousands of plants each year.

"It's a cost of business," Brown said.

Fire ants are at the vanguard of an army of pests expected to trudge northward as fossil fuel emissions continue to heat up the planet during this century. A U.S. Department of Agriculture-sponsored study in 2005 predicted that warming temperatures will increase the "habitable area" for red fire ants 21% by the end of this century, pushing their upper boundary about 80 miles northward.

Some time between 2080–89, fire ants could occupy a swath of Virginia as far west as Roanoke and stretching along a line bearing northeast toward the District of Columbia, according to the study. Maryland and Delaware can expect to see their first invasions by that time as well, it says.

Climate, environment targets in limbo as virus cuts MD session short

≈ Pesticide ban, oyster management among bills passed before lawmakers hurry home

BY JEREMY COX & TIMOTHY B. WHEELER

In a legislative session cut short by the coronavirus pandemic, Maryland lawmakers approved a ban on an agricultural pesticide and passed a handful of other environmental bills before hurrying home on March 18.

But the General Assembly's first work stoppage since the Civil War stalled dozens of bills that looked highly likely to pass. That number encompassed several environmental and climate change-related measures that will have to wait until a possible special session during the last week of May.

"I don't think this is a session like anybody has ever seen," said Kristen Harbeson, political director for the Maryland League of Conservation Voters. "There were a lot of things we were hoping to get done that we just weren't able to."

Many bills that conservationists supported sailed through one chamber or the other. But as lawmakers and a skeleton staff rushed to finish the state's business during the session's final days, some of that legislation got left behind, groups say.

Here are the key environmental steps that were taken and not taken during the legislature's 71 days together.

Maryland officials encourage anglers to catch and remove as many snakeheads as possible. (Dave Harp)

Pesticide ban: In the session's closing minutes, lawmakers handed environmentalists perhaps their biggest victory: a ban on the hard-to-pronounce pesticide chlorpyrifos (klor-PEER-uh-foss).

"No one should learn how to say it because no one should be able to use it," Harbeson said.

Pulled from residential use since 2000, chlorpyrifos has remained popular among farmers for controlling crop pests. But it has been linked to premature birth, childhood cancers and asthma. It's also been found to harm wildlife.

The U.S. Environmental Protection Agency had been on the verge of banning it nationwide until the Trump administration blocked the move. Maryland lawmakers came close to banning it last year.

The bill now heading to Gov. Larry Hogan's desk phases out its use, barring aerial application by Oct. 1 and prohibiting virtually all uses by the end of 2021. Maryland is the second state after Hawaii to ban the chemical through a legislative process; California and New York blocked it through regulations.

"Eliminating chlorpyrifos will protect our vulnerable populations, pollinators and Chesapeake Bay wildlife," said Ruth Berlin, executive director of the Maryland Pesticide Education Network.

Climate change: No major climate legislation passed the finish line during the session.

A bill backed by environmentalists would have accelerated the state's reduction of greenhouse gas emissions, requiring a 60% decrease by 2030 instead of the state's current 40% goal as well as net-zero emissions by 2045.

A similar fate befell a Hogan administration bill that would have classified certain nuclear and natural gas power facilities as "clean and renewable energy." But an administration bill did pass that provides fee and tax breaks for siting renewable energy projects on brownfields.

Lawmakers also approved two bills that could provide "resiliency" funding to localities to help pay for infrastructure and other measures to mitigate sea level rise or flooding.

A measure died that would have removed a paper-making byproduct known as black liquor and waste-to-energy plants from the list of "Tier I" renewable energy sources.

Agriculture: One bill that did pass will make it easier for farmers to get government funds to plant trees along streams and put in other permanent measures to filter nutrient pollution out of runoff.

Alison Prost, Maryland executive director of the Chesapeake Bay Foundation, called it "a step forward for the future of farming" in the state. In addition to helping finance more riparian buffers, she said the bill could help farmers switch to more environmentally friendly rotational grazing of livestock.

"These are practices we'll need for soil health, carbon sequestration and for water quality," Prost said.

Meanwhile, an effort to temporarily halt the construction of large-scale poultry farms on the Eastern Shore failed to get out of committee. The bill would have prohibited the Maryland Department of the Environment from approving permits until Sept. 30 for any new or expanding farms with at least 300,000 birds. Supporters said their goal was to protect the region's air and water quality until more can be done to deal with excess poultry manure generated by the industry on the Shore.

Oyster management: Early in the session, the General Assembly overrode Hogan's veto of legislation passed last year that called for a fresh approach to the state's fractious management of oysters.

Hogan objected to lawmakers interfering with his administration's handling of the ecologically and economically important shellfish. But environmentalists contended that the Department of Natural Resources has catered to watermen by trying to open oyster sanctuaries to harvest and by not moving forcefully enough to end overfishing.

The new law, which takes effect in April, calls for the DNR to revise the state's oyster management plan with the help of scientists and the consensus-based recommendations of a new advisory commission. Legislators passed a separate bill late in the session that gave the commission until Dec. 1, 2021, to make its final report. It also clarified that the agency may not alter or reduce the sanctuaries until the rewrite is done.

Litter: Environmentalists were surprised to learn that a ban on intentionally releasing balloons failed, despite slightly different versions being approved by wide margins in both chambers. They chalked it up to an oversight.

Also falling short was a bill that would have curtailed plastic bags by July 2021. It would have further required businesses to charge customers 10 cents for each paper bag, though they could have kept the proceeds. The measure passed the House but failed to get a vote before the full Senate.

Conowingo: A measure that failed to get out of committee would have blocked the deal Maryland struck last year with Exelon Corp. over addressing the environmental impacts of the Conowingo Dam.

Environmental groups and Eastern Shore local officials complain the deal falls far short of remedying the ecological harm the dam has caused in the lower Susquehanna River and Upper Bay. Exelon and state officials defend the agreement, saying it will start addressing the harm now rather than continuing their years-long dispute.

The Federal Energy Regulatory Commission is weighing whether to approve the settlement and issue a new 50-year license for the hydropower facility.

PFAS: Lawmakers did enact restrictions on the use of fire-fighting foam that contains water-contaminating toxic chemicals known as per– or poly-fluoroalkyl substances.

PFAS, as they are called, are widely used in the foam that military and civilian fire companies spray on plane crashes and other fuel fires. But PFAS contamination has been found in more than 600 sites nationwide, including eight in Maryland, many of them associated with use of the foam. Authorities are working to develop less-problematic alternatives. In the meantime, the bill would allow the foam's use for fighting actual fires, but not in training exercises as of October 2021.

Snakeheads: The toothy, invasive fish known as the northern snake-head has been multiplying in many Chesapeake Bay tributaries since at least 2002. A recent study conducted by the U.S. Fish and Wildlife Service and the DNR suggests for the first time that the species is wreaking havoc on aquatic ecosystems.

Legislation passed this session allows snakeheads to be harvested commercially using hooks and lines. Previously, only bows and arrows were allowed.

VA legislature wraps up session packed with environmental issues

≈ Reshaping the energy grid was focus of several measures

By Jeremy Cox & Whitney Pipkin

The Chesapeake Bay and other environmental issues had more floor time — and legislative changes — than they have in years during Virginia's 60-day General Assembly session that ended last week.

Some observers attributed the added attention to a political shift in which Democrats took control of both chambers and the executive mansion for the first time in a generation. Others said many of the issues — from energy reforms to pollution deadlines — were simply ripe for action after years of advocacy.

Reshaping the energy sector was a top priority as legislators moved to join a regional carbon-trading network, block offshore oil drilling and make the electricity grid carbon-free by 2045.

Under new legislation, farmers and cities will be seeing new deadlines — and, potentially, more funding — to curtail pollution as the state nears its own 2026 deadline for achieving water quality goals.

"This is what a 'conservation majority' looks like," said Michael Town, executive director of the Virginia League of Conservation Voters, pointing to the passage of renewable energy goals on the final weekday of the session.

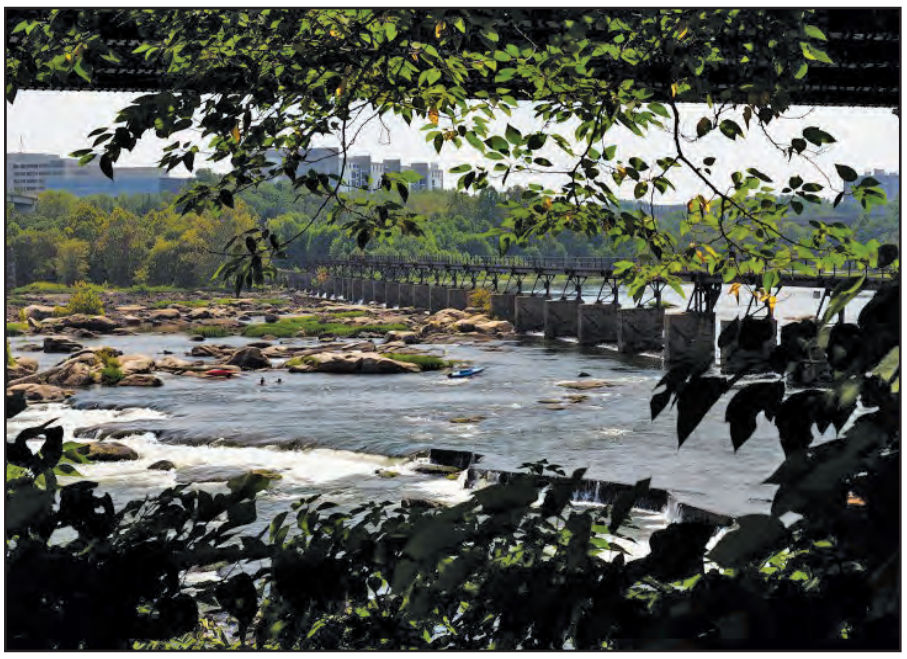
The bills still require Gov. Ralph Northam's signature to become law, but the Democrat has given no indication that he will block newly passed environmental and energy initiatives. He has already signed a measure into law, for example, creating a state council on environmental justice.

Clean Economy Act: In the session's closing days, lawmakers struck a deal to put the state's electricity providers on a path to eliminating carbon emissions by midcentury. Dominion Energy will need to be carbon-free by 2045 and Appalachian Power Company by 2050, according to legislation.

The wide-ranging Clean Economy Act also requires most large oil– and coal-fired power plants to shutter by the end of 2024. It also ends power generation from wood-burning pellets by 2028 and mandates that electricity providers begin constructing wind and solar facilities.

"It's not a stretch to say this is probably the most forward-thinking energy bill to come out of any Southern state's legislature in history," said Will Cleveland, a senior attorney for the Southern Environmental Law Center.

The bill falls short of the actions sought by more-liberal Democrats. But it still upset many Republicans, whose criticism centered on an $8 billion offshore wind project included in the legislation. They warn that it will drive up customers' utility bills.



The Virginia General Assembly ended its most recent session after giving much attention to environmental issues, including a move to reduce sewage overflows into the James River near Richmond. (Dave Harp)

The State Corporation Commission estimates that the legislation will boost the average monthly electric bill nearly $28 by 2027–30. Advocates dispute that. Their studies, they say, show it will reduce costs.

Dominion Energy supported the bill. "Passage of this legislation sets a clear path forward for Virginia's energy future," spokesman Rayhan Daudani said. "Consistent with this legislation, our focus has been and will continue to be on providing safe, reliable and sustainable energy to our customers."

The utility giant separately announced in February plans to reach "net zero" emissions of carbon dioxide and methane by 2050.

Carbon Credits: The legislature also removed a ban on Virginia's participation in the Regional Greenhouse Gas Initiative, a multistate program aimed at curbing carbon pollution from power plants. The state is poised to join the cap-and-trade program with Maryland, Delaware, New York and seven other states in the Northeast.

The system would make it more expensive to produce power from fossil fuels, requiring large power plants to pay for "credits" for the carbon emissions they generate beyond a cap set by the initiative's member states.

Half of the $100 million expected to be generated annually will be used to help low-income families improve energy efficiency. Most of the remaining funding will help communities with recurrent flooding.

Agriculture: The General Assembly also may be handing down deadlines to some farmers who have not fenced livestock out of streams or do not have nutrient management plans for croplands. The legislation gives farmers five more years to voluntarily participate in cost-share programs that support those water-quality measures. If they don't, the state will impose deadlines that require the farmers to act.

"It's a bill that both acknowledges the importance of farmers' voluntary efforts with support from cost-share programs and also recognizes that, if we don't get there by 2025, it will be a requirement," said Peggy Sanner, the Chesapeake Bay Foundation's Virginia executive director.

To help farmers, the legislature put $88 million into the state's two-year agricultural cost-share program. The state Department of Conservation and Recreation, though, estimates that the program needs $125 million over that period.

Menhaden: In a move celebrated by both conservation and fishing communities, management of Virginia's menhaden fishery will be moved from the General Assembly to the Virginia Marine Resources Commission, which manages other marine species in the state.

The need was highlighted this past year when a federal agency declared Virginia out of compliance with an interstate management plan that limits the menhaden harvest. The General Assembly had not officially adopted the plan, which placed new limits on menhaden harvests within the Chesapeake Bay. When Omega Protein, the largest harvester of menhaden on the East Coast, exceeded the Bay cap last year, the commission had no authority to halt harvests, putting the state out of compliance. As a result, the Virginia menhaden fishery faced a complete shutdown if the state failed to adopt and enforce the plan, an action that would affect many small operations that catch the fish for sale as bait.

Backers say the legislation will put science over politics when it comes to managing the fishery. Omega supported the move.

Sewage pollution: New legislation would set a timeline for Richmond to complete costly upgrades that will eliminate sewage overflows into the James River by 2035. The city will submit progress reports to the General Assembly and may request additional funding for the expedited work.

Lawmakers also set aside $50 million over two years to upgrade sewage plants, marking the first time in several years they have invested in the sector.

Environmental justice: Legislators passed several bills aimed at protecting vulnerable communities from environmental threats.

One measure establishes in state code a Council on Environmental Justice, which Northam first created with an executive order in January. Others add consideration of environmental justice and climate change into the mission of the state Department of Environmental Quality.

The changes came amid criticism from the U.S. Court of Appeals for the Fourth Circuit over a state board's approval of a compressor station in a historic, predominantly African American community that feared the project would impact air quality.

This effort, said Danielle Simms, interim political director for the Virginia League of Conservation Voters, "has helped ensure a forum for communities of color and low-income residents… a place to discuss their concerns in an impactful way."

Offshore drilling: The state banned oil and gas drilling within 3 miles of its coastline and repealed language that threw Virginia's support behind offshore drilling. It will effectively bar drilling beyond that 3 miles as well, advocates say, because it prohibits any pipes or other industry infrastructure from being placed in state waters.

The move comes after the Trump administration in 2018 proposed to open waters in the Atlantic, Pacific and elsewhere to energy exploration and drilling.

Plastic bags:

After several years of failed efforts, supporters of a plastic bag tax passed a bill in Richmond. If signed by Northam, it will give cities and counties the authority to impose a 5-cent tax on certain retail bags. The bill requires local governments to spend funds raised by the tax on environmental cleanups, education programs designed to reduce waste and provide reusable bags to welfare recipients.

Mike Sands leads his flock of sheep to a new pasture. "People used to be cattle people, sheep people, hog people," said the Virginia farmer, who raises sheep, cows and a few goats. "Now, you'll find people with more than one iron in the fire who say, 'I'm a grass farmer.'" (Wil Harlan)

Farmers counting on sheep to bolster soil, bottom line

≈ Smaller grazing animals have reduced startup costs and complement larger livestock operations

By Whitney Pipkin

When Mike Sands moved to Rappahannock County, VA, to take over a family farm, he decided to raise the animals he knew best — sheep — despite their reputation for being a little difficult to manage.

A previous career in agricultural research with a specialty in small grazing animals had often taken him overseas, where raising lambs and goats for meat is more common. That experience taught Sands that he could turn a few dozen sheep into a budding business more quickly and with less upfront funding than he could by starting with cows, which he later added.

He's not the only one testing the multi-species waters.

Though cattle are still king among livestock operations in the United States, more farmers are adding smaller animals to the mix to make the most of their pastures. When grazed together or consecutively, sheep and cows tend to eat different parts of the grass and reduce the number of parasites that could infect the other species. If well managed, often through rotational grazing, they can also help farmers make more money off the same amount of land.

"The focus now is on land management," said Sands, who previously worked for a decade as managing director at the organic farming-focused Rodale Institute in Pennsylvania. "People used to be cattle people, sheep people, hog people. Now, you'll find people with more than one iron in the fire who say, 'I'm a grass farmer.'"

Michael Heller, manager of the Chesapeake Bay Foundation's Clagett Farm in Upper Marlboro, MD, said the emerging trend follows the growth of grazing operations in general in the Bay watershed. The more farmers embrace the use of animals to improve soil health and water quality, the more they're willing to try new approaches.

"There's greater interest in grazing than I've seen in the 35 years that I've been in the grazing community," Heller said. "This year, we'll probably have a dozen farm field days on grazing, whereas, five years ago, there were a couple."

Mike Sands looks over the flock of sheep on his farm in Rappahannock County, VA. "Sheep do take a little more work, but I've come to really enjoy them," he said. For beginning farmers, it can also cost far less to enter the field with sheep than cattle. The smaller animals also have multiple births, making it possible to double the size of a flock in a couple of years. (Whitney Pipkin)

Heller said he added sheep to his cattle-grazing operation a few years ago because customers kept asking about grass-fed lamb.

"I resisted for a long time, because a lot of people who used to raise sheep got out of it and said, 'Oh, sheep are terrible. They do nothing but die,'" he said, noting the parasites that can plague flocks. "Sheep do take a little more work, but I've come to really enjoy them."

For beginning farmers, it can also cost far less to enter the field with sheep than cattle. The smaller animals not only cost less but also have multiple births, making it possible to double the size of a flock in a couple of years. Sands said that allows new farmers who may be struggling with startup costs to get to a commercial scale more rapidly without a lot of debt.

Heller echoed the remarks of Sands and other farmers who manage grazers: Sheep and lambs, when added to a cattle or other livestock operation, can bring extra income into the farm without requiring additional acreage. Generally, they say, an operation can add one ewe for every cow without needing more land because of the complementary way in which the animals graze.

Cows tend to eat taller grasses while sheep prefer shorter forbs like d lamb's quarters. Together, they can take better advantage of the pasture while adding their own fertilizer to the soil to promote regrowth.

The technique also allows farmers to harness the soil and water quality benefits of keeping the land in perennial pasture. Because managed grazing also reduces the amount of sediment and nutrients washing into streams, the state-federal Chesapeake Bay Program recognizes it as a practice worth adopting.

Farmers say that grazing a mixture of animals together can also help curb the number of parasites impacting each species. If a cow eats a parasite that only impacts a sheep, the parasite will die in the process, and vice versa. Rotating the animals through fields at a regular clip can also help cut back the number of parasites that flourish overall.

Sands said multi-species grazing and faster rotations are better ways to manage parasites such as the Barber's pole worm, which can devastate a flock of sheep and has developed some

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resistance to medication.

Bill Bryan shared many of the same insights at a recent farming conference, reflecting on an experiment he conducted as a researcher at West Virginia University in the early 2000s. At the time, managing spring-born lambs organically — without the help of parasite medicines — was uncommon.

"Some of my sheep friends in West Virginia said that, in three years, they'd all be dead," Bryan said. "But, even with the animals on grass 365 days a year, our method was successful. They didn't die."

Bryan attributed his success to quick rotations that, during peak parasite times, moved sheep and lambs through the fields faster than the six-day period it took a parasite to fully form.

"Grazing management is such a glorious, everyday decision-making process that mostly deals with your head, with animals and the soils," he said. "There's not much technology besides electric fencing."

A farmer who's used to managing other livestock would have to make adjustments to begin grazing sheep or goats. On the downside, the smaller animals require fencing with more strands, which can be more expensive.

But sheep and goats require less drinking water than cows, especially at the peak of summer. That means smaller operations can sometimes use buckets in lieu of expensive watering systems.

Also — and here's the kicker for water quality — sheep don't like to stand in water. They don't even like to be near moving water, such as a stream running through the farm, operators say.

Sheep and lambs, when added to a cattle or other livestock operation, can bring extra income into the farm without requiring additional acreage. Generally, an operation can add one ewe for every cow without needing more land because of the complementary way in which the animals graze. (Wil Harlan)

Unlike cows, which must be fenced away from streams to prevent them from cooling off and defecating directly into them, a stubborn sheep can hardly be forced across a water crossing, let alone be found standing in it.

"I don't encourage my cows to stand in the streams either, but that's a big behavioral difference," said Heller, who installed stream fencing long before adding sheep to the operation.

As an illustration of sheep's distaste for crossing water, farmers often mention Mike Peterson, who used to run a multi-species operation in Rappahannock County before moving to run a sustainable farm in New York. Peterson sometimes grazed his animals as a "flerd" — a flock of sheep with a herd of cattle — in a rotation pattern that meant crossing the Rappahannock River where a permanent crossing had been built. The cows went right across; the sheep refused.

But, Sands said, most farmers raising sheep in pasture-based rotations are already concerned about protecting water quality as part of a more holistic approach.

"If you're getting into livestock now, you're in a different culture," Sands said. "The whole issue of keeping animals out of streams and fencing is not a cost issue, it's a culture issue."

Some research indicates that more farmers are considering sheep as lamb meat grows in popularity in the United States, especially around religious holidays in the spring.

The American Sheep Industry Association reported in 2019 that sheep inventory had seen a second consecutive year of expansion in the United States in 2016, the most recent year recorded by the National Agricultural Statistical Service. Of the growing regions, the mid-Atlantic region ranked second behind Texas for the highest rate of growth in sheep inventory at a 4% increase between 2014 and 2016.

For Sands, the main driver of his sheep and lamb production is local demand for the meat, which he sells directly to customers from a self-service retail site on the farm and at a local farmers market. For those at the market who don't think they like lamb, Sands sways them by cooking up lamb sliders for sale with Middle Eastern spices, feta cheese and mint.

"We've been developing the market," Sands said. "Now, I've got more demand for lamb than I can satisfy."

Mike Sands' Bean Hollow Grassfed farm in Rappahannock County, VA, cozies up to the Jordan River, a tributary to the Rappahannock River. Though he has fencing to keep cattle from the streams, he says sheep prefer to stay far from moving water. (Above / Wil Harlan) (Right / Whitney Pipkin)

PA initiative to convert 10,000 acres of lawns into meadows, forests

≈ Campaign is a priority strategy to help meet state's Chesapeake cleanup goals

By Ad Crable

Well-shorn lawns are still the norm on the grounds of parks, schools, churches, hospitals, business parks and neighborhoods. While better than exposed bare earth, such swaths of green are still environmental minefields.

Rain flushes dog poop, pesticides, fungicides and other chemicals from those grassy surfaces into local streams. The springtime spreading of fertilizer to keep grass thick and green is a troublesome source of nutrients that are harmful to the Chesapeake Bay.

Close-cropped grass grows from compacted dirt that doesn't soak up much stormwater. The short, monoculture grass has no wildlife value. The army of lawnmowers needed to keep the grass cut to socially acceptable length emits air pollution at three times the rate of automobiles.

And keeping everything a tidy green eats up mowing dollars that could be better spent on the missions of churches, schools and the like.

"It's kind of tyrannical. Lawns control us more than we control them," said Ryan Davis of the Alliance for the Chesapeake Bay. "One of the most insidious parts of a lawn is it doesn't do anything. It's just sterile and sitting there."

Pennsylvania has come to the same conclusion, launching a campaign to convert 10,000 acres of mowed grass by 2025 into meadows or forests in parts of the state that are in the Chesapeake drainage. There are an estimated 1 million acres of lawn in Pennsylvania's portion of the Susquehanna River watershed alone.

The lawn conversion initiative, also known as conservation landscaping, is contained in Pennsylvania's latest official plan for helping to clean up the Chesapeake. It's the first time that lawn conversion has been included as a Bay cleanup strategy for Pennsylvania, and a priority one at that. The project will count toward the state's nutrient reduction commitments.

The plan seeks to reduce stormwater runoff which, according to the state-federal Bay Program, is the only source of pollution on the rise. The goal is convert half of the 10,000 acres into meadows and half into forests.

The first focused project to move that charge forward has already begun with a swirl of interest.

The Alliance has partnered with the Pennsylvania Department of Conservation and Natural Resources to do about 20 turf-conversion demonstration projects for free on 60 acres in four southcentral Pennsylvania counties targeted for stepped-up pollution reductions in the state's cleanup plan. The $400,000 project is being financed with a grant from the National Fish and Wildlife Foundation and others, with matching funds from the Alliance and DCNR.

This backyard in Lancaster County, PA, is slowly being turned into woods. (Ryan Davis)

"Rewilding is kind of what we're doing," Davis said.

In one pilot project, in Franklin County, several school campuses, totaling 20 acres, will have their neat lawns planted in trees. Guidelines call for 200 trees per acre and that no mowing can be done five to 10 years later. At a church in Lancaster County, the surrounding lawn will be dug up and turned into a meadow with native grasses that will attract pollinators and add to the area's biodiversity. Smaller lawns of about 1 acre each will get a makeover around home sites in the four targeted counties of Lancaster, York, Franklin and Adams.

To qualify, properties have to be mowed lawns — not pastures or old fields — and cannot have more than 30% of grounds already in trees.

Even though the project has received little publicity, Davis said he was swamped by interested landowners.

The hope is that the pilot projects will inspire other landowners — both in the public and private sectors — to convert their own green expanses into more environmentally friendly habitat.

"We know it will take a paradigm shift, but we think the time is now. Why not give it a shot?" said Teddi Stark, riparian forest buffer program manager for DCNR.

In addition to the 100%-funded pilot projects, how-to guides and resource materials are being drawn up to help landowners make conversions on their own. And a DCNR advisory committee, with members from the landscaping industry, wildlife groups, insect groups, conservation districts and universities, has begun meeting to draw together partners who can expand the initiative.

The project dovetails with the ongoing work of the nonprofit Chesapeake Conservation Landscaping Council. The organization has, since 2003, been holding training programs for nonprofits, landscapers and landscape designers to help them motivate their customers and community to want more native plants and less impervious surface around their homes and offices. Training programs are taking place throughout Pennsylvania, Maryland, Virginia and Washington, DC.

"It's a process. It's not overnight," said Beth Ginter, the group's executive director. "What we're looking for is water quality benefits and reducing the negative impacts of stormwater. Also, the habitat benefits of using native plants, whether meadow or tree planting."

Lawn conversion organizers hope that nonprofit groups will make grants available to landowners to help offset costs. And plans are in the works to add conservation landscaping to the list of best management practices eligible for existing conservation grants. But the reality for now is that, for conservation landscaping to take off in a big way, most willing landowners will have to foot the bill themselves.

"We hope that landowners who have the financial ability will take an interest and plant these meadows and trees themselves," Stark said.

DCNR estimates the cost to convert all 10,000 acres into forests or meadows would be around $17.5 million. Officials will pore over satellite images to find large swaths of turf and approach landowners about making a change. The agency is hiring a full-time lawn conversion specialist, joining a tree-planting specialist who has been on staff for years.

One possible incentive for municipal governments is that lawn conversions can help them meet mandatory stormwater runoff reductions required by permits known as MS4s. "It's not the biggest bang for the buck for MS4 reductions, but it will move the needle and every bit helps," Stark said.

When lawn owners are encouraged to allow their surroundings to grow up, they are often concerned about attracting snakes, ticks and mosquitoes.

When asked if a meadow may have more ticks, Davis was forthright. "Yeah, probably. But tick bites are found around the house already. You're not safe anywhere." Meadow habitat also attracts birds and other wildlife that eat ticks.

Shade from trees can lower air conditioning costs.

One obstacle program managers will have to deal with is getting many municipalities to revise old ordinances that restrict the height of lawn grass to no more than 6 inches.

But Davis and Stark hope the conservation landscaping movement eventually goes statewide, similar to the long-established push for streamside buffers. And the more people see meadows and treed areas around schools, churches and the like, the more people will accept it, they say.

"If we can make it a normal thing as part of a green landscape, people will take off with it," Davis predicted.

Taking Nature Black celebrates environmental action

≈ Conference attracted audience from around the nation

By Lara Lutz

The Audubon Naturalist Society hosted its third Taking Nature Black conference on Feb. 27 in Chevy Chase, MD. And for the third time since the inaugural conference in 2016, the number of participants doubled.

The biannual conference, designed to give African Americans in the environmental field a space to share ideas, network, and support one another, has begun drawing attention from across the country as well.

At least 450 people participated either in person or through a live video stream (weeks ahead of the coronavirus crisis), with many groups watching online from their workplace.

Conference organizer Caroline Brewer said in-person registration hit capacity three weeks before the event, and they are looking for a larger venue in 2022.

"The biggest challenge for us every year has been meeting the hunger that's out there," said Brewer, director of marketing and communications for the Audubon Naturalist Society. "It's a great challenge to have."

The nonprofit group, focused on building connections to nature in the greater DC area, drew topics and panelists for the conference mostly from the District of Columbia, Maryland and Virginia, but Brewer said that people from other areas, such as Florida, North Carolina, Wisconsin and Pennsylvania, either expressed interest or made the trip in person.

Brewer said the energy among attendees was especially rewarding. "Numbers don't mean anything compared with the amount of joy that was spread through the experience of that conference," she said.

Ronnie Webb, a panelist at the Taking Nature Black conference, describes his work as co-founder of The Green Scheme, which conducts programs with students in disadvantaged communities on environmental stewardship and community revitalization. (Don Baker/Courtesy of Anacostia Naturalist Society)

For those who could handle an early start to the day, the conference began at 6:30 a.m. with a meditation and woodland walk led by Rabiah Nur, an indigenous healer, activist and storyteller.

Climate change panelists spoke to the importance of outreach and environmental policies that are equitable for all communities, especially those that have shouldered the brunt of pollution.

"I have spent my career on trying to advocate for the inclusion of black and brown voices in this space because too often, within the environmental movement, blacks have had a lack of access, a lack of participation and an overabundance of the environmental burdens and not enough environmental benefits," said Dawone Robinson of the Natural Resources Defense Council.

BeKura Shabazz Branch, a Virginia activist, spoke about the disproportionate impact of air pollution in black communities and the need to empower people with information. She said that local activists are not brought into partnerships and conversations as much as they should be.

"Grassroots work is some of the most devalued and overlooked work that there is," she said. "When you all are looking to get certain information you always look to those who are closest to our legislators… But you also can get very valuable work and very valuable contributions from those that are boots on the ground, that are in the communities."

Panel presentations dealt with topics ranging from climate change policy, outdoor joy and environmental justice to youth in action, environmental careers, the greening of black and brown communities and the experiences of multigenerational farmers and land stewards.

Environmental education also garnered attention as panelists shared their experience with a variety of programs and projects.

Ronnie Webb of The Green Scheme described how his environmental education programs in DC schools motivated students to develop and market their own bottled water, called "Corner Water," in unique recyclable containers.

Symone Johnson, who manages education programs at the National Aquarium, talked about the importance of making aquarium experiences a resource for Baltimore youth and not just for tourists.

Landscape architect Maisie Hughes speaks to the audience at Taking Nature Black about opportunities and challenges for African Americans in the environmental field. (Don Baker/Courtesy of Anacostia Naturalist Society)

A midday break brought music and poetry from Word to Our Mother, a band led by Karen Wilson-Ama'Echefu, who emphasized the continuity of African-American connections to the land. "We can look back for 400 years over the African diaspora and transformation in the United States and for that entire period, and before, we have explored, embraced, and celebrated the natural world," she said. "So we got to celebrate together at Taking Nature Black, and that brings great joy."

Efforts of local governments to advocate for their residents and green their communities was explored by a panel that included Jacqueline Goodall, executive director for the Maryland Black Mayors. Goodall, former mayor of Forest Heights, MD, explained how creative funding for environmental projects can bring many benefits to communities.

Awards were presented for national and regional leadership, including a national champion award to Patuxent Riverkeeper Fred Tutman, one of the longest serving riverkeepers in the Chesapeake region and the only African-American riverkeeper in the United States.

Among the regional champions were Akiima Price, who promotes nature as a powerful way to support stressed youth, adults, and families; Tiaa Rutherford, manager of the litter reduction program in Prince George's County, MD; and Michael Carter Jr., an 11th generation farmer in Orange County, VA.

Jerome Foster II received the youth environmental champion award. Foster, 17, is a DC youth organizer for climate change action and voter registration. He also founded *The Climate Reporter*, an online publication with youth writers from eight countries.

"It's amazing to see how young people are rising up in the movement," Foster said.

Land ownership was highlighted in the closing session.

Donna Dear and Paulette Greene are the owners of Mount Pleasant Acres Farm in Caroline County, MD. Parts of the farm have been in Greene's family since 1900, and the land is part of the historic Harriet Tubman landscape, traveled by Tubman as she led family members and others out of slavery. A tulip poplar, approximately 25 feet in circumference, is considered a "witness tree" that would have been standing when Tubman passed through.

At one point, Dear and Greene declined a million dollar offer to sell the farm.

Videos of this year's sessions and award winners can be found on YouTube by searching for "Taking Nature Black 2020."

EPA's cutback of enforcement amid coronavirus draws criticism

≈ Environmentalists say the move allows many industries to skirt rules

By Jeremy Cox

As the new coronavirus spreads across the country, environmental regulatory enforcement is contracting.

The U.S. Environmental Protection Agency announced March 26 that it is "temporarily" suspending enforcement of environmental laws tied to a sweeping list of categories. The policy is retroactive to March 13, when President Trump officially declared a national emergency, and includes no end date.

"EPA is committed to protecting human health and the environment, but recognizes challenges resulting from efforts to protect workers and the public from COVID-19 may directly impact the ability of regulated facilities to meet all federal regulatory requirements," EPA Administrator Andrew Wheeler said.

The federal action comes as many states are also curtailing routine environmental monitoring and field work as part of a larger effort to limit in-person interactions that could lead to the virus' further transmission.

Environmentalists sharply criticized the EPA announcement, arguing that it effectively allows many industries to skirt environmental rules, including oil refineries and chemical plants.

"We understand the coronavirus is a public health emergency that may require a flexible response from EPA," a coalition of 14 groups said in a letter to the agency. But "that response must be tailored to specific and appropriate circumstances and not offer a blanket waiver of requirements that many companies that are up and running may have no trouble meeting."

The Chesapeake Bay-region groups signing the letter included the Chesapeake Climate Action Network, Potomac Riverkeeper Network, PennEnvironment and Waterkeepers Chesapeake.

In its memo, the EPA said the action is necessary because many companies are suffering from worker shortages and may not have the capacity to process lab results, submit required paperwork or keep emissions in check as they normally would.

The EPA "does not expect" to seek penalties for failure to complete routine monitoring, sampling, training and certain types of reporting, according to the memo.

The policy states that regulators may enforce at their discretion certain environmental violations caused, at least in part, by the pandemic. But entities must still "make every effort" to comply with the rules and take steps to minimize any excess pollution. They also must fully document the episode and identify how it was tied to the coronavirus crisis.

The agency, though, will grant extraordinary leniency to facilities determined to be "critical infrastructure." Such plants may be given "No-Action Assurance" notices to continue operating.

Enforcement will continue in several sectors, though.

The waivers won't apply to criminal violations, the EPA said. Nor does the policy affect Superfund cleanups, though the agency said it would address that program in a future announcement.

Public water systems also must continue normal operations and maintenance while continuing to perform routine lab tests to ensure their supplies are safe, according to the memo.

State environmental officials in the Bay watershed said they were still responding to environmental emergencies, such as oil spills. But they were shutting down routine facility inspections and taking other steps to slow the spread of the coronavirus. Offices have closed, turning most staff members into teleworkers.

In Virginia, the Department of Environmental Quality suspended all field work temporarily and canceled all public meetings through April. Pennsylvania's Department of Environmental Protection was prioritizing field work it deemed "critical" to public health and safety.

"All permittees and operators are expected to meet all terms and conditions of their environmental permits, including conditions applicable to cessation of operations," the agency said on its website. "DEP is committed to its mission of protecting public health and the environment and as such will continue to monitor these permitted facilities that have temporarily ceased operations."

The head of the Maryland Department of the Environment didn't criticize the federal action. The state is also making difficult decisions to balance its regulatory mission with protecting its employees' health, Secretary Ben Grumbles said.

"The [EPA] memo underscores upfront that authorized states may take a different approach under their own authorities, and we certainly intend to do that," he said. "We recognize the need for enforcement discretion in limited situation on a case-by-case basis."

The MDE is allowing a grace period for state licenses and permits facing expiration or renewal. And it is reducing field work as well to only those visits deemed most critical.

The agency is looking into ways to conduct inspections remotely using digital technology, Grumbles said. In the meantime, he added, "We're putting our greatest priority on non-routine inspections."

A team from Longwood University investigates boat remains on the Nansemond River in Suffolk, VA, once the site of a busy maritime complex where fresh oysters were iced and packed into barrels to ship to far-flung cities. (Courtesy of Longwood University)

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exceptionally low tide. Today, archaeologists are studying and cataloging the Nansemond "ghost fleet," reconstructing the city's neglected maritime past.

Brendan Burke, president of the Maritime Heritage Chapter of the Archaeological Society of Virginia, worked the site last fall.

"Suffolk's history in its purest sense is maritime history," Burke said. "It's based literally upon the Nansemond. The [river] was the reason Suffolk exists. It put Suffolk's legs under it and stood it up as a modern industrial city in the commonwealth."

Burke is also a research associate for his alma mater, Longwood University, and invited his former professor, Brian Bates, to join him in studying the ghost fleet.

"The curious thing is, it was hidden in plain sight," said Bates, executive director of the college's Institute of Archaeology. "You look out there and you see just a bunch of little bumps sticking out of the water at low tide. But then when you actually get above it, you go, 'Wow, that's actually a boat. And there's another one.' "

Even Suffolk natives, some of whom fished that very spot for years, had no idea what lay beneath.

Retired mechanical engineer and amateur historian Kermit Hobbs, 76, was one of the first to discover the wrecks. In 2014, a friend told him he'd found an old dugout canoe on the banks of the river and Hobbs, intrigued, went to check it out.

In March 2017, Hobbs mentioned the dugout to a fellow history buff and the two of them trekked out for another look. As luck would have it, they hit the site at low tide and noticed wooden stakes jutting from the mud flats.

Hobbs returned a few days later when a full moon tugged the tide even lower and launched his drone out over the flats.

"That's when I saw the outline of several boats," Hobbs recalled. "Some of them were estimated to be about 80 feet long. Well, I was excited."

He uploaded his aerial footage to YouTube and called around to find someone who could tell him more about the river's history.

"But nobody ever really knew anything that could help me out," Hobbs said. "So I just pretty much left it there."

A year and a half later, a Smithfield couple and members of the Archaeological Society of Virginia working on a logboat registry happened upon his video.

The canoe — or, more properly, the logboat — was retrieved and put on display at the nearby Riddick's Folly House Museum.

Eventually, Burke saw the video, too. "We realized that there was a diversity of vernacular — watercraft types — there in the Nansemond River," he said. "We also realized that what met the eye was probably just the tip of the iceberg."

He and Bates assembled a small team; took tape measures and cameras; pulled on waders and muck boots; and spent several weeks last October cataloging 13 wrecks ranging in length from roughly 15 feet to 100 feet. What they couldn't eyeball, they detailed with sonar and a 3D laser scanner.

"What we ended up finding is a collection of derelict wooden vessels

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that had been [discarded] at the end of their useful lives," Burke said. "And that sounds like the end of the story, right? A bunch of junk.

"But that's where archaeologists begin our research — when something goes into the ground or into the ocean or into a river, into mud, and we pull out the stories that get forgotten. Pull out the parts of our heritage that are misunderstood, or not understood at all."

The archaeologists consulted with ship experts to identify the various types of workboats by what little remains of their wooden bones.

The most accessible wreck is a schooner-rigged bugeye, native to the Chesapeake Bay and one of only 25 known to be built. In its heyday. This vessel stretched about 50 feet from bow to stern, although others were bigger.

Bugeyes had shallow drafts built to navigate the tidal rivers, inlets, sandbars and guts of the Chesapeake. But they could also sail on the open ocean through the canny use of a centerboard that could drop through the boat bottom to provide lateral resistance, preventing the vessel from blowing sideways.

During a recent low tide, the bugeye's keel and curved frames lay on the riverbank like the spine and ribs of a giant, decayed beast, next to rotting pilings.

"To me," Hobbs said, "it looks like an old trilobite fossil."

Log-bottom boats like the one retrieved from the riverbank are a famous style in the Chesapeake, Burke said, but have deep roots in African culture.

To build it, tree trunks in groups of three, five or seven are held together with iron pins, then hollowed out and fitted with a sail. When they weren't used for oystering and fishing, logboats hauled a variety of cargo: firewood, watermelons and chickens. They were a vessel of the working man, not the wealthy.

"The appeal to me," Bates said, "is that it seems like these are more close to the average person or the average circumstance sometime in the past. It's a bit of the story that doesn't often get told."

Burke pored over library records, historical documents, vintage fire insurance maps, old Suffolk "snapbooks" and the like to piece together a history wholly at odds with modern Suffolk's downtown business district of fast food restaurants, motels, pharmacies and gas stations, as well as the din of traffic, car horns, sirens and train whistles.

More than a century ago, he found, a major business epicenter took root on the Nansemond waterfront complex, located at the site where the ghost fleet now sits: a big packing house, cannery and wharfs. Workboats navigated the tidal river, up and down the Chesapeake and Atlantic. A Standard Oil terminal stands near an icehouse.

A towering figure of that age was William Norman McAnge, a man Burke calls "an entrepreneur's entrepreneur."

Originally from South Carolina, McAnge arrived in Suffolk around 1880 with the means to lease hundreds of acres of river bottom to grow oysters and to build the packing house and the wharfs.He then leveraged them into a local empire.

"He's often quoted as having taken the oyster industry from the bucket trade to the barrel trade," Burke said. "He was a master of systems, as most entrepreneurs are. They don't just do one thing — they're able to assemble systems and get multicomponent parts working smoothly."

Americans, for instance, were consuming canned oysters. But McAnge had fresh oysters iced and packed into barrels to ship to far-flung cities where customers were willing to pay top dollar for oysters on the half-shell.

"That changed the nature of the industry and began to grow it in new ways for Virginia — which, of course, in the post-Civil War economy, was on its knees," Burke said.

McAnge also had interests in wild oyster fisheries here and in North Carolina, as well as the ocean scallop fishery out of New Jersey. The riverbanks near the ghost fleet are still littered with century-old oyster and scallop shells.

He ran his own fleet of oyster boats and was involved with the trucking industry. He was instrumental in bringing the telephone to Suffolk — likely, Burke said, to keep in close contact with customers. He also helped bring in the automobile and earned one of the city's first speeding tickets. He operated a kiln to burn oyster shells for lime to fertilize Virginia peanut fields.

The riverfront complex began to falter sometime after World War I as five railroad lines offered faster shipping, and major nearby ports had deep-water terminals to handle big cargo vessels. Workboats became obsolete. Many were discarded, some as recently as the 1930s.

"In the early 1900s, it probably seemed like a perfectly reasonable thing to do," Bates said. "It was probably quite informal — maybe one person let their boat die there and then someone else did the same thing. And after a while people figured, 'Well, OK, this is where the boats go to die.' "

Every port city has an old ship dump, Burke said, and many put them to good use. San Francisco, downtown Manhattan and London, for instance, are built atop old ships. In Alexandria, VA, ships were scuttled and buried to help expand land along the Potomac River shoreline. A handful of 18th-century vessels have been found there under the foundations of modern buildings.

"They were wonderful ways to create cheap real estate," Burke said. "What is rare is when they're well-preserved and they're accessible to archaeologists."

Much of the Nansemond riverfront got paved over. The remains of the packing house now lie under a Super 8 parking lot. But the boat graveyard lingers.

The wrecks won't be removed from the Nansemond — their water-soaked wood would dry to dust, and preserving them would be far too costly. Burke is preparing a report for the Virginia Department of Historic Resources, which provided an $11,000 grant for the study. He hopes it will serve as a reminder of a common seafaring history.

"Every one of us has a significant maritime chapter in our past," Burke said. "If you dig back, everyone on every continent — no matter how landlocked you are, no matter how much of a mountaineer you are — you've got a sailor in your background. You've got somebody who made a momentous voyage onboard a boat from one place to another. Somebody that worked in the Atlantic trades, in the maritime trades. It's a human thing. It's universal.

"The boats are neat. But it's the people and their stories — that's the reason why we do this."

Tamara Dietrich is freelance writer based in Virginia.

Brendan Burke of the Maritime Heritage Chapter of the Archaeological Society of Virginia looks over the site of the Nansemond River 'ghost fleet." Archaeologists' work begins, he said, "when something goes into the ground or into the ocean or into a river, into mud, and we pull out the stories that get forgotten." (Tamara Dietrich)

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nonessential service was affecting many on-the-ground conservation projects while the need to keep volunteers at home is hamstringing others. The 10 Million Tree Partnership in Pennsylvania, which can often draw 50 to 100 volunteers to a planting event, is still undertaking projects this spring — but often with a single person and a shovel.

The Alliance for the Chesapeake Bay has been forced to postpone Project Clean Stream, the largest network of stream cleanups in the Bay watershed, to this fall.

Likewise, the Alice Ferguson Foundation, which has coordinated spring cleanups throughout the Potomac River watershed for 32 years, has had to postpone or cancel this year's events. Last year, more than 9,500 volunteers participated in 267 cleanups coordinated by the nonprofit, collecting 346,000 pounds of trash in portions of Maryland, the District of Columbia, Virginia and West Virginia.

Theresa Cullen, Alice Ferguson's executive director, said she remained hopeful the cleanups could take place later this year.

In the meantime, individuals can still help the Bay and their local rivers by picking up trash in their neighborhoods or planting native plants in their gardens, said Marissa Spratley, an Alliance spokeswoman. "We're encouraging folks to remain positive because this, too, will pass."

Other volunteer efforts are also being hit. CBF's oyster gardening programs in Virginia and Maryland are expected to be significantly reduced because of an inability to gather volunteers in groups right now. Managers of the community-supported agriculture project on CBF's Clagett Farm, which provides fresh produce and meals to food banks and people living in poverty in and around Washington, DC, will have to find a way to distribute food other than through large gatherings.

Groups are trying to find creative ways to stimulate environmental involvement during a time of year that is usually bursting with related events and activities, leading up to Earth Day on April 22.

This year, hands-on opportunities are more limited. The Alliance is encouraging people to crowdsource and share knowledge on its Chesapeake Network, and stormwater and native plants websites. The Chesapeake Conservancy is highlighting opportunities to take "virtual tours" of the rivers and other sites around the region.

Also eliminated are spring outdoor field trips for students. The Bay Foundation's Agee said he expects such excursions will be lost for the spring, and perhaps the remainder of the school year, removing a curriculum mainstay for hundreds of teachers and thousands of students in Maryland, Pennsylvania and Virginia.

Cancellations and postponements of spring stream cleanups are among many impacts the coronavirus is having on environmental stewardship activities in the Chesapeake Bay watershed. (Dave Harp)

Although the nonprofit had canceled all programming indefinitely, it is examining ways to continue engaging with the public, such as through digital learning, said spokesman A.J. Metcalf.

Cullen, of The Alice Ferguson Foundation, which typically hosts students at the nonprofit's farm for educational outings in the spring, said some of that programming will be available online.

"We're working on videos that can be useful for parents and teachers teaching about environmental topics," she said. "There's always something happening at the farm, even if they can't visit."

Farmer assistance at risk

Of particular concern for Chesapeake restoration is the impact on efforts to reach out to farmers and support them in conservation efforts. All of the states in the region are relying on a massive ramp up in efforts to control farm runoff to meet 2025 nutrient reduction goals aimed at clearing the Bay's murky water and ending its summertime oxygen-starved "dead zone."

But those efforts rely heavily on technical assistance providers from agencies or nonprofit groups working one-on-one with farmers to plan and install various farm conservation practices, such as stream buffers or manure storage facilities.

Most county conservation districts and Natural Resource Conservation Service offices, which provide most of those services to farmers, are either closed with staff working remotely or open with a single staffer to answer phones.

In Maryland, the state was no longer processing applications for new conservation infrastructure, such as manure sheds, because officials began limiting site visits to ongoing construction projects and emergencies, said Lindsay Thompson, of the Maryland Association of Conservation Districts.

"If this is lifted in a month or six weeks, maybe it won't be all that much of a backlog," Thompson said. "The magnitude will be determined by how long it goes on."

In Virginia, farmers seeking technical assistance with conservation projects were still able to get it as of late March. Kendall Tyree, executive director of the Virginia Association of Soil and Water Conservation Districts, said most districts were still doing site visits "as long as the farmer is comfortable keeping a safe distance."

Any slowdown is a concern because Virginia conservation districts have to spend funding for the current fiscal year by June 30. Those expenditures require approval from district boards — but the boards aren't meeting because of health concerns, and it is unclear under state law whether they could legally approve those projects through online meetings.

"Right now, unless a meeting prevents irrevocable public harm, districts are not able to have electronic meetings," Tyree said. "We have reached out [to the state attorney general] to find out if cost-share and conservation projects would fall into that category and have not yet received that opinion."

In Pennsylvania, Christopher Thompson, head of the Lancaster County Conservation District — the county with the most farms in the Bay watershed — said that, as of March 20, no staff would be working in the field with farmers. The timing is especially bad, he noted, because the recent influx of federal grant money to help Chesapeake Bay conservation work in the state has to be spent by the end of September or it will be reallocated.

While conservation district staff around the region are trying to provide technical assistance to farmers remotely, Mark Dubin, agriculture coordinator with the state-federal Chesapeake Bay Program, cautioned that such efforts have their limits because farmers in rural areas are often hampered by poor internet connections. He operates his own farm on the Maryland-Pennsylvania border in an area where he described service as "minimal."

"There are definitely going to be more challenges here," he said. "It is inevitably going to cause some delays."

Also, most conservation programs require farmers to share in the cost of the projects. But farmers have been suffering financially for several years from collapsing dairy prices, tariffs and other economic hardships. The coronavirus crisis adds a new layer of financial uncertainty.

"If you are trying to survive," Dubin said, "the last thing that is on the list is going to be implementing some new practice while you're trying to pay the bills."

Ann Swanson, executive director of the Chesapeake Bay Commission, which includes state legislators from across the region, worries that the faltering economy will mean trouble for the future funding of conservation programs.

Most conservation improvements come from programs with dedicated funding tied to tax revenue at the state or federal level, she said. "When the going gets rough and cash gets limited, often those dedicated funds get raided," Swanson said. "So not only are we looking at budget shortfalls but also at potential raids of those dedicated funds. It's not a pretty picture."

Watermen hit on multiple fronts

In the Bay, as is the case all along the coast, the closure of restaurants has hit the fishing industry hard. "It killed the last two weeks of oyster season. There's been no market," said Robert T. Brown, Sr., president of the Maryland Watermen's Association.

And it's not clear the situation will get better with the opening of crab season, which began March 17 in Virginia and April 1 in Maryland. With the foreign workers essential for crab meat-processing being forced to stay home, the region's

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Bay seafood industry suffers as coronavirus closes restaurants

≈ Watermen try new marketing strategies as pandemic drives demand and prices down

By Timothy B. Wheeler

The Chesapeake Bay's seafood industry has been especially hard hit by the coronavirus pandemic, as buyers dry up for oysters and prices plummet for fish and crabs.

Watermen say they've given up on the final weeks of the oyster season, as restaurant and raw bar closures have deprived them of lucrative markets for their catch.

"It's very drastic," said Robert T. Brown Sr., president of the Maryland Watermen's Association. "I've seen things bad, but I've never seen them like this before."

Oyster farmers say they're idled for the same reason, though some are trying to eke out some direct sales to consumers. Ted Cooney, founder of Madhouse Oysters on Hooper's Island on Maryland's Eastern Shore, said sales suddenly stopped at a time when they're usually selling 100 or more boxes of bivalves every week.

The oyster shutdown extends Baywide, as Maryland and Virginia have both limited food establishments to takeout or delivery.

"With no restaurants, there are no sales," said Mike Oesterling, executive director of the Virginia Shellfish Growers Association. "The industry is pretty much at a standstill right now."

Workers cull oysters at the True Chesapeake Oyster Company in 2015. Demand for Chesapeake oysters is almost nonexistent as the coronavirus has closed restaurants in the region. (Dave Harp)

Some oyster farmers who have state and federal licenses to do so are peddling their shellfish themselves. When restaurant orders stopped, Scott Budden, co-owner of Orchard Point Oyster Co. on Maryland's Eastern Shore, said he and his partners began offering their products for pickup at a bar in Chestertown and at their offices on Kent Island. They spread the word via Facebook and with paper flyers posted at the stores still open.

In the first week, the partners' hustle brought in about 20% of the revenue they normally make, Budden said.They are now looking into trying to expand their market beyond the Shore by offering to ship refrigerated boxes of oysters via FedEx or UPS.

"We've got to keep the lights on if we want to stay in business," Budden said.

Crabbing season began March 17 in Virginia, where at least some watermen have pivoted to the new fishery. J.C. Hudgins, president of the Virginia Waterman's Association, said the market for crabs has been slow so far, but there are still some buyers for takeout sales in places like Washington, DC, and Baltimore.

The prices watermen are getting for their catch, though, are "about half what it was last year," Hudgins said. Those buyers interested in crabs are offering $40 to $45 per bushel for females and up to $125 a bushel for large male "jimmies," he said.

Watermen and oyster farmers alike say they fear their livelihoods could be affected for some time to come, depending on how long people are out of work and restaurants shut down. Even when restrictions ease, they say, they expect a glut of fish and shellfish will suddenly flood the markets, keeping prices depressed.

Oyster growers also say the shutdown comes at a particularly inopportune time. Those who raise bivalves in cages say they need to harvest them now so they can use that gear to plant the next crop. Otherwise, they'll lose a year of production.

"We're looking at different options of what can be done," said Oesterling of the Virginia Shellfish Growers group. "But right now, it's just a matter of hunkering down, trying to survive."

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seafood industry is entering rough waters.

To protect its staff from the coronavirus, the State Department announced on March 18 a halt to processing most temporary work visas in its Mexico offices. Mexico is one of the biggest suppliers of labor to the Chesapeake's crab-picking houses.

The industry was already facing a shortage of temporary work visas because employer demand nationwide far outstrips the number that the government releases. On Hooper's Island, the epicenter of Maryland's crab-picking operations, six out of the nine processors did not receive visas this year before the virus-induced interruption.

For watermen, Brown said, "It's wait and see, pretty much, how bad it's going to be — not how good, how bad."

Air pollution reductions

All of the economic and social disruption wrought by the coronavirus could contain a silver lining: a sharp — if temporary — decrease in emissions of greenhouse gasses and other pollutants as people drive less, flights are grounded and the economy slows.

NASA and the European Space Agency recorded substantial drops in pollution concentrations over Italy and China as those countries sought to lock down their populations. Such measures were only beginning to trickle into American life in March, but there were already signs that they might be having an environmental effect.

"Trends aren't entirely clear yet," said Virginia Department of Environmental Quality spokesman Greg Bilyeu, "but if traffic and commerce follow patterns we've seen elsewhere, we expect pollution to decrease more markedly. We have started noticing some potential difference in areas that typically experience more traffic."

Levels of nitrogen oxide and fine particulate matter, which are tied to soot from diesel trucks, were down along many busy highways, according to DEQ's air-monitoring sensors.

Climate scientists caution, though, that if history is any guide, the emissions will likely return once the virus runs its course. Meanwhile, some industries have already begun lobbying against climate regulations, arguing that they can't bear the costs along with the slowdown caused by the pandemic.

Concerns over new rules

A number of organizations, from conservative think tanks to labor unions to environmental groups, have asked the Trump administration to alter its rule-making process while the president's national emergency declaration, issued March 13, remains in effect.

The groups argue that many stakeholder organizations have been forced to close their doors to prevent exposure to COVID-19, which hinders their ability to develop meaningful comments to agencies at a time when a number of proposals that would impact environmental regulations are under review.

In a letter to the White House, CBF said interested citizens may lack the technology needed to weigh in remotely or may be unable to attend meetings or collaborate with others to comment on proposals, such as changes to coal ash regulations, which are under consideration by the U.S. Environmental Protection Agency. "Perhaps most importantly," CBF wrote, "many will be consumed with taking care of themselves, their businesses, families, communities, and neighbors."

"For EPA and some other agencies to insist on proceeding with business as usual is unacceptable," said Jason Rano, CBF's federal executive director.

As of late March, the EPA had declined to delay its rule-making, with officials noting that its regulatory website was fully functional and able to receive comments.

Changes in & out of homes

The large number of people staying home has raised special issues, too.

Wastewater treatment plant operators are worried that people confronted with a shortage of toilet paper will begin flushing wipes, paper towels and other materials. Those materials can clog sewer pipes and cause backups or damage treatment plants.

The Maryland Department of the Environment is conducting a "No Wipes in the Pipes" campaign while others are launching similar public awareness efforts.

If people become stir-crazy after being homebound, they will find many state and national parks and wildlife refuges open, though visitor centers, bathrooms and campgrounds are closed.

But some of those areas are in danger of being overcrowded: The Appalachian Trail Conservancy was urging people to stay off the trail, sections of which were becoming too crowded to practice social distancing.

What's that plant? A field test for Plant ID apps

Signs point out trail routes at the Nassawango Creek Preserve in Maryland. (Dave Harp)

By Jeremy Cox

Do these blue flowers belong to creeping phlox or spiderwort? Is this thick-leafed plant an American holly or southern wax myrtle? Is that poison ivy?

The ability to identify plants and trees was once the sole province of experts such as naturalists, botanists and master gardeners. But with new technology just a download away, anyone can do it.

Well, mostly do it. So I learned during a recent hike through a soggy portion of the Nassawango Creek Preserve in Worcester County on Maryland's Eastern Shore.

I field-tested four plant identification apps on my mobile phone to see whether they offer a friendly user experience and deliver reliable results. None of the apps emerged as a "winner." Clearly, the technology could use more time to mature, but the day is probably close at hand when software overtakes humanity when it comes to singling out greenery.

Plant identification can be a nettlesome task. To this day, scientists are still discovering an average of about 2,000 new plants per year. Sometimes, it can take years, even decades, for biologists to confirm whether one of those plants is a unique species.

What hope do the rest of us have?

Luckily, identifying your garden-variety plants isn't usually so complicated. But it can still be daunting for those of us without specialized degrees or a lifetime poring over field guides.

From the comfort of my WiFi-enabled home, I downloaded four apps — iNaturalist, PictureThis, PlantNet and PlantSnap — and hit the road. All were free. Or at least they started as free; some began asking for money after I reached a certain number of identification attempts.

For nature lovers in search of a little botanical variety, Nassawango Creek Preserve is a great choice. Owned and managed by The Nature Conservancy, it protects nearly 10,000 acres of land along the 18-mile stream. On its way to the Pocomoke River, a significant Chesapeake Bay tributary, the Nassawango trickles past rare stands of seaside alder, bald cypress and Atlantic white cedar. There are also orchids and — just discovered last year — a meat-eating plant found nowhere else in Maryland.

The conservancy operates a few free access points to the creek along its holdings there.

On a crisp January afternoon, my 9-year-old daughter and I tromped down the preserve's Prothonotary Warbler Trail which, from high above, resembles the upper half of a stick-man drawing. It starts with the semicircular outline of a torso topped by a loop trail (the head) that touches the riverbank. Then, two out-and-back lengths jut out like arms from either side of the "body."

The entire trail can be covered probably in a little more than an hour. But that's pushing it when it's 43 degrees and your companion's age is not quite into double-digits. On the bright side: This is the Shore, so most of the going is flat. There are some surprisingly steep knolls, though, particularly on the eastern "arm."

During the winter, the landscape is a veritable rainbow of browns and off-browns. That's no strike against it; there's still plenty to explore if you're willing to look a little deeper.

That's how I discovered that these apps can really help to elevate your experience with the outdoors. To understand what I mean, it helps to know how they work.

The apps function largely the same way: You snap a picture of a plant, upload it to the app and it spits out its best guess at what you're seeing. Depending on the app, you can submit images of leaves, flowers, the bark or the whole plant.

All of the apps I used depend on image-recognition technology to suss out a plant's identity. But at least one supplements that information with actual humans — unpaid site contributors — who follow up via email with their own rulings. Their replies usually start trickling in within a few hours.

A common critique of such technology is that its ability to make accurate identifications hinges largely on the quality of the information you feed into it. To borrow a phrase from the computing world: garbage in, garbage out.

Shadbush, also called serviceberry, shows off springtime blooms at the Nassawango Creek Preserve on Maryland's Eastern Shore. (Dave Harp)

Red maple buds at the Nassawango Creek Preserve, an early sign of spring. Bay Journal writer Jeremy Cox (right) photographs holly leaves to test plant ID apps. (Above, Dave Harp / Right, Charlie Cox)

An example: If you take a blurry picture of a leaf belonging to a Joe Pye weed *(Eutrochium fistulosum)* — a stalky native bush with purplish flowers — you could wind up with an output on your screen of a different genus altogether.

The apps are finicky about photography. A whole leaf must be shown, not just part. A wilted flower is no good. A leaf silhouetted by the sun won't work. Don't be too far or too close to your subject.

It's not enough, then, to take a quick pic of some random leaf with your smartphone and move on. You must spend a little time with your plant or tree to find a good representative leaf. Be sure it's not obscured by other leaves or missing some vital facet — perhaps a serrated margin or a fourth lobe. These things matter.

Suddenly, before you know it, you and your normally half-interested child are communing with nature. It's like an open-ended scavenger hunt. You're hunched over a log, pawing through a tangle of vines. You're stopping by a sapling, considering its shape, its worth here in the forest.

For eons, critics have been railing about how technology distances us from the wonders of creation. In a small way, these apps may help reconnect us, even if only for an afternoon.

But do they work? The bad news is that you won't know an answer is wrong unless you already know the answer. So I planned my experiment with a different goal. I decided to pit the apps against each other. How often do they agree?

To find out, I took photos of nine leaves from what I believed to be different plant species along the hike. In more than half of the cases, I don't think I could definitively identify that plant myself.

The number of times all four apps agreed on the identity of a plant? Once. Apparently, with its dark-green, pointy leaves, American holly cuts a distinctive figure. A close runner-up was the beech tree, whose fanlike leaves were recognized at the genus level by all the apps. There was some disagreement over whether it was an American or European variety.

At no time did exactly three apps line up with one another. But with four of the plants, I got two apps to produce identical answers. A long-dead oak leaf I scrounged off a wooden plank, for instance, generated two guesses of northern red oak followed by one each of white oak and scarlet oak.

Three of the plants just gave the apps fits. With four programs, I got four different suggestions. I tried a mushroom and the apps replied:

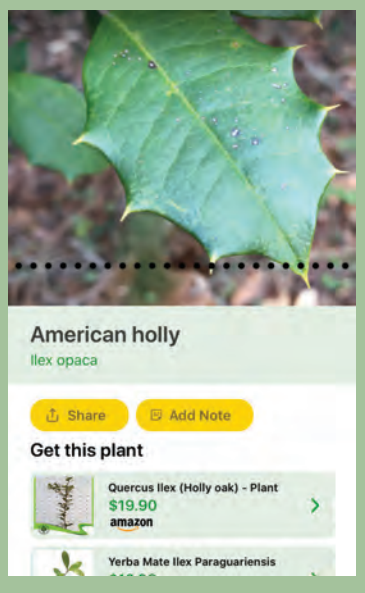
- "Amanita franchetii," which doesn't appear to grow on this side of the globe (PlantSnap)
- "Not a plant (may be fungi)" (PlantNet)
- "Lumpy bracket," a fungi that at least pops up quite often in the mid-Atlantic (iNaturalist)
- "Oops, I couldn't find plants in the picture." (PictureThis)

I re-used the same photograph for each plant in the apps, so you can't chalk up the variations to some difference in hue or angle.

Far from being disappointed, I was still impressed with the apps. We now have in our pockets tools that can narrow down the identity of a plant out of tens of thousands of possibilities — and sometimes hit the mark.

Some plant ID apps to consider

There are several apps that claim to accurately identify plants and trees in the wild. Here's a look at a few examples available on both Apple and Android phones:



- PlantSnap (plantsnap.com): Uses image-recognition software powered by machine learning. More than 600,000 plants in database, representing 90% of known plants and trees. Cost: Free with ads. A premium, ad-free version is available for $2.99/month or $19.99/year.
- iNaturalist (inaturalist.org): Uses image-recognition software backed up by crowd-sourced suggestions (emailed to you within hours or days). Operated by the California Academy of Science and the National Geographic Society. Linked to its own social network. More than 250,000 species represented (includes fish, birds, etc.). Cost: Free.
- PictureThis (picturethisai.com): Uses artificial intelligence-powered, image-recognition software. Claims 99% accuracy identifying common species and overall 95% rate with a database of more than 10,000 plant species. Cost: Free. Also a premium service with 7-day trial, then $29.99/year.
- PlantNet (plantnet.org): Uses image-recognition software. A database of more than 27,000 species and growing. Can search by leaf, flower, bark, fruit, habitat, etc. Cost: Free.

Susquehanna pontoon immerses you in river history

Guide Sara Knudson prepares to launch a boat tour during the 2019 season for a 17-mile loop of the Susquehanna River in southern Pennsylvania.

It was the hottest ticket in town during its inaugural season last year — and free boat tours of the gorgeous Lower Susquehanna Gorge in southern Pennsylvania will launch again for its second season this year.

Story and Photos
By Ad Crable

Oozing with history and beauty, the Susquehanna National Heritage Area River Discovery Boat Tours are one-hour and 20-minute loops on a pontoon boat, traversing 17 miles at the Susquehanna's widest, fastest-dropping and deepest point.

The tours, with a capacity of 10, are scheduled to take place four times a day on Fridays, Saturdays and Sundays, May 22–Sept. 27, as well as on Memorial Day and Labor Day (but the tours may be postponed due to the coronavirus). The excursions are provided by the Susquehanna National Heritage Area with grants from the National Park Service and Pennsylvania Department of Conservation and Natural Resources.

Launching about 18 miles north of the Maryland line, the leisurely boat rides highlight one of the oldest rivers in the world as few others besides boating anglers see it.

Embedded between steep hills, with few roads at river level, most people see this section of the Susquehanna by looking down into it. Jane Lindhorn, a York County resident who lives a mere mile from the river, was blown away by a boat tour on a glorious fall day. "It was really cool to go up the middle and see how it was on the sides. It's totally different," she marveled.

The river contours are relatively flat where you board the pontoon boat at the Zimmerman Center for Heritage at Long Level, on the western side of the river in York County. Allow time to visit the center either before or after the trip. A striking stone mansion dating to the mid-1700s, the building displays old and new paintings of the river and artifacts from a 1670 Susquehannock village located nearby. There is a 1.5-mile trail from the center through the site of the settlement.

The Zimmerman Center also serves as Pennsylvania's official visitor contact station for the Captain John Smith Chesapeake National Historic Trail, the nation's first water trail. You can collect the popular National Park "passport" stamps here, too.

At the end of the ramp leading to the boat, past a butterfly garden, is a 10-foot-long reproduction of an 1810 survey painting by Benjamin Henry Latrobe of the river from its mouth to the town of Columbia, just north of the launch site.

I climbed aboard last fall. Our guide, Sara Knudson, handed out headphones so you can hear her spiel above the wind, as well as life vests, sunscreen, bottled water and binoculars. The captain eased the boat past a small armada of moored sailboats and sailboards, rigging chains clanking in the wind, and we were off.

Near here, Smith, one of the first Europeans to explore the Chesapeake Bay and its rivers, met the Susquehannock people in about 1608. He described them as "great and well proportioned men."

Lightly perfuming the air as we travelled was the occasional fertile smell of manure freshly spread on Lancaster County's famous farmland. To most on the boat, the scent was familiar and not unpleasant.

Chugging past some river cottages, we were soon into the gorge proper. Ironically, thanks to a hydroelectric dam downriver, which bought the surrounding hills for a buffer a century ago, most of the landscape is wooded and preserved. In all, utilities in the area have donated about 2,500 acres to The Lancaster Conservancy and state agencies.

The landscape has changed little since the 1810 survey, though the march of industrial time has certainly left its mark.

We passed an aqueduct built in the early 1900s, chuting streamwater over the old Low Grade Rail Line and into the river like a water feature at an amusement park. The former railbed, on the Lancaster County side of the river, is now the multi-use Enola Low Grade Trail.

When the railroad was built with very low grades and curves, it was an engineering marvel, second only to the Panama Canal in amount of earth moved. The jagged

Participants on the Susquehanna boat tour will see an aqueduct that shoots stream water over the old Low Grade Rail Line. The railroad, an engineering marvel at the time, is now a public multi-use trail that runs along the shoreline.

Safe Harbor Dam has transformed part of the Susquehanna into a tranquil reservoir called Lake Clarke, which is part of the travel route on the Discovery Boat Tours.

rock walls, blown asunder by explosives that killed more than a few men, attest to the feat.

Above the trail sits Lancaster County's landfill, which has made Turkey Point one of the highest spots above the entire Susquehanna. It is marked by two giant wind turbines. Just beyond is the Turkey Hill Dairy, home to famous ice cream and teas.

The river here is 1.6 miles from bank to bank, the widest spot of its 444-mile journey.

Other signs of human endeavor go back further in history: We boated past one of the last vestiges of the Susquehanna and Tidewater Canal. The canal system along the river and other industrial fixtures almost made Columbia, within view of the canal, the nation's capital in 1789. The proposal came up a few votes short, and political wrangling eventually placed the capital along the Potomac River, as preferred by Southern legislators.

It was a wise decision, as canals and their ability to move the young nation's goods later fell to railroads. In fact, it was said that dignitaries coming to attend the dedication of the Susquehanna and Tidewater Canal arrived by train.

The Safe Harbor Dam, where the tour necessarily turns back upriver, produces renewable electricity. But it was cursed by many local residents when it began operating in 1931. The dam, and two others downriver, blocked one of the nation's most prolific shad runs — a staple of the local economy.

It was said masses of shad coming upriver appeared as a wave from shore to shore. In 1806, anglers at two spots along the York County shoreline recorded 22,000 shad in their nets. Favored rocks and islands to intercept the delicious fish were passed down in family wills.

"For some people, the river runs in their blood," Knudson said.

The dam has made this section of the Susquehanna a tranquil reservoir, called Lake Clarke. But it was not always so. In fact, this was once a treacherous stretch of rapids feared by boatmen who shepherded great rafts of timbered logs from upstate. Safe Harbor was a place of rest before the raftsmen made the 50-mile or so trudge back to the mountains on foot.

The backwater created by the dam spurred another cottage industry. A ragtag fleet of boats known as the Susquehanna Navy dredged more than 10 million tons of coal from the river bottom, washed downstream from coal country, until the 1970s.

Just below the dam are hundreds of petroglyphs still visible on great rocks, 1,000 years after they were carved by Native Americans. This 30-mile stretch is the only place along the Susquehanna where they are found.

"This river has been bringing inspiration to people for thousands and thousands of years," Knudson said.

We learned why she handed out binoculars when we passed well within sight of a massive eagle nest on the hillside. The great stick nest, she said, has been active for years.

Nearby on a large outcropping hangs a frayed rope swing, the vehicle for daring plunges into the river on hot summer afternoons.

A symbol of recreation, that simple swing stood in contrast with the many industrial uses pressed on the Susquehanna through time. It drove home the point that, while the river has had many faces, it continues to be important to the people who live near it.

This rocky bluff is a popular summer swimming hangout along the lower Susquehanna River in Pennsylvania, a contrast to the historic industrial uses that once dominated this segment of the river.

Susquehanna Discover Boat Tours in 2020: Check the schedule, free tickets go fast

The Susquehanna National Heritage Area River Discovery Boat Tours are scheduled to start Memorial Day weekend but may be postponed due to the coronavirus. Use the contact information below to check for updates in late April.

The tours will hopefully take place four times a day on Fridays, Saturdays and Sundays, May 22 through Sept. 27, as well as on Memorial Day and Labor Day. All tours are free but online reservations are required. Tickets will be available for booking online a month in advance through the season, starting in late April.

Snagging a ticket can be difficult. The tours, on a 10-person pontoon boat, leave from the Zimmerman Center for Heritage at 1702 Long Level Road, Wrightsville, PA. For information and to reserve a seat, e-mail info@susquehannaheritage.org; visit susquehannaheritage.org/programs/boat-tours; or call 717-252-0229.

MD to test water, oysters in St. Mary's River for toxic chemicals

≈ State to check for PFAS near naval airfields.

By Timothy B. Wheeler

Maryland officials say they plan to test a Chesapeake Bay tributary and oysters in St. Mary's County after a local resident found high levels of toxic chemicals in his tidal creek — a category of contaminants that have been traced to military and industrial sites nationwide.

Lee Currey, director of the water and science administration for the state Department of the Environment, said the agency intends to sample surface water, sediments and oyster tissue in the St. Mary's River watershed for per– and poly-fluoroalkyl substances, or PFAS. The agency had hoped to begin by April and have results by May, but an MDE spokesman said sampling has been delayed because field work has been suspended by the coronavirus pandemic.

"It is a priority for us," said MDE Secretary Ben Grumbles. He noted that he had formed an internal agencywide task force to deal with PFAS, which are among the most widely used and persistent chemicals in the world. They have increasingly turned up as a contaminant practically everywhere — in air, water, soil, food and even people's bodies.

PFAS don't readily break down in the environment, which has earned them the nickname "forever chemicals." They are a family of more than 4,000 chemicals that have been used in a wide variety of products, such as food packaging, stain- and water-repellent fabrics and nonstick coatings on cookware. They are also used in fire-fighting foam, which has left contamination at hundreds of airports, military bases and firefighting training sites.

PFAS have been found in groundwater, streams and drinking water supplies in nearly 1,500 places nationwide, including about four dozen sites in the six-state Bay watershed.

Most detections have been at very low levels, but a number of sites exceed the lifetime exposure level recommended by the U.S. Environmental Protection Agency for drinking water, including some in the Bay region.

Pat Elder, the St. Mary's County resident who reported finding PFAS in St. Inigoes Creek in front of his home, said he was glad the MDE was responding. He is a peace activist who's been working to raise awareness about toxic contamination around military bases. Using a testing kit he bought from a Michigan environmental group, he collected water from the creek earlier this year and had it analyzed by a laboratory in that state.

"My wife prompted me," Elder said. "She said, 'Why don't we get our water tested?'"

Pat Elder kneels on the shoreline of St. Inigoes Creek by his house, where he collected a water sample. A Michigan lab that analyzed it found elevated levels of PFAS, a family of widely used "forever chemicals" that now have caused widespread contamination. The foam in photo is most likely a natural byproduct of wind and wave action. (Timothy B. Wheeler)

St. Inigoes Creek is a tributary of the St. Mary's River. Across from Elder's home is Webster Field, a naval air research facility with a small airfield. It's an annex to Naval Air Station Patuxent River, the sprawling base about a dozen miles away.

Webster Field's 1,000-acre site includes a fire station. Fire-fighting foam containing PFAS was sprayed there years ago, according to Lance McDaniel, environmental director for NAS Patuxent River.

The lab that analyzed Elder's water sample found 14 different PFAS compounds with a total concentration of 1,894 parts per trillion of water. That's 27 times the EPA's recommended safety limit for drinking water. St. Inigoes Creek is not a source of drinking water, but Elder questions whether oysters harvested from the creek and river are safe to eat.

Health effects of ingesting PFAS haven't been thoroughly researched, but the most frequently studied compounds, including the type used in fire-fighting, have been found to interfere with the body's natural hormones, increase cholesterol levels, affect the immune system and raise the risk for some cancers.

PFAS have been found in oysters in China and New Hampshire, among other places, and even in St. Mary's County nearly two decades ago. A 2002 study detected seemingly significant levels in oysters along the Gulf Coast and in Maryland at Hog Point at the mouth of the Patuxent River — at the northern tip of the naval air station. That study drew little attention and elicited no followup.

Elder said he tried, initially without success, to get local or state officials to take his test result seriously.

But Bob Lewis, executive director of the St. Mary's Watershed Association, found Elder's test results alarming and posted them on the group's website in February. Lewis said he didn't want to overreact, because the Navy said the lab Elder used was not certified to test for PFAS. But he said the results raised questions that called for answers.

"I don't know how to quantify all this," he said, but the level reported by the Michigan lab "sounds like it's a problem."

On March 3, more than 275 people showed up for an open house the Navy held to explain its plans for investigating PFAS contamination at the naval air station. Many wanted to know what was being done in response to Elder's test results. They left frustrated.

The Navy and its contractors presented plans to test ground water in 18 spots on the base. But David Steckler, who runs environmental restoration efforts at the naval air station, said there were no immediate plans to sample outside the fence line because there was no evidence of contamination moving off-site through ground water. No information was presented about Webster Field.

"I think the Navy did a pretty good job of assuring people there's no threat to the drinking water supply," Lewis said. But, he added, "They didn't do anything to assure people about open water and aquatic animals."

Navy officials say they welcome MDE's testing plans. "Any opportunity to learn more about these compounds is a benefit to the public and the scientific community," Lance McDaniel, the base's environmental director, said in an email. He said the Navy is focusing its investigation "on our installations where we have already identified releases."

That includes two locations at Webster Field. He said that former base personnel had identified an area at the airfield where foam was sprayed and, as a precaution, the fire station on base would also be checked.

Runoff from Webster Field is collected and discharged into the St. Mary's River below St. Inigoes Creek, as is treated wastewater from the facilities on the base, according to McDaniel. The MDE plans to sample water and sediment in the creek as well as in the river above and below the creek.

Ira May, who oversees federal site cleanups for the MDE, suggested that contamination in the creek, if it exists, could have another source. The chemicals are often found in landfills, he noted, as well as in biosolids and at sites where civilian fire departments sprayed foam.

"So, there are multiple potential sources," May said. "We're just at the beginning of looking at all of those."

Kathy Brohawn, chief of the MDE's public health section, said the agency plans to sample oysters in the creek, as well as above and below it in the river. The agency also "tentatively" plans to test oysters at Hog Point, she said.

J.D. Blackwell, who raises oysters in St. Mary's County waters, doesn't think any of his leases there are close enough to the military sites to be at risk of contamination.

"I don't think eating my oysters or oysters off most public waters presents an elevated risk," he said. "But I do wonder if [oyster] bars and leases adjacent to bases are a problem." And, he said, "if there's a problem, I want to know it."

Elder voiced no regrets about stirring public concern with his own test of the water, which he dubbed "guerilla science."

"Call me a gumshoe or whatever," he said, "but at least it'll get some action."

He noted that other states, such as New Jersey and Michigan, have already tested their fish and shellfish and set fish consumption advisories.

"It's about protecting public health," he said. "They're years ahead of Maryland."

Currey said the surface water and oyster testing are part of a broader approach to PFAS. The agency is finalizing a statewide survey for sites where the chemicals may have been used, and regulators will focus on investigating and remediating any sites with risks of significant human exposure.

The MDE's Grumbles acknowledged the public anxiety in St. Mary's County.

"Every person who's aware of a potential risk wants to get real information and understand the extent of the risk or if it's a false positive," he said. "We share the concern and we're committed to following through."

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A dew-laden cobweb clings to a stalk of phragmites. (Dave Harp)

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Forum

Commentary • Letters • Perspectives

Appalachian Trail hike reignites urgency to protect landscapes

By Paul Farragut

This section of the Appalachian Trail is between Buzzard Hill and Raven Rock, near Route 7 in Virginia. (Grant Blankenship)

A job related to regional Chesapeake Bay planning attracted me to Maryland from New England more than 50 years ago. I worked as a planner at a regional agency, analyzing water and land use issues related to the Chesapeake Bay and its shoreline in the Baltimore region.

When I first came to this region, I had worked on an analysis that found that water quality in the tidal areas of the Baltimore region were in rapid decline. On the land side, the study noted a lack of public open space compared with other bays around the country, as well as some poorly planned shoreline developments.

This connection between water and land became more apparent to me soon after arriving in Maryland, when I visited my brother in upstate New York. On that trip, driving along the Susquehanna River in Pennsylvania and New York, I began to appreciate the sheer size of the Chesapeake Bay watershed. The river, on average, accounts for nearly half of the water in the upper Chesapeake Bay and is quite spectacular in its length, breadth and beauty.

Driving along this important tributary, I realized that the health of the Chesapeake Bay is directly related to good farming practices, forest conservation and the quality of treated effluent from wastewater treatment plants.

In recent years, my interest and fascination with the size of the Chesapeake drainage centers around that portion of the Appalachian Trail that traverses the watershed. The 2,186-mile Appalachian Trail covers 14 states from Maine to Georgia. The Bay portion of this mileage, in Virginia, West Virginia, Maryland and Pennsylvania, makes up almost 25 percent of its length.

Along the way one crosses the mighty Susquehanna, the Potomac, the Shenandoah and James rivers.

At age 78, I am completing a 500-mile, multi-year hike of this area. I plan to finish my last hike near Troutville, VA, the trail's southern terminus of the Bay watershed. The northern terminus of the watershed is west northeast of Port Clinton where streams on the other side begin to flow toward the Schuylkill River and on to the Delaware Bay.

The auto travel time between these points is six hours and, if one averages my 8 miles of hiking per day, it would take about two months to complete the journey. But I completed my goal largely by day hiking from my home in Maryland.

When I began hiking the trail with my sons and friends, I soon became enamored with its interesting geology, varied topography, overlooks that feature views to beautiful valleys below, Civil War historical sites, vast forests, stream crossings, springs and interesting flora and fauna. In regard to the latter, seeing extensive areas of mountain laurel and rhododendron in bloom along with black bears in the Shenandoah National Park were highlights.

The trail is sometimes called the "green tunnel" because of the tree canopy overhead. With much of the trail traveling through protected federal and state parks or forests, wooded areas are dominant and beautiful examples of climax forests are prevalent. As a person interested in woodlands, some of my favorite sights were large groves of mature beech and tulip poplar trees along the trail.

Proper stewardship and environmental education is critically important if we are to improve water quality in local streams and the Bay. As a result, I am encouraging trail management organizations to place small, attractively designed signs for hikers to let them know when they are entering and leaving the Chesapeake Bay watershed. For those unable or unwilling to walk the entire trail, hiking sections of the Bay watershed portion is a worthy and enjoyable goal and a close-to-home adventure. This also allows people to time their hikes to coincide with seasons of the year as a way of experiencing full streams in spring, colorful foliage in fall, improved vistas in winter and warm weather in summer. When scheduling short day or overnight hikes, one can select the best weather and off-peak times when there is less foot traffic.

My hikes along the Appalachian Trail have emphasized to me that we are all stewards of an incredibly large, beautiful and fragile resource — one that I hope we will leave in an improved state for future generations.

Paul Farragut can be reached at pjfarragut@aol.com.

On March 24, the Appalachian Trail Conservancy advised all hikers to postpone their hikes on the Appalachian Trail to avoid potentially spreading COVID-19. After multiple sections of the Trail experienced large crowds over the weekend, it is no longer a viable space to safely practice social distancing. For information, visit appalachiantrail.org.

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.

The Joy of Junk

Going crazy trying to think of things for you and your family to do while riding out the coronavirus at home? Here are crafts made from everyday items that might otherwise be heading to the trash or recycle bin. I have selected projects that require little more than scissors, glue and thread to complete. Other tools and objects for individual projects are also likely to be found in the home.

Plastic Grocery Bags

≋ ***Crocheted Rug:*** (big crochet hook) There are no instructions for this craft, but anyone who can do a single crochet stitch will be able to figure this out just by looking at the photo. Visit: diyncrafts.com/27162/repurpose/30-amazing-upcycling-ideas-turn-grocery-bags-spectacular-creation.

≋ ***Beads:*** (parchment paper, iron, strong crafting glue, toothpicks or similar, scissors, ruler): Visit thegreendivas.

The cover of this mini journal was constructed from a thick advertising postcard covered with a calendar page and bound with a handle from a worn-out gift bag. It is embellished with canceled stamps and a yarn scrap. (Project& Photo / Kathleen A. Gaskell)

com/2013/06/06/plastic-it-changed-our-world.

≋ ***Coin Purse:*** (scissors, thread, masking tape, zipper, needle or sewing machine) Visit: wecanmakeanything.net/2014/09/recycled-coin-purse.html

≋ ***Crocheted Flower Pot:*** (big crochet hook) Visit: mamimadeit.blogspot.com/2010/04/tutorial-recycled-plastic-bag-flowerpot.html

Coffee Pods

≋ ***Seedling Starter Pots:*** (potting soil or dirt, seeds) Visit: instructables.com/id/K-cup-sead-starters. (*When seedlings become too big for pods, plant in the garden. No garden? Repot in larger plastic containers [yogurt, cookie tubs, etc.] Put container gardens in your internet search engine and look for ideas that best suit your patio, balcony or window. — KG*)

≋ ***Herb Ice Cubes:*** (fresh herbs from earlier project?) Visit: viralnova.com/coffee-pod-crafts.

(Used coffee is a great fertilizer for acid-loving plants. One website noted that the paper liners are biodegradable and can be put in compost. — KG)

Plastic Bottles

≋ ***38 Plastic Bottle Life Hacks:*** (most use only scissors or craft knife, nail to punch holes) Magnifying lens, sprinkler, camping drainboard and hand-washing sink, outdoor faucet/electrical plug guards, automatic filler for pet water bowl, mini camera tripod, citrus juicer and more. Visit: youtube.com/watch?v=xEAOvFG1AmM.

This clutch was made out of a foiled coffee or snack pouch. (Kathleen A. Gaskell)

Coffee Pouches / Foiled Chip & Snack Bags / Magazines

≋ ***Coffee Pouch/Chip Bag Woven Purse:*** (scissors, needle thread, zipper) Don't be alarmed by the "Part 2" in the title, this remake of an earlier version is slower and easier to follow. Also, while she uses coffee pouches, a similar purse can be made from foiled chip or snack bags that have been thoroughly washed to clean the oil off. (See photo above) Visit youtube.com/watch?v=7uGmQWdHl5g.

Or, if you are challenged when it comes to zippers:

≋ ***Woven Magazine Clutch Purse:*** (scissors, clear package tape, button, thread) Visit: youtube.com/watch?v=bh9p6t16IKQ.

Food Containers

≋ ***Time Capsule:*** What are you and your loved ones doing during this history-making time? Fill this with thoughts, memories of how you coped, photos, etc. to share with future generations. Visit: experthometips.com/empty-glass-jam-jars-decoration-upcycle-crafts. (*The site uses a glass jar, I suggest a plastic jar, which will not pose a hazard in case someone strikes it with a shovel when digging it up at a later time. — KG*)

Junk Mail, Scrap Paper, Old Calendars, Magazines

The possibilities here are endless: Cards, collages, paper mache, boxes, lampshades, decoupage. Just put paper crafting in your internet search engine and explore… I have chosen to highlight "junk journals" which can be made of any piece of paper in a home. (See photo, left) I recommend putting "treasure book youtube" in your search engine for a collection of tutorials on how to make elaborate journals out of anything: junk mail envelopes, old books, cereal boxes…There are also tutorials on making several varieties of mini journals; exquisite pouches out of plastic cereal box liners, old newspapers; flowers and other embellishments out of scraps of paper, lace, yarn or items that would normally be thrown away.

— Kathleen A Gaskell

Ocean in a Jar (Project & Photo / Kathleen A. Gaskell)

Trash to Terrific Toys

Bay Buddies

Parental supervision may be needed for some of these depending on the age of the child

≋ ***Nesting Animals:*** (paper food boxes of different sizes, brush & paint or markers or crayons, scissors, glue [or glue gun w/parent's help])

≋ ***Mini Helicopters:*** (egg cartons, paint & brush or markers, paper, brads, scissors)

These are two of many ideas at parentmap.com/article/upcycled-crafts-for-kids-and-families.

≋ ***Whirlygig:*** (Your parents' & grandparents' spinner toy): (String, heavy cardboard scrap, glue stick, scissors, kitchen skewer) Visit: thecrafttrain.com/how-to-make-a-whirlygig.

≋ ***Rock Face Game & Free Printables:*** (rocks, face features from magazines or download free pages of human/animal eyes, ears, noses, etc.) Visit: rightbrainedmom.com/2016/06/23/rock-faces-free-printable.

≋ ***Ocean in a Jar:*** (glass jar, water, blue food coloring, cooking oil) *See photo, right.* Visit: diyprojects.com/things-to-do-with-glass-jars-diy/

≋ ***Plastic Carrying Case:*** (20" length of cord / string or ribbon, punch strong enough to go through lid, glue) Visit: artistshelpingchildren.org/plastic-containers-artscraftsideaskids.html

≋ ***Rubber Band-Powered Toy Dump Trucks & Cars:*** (rubber bands, glue gun or strong glue, electrical or duct tape, old skinny markers or chopsticks for axles, caps for wheels) Visit: artistshelpingchildren.org/kid-scraftsactivitiesblog/2011/02/how-to-make-rubber-band-powered-toy-dump-trucks-and-cars-lesson

Bay Journal Boredom Busters

More than 20 years of *Bay Buddies* and *Chesapeake Challenge* quizzes and puzzles can be found at bayjournal.com. Put Chesapeake Challenge or Bay Buddies in search engine to bring up hundreds of puzzles.

Binge Watch the Bay

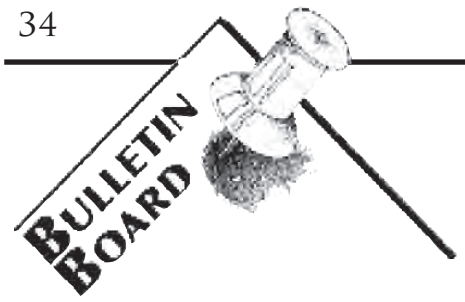
Watch all of the Bay Journal-produced movies from Tom Horton, Dave Harp, and Sandy Cannon-Brown for free online. Go to bayjournal.com, click on Films in the menu.

≋ ***Nassawango Legacy*** (2019): A look at one family's multi-generational efforts to protect a Chesapeake Bay stream and The Nature Conservancy's work to assure that it continues to flourish as an 11,000-acre preserve.

≋ ***An Island Out of Time*** (2019): Visit Mary Ada and Dwight Marshall, whose lives personify the Chesapeake Bay's seafood-harvesting culture and history, and their four children — who chose to break with that tradition.

≋ ***High Tide in Dorchester*** (2018): If the consequences of global warming and higher sea levels are distant concepts for you, come on down to Dorchester County, ground zero for sea level rise along the Maryland portion of the Chesapeake.

≋ ***Beautiful Swimmers Revisited*** (2016): It's been 40 years since William W. Warner's Pulitzer Prize-winning book, *Beautiful Swimmers,* introduced us to the Chesapeake Bay blue crab. *Beautiful Swimmers Revisited* takes a journey around the Bay to look in on those who catch, study and eat blue crabs.



VOLUNTEER OPPORTUNITIES

Plant trees in Frederick, MD

Stream-Link needs volunteers of all ages to plant trees 9–11 a.m. April 25 & May 2, 9, 16 in Frederick, MD. Tree care events are scheduled 9–11 a.m. June 6 & 13. Registration required: streamlinkeducation.org/plantings.

Swatara Creek tree planting

Help the Manada Conservancy in Hummelstown, PA, plant trees at several sites along Swatara Creek on April 24. Contact the conservancy for information: office@manada.org, 717-566-4122, www.manada.org.

Waynesboro, PA, tree planting

Help the Antietam Watershed Association and Waynesboro Fish & Game Protective Association (PA) 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: rfgoldman@comcast.net, antietamws@gmail.com, antietamws.org/events.

Quantico Creek monitoring

Larry Heath and Professor Shabana Meyering of Virginia Community College/Woodbridge will discuss and conduct water quality monitoring 10 a.m.–12:30 p.m. April 28 at Quantico Creek in Prince William Forest Park in Triangle, VA. Park at Lot A on Scenic Drive. Info/registration: lkhdoc@gmail.com.

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:

≋ *Bear Creek & Chalesmont Park Shoreline:* 9 a.m.–2 p.m. (register at 8 a.m.) April 25. British and American troops set up defensive positions in the War of 1812's Battle of North Point at this site. Register at tents near intersection of Park Haven and Gray Haven Road.

≋ *Stansbury Park:* 9 a.m.–2 p.m. (register at 8 a.m.) May 16.

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: 410-285-1202, info@BreadandCheeseCreek.org, BreadandCheeseCreek.org.

Severn River Association

Volunteer opportunities with Severn River Association include:

≋ *Water Quality Monitoring:* April–October. Crew needed to conduct weekly boat tours to monitor the 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 a 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 journalists of all ages who want to tell a story, cover meetings, take pictures, build up their clip file. Info: Info@severnriver.org.

Goose Creek Association

Opportunities with the Goose Creek Association in Middleburg, VA, include:

≋ *Canoe Cleanup:* 8:30 a.m.–2 p.m. May 2 (rain date May 3). Canoes, kayaks provided or bring your own. Lunch included. Registration required.

≋ *50th Anniversary Fall Festival:* 1–4 p.m. Sept. 20. Historic Aldie Mill. Volunteers needed.

Info: goosecreek.org/volunteer/, 540-687-3073, info@goosecreek.org.

Chemical monitoring team

Prince William Soil and Water Conservation District needs volunteers for a 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 its *Invasinators Workday* 12–2 p.m. April 25. Ages 14+ Learn about nonnative invasive plants, removal & restoration strategies. Wear sturdy shoes, long sleeves, work gloves. Registration required: 410-612-1688, 410-879-2000 x1688, otterpointcreek.org.

KNOW BEFORE YOU GO

Bulletin Board includes the most current information we had when the *Bay Journal* went to the printer. It is quite possible in these uncertain times that events may have been canceled after that. Please check with the contact given with each event to see that it is still taking place before you head out. Be safe.

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 April, May and June 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.

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.

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.

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 April, May and June at Little Paint Branch Park in Beltsville. Learn about native plants. Sign in for a safety orientation. Gloves, tools provided. Info: 301-442-5657, Marc.Imlay@pgparks.com.

Cromwell Valley Park

Cromwell Valley Park in Parkville, MD, needs volunteers of all ages (12 & younger w/adult) for its *Habitat Restoration Team / Weed Warrior Days,* 2–4 p.m. April 25, May 9 & 16. All ages. 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.

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 data from their catch: species, location, size. The data is used to develop management strategies. The artificial reef initiative, blue crab, freshwater fisheries, muskie, shad and striped bass programs have upgraded mobile-friendly methods, too. 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:

≋ *Spring Intern Symposium:* 10 a.m.–12 p.m. May 1. Learn about unpaid internships for college, high school students. Interns work with supervisors in their field of interest and commit to 10–20 hours per week, individual semester-long project. Light refreshments. Applications accepted on rolling basis.

≋ *Weekend Weed Warriors:* 10 a.m.–12 p.m. May 2, 30 & June 13, 27. 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.

≋ *Citizen Science / Breeding Bird Atlas 3:* 10–11 a.m. May 16. Brand-new to expert birders, ages 10+ Learn about the Third MD/D.C. *Breeding Bird Atlas.* This summer, search for signs of nesting among any/all bird species in the field, at Irvine or in one's backyard. Learn basics of using Cornell Lab of Ornithology's eBird website.

Info: Ben Fertig at fertigb@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

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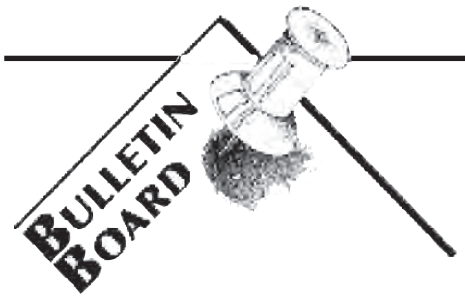

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shifts each month in the spring, summer and fall. Training sessions are required. Info: brzezins@umces.edu.

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 April, May and June 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, 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 April, May and June 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.

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 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 & Bees Survive?* These, and other titles, are available at severnriver.org/category/speaker-series.

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 Bay-Wise

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.

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.

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 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.

Compost Awareness Day

The Prince William County Solid Waste Division's annual International *Compost Awareness Day* takes place 10 a.m.–2 p.m. May 9 at the Sean T. Connaughton Community Plaza in Woodbridge, VA. The event highlights the positive effects compost has on plant growth, soil and lawn health, the environment and waste management and includes gardening and soil experts. Info: dcampbell@pwcgov.org, 703-792-5328, Fax 703-792-4617.

Wildlife education trunks

MD Department of Natural Resources *Wildlife Education Trunks* are available to teachers, homeschool educators and naturalists.

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.

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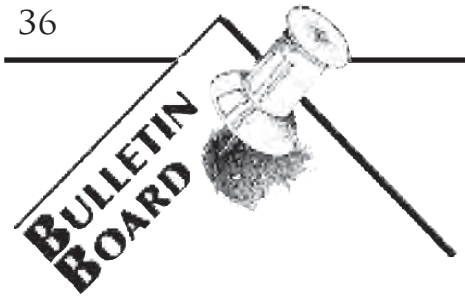

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Free, interdisciplinary tools are designed to interest students in local wildlife while building on art, language arts, math, physical education, science, social studies skills. Trunk contains an educator guide, lesson plans, hands-on K–12 activities, 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.

Stormwater class

The Alliance for the Chesapeake Bay's Municipal Online Stormwater Training Center's Dig Once Course suggests how local leaders can integrate green infrastructure into community capital projects such as road construction, and school and park improvements. Interactive lessons, videos in a user-friendly format give communities the tools to build, enhance local stormwater programs. Info: mostcenter.org.

EVENTS / PROGRAMS

VA Youth Conservation Camp

Applications are available for the 44th Conservation Camp July 12–18 at Virginia Tech in Blacksburg. Student enrolled in grades 9–12 during the 2019–20 school year are eligible to attend. The $550 fee covers meals, lodging, activities, transportation while at camp. Students are responsible for their transportation to and from camp. Applications, due to the District by April 15, can be dropped off or mailed to: PWSWCD Attn: Conservation Camp, 8850 Rixlew Lane Manassas, VA 20109, or emailed to education@pwswcd.org. Info: pwswcd.org, 571-379-7514.

Pollinator festival, plant sale

The Lower Shore Land Trust's *Delmarva Pollinator Festival & 13th Annual Native Plant Sale* takes place 9 a.m.–3 p.m. May 2 at Sturgis Park in Snow Hill, MD. The free event celebrates pollinators and educates the public on their vital importance. It include live music, food, children's activities, a pollinator parade, craft vendors, regional organizations. The plant sale includes more than 65 varieties of native plants and shrubs. Most bloom March–October. Master gardeners, educational exhibits and other pollinator resources will be on hand to answer questions, help with plant selection. Free. Contact Josh Hastings at 443-234-5587, jhastings@lowershorelandtrust.org.

Corsica watershed presentation

The Corsica River Conservancy invites the public to a free community meeting April 30 at the Centre for the Arts in Centreville, MD. Local student projects will be on display at 6:15 p.m. From 7–9 p.m., a panel of experts will present results from a state-sponsored study on the impact of more than a decade of conservation and restoration practices on water quality in the Corsica and its tributaries. It will also report on local water quality test results from 2019. Other topics include the status of cooperative efforts to restore Conquest Preserve, future restoration projects. Preregistration is requested: www.corsicariverconservancy.org. Info: corsicariverconservancy @gmail.com.

Manada Conservancy

Upcoming events from Manada Conservancy in Hummelstown, PA, include:

- *Earth Week Wildflower Walk:* 1 p.m. April 26. Guided walk on Horse-Shoe Trail along Manada Creek. (Directions provided upon registration). Free.
- *20th Annual Spring Native Plant Sale:* 10 a.m.–3 p.m. May 2. Boro (Schaffner) Park, in Hummelstown. 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. Also present: art & food vendors, children's activities, live music, gardening-for-nature consultant. Free. Rain or shine.

Info: office@manada.org, 717-566-4122, manada.org.

Merrimac Farm bird walks

The Prince William Conservation Alliance offers a monthly bird walk at 8 a.m. the last Sunday of every month (except December) at Merrimac Farm Wildlife Management Area in Nokesville, VA. Everyone is invited to walk the uplands to the edge of the floodplain, covering a variety of habitats. Bring binoculars, camera. Info/registration (appreciated): 703-499-4954, alliance@pwconserve.org, pwconserve.org/events/index.html.

Chesapeake Bay Maritime Museum

Upcoming programs at the Chesapeake Bay Maritime Museum in St. Michaels, MD, include:

- *Island Life: Changing Culture, Changing Shorelines:* Through Aug. 30. Chesapeake photographer Jay Fleming's work reveals how environmental changes affect cultures, shorelines of inhabited & formerly inhabited offshore islands in the Bay. Included in admission. Info: cbmm.org, 410-745-2916.
- *Lighthouse Overnight Adventures:* Select Fridays & Saturdays through June 27 & Sept. 4–Oct. 30. Youth groups, under the guidance of a museum educator, experience the rustic life of a lighthouse keeper while spending the night in the historic 1879 Hooper Strait Lighthouse, located on CBMM's 18-acre campus along the St. Michaels Harbor. Activities include the keeper's traditional duties, stories, games, puzzles. Fee of $40 per person, (12-person minimum, 18-person maximum, for both students and their chaperones) includes one overnight stay, dedicated museum facilitator, activities, two-day admission to CBMM, souvenir patch. Weekend groups may add a scenic river cruise aboard the 1920 buyboat Winnie Estelle (weather permitting) at a discounted rate. Reservations are first-come, first-served. Info: cbmm.org/lighthouseovernights.

Music festival for CBF

The public is invited to Tributary Festival, an outdoor rock concert to benefit the Chesapeake Bay Foundation, 10 a.m.–4 p.m. April 25 at the Baltimore Museum of Industry. Fifty to 100 high school and middle school students will serve as volunteer staff at the festival, which includes three professional bands and three youth bands. The event is free, but donations are encouraged. These donations, plus proceeds from merchandise sales, will be given to CBF. Info: tributaryfestival.org,@ tributaryfestival.

Broad Run water monitoring

Learn about benthic macroinvertebrates and how they interpret a stream's health, 10 a.m.–12.30 p.m. April 25 at Broad Run, a tributary to the Occoquan River. Park at Victory Elementary School in Bristow, VA. Register/info: 1vespermax0@gmail.com.

Catharpin Creek monitoring

Help monitor water quality at Catharpin Creek 12–2 p.m. April 26 at James S. Long Park in Haymarket, VA. Learn about creatures unique to this site. Park at Old Library parking lot. Spots are limited. Register/Info: Elaine.Wilson@dcwater.com

Youth Fishing Rodeos

The Maryland Department of Natural Resources and its partners, U.S. Fish and Wildlife Service Wildlife and Sport Fish Restoration Program, invite children, ages 3–15, to this year's *Youth Fishing Rodeos*, which introduce Maryland's youth to the sport of fishing in a safe and interactive environment. To ensure participants can reel in a catch, the department raises and supplies thousands of hybrid sunfish, channel catfish and rainbow trout. The events are free, but require preregistration. Upcoming rodeos, by county, include:

- *Allegany / Dan's Mountain:* 8 a.m. May 2. Info: Dan Lewis at 301-895-5453
- *Baltimore City / Patterson Park:* 10 a.m. May 9. Info: Bob Wall at 443-955-0484
- *Carroll / Krimgold Park:* 8 a.m. April 26. Info: Lisa Carroll at 410-386-2103
- *Cecil / Rising Sun Pond:* 8 a.m. May 2. Info: Judy Melton at

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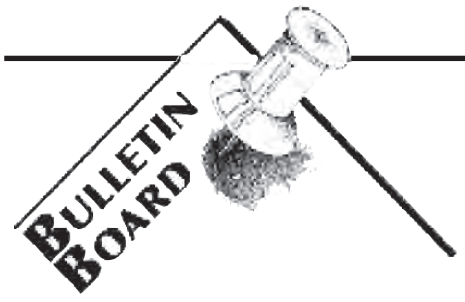
SUBMISSION GUIDELINES

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.
- **May issue: April 11**
- **June issue: May 11**



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410-658-5353

≋ *Frederick / Fountain Rock Park:* 9 a.m. April 25. Info: Wayne Leadbetter at 240-600-4460

≋ *Frederick / Middletown Pond:* 8 a.m. May 2. Info: Phil Kefauver at 301-600-1778

≋ *Harford / John Carroll School:* 11 a.m. April 25. Info: Bob Wall at 443-955-0484

≋ *Montgomery / Steven Park Pond:* 12 p.m. May 3. Info: Preston King at 301-370-9706

≋ *Washington / Sharpsburg:* 7 a.m. May 2. Info: Darryl Benner at 301-991-2230

≋ *Washington / Boonsboro Pond:* 7:30 a.m. May 2. Info: Kim Miller at 301-432-5141

≋ *Washington / Beaver Pond:* 8 a.m. May 2. Info: Jeremiah Corbin at 301-842-2110

≋ Washington / Willow Pond: 8:30 a.m. May 2. Info: Steven Younker at 240-291-2845

≋ *Washington / Tonoloway Lake/ Picnic Area:* 8 a.m. May 9. Info: Leroy Mann at 301-302-9112

Anita Leight Estuary Center

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

≋ *Bush River Photography Pontoon:* 10 a.m.–12 p.m. April 25. Ages 8+ Venture north on Bush River to photograph wildlife of Grays Run & Church Creek. Fee: $10.

≋ *Earth Day 2020 Celebration:* 11 a.m.–4 p.m. April 25. Aberdeen (MD) Festival Park. All ages. Stop by Estuary Center's face-painting booth. Live music, native animals, exhibits, "green" games, recycled crafts, local food. Free.

≋ *The Snail Life:* 2–3 p.m. April 25. Ages 3–6 w/adult. Learn what snails eat, where they live, how they move. Take home a snail habitat. Fee: $5/child.

≋ *Wandering for Wildflowers:* 3–4:30 p.m. April 25. All ages. Hike on/off trail; discover plants' survival secrets. Fee: $2.

≋ *Drop-in Tails & Tots:* 2 p.m. April 26. Ages 0–6 w/adult. Learn about nature through stories, songs, movement. Free.

Except where noted otherwise, 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.

Cromwell Valley Park

Upcoming programs at Cromwell Valley Park's Willow Grove Nature Center in Parkville, MD, include:

≋ *Saturday Morning Bird Walks:* 8–10 a.m. through May 30. Meet at sign in Willow Grove Farm gravel parking lot. Free. No registration.

≋ *TALMAR Spring Plant Sale:* 8 a.m.–12 p.m. April 25, May 9. Use Sherwood Entrance. Purchase of spring vegetables, herbs supports mission to serve individuals with disabilities. Info for this event: talmar.org.

≋ *Wild Edible Spring Greens:* 1–3 p.m. April 25. Ages 12+ Learn to identify, harvest, prepare season's earliest wild edibles. Fee: $5.

≋ *Canoe the Dundee:* 10 a.m. 2 p.m. April 26. Meet at Marshy Point Nature Center in Baltimore. Ages 8+ Explore marshes of Dundee Creek in Middle River, net for wildlife. Participants get basic paddling instruction before launch. Bring lunch. Shoes will get wet. Fee: $10.

≋ *Primitive Technology Weekend:* 10 a.m.–4 p.m. May 2 & 10 a.m.–1 p.m. May 3. All ages. Meet at Willow Grove Farm. Share knowledge, acquire hands-on experience in replicating items of stone, bone, wood, natural fibers. Free. No registration.

≋ *Night Out with Nature / Be Part of the Solution with GVC:* 7–9 p.m. May 8. Meet in Sherwood House. Amy Young, Clear Creeks Project Volunteer/Outreach Coordinator & Charlie Conklin, Gunpowder Valley Conservancy vice president of outreach, will discuss the Gunpowder watershed, source of almost two-thirds of Baltimore's drinking water. Learn how to join the conservancy's environmental stewardship activities, such as tree planting and stream clean-ups. Dessert included. Fee: $10.

≋ *Orioles - Neo-Tropical Migrants:* 11 a.m.–1 p.m. May 9. All ages. Bring binoculars and join a naturalist to spot a nest, listen for their songs, and find out where they've been. Fee: $4.

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.

Know Before You Go

Bulletin Board includes the most current information we had when the *Bay Journal* went to the printer. It is quite possible in these uncertain times that events may have been canceled after that. Please check with the contact given with each event to see that it is still taking place before you head out. Be safe.

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.

≋ *Warbler Walks:* 8–10 a.m. May 1, 8, 15 & 22. Adults. Free.

≋ *Lunch & Learn / Pollination Game:* 12–1:30 p.m. April 28. Adults. Master Gardener and naturalist, Clare Walker, will discusses the world of pollination. Stroll through the Woodland Garden after lunch (provided).Fee: $20.

≋ *Gettin' Fishy With It!* 9 a.m.–12 p.m. May 9. All ages, families. Learn about the underwater lives of trout! See baby pictures of Irvine's *Rainbow Trout in the Classroom* then view how large they've grown in their short time at Irvine. Make a fishy craft. If you like, join a Trout Unlimited volunteer to tag, release these fingerlings into the stream at Morgan Run Environmental Area in Carroll County, then search for macroinvertebrates. Optional: Bring bagged lunch for a picnic. Fee: $10.

Info: Stephanie Holzman at 443-738-9221, ExploreNature.org.

Oregon Ridge Nature Center

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

≋ *Shoots & Letters:* 10–11 a.m. April 30 (Worms); May 7 (Pollinators) Ages 3+ Outdoor adventures, activities. Fee: $2 per child. No registration.

≋ *Bird Walk:* 8–9:30 a.m. May 8. Adults. Bring binoculars (or borrow pair from center). Free.

≋ *Cub Club for Preschoolers / Springtime at Oregon Ridge:* 10–11:30 a.m. April 28, May 5 & 12. Ages 3–5 (nonmobile siblings only, adult is an active participant). Investigate plant or animal. Story, lesson, snack, activity. Fee: $20.

≋ *Senior Stroll:* 10:30 a.m. May 2 & 16. Adults. Stroll on paved, 0.3-mile Marble Quarry Loop. Later, take part in a guided reflection activity and/or hike unpaved, non-strenuous trail. Free.

≋ *Earth Day Scavenger Hunt:* 10 a.m. –3 p.m. April 25. All ages. Follow clues on map on to learn about caring for the Earth. Moderately difficult (not stroller friendly) hike takes 60–90 minutes. Return to center for prize. Fee: $2. No registration.

≋ *Bookworm Story Time:* May 1. Toddlers to age 6. Nature story, activity. Dress for brief outdoor experience. Free. No registration.

≋ *Cane Pole Fishing:* 10 a.m.–12 p.m. May 2 & 3. Ages 5+ Fish (catch & release) for bluegill, largemouth bass. Pole, worms provided. Ages 16+ must have valid MD fishing license. Everyone, including adult companion, must register Fee: $5.

≋ *Homeschool Nature Days / Something's Fishy!* 10–11:30 a.m. or 1–2:30 p.m. May 8, 15, 22 and 29. Ages 6–13 (parents welcome; no siblings). Learn about streams, Bay watershed. Fee: $20 (includes all 4 sessions).

≋ *Spring Family Camp Out:* 6 p.m. May 8 to 9 a.m. May 9. All ages. Bring tent, camping gear, bag dinner. S'mores, light breakfast provided. (Limited number of tents available for rent / $10.) Fee: $10.

≋ *Native Plant Swap:* 1–3 p.m. May 9. Come to trade at Lake Pavilion. Identification resources will be available. Free. No registration.

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: 410-887-181, info@OregonRidgeNatureCenter.org. 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).

Eden Mill Nature Center

Eden Mill Nature Center Upcoming events at Eden Mill Nature Center in Pylesville, MD, include:

≋ *Preschool Nature Series:* 10–11:15 a.m. April 28. Ages 2–5 w/ adult. Nature games & activities, story, hike (weather permitting). Fee: $11.

≋ *Preschool Nature Series:* 10–11:15 a.m. May 5, 19 & 26. Ages 2–5 w/ adult. Nature activities, story, hike (weather permitting). Fee: $11.

≋ *Homeschool / Nature Storybook Art:* 12:45–2:45 p.m. May 6, 13, & 20. Ages 5–12 years. Learn about books, illustrators & art techniques: drawing, painting, collage, crafting/constructing. Fee: $45.

Except where noted, Preregistration is required for each program: edenmillnaturecenter@gmail.com, edenmill.org.

Revive Earth Day's roots: Celebrate its 50th by planting a tree this year

By Ryan Davis

"Tree planting magic" in action: This large, energetic group of volunteers planted approximately 600 trees in just a few hours at a school in northern York County, PA, in the fall of 2019. (Ryan Davis)

As a 30-year-old, I cannot personally speak about the first Earth Day. But I do know that 50 years ago we had no U.S. Environmental Protection Agency, no Clean Water Act and appallingly inadequate proto-versions of the Endangered Species Act and Clean Air Act. Rivers were burning, DDT was sprayed from airplanes across the nation and people were faced with the reality that, while we only have one planet, the status quo would not allow us to survive on it for long.

The first Earth Day on April 22, 1970, was the turning point for environmental awareness. It was a clear indication of public demand for better stewardship, galvanizing the nation and its leaders to take action. The years that followed mark an era of bipartisan accomplishments for environmental stewardship. New point source pollution standards and regulations were enforced, and mechanisms for reining in nonpoint source pollution set up our modern fight for the Chesapeake Bay.

The environmental awakening that gave us Earth Day also marks a turning point for the Bay.

Several organizations emerged, focusing on its restoration (including the Alliance for the Chesapeake Bay). Their increased scrutiny revealed that the Bay was home to the first marine "dead zone" documented in the United States. A dead zone occurs when excess nutrient pollution feeds algae blooms, which are decomposed by oxygen-consuming bacteria and other organisms, resulting in very little dissolved oxygen to support aquatic life. It still haunts us every summer, but the shock in the late 1970s and early 1980s spurred action.

The Chesapeake Bay Program, a state-federal partnership, was soon created, and after a few decades of hard work by scientists, activists and restoration professionals, the EPA intervened. Using its authority granted in the Clean Water Act, the EPA in 2010 issued a Total Maximum Daily Load — or "pollution diet" — that sets allowable limits for pollutants reaching the Bay. The clock was also set, with a 15-year deadline for all of the states that drain into the Bay to take the needed actions to meet their pollution limits.

With five years left before the EPA's deadline, I see stark parallels between the Chesapeake cleanup effort and global climate change action. On both fronts, brilliant people have been doing their best for decades. On both fronts, a majority of the public is in favor of dramatic action. On both fronts, some nations (or, in the case of the Bay, states) are making much more headway than others. And on both fronts, it hasn't been enough.

So what can conservation professionals and concerned citizens do? We are taking restoration action and reaching out to the public to inspire them to do the same. We are working hard to achieve top-down political change and simultaneously bringing resources to landowners so that conservation can happen on the ground.

If you've ever attended a volunteer tree planting, you've almost certainly felt what I call "tree planting magic." Volunteers will trickle into the planting site, usually a cold Saturday morning. They're often quiet and timid at first. When they get started, the work goes slowly. Many people have never planted a tree before, and it takes a few trees to get the hang of it. Gradually, the pace picks up and the number of trees left to be planted looks much more feasible.

Some people talk, others sing and almost everyone smiles. The air is loud with pounding hammers and laughter. And suddenly, far earlier than expected, there are no more trees to plant. The muddy group will, one by one, turn around and marvel at the new forest that they helped to plant. Each volunteer leaves the site with a stronger stewardship ethic than when they arrived.

The tens of thousands of residents who volunteer to plant trees each season are energized, empowered and eager for the next planting. So my question is: What if everyone planted a tree?

An estimated 20 million people participated in Earth Day in 1970. At the time, the U.S. population was around 200 million, meaning that approximately 10% of our nation participated in the first Earth Day. If it feels like this was a watershed moment it's because it was. Perhaps residents and politicians responded to a whopping 10% of Americans demonstrating for our planet by joining the effort themselves.

While I may not be able to get 10% of Pennsylvanians to join me in planting trees this spring, it may be possible to get that many to hear about what we're doing and resolve to join a tree planting as soon as they can.

In an attempt to tackle this huge task, the Alliance for the Chesapeake Bay is going big for our celebration of the 50th Earth Day. A regular tree planting, even a huge one, won't quite do. We need a planting that is so much fun, so novel, so absurd, that people will pay attention and want to plant trees themselves.

What we came up with certainly is absurd: We're going to plant trees for 24 straight hours. Our "50th Earth Day 24-Hour Tree Planting Relay" — or "Treelay" for short — will consist of six volunteer tree plantings running back-to-back, around the clock.

Because of the current public health risk of large gatherings, the Treelay will now be held in autumn. We'll take extra care that the spirit of Earth Day is still there, strong as ever!

As fun as the Treelay is going to be, it will not be written about in 50 years as the tipping point that led to the restoration of the Chesapeake Bay and mitigation of global climate change. If 10% is still the number to reach, we will need 1.8 million residents of the watershed to take action in order to spur the remainder to join. For the United States to take adequate action on climate change, we will need 37.2 million residents. That is a wildly lofty goal, but imagine if that many people joined a tree planting someday.

It is our duty, as the conservation-minded community, to bring our fellow Americans with us. We need to make participation accessible by everyone, everywhere. Not only because the environment belongs to us all, but because we will need the participation of as many people as possible if we are to have hope for the future.

And what better way to energize your community than to commemorate the 50th anniversary of Earth Day?

Ryan Davis is the program manager for the Alliance for the Chesapeake Bay's Chesapeake Forests Program.

Canada warbler goes the distance in its journey of life

By Mike Burke

It was April 2015. Somewhere on the eastern slope of the northern Andes, a tiny wood warbler was feasting on insects and spiders rich in protein and fat. An instinctive drive was demanding an arduous 3,000-mile trek north. The little bird would need all of those calories for its epic journey.

A month later, after several days of rain, the weather in Maryland turned bright, sunny and warm. My wife and I were seized by a powerful case of spring fever. We simply had to get outside.

The little bird had followed its own irresistible urge up through Central America and Mexico and continued through an expanding swath of the eastern United States, including the Chesapeake watershed.

Our paths crossed that May morning along Indian Creek in the Lake Artemesia natural area in Prince George's County, MD. We saw the bird streamside, actively capturing flying insects, which would power its flight even farther north.

The Canada warbler (*Cardellina canadensis*) was at eye level, and we could see the bright yellow underside (from chin to belly) with the diagnostic black necklace across its breast. The necklace, composed of black streaks ringing the top of the breast, was the key field mark, and it was unmistakable.

The bird's face included a broad bill, yellow spectacles, thin white eye-rings, a black forehead and black wedgelike sideburns. Up top, the bird was a solid dark gray with a hint of blue.

There were no wing bars or tail markings. The stark contrast in feather colors indicated this was a male. Females tend to be paler overall.

In the Chesapeake, May is prime time to view wood warblers, that delightful set of birds known for their bubbling songs and flashes of bright colors. We call them neotropical migrants, birds of the "New World" (neo) that come to us from the geographic region we call the Tropics.

Few migrate as far as the Canada warbler. It winters in northeastern South America, residing along the leeward side of the Andean Range.

Summer breeding territory in North America includes the sub-boreal Canadian forests from Alberta to the Maritime Provinces. In the United States, the bird breeds in New England, the Great Lakes region and along the upper elevations of the Appalachian ridge.

May is the prime time to see Canada warblers in the Chesapeake region. (Mike Burke)

Canada warblers are one of the last migrants heading north and one of the first to return south. Although they leave their winter territory in early April, it takes them until May to reach Maryland. They arrive on their breeding grounds in Canada in June and start heading south again in August.

Breeding territory is usually characterized by forested wetlands with dense, mossy understories.

Our spot along Indian Creek was typical of stopover landscapes: cool, damp woods hugging a stream.

Canada warblers use a variety of hunting techniques, from flycatching to hovering, from methodically gleaning low branches to searching leaf litter.

In the fall especially, Canada warblers may expand their diet to include fruits. They are very active feeders, often with tails cocked and wings flicking.

These warblers build nests on the ground, in low branches or even upturned tree roots. Females shape crude cup nests and line them with deer or rabbit fur. They lay one egg a day for five or six days in a row. After the last laid egg, mom settles in to incubate the clutch. Ten or 12 days later, the eggs hatch — more or less all at once.

Although they are born featherless and helpless, they develop rapidly. Chicks take just eight days before they leave the nest.

Banded birds have returned to the same nesting area for several years in a row. Some have even reused their old nest sites. It may be thousands of miles from the warbler's winter home, but nest site fidelity suggests that Canada warblers are as attached to their summer homes as they are to their winter ones. How they find that natal area is a wonder of avian memory and navigation.

Although the population of these warblers is rather large, there has been a precipitous drop in its abundance over the last several decades. Canada warbler numbers are down 60 percent since 1970, and the trend may be accelerating. This is primarily due to the loss of appropriate habitat. The massive die-off of insects throughout the Western Hemisphere and global climate change may also figure in the decline.

Within a day or so, the warbler we were watching would be gone. With luck, we would see one of his brethren during the fall migration in September.

It seems remarkable, but the long-distant migrant is merely following the best path for its reproductive success. That path might involve huge distances, but somewhere is the perfect combination of food supply, temperature, nesting material and protection from predators, as well as other ecological factors that are the ideal fit for the species. It has taken centuries to develop this formula, and it is both amazing and complex.

Spring is upon us. A universal biological clock ticks. We humans are pushed outdoors.

Millions of birds heed the call of the seasons in their own way. Miraculously, both warbler and birder find themselves inexorably drawn to the woods. When paths cross, it is a joy not to be missed.

Mike Burke, an amateur naturalist, lives in Mitchellville, MD.

Forests' hidden wetlands work for wildlife, water quality

By Kathy Reshetiloff

Diversity is the spice of life. Nowhere is this more apparent than where land and water meet. The blending of terrestrial and aquatic environments creates a wetland, an ecosystem that often supports more life than either the land or water alone.

When they hear the term "wetlands," many people in our region only envision the marshes found mainly along the shore of the Chesapeake Bay and tidal portions of rivers. They are aware that these areas are extremely valuable as spawning and nursery grounds for fish, blue crabs and other Bay aquatic life.

These marshes are also important to wintering waterfowl. Colonial waterbirds, shore birds and some waterfowl feed and nest in coastal marshes in the spring and summer.

The meandering flow of water provides opportunities for boating, fishing, crabbing and bird watching.

Low-lying marshes also store floodwater, minimizing erosion. This water is cleansed while it is slowly released: Some nutrients are processed by vegetation, and pollutants and sediments are intercepted and trapped.

The forested wetland, meanwhile, is just as valuable but often overlooked. Many forested wetlands have standing water on a seasonal or temporary basis. They provide the same benefits as marshes even if it is not as apparent.

As with all wetlands, the hydrology — or the movement of water — drives the forested wetland ecosystem. The hydrologic cycle has a wet and a dry phase that is affected by local weather, climate and human activities.

From early summer to late fall, precipitation in the Bay watershed becomes less frequent. Vegetation, particularly trees, uses large amounts of water to grow. As a result, the groundwater in forested wetlands may drop to a foot or more below the surface. This is the dry phase and a casual observer would scarcely recognize the habitat as a wetland.

The wet phase begins in late fall through spring. Nourished by thaws, spring rains and dormant vegetation, groundwater levels rise, often covering the surface of the wetland. The wetland habitat is strikingly apparent. This alternating dry/wet cycle influences the diversity of plant life which, in turn, influences the types of wildlife found here.

Many trees thrive in forested wetlands, including red maple, sweet gum, black gum, American holly, willow oak and loblolly pine. Highbush blueberry, spicebush and sweet pepperbush are some of the common shrubs. The forest floor explodes with a wide variety of flowering plants, ferns and vines.

This lush forested wetland in Virginia is home to many types of wildlife. Wetlands like this also improve water quality by storing excess rainwater and slowly releasing it over time. (U.S. Fish and Wildlife Service)

Spring moisture and warming temperatures promote a literal rebirth for some species. Small saturated areas and temporary pools are critical for amphibians that gather in them to mate and lay eggs. These pools are critical nurseries for species like green frogs, wood frogs, spring peepers, red-spotted newts and spotted salamanders to name just a few.

Bird watchers appreciate the importance of forested wetlands, which provide breeding and nesting habitat to both migratory and resident birds. Common yellow throat, black-and-white warbler, Kentucky warbler, oven birds, tufted titmouse and wood thrush are a few of the birds whose songs can be heard here.

Dead trees, known as snags, are prime sites for cavity-nesting birds like wood ducks, many species of woodpeckers and owls.

Although you may only spy their tracks, black bear, white-tailed deer, raccoon, beaver, opossum and river otter are just a few of the larger mammals who call these forested wetlands home.

Just like marshes, forested wetlands are great places to hunt, fish, watch wildlife and explore. Expansive floodplains temporarily store water from excessive rains, reducing the threat of flooding. And, as is the case in coastal marshes, floodwaters are slowly released, suspended sediments and pollutants are intercepted and trapped, which cleanses the water before it returns to local streams or the water table.

Forested wetlands literally breathe life into the Chesapeake Bay ecosystem, supporting a huge diversity of plants from tiny mosses to huge trees.

A multitude of animals use these areas for mating, spawning, nesting and rearing their young.

Forested wetlands not only help protect our property but also clean our waterways.

These often overlooked underappreciated swampy lands preserve the biodiversity and healthy functioning of our planet.

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Temporary, springtime pools in forests are critical breeding and nursery sites for a number of amphibians, including the spotted salamander. (Evan H. C. Grant)