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Nature has it all figured out. Wildflowers and foxes have a beautiful connection that not many folks know about.

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Cover: An Atlantic sturgeon breaches in the James River at Richmond, see page 6. @ Rob Sabatini Left: North Fork Holston River near Clinch Mountain Wildlife Management Area welcomes spring. In this river you can find little known catfish called madtoms, see page 30. @DCR-DNH, Gary P. Fleming Back Cover: Gobblers can be quiet but there are a few things you can try to outsmart them, see page 34. ©Tommy Kirkland



Executive Director

recently had a conversation with a longtime friend. Years ago, we had first been in contact over a common interest in hunting. As I learned more about this individual, however, it became clear to me that his interests extend much further than just that.

Not in name, but by example, I often point to him as a "complete conservationist"—one who is engaged in all aspects of the natural world around him, concerned with the conservation of all of our resources, and passionate about sharing his knowledge and enthusiasm with others. In so doing, he reaches people of all backgrounds and

gains extensive insight into how they experience and value the outdoors.

I thought about the broad spectrum of my friend's life in the outdoors when I read about how hunting, fishing, and other outdoor pursuits have helped Lock Dolinger, a young man whose life has taken him from an urban Chinese orphanage to the fields and woods of Virginia, build confidence and feel pride. (Read "Hunting Changed Lock Dolinger's Life" on pg. 15.)

Our relationships with wildlife and the outdoors help shape us in innumerable ways, whether we're sitting quietly at the edge of a field on a frosty morning waiting for a gobbler to appear, casting for a fish lurking just beneath the surface, searching the skies for a bird species to add to our list, or simply enjoying a walk in the woods. Equally, our actions while in the outdoors can affect the health and well-being of wildlife that inhabit it.

Wildlife conservation can take place anywhere, and be done by anyone. It's inspiring to read of how urban Virginians have used green space in their cities to create havens for wildlife in the article on page 20, "Nature Where You Least Expect It." We as an agency devote our work to conserving and protecting Virginia's wildlife, but every outdoor enthusiast can also play a part in conservation no matter what activity they enjoy in the fields and woods of the Commonwealth.

No matter your primary interests in enjoying our outdoors, I hope you will take the time to appreciate and forward the conservation of all of our resources and to encourage others to experience all that Virginia has to offer. Especially in current times, outdoor activities have benefits to our lives that extend far beyond the time spent in the field. It is each of our responsibility to promote these experiences for all, and to conserve the interrelated resources that provide so much opportunity to us.





MISSION STATEMENT

Conserve and manage wildlife populations and habitat for the benefit of present and future generations. Connect people to Virginia's outdoors through boating, education, fishing, hunting, trapping, wildlife viewing and other wildlife-related activities. Protect people and property by promoting safe outdoor experiences and managing human-wildlife conflicts.

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www.virginiawildlife.gov



From Our Readers

On Our Website...

Fishing Reports



Every month, DWR's Aquatic Education Coordinator Alex McCrickard discusses various water bodies, fishing tactics, species to target, and more in the Fishing Report videos. *virginiawildlife*. *gov/fishing/forecasts-and-reports*

Adding to the K9 Capabilities



Two of the DWR Conservation Police K9 Officers and their dogs are completing advanced training in human remains location, broadening the range of skills of the DWR K9 unit. *virginia* wildlife.gov/blog/adding-k9-capabilities

DWR's F1 Largemouth Bass Stocking Program FAQ

What are F1 largemouth bass? Why is DWR stocking them? Where are they being stocked? All the answers are here! virginiawildlife.gov/blog/dwrs-f1-largemouth-bass-stocking-program-faq

Something Squirrelly

Robert and Judy Adams live in rural Amherst County and have subscribed to *Virginia Wildlife* for 30 years. Robert, an avid outdoorsman, enjoys photographing the birds and squirrels in the family's large front yard. In the spring of 2020, he noticed baby squirrel triplets that he and Judy observed each day and photographed. The triplets always stayed together when eating and remained at the base of a large oak tree.

Robert and Judy's daughter, Robin, wrote to *Virginia Wildlife* in November 2020 asking if the squirrels' small size put them at a disadvantage going into the winter. Marc Puckett, a Virginia Department of Wildlife Resources wildlife biologist, replied that "They are small but seem to be healthy and well furred for winter. Squirrels are slow to develop and wean, and typically stay near their den tree until more grown. It looks like

these ones are fattening up on sunflower seeds!"

By January, Robin reported back to *Virginia Wildlife* that the triplets had grown and still maintained their feeding spot together at the base of the oak tree. Although they still fed at times when the adult squirrels are not as prevalent, they appeared to be thriving.



Baby squirrels enjoy sunflower seeds in the Adams' front yard in Amherst County.





Tyler Armel of Amissville sent in these two images taken in Bath County. The images reveal how a tree can eat a sign over the years. The image on the left was taken in 2002 and, 18 years later, the same tree and sign. Be careful where you post your signs because, obviously, trees will eat them! Thank you Tyler for sharing these photographs!

We want to hear from you! We welcome letters to the editor, questions for our staff, photos you capture of wildlife, and experiences you want to share. Please include your name and address when you send correspondence to editor@dwr.virginia.gov via email or by mail to Editor, Virginia Wildlife, P.O. Box 90778, Henrico, VA 23228-0778. Correspondence chosen for publication may be edited for clarity and/or length.

Connect with Us!













By John Page Williams

plash! CRASH!!

"That was a BIG fish! What happened?"

We'd just witnessed a five-foot male Atlantic sturgeon breaching clear of the James River in the channel at Jones Neck. We smiled as the ripples subsided. My daughter, Kelly, her daughter Mary Page, a fourth-grade classmate, and I were headed back from Henricus Historical Park to Deep Bottom one day in the fall of 2019 in my skiff. The girls were studying Virginia history and wanted to learn about Pocahontas, so we visited Henricus the same way the Powhatan princess did 406 years earlier—by river. Seeing the magnificent fish was a bonus, but since it was mid-September, not a surprise.

Nor would it have been for Pocahontas. In Tsenacomoco (her people's name for Virginia's coastal plain), the big fishes' meat had been a staple for centuries. Atlantic sturgeon spawn in freshwater over clean, hard bottom, live their first years in the estuaries, and migrate out at the age of 2-3 years, roaming the Atlantic's continental shelf.

Historians tell us the fall spawning -run sturgeon helped the Jamestown

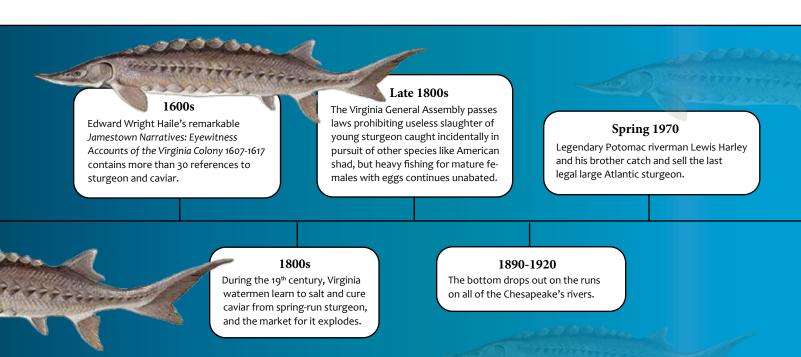


No one really knows why sturgeon breach, but they can be seen leaping in the James River from Hopewell to the city of Richmond during the September spawning run.

colonists survive that difficult first year of 1607 (after Native American fishermen taught them to trap the big fish for sustenance). Atlantic sturgeon remained valuable for people along Virginia's rivers for 300 more years, becoming common enough that markets labelled them "Charles City Bacon."

Caviar and Collapse

Atlantic sturgeon are anadromous fish—born in freshwater, then migrating to the sea and back again to freshwater to spawn. During the 19th century, Virginia watermen learned to salt and cure caviar from sturgeon during their spring spawning run up the rivers, and the market exploded. They had better equipment than their Native and colonial predecessors—gill nets, haul seines, and skiffs purpose-built for the



fishery—but they understood less about the sturgeons' life cycle than Pocahontas's people had.

Heavy fishing for mature females with eggs persisted. What no one understood is that Atlantic sturgeon, though long-lived (up to six decades), don't mature to reproduce until their teens (early for males, late for females), and the big females spawn only every two or three years. The caviar boom caused the watermen to harvest the spawning stock, with predictable results.

Meanwhile, land clearing without soil conservation, sewage from the Commonwealth's growing urban population, and pollution from the Industrial Revolution fouled the rivers. The combination ravaged the river bottoms where the sturgeon had for millennia vacuumed up worms, crustaceans, shellfish, and small finfish. The silt destroyed the eggs they deposited on rocky bottom.

It was no surprise, then, that the bottom dropped out between 1890 and 1920. In the 20th century, seeing a sturgeon anywhere—alive in a springtime gill net, on ice in a fish house, or floating dead from a ship strike in a narrow river channel—was a story for the newspapers. They were gone, ghosts from other centuries. The directed fishery ended by 1970.

Regulatory changes, including fishing bans in Virginia and Maryland, went into

effect to protect the sturgeon, while the Clean Water Act of 1972 and the first Chesapeake Bay Agreement in 1983, led to broad cleanup programs that are restoring health to Chesapeake rivers. Even so, biologists feared there was no more natural reproduction of sturgeon in Maryland or Virginia.



It turns out, though, that the ghosts had been hiding in plain sight. During multi-agency work on recovery of striped bass stocks in the late 1980s, Albert Spells of U.S. Fish and Wildlife Service (USFWS) suggested also



Sturgeon for sale on a Maryland dock in 1901. By 1920, there weren't enough sturgeon to support a fishery any longer.

studying sturgeon. Later, as project leader for the Virginia Fish and Wildlife Conservation Office of USFWS, he wondered if they weren't looking in the right places. Jim Owen, then-liaison with watermen for the Virginia Institute of Marine Science (VIMS) Sea Grant Marine Advisory Service, remarked, "You know, Albert, watermen are catching sturgeon, but they won't tell you till you put some money on the table."

CHARLES CITY BACON

So plentiful have sturgeons always been in this county that they are called "Charles City bacon"; of recent years the number has fallen off, owing to thousands of the young sturgeons or "hand malls" as they are called having been caught and destroyed in the nets at the mouth of the James river; but a recent enactment of the Legislature has provided against the wholesale slaughter of these most valuable fish and last year the upper waters of the river were once more full of them.

As noted in the February 1, 1903 Richmond Times Dispatch, sturgeon were in decline and folks wanted to save them.

1974

With strong support from Fisheries Professor Dr. Jack Musick of the Virginia Institute of Marine Science (VIMS), Virginia bans all fishing for sturgeon.

1996

Maryland follows with a moratorium on sturgeon fishing, though it was late to be closing the barn.

1998

ASMFC institutes a moratorium for the entire coast and its rivers, while setting a stock-rebuilding target of at least 20 protected year classes of females in each spawning river.

1990

The Atlantic States Marine Fisheries Commission (ASMFC) enacts a Fishery Management Plan for Atlantic sturgeon that called for rebuilding the coast-wide stock.

1997-1998

Albert Spells brings together a small fund from USFWS, the states of Virginia and Maryland, the Chesapeake Bay Foundation (CBF), and VIMS to offer bounties for watermen who catch and retain sturgeon alive for examination and tagging by his team.

At the time, other fishery scientists believed there were not enough mature Chesapeake Bay Atlantic sturgeon to maintain self-sustaining populations. Spells, however, did not agree, based on Owen's information and credible evidence of a juvenile sturgeon caught on hook and line from the York River in 1996.

In 1997, he assembled a small fund from USFWS, the Commonwealth of Virginia, the state of Maryland, the Chesapeake Bay Foundation (CBF), and VIMS to offer bounties for watermen who caught and retained sturgeon alive for examination, tissue sample collection for DNA analysis and aging, and tagging. Tissue samples for DNA analysis went to the U.S. Geological Service's Leetown Science Center (West Virginia). Suddenly, there were several hundred fish, many 2- and 3-year-olds, including both Atlantic and even one rarer shortnose sturgeon.

It soon became obvious that most sturgeon were coming from the James River in spring, possibly because watermen were most active there, setting nets for rockfish from the Hampton Roads Bridge-Tunnel upstream past Jamestown to the Chickahominy River's mouth. That fishery posed both problem and



Albert Spells, project leader for the Virginia Fish and Wildlife Conservation Office of the USFWS, wondered if sturgeon were still around and suggested studying them.

opportunity, because unintended sturgeon catches threatened both fish and nets, but the watermen were learning more about catching them. In the early 2000s, Chris Hager, a fisheries bycatch specialist with the Sea Grant Marine Advisory Program at VIMS, began working with watermen Kelly Place, George Trice, and Jimmy Moore on designs for nets that caught rockfish but avoided sturgeon.

Place also worked out funding from Sea Grant to tag Atlantic sturgeon with Trice and Moore, under a VIMS scientific collecting permit, in cooperation with Spells and USFWS. Concentrating on channels between Cobham Bay and Burwells Bay, they implanted external and acoustic tags in sub-adults (20"-40"), while

Early 2000s

Chris Hager, a fisheries bycatch specialist with the Virginia Sea Grant Marine Advisory Program at VIMS, begins working with watermen on designs for nets that caught rockfish but avoided sturgeon. Participating watermen begin tagging Atlantic sturgeon under a VIMS scientific collecting permit.

2008

Sturgeon researchers and fishermen begin seeing growing numbers of sub-adult and adult sturgeon in the James and the York rivers.

March 2004

A six-inch sturgeon is caught in the trawl net of *Baywatcher*, the CBF education/ workboat, in the mouth of Herring Creek on the James River.

2009

The Natural Resources Defense Council (NRDC) petitions NOAA's National Marine Fisheries Service (NMFS) to consider five Distinct Population Segments of Atlantic sturgeon for listing under the Endangered Species Act.





Sturgeon born in mid-September 2018 were discovered during an October 31, 2018 trawling survey by VCU Rice Rivers Center researchers, proof of natural reproduction.

collecting small clips of fin and tail for age and DNA analysis. Over time, recovery of tagged fish has shown that, as Spells says, "They wander more than we thought."

In March 2004, *Baywatcher*, the CBF education/workboat based at Jordan Point near Hopewell, caught a six-inch sturgeon in her trawl net in the mouth of Herring Creek with an 8th-grade class of Earth Science students aboard. It was the first evidence of natural reproduction in the James River in 50 years. Spells smiled when he heard the news, as did the students and the boat's educators.

The catch was accidental, but "The more data points, the more eyes and ears, the better," said Spells. He began offering public outreach programs, including sturgeon

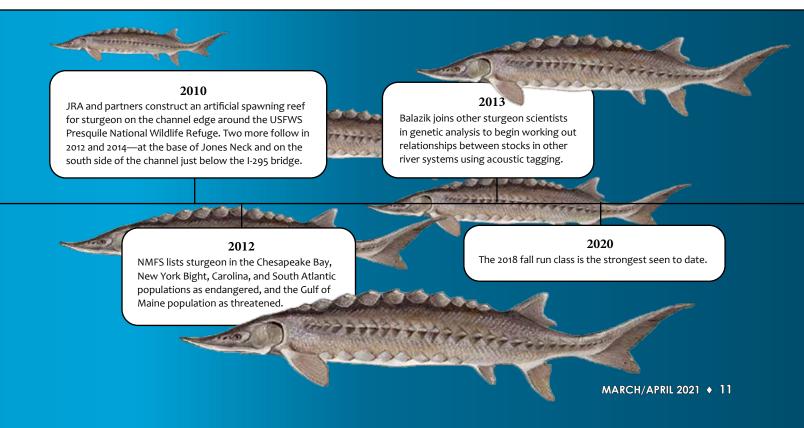
in tanks. "People started falling in love with them," he said, smiling. The James River Association (JRA) joined this effort with educational materials and field trips for schools and the public.

James River Rats

In the spring of '04, a pair of James River rats from different generations took professional interest in sturgeon. Chuck Fredericksen, recently retired from Fort Lee, became Lower Riverkeeper for JRA, putting him on the James every day aboard a patrol boat. He had fished the river all his life and participated in Hopewell's volunteer Sturgeon Resurgence Committee.

Meanwhile, Hopewell native Matt Balazik completed undergraduate studies at Virginia Commonwealth University (VCU) and began a Master's program in Fisheries under Dr. Greg Garman of VCU's Rice Rivers Center, near the USFWS Office at Harrison Lake. When Spells looked for help with the tagging project, Garman recommended Balazik.

Balazik had grown up on a riverside farm, fishing with his older brother Martin, but he never saw sturgeon in the 1980s and '90s, even during the fish kills that plagued the river then. He helped the watermen involved in the project



with gear, monitored their catch, and filled out reports. "I learned a lot from those professional fishermen," he said. "I visited and listened to a lot of people up and down the coast."

In the fall of 2007, the river people began seeing sturgeon breaches, along with, unfortunately, ship strikes. Balazik and Fredericksen began fishing for them, while Spells helped with gear. "No one knew how, beyond conventional drift-netting," said Balazik. "It took us several years to get okay and several more to become efficient," he said. They kept tanks in their skiffs to keep the fish healthy while measuring and tagging.

Balazik was convinced that the fish he was handling were spawning, based on their condition, the historical accounts from Jamestown, and the size of the juvenile caught by CBF. Spells argued against existence of the fall run until 2013, but evidence built. In 2018, JRA field educators and students aboard the association's *Spirit of the James* pontoon boat caught sturgeon larvae in a plankton net. Balazik confirmed the catch and found more.

"When JRA captured those larvae," Spells said with a chuckle, "that was the seal. So now, rather than arguing with Matt, I just bow to him."

Endangered Species Listing

In 2009, the Natural Resources Defense Council (NRDC) petitioned NOAA's National Marine Fisheries Service (NMFS) to consider five Distinct Population Segments of Atlantic sturgeon for listing under the Endangered Species Act. In response, NMFS in 2012 listed



Matt Balazik holds the first known female sturgeon to be caught during his research.

the Chesapeake Bay, New York-New Jersey Bight, Carolina, and South Atlantic segments Endangered, and the Gulf of Maine population Threatened. The listing opened research funding from NOAA and the U.S. Army Corps of Engineers Engineer Research and Development Center (ERDC).

Balazik was the right person at the right time for the sturgeons' Endangered Species listing. He finished his Ph.D. that spring, became a full-time VCU employee, and took a part-time position with the Corps' ERDC, working on relationships between endangered species and channel dredging. "I've spent time talking with dredgers, learning a lot from them and the Corps: how it can be done better, more efficiently, with minimal environmental effects," Balazik said.

As evidence of spawning increased, Fredericksen had an idea. Concerned about excessive sediment fouling eggs, he wondered if building a spawning reef was possible. In 2010, JRA collaborated with VCU and Luck Stone Corporation to construct a hard-bottom reef standing two feet above the bottom on a channel edge beside the USFWS Presquile National Wildlife Refuge. Two more followed in 2012 and 2014, one with Vulcan Materials on the south side of the channel just below the I-295 Bridge and the second with Luck Stone in the cut-off at the base of Jones Neck. Hopefully, these artificial spawning reefs will be used by female sturgeon.

Atlantic sturgeon (*Acipenser oxyrinchus*) belong to a family of fish that have swum the waters of Earth for at least 80 million years, back in the time when dinosaurs roamed the land. They possess powerful, asymmetrical tails and five rows of bony plates (scutes)—one down the back, one down each side, and one on each side of the belly. As a family, the fish are large, long-lived, and slow to reproduce, but beautifully developed to live their lives on the bottom of rivers, estuaries, and oceans, where they tap the huge resource of invertebrate foods—worms, crustaceans, mollusks, insect larvae, and small fish that live on and in the bottom sediments.

Atlantic sturgeon feed by rooting their elongated snouts in the bottom, tasting whatever is there with four chin barbels, and vacuuming it up with their toothless but muscular, extendable mouths, which are located on the bottom of their heads. These fish grow to a maximum length of 14' and 800 lbs. (the largest individual recorded), though today full-grown males in the Chesapeake stock are 4.5'-6' long and females 7'-9'. Their lifespan ranges from 25 to 30 years.



An adult Atlantic sturgeon receives one yellow T-tag for immediate identification.

One new research tool is a side-scan sonar developed by ERDC and several partners that records detailed images of sturgeon, allowing the VCU crew literally to count fish, including individuals around the reefs during the runs. "I really don't see the surface of the river so much now," Balazik said. "I can visualize the bottom so much better because of sonar, GPS, and electronic charting. It's important that we document their spawning areas and get good estimates of how many are in the river."

A Coast-wide Tracking System

In 2013, Balazik joined other sturgeon scientists in genetic analysis to work out relationships between stocks in other river systems. Coordinating research allows scientists to track movements of individual fish with acoustic tags during the long migrations in their life cycle. The project deploys and monitors receiver arrays for the acoustic tags throughout the entire Chesapeake Bay, in cooperation with other research institutions coast-wide under



To track the sturgeon's movements, acoustic tags are surgically implanted inside the fish's body. These tags follow the fish's movements throughout the migrations of their life cycle.



Side-scan sonar reveals sturgeon swimming in the James River making them countable for research.

the Atlantic Cooperative Telemetry Network. The standardized receivers detect tagged fish within a half-mile. Scientists monitor the receivers monthly, building information on sturgeon movements throughout the Chesapeake while supporting other research efforts along the Atlantic seaboard.

Atlantic sturgeon are anadromous—born in freshwater, migrating to the sea and back again to freshwater to spawn. They spawn in freshwater over clean, hard river bottoms, live their first years in the estuaries, and migrate out to the sea at the age of 2-3 years, roaming the Atlantic's continental shelf. Atlantic sturgeon have a tendency to "visit" river systems for reasons other than spawning. It is believed that the fish exhibit strong stream fidelity and return to spawn in the same rivers in which they were born.

CHECK OUT THIS FABULOUS FILM: James River Sturgeon, a short documentary following Matt Balazik, Ph.D, as he catches, researches, and tracks the Atlantic sturgeon. The film, created by Melissa Lesh, took first place at the 2014 inaugural RVA Environmental Film Festival Local Documentary Contest. It can be seen at: vimeo.com/81156656



Balazik continues to study the relationship between the fishes' age and growth, adding his own fieldwork on live and recovered dead fish to earlier data from Place and Spells, studying both the spring and fall seasons. "I'm concerned about the spring run, based on juvenile captures," Balazik said.

"In 2020, we had 55 spring recaptures versus 980 fall recaptures and 60 new fall fish. Most of the young-of-theyear fish are fall run. There's a good chance that spring net fishing for other species damaged those sturgeon runs years ago."

The Virginia Department of Wildlife Resources (DWR) worked closely with VCU's Rice Rivers Center in early field studies and data management. Once NMFS listed the fish as endangered, the agency maintained the receiver array, but Rice Rivers has taken over that task now. DWR remains a partner on the NOAA/USFWS permit to handle Atlantic sturgeon and looks actively for ways to contribute as program evolves.

JRA, for its part, continues to lead a broad partnership of government agencies, non-profit organizations, businesses, and citizen volunteers in improving water quality, restoring habitat, and educating the public. The great improvement in the river's health over the past 50 years has certainly played a key role in the sturgeons' rebound. The organization and its partners also address specific threats like entrainment, in which the cooling water intakes at the river's power stations suck in sturgeon larvae.

Thanks to the heavy rains throughout 2018, "all the stars aligned," Balazik

said. "The spawning habitat was available. The 2018 year class is the strongest we've seen to date. We're monitoring them right now. They are 55-65 cm fork-length (22"-26"). We're catching them from Dancing Point, at the mouth of the Chickahominy, to Skiffes Creek on the upriver side of Fort Eustis. There's lots of channel dredging in that part of the river, so we're watching the effects closely, looking to see where they go. I'm excited to follow these 2018 fish as they grow. That's my mission. I figure I'll retire after I catch the first mature, spawning females from this year class around the fall of 2035."



Hope for the Atlantic sturgeon.

Epilogue

While the James River has been action central for Virginia's Atlantic sturgeon, they are turning up in other Chesapeake rivers. Riverman Mike Harley continues to catch and release a few subadult sturgeon in the Potomac. On the Rappahannock, pound-netters Wayne Fisher and Albert Oliff release several sturgeon each year between Tappahannock and Port Royal. Balazik has caught and tagged a few Rappahannock sturgeon and plans more work there. A U.S.Navy-funded

research team working with the Pamunkey Tribe has caught and tagged apparently spawning sturgeon in the Pamunkey River and its sister, the Mattaponi.

In June 2019, Kevin Falvey, an angler on New York's Long Island South Shore, was drifting squid strips for flounder when a powerful fish struck. After a tough fight, he netted and released a 40-inch, sub-adult sturgeon. Smart money would say that fish had come from the Hudson, but the Pamunkey team last October caught a large tagged female full of eggs. According to the USFWS database, she had been caught in a research net and tagged off Long Island in 2006 as a sub-adult about the size of Falvey's fish. So, 12 years later, she had returned to her native river to spawn. Falvey's fish could belong to any of the Atlantic's Distinct Population Segments, including the Chesapeake. Since it carried no tag, though, its origin remains a mystery.

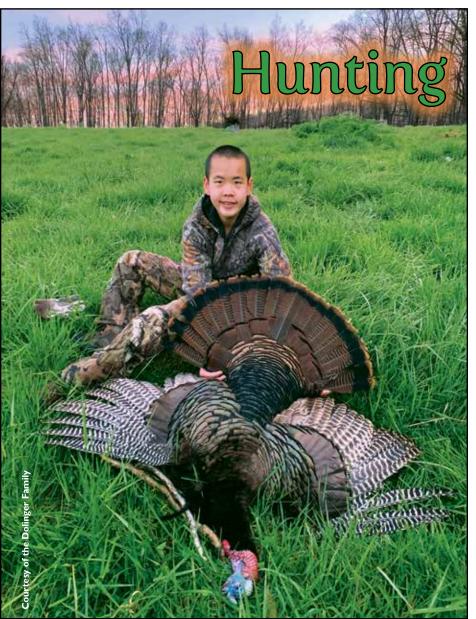
Atlantic sturgeon have been on Earth for tens of millions of years, and they might just survive even the worst damage we could do to them. Ghosts no more, theirs is a story of hope. We still have work to do—improving water quality, reducing soil erosion, learning to be smart about dredging, managing fisheries, and confronting climate change—but our sturgeon give us encouragement that we are headed in the right direction. We hope Pocahontas is looking down and smiling as these iconic fish rebound and we take better care of Tsenacomoco.

In more than 40 years at the Chesapeake Bay Foundation, Virginia native John Page Williams championed the Bay's causes and educated countless people about its history and biology.

PLEASE ALERT US!

If you notice a dead sturgeon on the river, please call VCU at 804-827-0236 or email Matt Balazik at balazikmt@vcu.edu





Changed Lock Dolinger's Life

Outdoor pursuits have helped this teenager adjust to rural Virginia life after adoption from China.

By Jonathan Bowman

or many people, one gobble at 5 a.m. is all it takes to start a lifelong obsession with turkey hunting. Lock Dolinger got hooked on the pursuit early, at age 10, after his first turkey hunt in Smyth County, Virginia. Like many new turkey hunters, he came home from that first hunt empty-handed. Turkey hunting is hard! The challenge of turkey hunting lies in outsmarting the eastern turkey's amazing instincts for self-preservation and their keen eyesight.

Despite his lack of success, Lock continued to hunt for the next four years in pursuit of harvesting a gobbler. As you will learn, Lock does not give up easily.

Lock, now 14, was born in China and lived in an orphanage for his first seven years. Not surprisingly, he had very little "outside time." In all actuality, Lock had never even experienced life outside of a city. Life changed drastically for him seven years ago when Rick and Becky Dolinger adopted him and

brought him to their Chilhowie, Virginia home, a short drive from Bristol.

When Lock came to Virginia, he was blown away by his new environment. He now had a green grassy yard, tall breezy woods, and wide-open crop fields. Talk about a change of pace! However, coming to the United States was not all excitement and relaxation. In fact, coming to the U.S. presented Lock with a whole new set of obstacles. First, he did not speak any English. "Lock learned to communicate in many ways,

Lock Dolinger waited four years to harvest his first gobbler, which he got during the 2020 Youth and Apprentice Spring Turkey Hunting Weekend.

not just speaking. He learned to draw things he wanted to let us know he needed," recalled Rick.

Second, he had no experience or knowledge of American culture. And third, he had no friends. As a result, Lock explained that he had almost zero confidence in himself. While things looked bleak, Lock did have two loving parents, a great backyard, and, as he unabashedly expressed to me, a new faith in God.

No Limits

One day, Rick, an avid outdoorsman, decided it was time to teach Lock to shoot a gun so that they could go hunting together. Lock was eager to learn, but he couldn't seem to get the hang of it. Noticing how challenging it was for Lock to shoot, Rick and Becky took their right-handed son to the doctor where they learned Lock was completely blind in his right eye. They already knew that Lock was deaf in his left ear. Should they even bother trying to teach their son to hunt? But Lock accepted the cards he was dealt, rose to the challenge, and learned to shoot left-handed while listening with his right ear.

"Lock is very determined to succeed at anything he attempts to do," Rick said of Lock. "He is not a person who gives up on goals he sets for himself. He does not let anything limit



Hunting has helped Lock Dolinger develop confidence, patience, and an appreciation of the outdoors.

his success. But at the same time, he is also very caring and wants to help anyone he comes in contact with."

After much practice and patience, from both Lock and Rick, Lock finally began to build consistency with his shot groupings. As his skills increased in hunting, other aspects of his life improved as well. "I had no confidence, and I was afraid of more failure and rejection," Lock said. "But I felt that if I could overcome this challenge of learning to shoot and hunt, I could overcome anything."

Rick noted that when Lock first started hunting, he struggled with the patience necessary for a day afield. "Hunting taught him that he had to be patient to wait on what he was hunting," Rick said.

Last year, Lock harvested a whitetail buck at 250 yards with a .243 Winchester. Rick and Becky say that this improvement in marksmanship is directly correlated with Lock's increase in self-confidence. As Lock started succeeding in hunting, he also started making new friends and doing well in school. Things were looking up. However, let's not forget, he still had yet to conquer the elusive eastern turkey.

Gobbler, Check

People also call turkeys "thunder chickens." This nickname is appropriately given due to the thunderous sound that reverberates through your bones if you happen to be close by when a turkey gobbles.

In April 2020, the Dolingers' friend, Tom Hampton, connected Rick and Lock with an opportunity. "Turkey hunting is a real challenge. I think that's what those of us who love it value about it—the uncertainty and the challenge," Hampton said. "I was aware of a property that had a lot of turkeys and where there were some blinds set up. Knowing Lock was so anxious to get a turkey, it was my pleasure to put those two things together."

Hoping for an encounter with a gobbler, Lock and Rick hunkered down in a ground blind. All it took was a few strokes on their slate call, and just like that Lock understood the true meaning of "thunder chicken" as the gobbles rang out. In a matter of minutes, a big ole' tom came in spitting and drumming. In fact, the gobbler got so close that he started fighting their decoy by pecking it—a spectacle Lock found rather amusing. Finally, the moment Lock had been waiting for had arrived. He steadied himself and prepared his shot.

In the brilliant moment that precedes a shot, hunters experience an astounding range of feelings. Apprehension, excitement, fear, and hope are just a few. Lock focused and carefully squeezed the trigger, just as his father had patiently taught him to do. The crack of his .22 magnum thundered through the woods resulting in a giant flop—the gobbler collapsed. Now with his first turkey on the ground, Lock reverently approached his magnificent bird. He had worked so hard for this moment. His sense of accomplishment was accompanied by a sincere and humble gratitude.

of the Dolinger Famil



Lock Dolinger also enjoys the Korean traditional martial art of taekwondo and has enjoyed success in the sport.

Lock had accomplished something many hunters with two good eyes and two good ears never experience. Like most things in Lock's life, successfully harvesting a turkey did not come easily. But, also like most things in life, the struggle seems to always make the success that much sweeter. Today, after many delicious meals, the memory of this hunt remains enshrined in Lock's room where he insisted the turkey fan and 10.5-inch beard be mounted. "It gives me happy memories every time I see that turkey," Lock said. "I had been waiting almost four years to get that gobbler, and I got him!"

Lock finished 2020 by harvesting an eight-point buck.

Patience and Persistence

Hunting changed Lock's life. And while many other factors were working behind the scenes of that change, something about the great outdoors and nature impacted him in profound and inspiring ways. Lock will do anything he can to get outside, and he mentioned that he also loves squirrel hunting and fishing for catfish. Lock loves to eat the wild game he harvests, although Becky noted wryly, "He's more into eating than cooking at this point."

"He's also learned the importance of hunting as part of conservation," said Rick. "The outdoors is very important to Lock as he spent the first seven years confined to an orphanage. He appreciates all aspects of the outdoors."

When Lock is not hunting or fishing, he tends to be swimming or practicing taekwondo. Lock has won two gold medals at Arnold Schwarzenegger's taekwondo tournament, and even has a photo with Schwarzenegger to prove it. Oh, and Lock usually gets straight As in school.

For Hampton and Lock's parents, seeing Lock thrive in the outdoors is rewarding. "The real benefit of outdoor recreation is that everybody can participate. You can find your own level of participation," said Hampton. "You can have success even if you have a language barrier and hearing and vision loss, like Lock had. He was determined and because he has a tremendous work ethic, he was able to achieve a good measure of success because of his consistent effort.

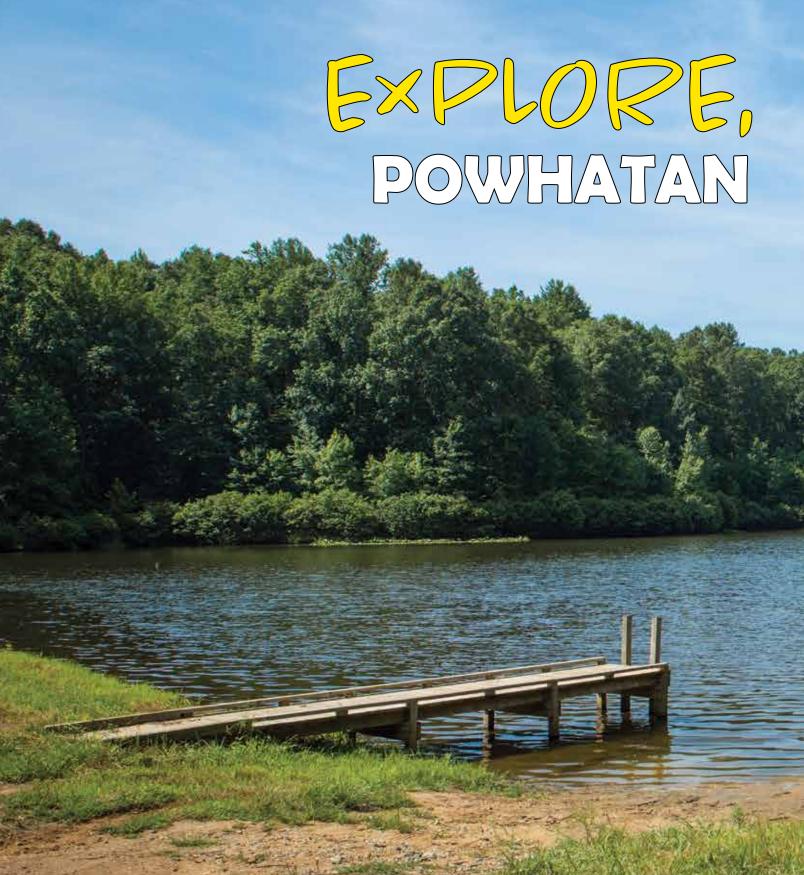
"I think that's true of all of us in outdoor pursuits," Hampton continued. "We may not be successful every day, but if we're patient and persistent, eventually success comes. I think that's a good life lesson."

Jonathan Bowman lives in Amelia County, Virginia where he spends as much time as possible hunting, fishing, and cooking. Jonathan loves sharing his passions with others, and is determined to one day convince his wife to join him on a turkey hunt.





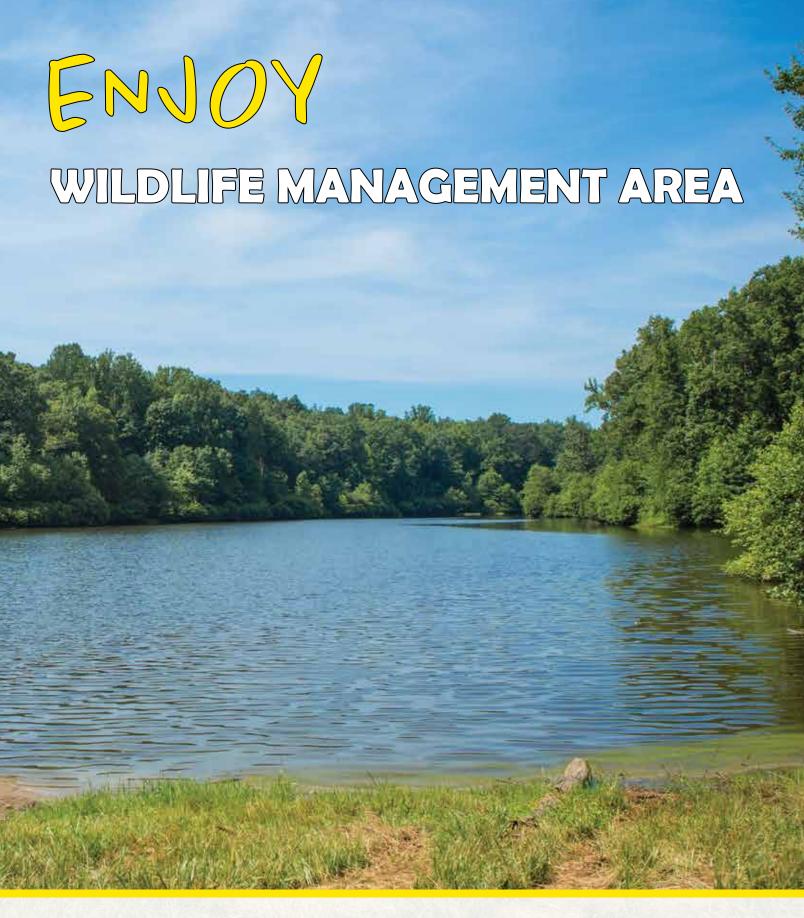
Becky, Lock, and Rick Dolinger enjoy sharing their outdoor life and the American tradition of hunting together.



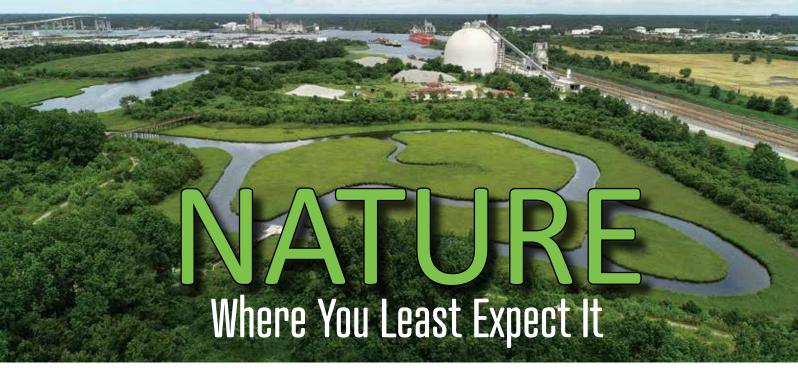


The Virginia Department of Wildlife Resources maintains 46 Wildlife Management Areas (WMA) totaling more than 225,000 acres for a variety of outdoor recreational opportunities. To access a WMA, you'll need a DWR Restore the Wild membership or a Virginia hunting license, freshwater fishing license, boat registration, or access permit. For more information on WMAs: www.virginiawildlife.gov/wma.

Photo by Meghan Marchetti / DWR



Just west of Richmond, the 4,462-acre Powhatan WMA's varied habitats support a diversity of game and non-game wildlife. Deer, turkeys, quail, rabbits, and squirrels abound, while beaver swamps attract woodcock, wood ducks, and other wetland species. Wildlife viewers can enjoy a plethora of songbirds and night-hunters like great horned, barred, screech, and northern saw-whet owls. Four ponds and two small lakes host largemouth bass, black crappies, bluegills, chain pickerel, channel catfish, and pumpkinseed and redear sunfish. There are small boat-launch facilities at both lakes and two of the ponds; gas-powered motors are prohibited.



In highly developed Hampton Roads, a trio of distinctive green spaces provide critical wildlife habitat, foster healthy communities, and spur neighborhood revitalization.

Story and photos by Beth Hester

irginia's Hampton Roads region is the eighth largest metro area in the southeastern United States and home to one of the busiest and fastest growing ports on the eastern seaboard. Much of the area's land is occupied by military and government installations and industrial, transportation, tech, university, and maritime concerns. Rural areas are becoming more densely populated, and once-pastoral byways are being overtaken by office parks, mini-malls, and apartment complexes that seem to pop up overnight.

Fortunately, Hampton Roads is also home to some of Mother Nature's most fierce advocates. Birders, outdoor educators, kayakers, gardeners, and green space supporters work with civic and environmental organizations to preserve and enhance existing urban parks and sanctuaries, and to acquire and conserve additional parcels of undeveloped land to support wildlife, build healthy communities, and create new opportunities for outdoor education for visitors.



Weyanoke Bird and Wildflower Sanctuary was created from unused railroad property.

Discover three of these diverse, urban green spaces thriving in unexpected places...

Weyanoke Bird and Wildflower Sanctuary

Location: Norfolk - 1501 Armistead Bridge Road Size: 8 acres

Stewardship Organization/s: The Cape Henry Audubon Society in cooperation with The Nature Conservancy, local Master Gardeners, and devoted community volunteers

Urban Context: Mixed use. Flanked by a relatively affluent, established neighborhood, and adjacent to the Lambert's Point/Norfolk Southern rail yard and coal terminal, busy Hampton Boulevard, and the Elizabeth River Trail.

Website: chasnorfolk.org/weyanokesanctuary.html

The story of Weyanoke began when Audubon Society members Joan and Wickham Taylor were shocked to find a purple gallinule feeding in the small

Top: Once a dump site, Paradise Creek Nature Park offers 40 acres of restored forest, wetlands, and plenty of wildlife. Courtesy of The Elizabeth River Project



Unlikely residents, purple gallinule were discovered using the neglected property.

creek between their property and an eight-acre section of undeveloped land then owned by the Norfolk and Western Railroad. Purple gallinules, startlingly colored tropical marsh birds, typically don't venture as far north as Virginia. The property was neglected, overgrown with invasive plants and vines. But it was also a cool patch of green in a highly developed, semi-industrial area.

Auspiciously, the Taylors knew the CEO of Norfolk and Western (now Norfolk Southern). According to legend, they rode their bicycles up to the railroad's office to propose the idea of conserving the acreage. With the support of other accidental activists, and with the help of The Nature Conservancy, in 1979 the railroad transferred the land to the Cape Henry Audubon Society, the organization primarily responsible for the sanctuary's transformation. With the help of Norfolk Master Gardeners and



Found in the sanctuary, native butterfly weed lures in a multitude of pollinators.

community volunteers, Weyanoke became a place where wildflowers, native plants, and wildlife could prosper, and where visitors could be nourished and renewed by the natural world.

Weyanoke hosts at least 36 different kinds of flora including yaupon holly, eastern hornbeam, sassafras, red mulberry, wild bleeding heart, mountain mint, and Virginia bluebells. Varieties of ferns and moss, shrubs and seedlings add texture to the understory and enrich the ecosystem. Insects click and hum throughout Weyanoke's meadow garden, skimming along the surface of the sanctuary's marshy areas and over the shady, vernal pools that filter out pollutants and serve as breeding and foraging habitat. Butterflies, bees, and other



Vernal pools filter out pollutants and offer breeding locations for amphibians.

pollinators do what they do best thanks to the special plantings in the meadow garden.

From aerial maps and photos, Weyanoke appears to be a humble little island of green. But when viewed from the inside, it seems worlds away from surrounding coal terminals, rail cars, and city traffic. It's natural and rustic, entirely supported by volunteers who keep invasive plants and vines at bay and renew the park with infusions of native plants. Weyanoke's tree stands reduce

environmental noise, and decrease urban heat island impacts.

Locals revere the sanctuary, but judicious scheduling of organized tours and birding days and limited hours of operation keep the foot traffic manageable. Mike Schoen, chairman of the Sanctuary Committee, has been volunteering at Weyanoke for 11 years. He said that Weyanoke has most recently become a refuge for people seeking physical and emotional relief from pandemic-related restrictions and difficulties. He also listed varieties of wildlife that visit as well: migratory birds, river otters, a fox with a den and four kits, turtles, non-poisonous snakes, skinks, and huge assortments of butterflies, bees, and spiders.

Tamara Haines, a volunteer for nine years, has spotted vultures, beetles, owls, and raptors. Her favorite sanctuary resident is an alligator snapping turtle, one of the largest and heaviest freshwater turtles in the United States. They can live 50 to 100 years. She described it as huge, loping around as if it owns the place. Haines also enjoys watching the butterflies in various stages of metamorphosis in the meadow garden.

"Though we're living in the middle of the city, we have this hidden oasis filled with native plants and wildlife," Haines explained. "It's a place where people can come for a bit of peace and quiet without having to drive far. It's easy for school groups to come for practical, hands-on learning, and scouting groups often select Weyanoke for special projects. I have heard from so many



Passion flower is another native resident of Weyanoke Bird and Wildflower Sanctuary.

people in the neighborhood who spent time here as children, and who now enjoy watching their own children running through the paths. Being able to share even a tiny bit of nature goes a long way."



Visitors enjoy viewing wildlife at Paradise Creek Nature Park.

Paradise Creek Nature Park

Location: Portsmouth – 1141 Victory Boulevard

Size: 40 acres

Managing Organization/s: Jointly operated by The Elizabeth River Project and the City of Portsmouth

Urban Context: Adjacent to a modest residential neighborhood, naval facilities, manufacturing concerns, and one of the busiest industrial harbors in the world.

Website: paradisecreek.elizabethriver.org

Paradise Creek is a small tributary to the southern branch of the Elizabeth River. The Elizabeth had been compromised by decades of environmental abuse but has experienced a long, steady process of renewal that is improving water quality, restoring wildlife habitat, and providing healthy outdoor experiences not only for nearby community residents, but for the entire area.

A manageable microcosm of the river itself, Paradise Creek was the perfect target for a multi-year, citizen-led environmental restoration mission initiated by the non-profit Elizabeth River Project (ERP), and made possible by multiple organizations, foundations,

and government entities. The Paradise Creek initiative became the blueprint for ERP's "one creek at a time" model for river renewal, and it has proven to be an effective approach due in no small part to its focus on enlisting diverse community stakeholders to help transform urban rivers and create living shorelines. Paradise Creek is a local park with a regional impact.

The Elizabeth River's restoration and the community partnerships forged in the process—spurred the idea for the 40-acre Paradise Creek Nature Park. Opened to the public in 2012, it's not just an urban park—it's a phenomenon. Once a dump site, it's now the third largest park in Portsmouth with 40 acres of restored forest and wetlands that include a marsh overlook bridge, public kayak launch, outdoor art installations, and a playground. Multiple gardens feature edible plants and herbs, and pollinator-friendly plantings, while a shade garden includes plants specifically chosen to enrich the biodiversity.

One of the most exciting residents of the park is a relatively rare, mature American elm that managed to dodge the devastating Dutch elm disease. Discovered by a volunteer work crew, it's estimated to be between 100 to 125 years old. Members of the Elizabeth River Garden Club and the Portsmouth Master Gardeners are working to create a special contemplative shade garden around the venerable tree.



Native New England asters are one of the many wildflowers growing in the park.



Public educational programs encourage the discovery and celebration of nature.

The park brings in public programs, forest schools, and field trip opportunities from numerous educational groups and neighboring communities. Adapting programs to conform to COVID-19 health and safety protocols has allowed groups to celebrate and explore nature. Equipped with binoculars, students enjoy watching birds, crabs, and minnows from the vantage point of a spacious wetlands foot bridge before moving on to other exploration stations where they can create eco-art, make seed balls, learn about forest trees, and discover pollinators in the wildflower gardens.

Paradise Creek Nature Park/ERP was also awarded a coveted 2019 Safe Routes to Parks Activating Communities grant, providing funding, technical assistance, and action plan development support for communities expressing a desire to improve safe and equitable access to local parks.

Paradise Creek, now a major stop along the Atlantic Flyway, is a favorite destination of nature photographers and birdwatchers. David Gibson, a birdwatcher and wildlife photographer, has been birding and leading field trips at Paradise Creek since 2012. He explained that 161 species of birds have been spotted in the park, and that at least one quarter of all birds that stop at Paradise Creek are neotropical migrants pausing during the migration to rest and refuel.

Gibson also loves observing the varieties of shorebirds and waterfowl

that enjoy Paradise Creek's restored and revitalized wetlands. He encourages nature lovers, photographers, trail walkers, and birdwatchers to put Paradise Creek Nature Park on their outdoor itineraries. Paradise Creek Nature Park has earned a spot in the Virginia Department of Wildlife Resources' Virginia Birding and Wildlife Trail listing, an honor of which the City of Portsmouth is particularly proud.



Great Bridge Battlefield and Waterways Historic Park offers an enjoyable hiking trail.

Great Bridge Battlefield and Waterways Historic Park

Location: Chesapeake – 1775 Historic Way

Size: 1.5-mile hiking loop
Managing Organization/s: Nature trails
operated by the City of Chesapeake
Parks and Recreation in coordination
with the Great Bridge Battlefield and
Waterways History Foundation
Urban Context: Adjacent to Battlefield
Boulevard, a Revolutionary War historical site, the Elizabeth River, and the
Intracoastal Waterway.
Website: gbbattlefield.org

Great Bridge Battlefield and Waterways Historic Park, the smallest of our featured parks, is located at the junction of the southern branch of the Elizabeth River and the Atlantic Intracoastal Waterway. The park is the newest addition to the constellation of parks and natural areas that surround this bustling section of the city. Though small in size, it's a triple threat: it's adjacent to the site of the first land battle of the American Revolution in Virginia in 1775, it boasts a 1.5-mile picturesque waterway trail loop with footbridge and marsh overlook, and an interpretive historic pathway features trees, shrubs, and plantings that are native to coastal Virginia.

The majority of the trail is level, accessible, and family-friendly. For those wanting a bit more of a challenge, a narrow berm trail is a fun alternate route leading to the marsh overlook where bald eagles, osprey, and kingfishers can be spotted. The configuration of the park makes it easy for people to practice social distancing, and visitors expressed gratitude that the park provided them with a convenient, safe, and scenic place to exercise, take in the fresh air, launch a kayak, or picnic with family. Visitors can also get an unusually close-up view of the Great Bridge twin-span bridge as it opens for the watercraft heading up and down the Intracoastal Waterway.



Southern magnolia, loblolly pine, and other native plants can be found in the park.



A waterway trail loop includes an interpretive historic pathway featuring native plantings.

Ed and Linda Bradley, two of the park's volunteer guides, took me on a tour of the loop trail and interpretive pathway. Once along the trail, it's hard to believe that you're just steps away from the heavily traveled and developed VA-168 corridor. We passed loblolly pine, red maple, willow oak, black gum, swamp bay, American holly, Atlantic white cedar, and southern magnolia. A variety of edible plants, including the hairy highbush blueberry, provide forage for whitetail deer and other woodland creatures. Woody grasses and shrubs add depth and biodiversity, and the tall pines give you the impression that you're entering a forest cathedral.

Along the interpretive historic pathway and living shoreline, plantings have been specifically chosen to honor the soldiers who fought in the Revolutionary War at the Battle of Great Bridge in 1775. A tree called the Kindred Spirit Oak, a hybrid tree created from oaks native to England and those native to the United States, stands as a moving tribute to the soldiers who fought and died on both sides of the conflict.

Beth Hester is a writer and freelance photographer from Portsmouth. Her passions include reading, shooting, kayaking, fishing, tying saltwater flies, and tending her herb garden.

Wildflowers and Foxes -A Unique Connection



Red fox kits play near their den site.

Photo Essay by Mike Roberts

or those fortunate individuals who have discovered the natural environment to be an essential element of daily life, wildflowers are a fundamental component. This kaleidoscope of richly pigmented blossoms painted across the fields and forests of our Commonwealth is a true harbinger of refreshing, seasonal change. And the weeks subsequent to the vernal equinox occasionally expose another colorful community of life—a den of playful, young red foxes.

For wildflowers, early spring is an endurance test; a fickle time significantly affected by winter's reluctance to release its raw grip. Altitude, too, affects the plant world's calendar of events. Even when the lower valleys are veiled in lush green leaves, the high mountain ridges remain jaded. Yet when nature's biological alarm clock finally heralds its belated, perennial proclamation, the mountains awaken to sprout a menagerie of awe-inspiring blush. And there is no better season of the year to be afield.



Bird's foot violet

Large-flowering trillium



Purple-flowering raspberry



Showy orchid







Eastern meadow vole

Ironically, there is a vital connection between wildflowers and foxes. In the food web, vascular plants are recognized as the producers of life—made possible by the sun's heat and energy. In turn, forbs and grasses are food sources for a host of herbivores, the primary consumers, such as rats, mice, voles, cottontails, and woodchucks. These small rodents are high on the menu of predatory red foxes that are categorized as secondary consumers. And while a vixen hunting to feed her litter of hungry kits might be considered a competitive menace to sportsmen who chase bunnies with beagles, farmers and orchard growers appreciate her assistance in controlling populations of small, furry creatures that destroy grain, relish the outer bark and roots of fruit trees, or dig holes in hayfields.



Flame azalea



Wild geranium



Red fox kit

Spring is an opportune time to develop a deeper respect for all of Virginia's natural resources. Absorbing the beauty results in appreciation—the prerequisite for developing personal stewardship responsibility. And that duty remains inherent to every person in our great state, throughout America, and on this planet. Happy Earth Day on April 22!

A lifelong naturalist and accomplished wildlife photographer, Mike Roberts enjoys sharing his knowledge and photographs with others. You can contact him at: return2nature@aol.com.

Working for Wildlife By Molly Kirk

The mission statement of the Department of Wildlife Resources (DWR) reads that we seek to conserve, connect, and protect: Conserve and manage wildlife populations and habitat for the benefit of present and future generations. Connect people to Virginia's outdoors through boating, education, fishing, hunting, trapping, wildlife viewing, and other wildlife-related activities. **Protect** people and property by promoting safe outdoor experiences and managing human-wildlife conflicts. Here are a few of the many accomplishments of DWR staff in working toward those goals...

Tracking Woodcock Migration



This will be the third year that DWR has been involved in an international collaborative, the Eastern Woodcock Migration Research Cooperative, seeking to better understand the migratory ecology of the American woodcock. Coordinated by the University of Maine, the project involves partners from throughout the United States and Canada.

In states and provinces in the U.S. and Canada, GPS transmitters are attached to captured woodcocks. The transmitter broadcasts the bird's location to a satellite every few days to track the woodcocks' movements between northern breeding areas and southern wintering grounds. "This study looks at the migration routes and timing, and what habitats they use when migrating," said Dr. Gary Costanzo, DWR migratory bird program coordinator. We're finding out some really interesting stuff. "We're getting habitat information, movement data, and timing of migration." In Virginia, woodcock inhabit three different locales—the mountains, the Piedmont, and the coastal plain. Costanzo noted that the location data shows that each population has its own migratory timing and route.

The study is revealing some interesting results, such as that Virginia's woodcocks can venture as far north as Quebec or Nova Scotia for nesting. Also, woodcock sometimes spend time along their migration route in urban locations, such as in a park in downtown Baltimore, Maryland, or on Staten Island, New York. "It's been amazing to see where they stop," Costanzo said.

You can find more information and maps of migration routes at woodcockmigration.org.

A Day in the Life of a DWR Bear Technician

Robert "Philip" Hanger, a bear technician in Region 4, assisted the Albemarle County Animal Control in dealing with a female bear wedged in between branches of a tree in a commercial district of Charlottesville. Hanger, with the help of the Animal Control officers and DWR's local district wildlife biologist, was able to climb the tree and immobilize and safely remove the bear from the tree. After she recovered from the effects of the immobilization drugs used during her extraction, she was transported out of town and released.



Recognition from the Governor's Office



DWR employees were recognized for their work with two Governor's Honor Awards in 2020—Statewide Project WILD Coordinator Suzie Gilley and the DWR team that worked to organize the Hampton Roads Bridge-Tunnel (HRBT) Seabird Nesting Colony Project.

The DWR/Virginia Department of Transportation team responsible for the HRBT Seabird Nesting Colony Project was presented with the Innovative Spirit award for demonstrating a spirit of innovation by creating something new, improving existing technology or process, or adapting a tried and true idea to a new context. DWR's efforts were led by Becky Gwynn, David Norris, Ruth Boettcher, and Steve Living (and with thanks to all who contributed to this monumental effort).

The achievements of the HRBT seabird nesting colony group in saving the migratory seabird colony at the Hampton Roads Bridge Tunnel truly corresponded perfectly with the Department of Wildlife Resources' transition to its new name, and carried out the result directed by the Governor. Relocating a colony of this size had never been attempted before, in such a short time span, and there were serious doubts it could be accomplished before the birds began returning in the spring. Yet, this group at Henrico headquarters, in partnership with the Virginia Department of Transportation, was able to complete the task on the timeframe initially established. The seabird colony was successfully relocated to Rip Raps Island and this critical nesting area was preserved.

Suzie Gilley, the Statewide Project WILD Coordinator, received the Public Service award recognizing a state employee who makes outstanding contributions by participating in or implementing community and public service projects that have made a beneficial and sustainable effect on the quality of community life for citizens in the Commonwealth.



Gilley, who retired from DWR in January 2021, served as the Statewide Project WILD Coordinator since 1982. In that role she assisted learners of all ages in developing awareness, knowledge and commitment resulting in responsible behavior, informed decisions, and constructive actions concerning wildlife and the environment. In addition, Virginia's Project WILD program provides educators with materials that supports Virginia's Standards of Learning. Each year, an average of 900 educators statewide attended one of the over 50 Project WILD teacher professional development trainings offered by Suzie or one of her 100 volunteer facilitators. These 900 teachers work with more than 27,000 students annually to meet the program's mission of providing wildlife-based conservation and environmental education that fosters responsible actions toward wildlife and related natural resources.

Besides her work with Project WILD, Suzie is a lifelong member and volunteer for the Girl Scouts Commonwealth Council, worked with the Virginia Naturally School Recognition Program, applying for schools across Virginia to be recognized for their stewardship and environmental efforts, and served on the Education Workgroup of the Chesapeake Bay Program.



They may not be flashy or massive, but madtoms are essential in Virginia's waters.

By Michael J. Pinder

oing almost unnoticed in Virginia's waters lives a little-known group of miniature catfishes known as madtoms. Because of their small size and reclusive nature, they do not have the prestige or popularity of their larger cousins—the flatheads, channels, and blues.

You will never hear someone brag about the madtom that they fought for over an hour that nearly took them and their fishing rod overboard, or about the diver who saw a monster five-foot madtom near a dam. Such notoriety will never come the madtom's way.

All members of North American catfishes belong to the family Ictaluridae

and are collectively called the bullhead catfishes. They are characterized by eight long barbels (i.e., whiskers), a wide head, smooth scaleless skin, rigid spines, and a small, fleshy lobe just above the tail known as the adipose fin.

Two basic features separate madtoms from the larger, showy members of their family. First, madtoms are little, with the smallest measuring less than two inches. The largest madtom in Virginia grows to eight inches; however, most are less than five inches even as adults. In fact, their small size has led many locals to give them the name of "catminnows." The second feature is that the adipose fin in madtoms is directly attached to the tail (caudal) fin.

A Reclusive Creature

What madtoms lack in stature, they make up in species numbers. Of the 46 North American catfishes, 27 are madtoms. Virginia has six species—the yellowfin, orangefin, margined, tadpole, mountain, and stonecat. Madtoms are present throughout the state except the Eastern Shore. The margined madtom has the widest distribution of all and occurs in most drainages. The yellowfin, stonecat, and mountain madtoms are found in the upper Tennessee River drainage. The stonecat is also known from the Big Sandy. The orangefin madtom is native to the upper Roanoke and Dan rivers and has one of the most restricted ranges of all madtom species.

Above: A juvenile yellowfin madtom discovered in the Clinch River and photographed during a darter survey. By Michael J. Pinder / DWR

The tadpole madtom ranges along the lower Piedmont and Coastal Plain regions.

Virginia's madtoms are known from small creeks to large rivers; few records are from lakes and reservoirs. Most species inhabit the faster-flowing sections of runs and riffles, although pools are also frequented. The tadpole madtom is the exception, preferring sluggish backwaters and pools. During the day, madtoms are found in areas that have an abundance of large, flat rocks and logs where they can shelter. If discovered in the open, they will quickly and erratically swim away or burrow into gravel and vegetation. Upon seeing this "angry" behavior, early ichthyologists came to call them, "Mad-Toms."

The lackluster appearance of most species well suits their reclusive nature. Madtoms typically have drab, earthy colors and patterns that blend into their environment. Although most in Virginia are primarily yellowish-brown in color, some species have distinctive characteristics that aid in their identification. For example, the orangefin madtom has a spot at the base of the top (dorsal) fin and a white-to-orange triangle on the upper edge of the caudal fin. Like its name implies, the margined madtom has dark edges on its fin

These small catfishes are active at night to avoid competing for food and to reduce the risk of being eaten by larger animals. Their primary prey is small aquatic insects and other invertebrates. Because their eyes are useless except on the brightest moonlit night, madtoms will actually smell out their prey. Robert Jenkins and Noel Burkhead, authors of Field Guide to Freshwater Fishes of Virginia, indicate that madtoms use sensory cells or "taste buds" located over their bodies and

margins. The short and stubby

tadpole madtom has an easily

recognizable dark stripe along

each side.

concentrated in barbels to find hidden prey.

Large fish, watersnakes, herons, and otters are just a few animals that like to put madtoms on their dinner menu. Once captured, the madtom still has a few strategies to keep it from being eaten. Just like their larger catfish cousins, madtoms can lock the position of sharp spines on its front (pectoral) and dorsal fins, making them bigger and more difficult to swallow. If this doesn't work, the spine is coated with a toxic membrane that is injected into the wound of the attacker. As anyone who has been stuck can testify, the injured area will burn and become red and swollen, similar to that of a bee sting. The sting from the tadpole madtom is considered the most painful.

The Lifecycle

Because of the madtom's secretive nature, little is known about their breeding and nesting habits. That which we do know is generalized for this description. Madtoms breed during spring and early summer when temperatures rise above 65°F. The male will excavate a nest under rocks, logs, or vegetation, or simply use pre-made structures such as soda cans,



A male yellowfin madtom guards a clutch of eggs. Pink dots near its dorsal fin reveal this is a previously tagged fish.

old tires, and empty mussel shells.

Anywhere between 30 and 300 yellowish-orange eggs are laid in grape-like clusters. The female departs soon after spawning, leaving the male to care for their offspring. In many species, the male will develop enlarged muscles on its head and back that are thought to help in excavating and defending the nest. The male does not eat during this time and will diligently fan and roll the eggs, keeping them well oxygenated and clean. Young hatch in six to 12 days.

Being less than one-quarter inch long with a large yolk sac, they have little resemblance to the adult. The adult male stays on guard for several days until the young can fend for themselves. In a matter of one to three years, depending on the species, the madtom will grow and repeat this critical portion of its life cycle. The life span ranges from two to nine years.

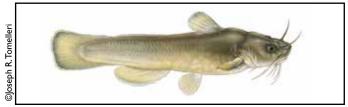
Anglers consider madtoms to be excellent bait for smallmouth bass. It is speculated that smallmouth bass are able to avoid the venomous spines by swallowing the madtom headfirst. Unfortunately, their popularity as bait may be the leading cause of the introduction of several species outside their native ranges.

The orangefin madtom is now established in several tributaries of the upper James River drainage, and margined madtoms are in the North Fork Holston River. Introduced madtoms, like other introduced species, have the possibility of competing with native animals and upsetting the natural ecology of those systems. Anglers can help prevent such problems by collecting non-listed madtoms only in the drainage they plan to fish.

Managing Madtoms

Compared to many fish groups, madtoms have a disproportionally large number of imperiled species. Nationally, 18 of the 27 madtom species have protected or special status. Among the

Virginia's Six Species of Madtoms



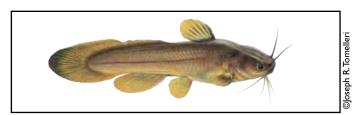
Margined madtom



Stonecat madtom



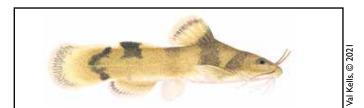
Mountain madtom



Tadpole madtom



Orangefin madtom



Yellowfin madtom

SPECIES	SIZE maximum	HABITAT	SPAWNING	DISTRIBUTION
<u>Margined</u>	7"	Cool to warm creeks to large rivers, riffles, and runs	May-June	All Atlantic Slope streams, New River, introduced to North Fork Holston
Mountain	3"	Medium streams to large rivers, riffles, and runs	June-July	Clinch, Powell, and North Fork Holston
<u>Orangefin</u>	4"	Cool to warm rivers, riffles, and runs	April-May	Roanoke and Dan rivers, introduced to Upper James
Stonecat	8"	Warm streams, riffles, and runs	June-August	Clinch, North Fork Holston, and Big Sandy
<u>Tadpole</u>	5"	Warm creeks and rivers, pools, and blackwaters	May-August	Atlantic Slope, Piedmont, and Coastal Plain
Yellowfin	4"	Medium streams to large rivers, riffles, pools, and runs	May-July	Clinch and Powell, re-introduced to North Fork Holston



Before: Degraded stream banks such as Asylum Creek in Staunton are serious threats to madtoms and other aquatic species.



After: After implementing erosion control and reseeding, Asylum Creek is much healthier thanks to DWR and its partners.

species in Virginia, the yellowfin and orangefin madtoms have protected status. Remarkably, the yellowfin madtom was thought extinct until it was rediscovered in 1969 in the Clinch River drainage.

The most significant threat to madtom populations is siltation of their aquatic habitat. Siltation is associated with degraded streambanks and run-off from disturbed areas including agricultural fields, residencies, and construction areas. Silt is a very fine substance that fills in the important spaces between gravel and pebbles on the stream bottom. It impacts madtoms by suffocating their eggs and killing their food source.

The good news is that in areas where siltation occurs, there is a cure.

Fencing cattle from streams, establishing a wooded buffer strip between fields and streams and rivers, quickly reseeding disturbed areas, and implementing erosion control structures in construction areas can significantly reduce siltation and improves water quality for the benefit of all, including us!

Virginia is actively working to manage madtom recovery. In 2016, the Virginia Department of Wildlife Resources and its partners began releasing yellowfin madtoms back into the North Fork Holston

River, where they had not been seen since 1888. Over the last several years,

more than 1,500 have been propagated and released by Conservation Fisheries Inc, a non-profit organization in Knoxville, Tennessee. To date, madtoms from each year class have been found, but it's even more encouraging that released madtoms have been observed nesting! Additional monitoring will hopefully start finding their offspring, which would be the first step toward establishing a self-sustaining population.

While we still need to know more about them, madtoms should not be underestimated in regards to their

importance. They can comprise
a significantly large portion of
the fish community where
good habitat and water
quality exists. Because they
feed on small animals and
are likewise fed upon by
larger creatures, madtoms
are critically important in
moving energy through the
ecosystem. They are undoubtedly an interesting and unique

aspect to our rich and diverse aquatic environment. So the next time you are near a river or stream, remember to stop and appreciate Virginia's little, unsung catfish.

Catilisii.

Mike Pinder is an aquatic biologist with the Virginia Department of Wildlife Resources.

You can watch a video of juvenile yellowfin madtoms being released into the North Fork Holston River here: bit.ly/2YENAm7



In 2016, the Virginia Department of Wildlife Resources and its partners released yellowfin madtoms into the North Fork Holston River where they had not been seen since 1888. Inset: One of the many yellowfin madtoms released on that day.

10 Tactics for Quiet Toms



It helps to have a variety of strategies to try when gobblers go silent.

By Gerald Almy

uiet toms represent a particularly frustrating challenge for spring turkey hunters. You know birds are there—you've seen their sign, spotted them at a distance, or perhaps heard them call feebly once, then grow silent. But the elation you felt on hear-

ing that first gobble disappears as the woods grow quiet,

replaced with an almost palpable silence.

Working vocal birds is the essence of spring turkey hunting at its finest. But sometimes gobblers just don't follow the script. Take heart! Such quiet toms can be fooled. Like many challenges in turkey hunting, though, there is rarely one easy, clear solution. Rather, it pays to keep a variety of tactics in your bag of tricks and try one or another depending on the conditions you face.

That's the approach
Matt Kline, avid turkey
hunter and supervisor of the
Big Woods Wildlife Management Area, uses. That flexibility
has allowed him to consistently
harvest birds when other hunters would
have left the woods downcast because toms
either weren't gobbling or sounded off once and then
grew quiet.

Before getting into strategy, though, let's take a quick look at five reasons why turkeys sometimes won't gobble. Kline has some insights on that as well, having hunted turkeys for nearly two decades.

"One factor may be bad weather," he said. If it's sleeting, snowing or raining hard, it's fairly obvious why toms aren't

talking. Bitter cold and extreme heat can also slow gobbling activity, as can a sudden drop in barometer.

Hens may be roosting nearby or hook up with toms right after fly-down. If the ladies are close by, a gobbler has little reason to sound off.

Heavy hunting pressure may have subdued a tom's urge to call as a survival move. Said Kline, "toms

certainly become 'tight-lipped' once pressure is added in heavily hunted areas. And the most vocal birds are often

harvested early in the season."

Some gobblers may be sub-

ordinate to 2-year-old birds and not want to challenge the boss.

the boss.

Finally, Kline says, the turkey's "personality" may be an issue. "Not all toms gobble a lot. Just like humans, some birds seem to talk more."

Here are 10 possible solutions to the quiet tom challenge.

Pattern the Birds

Hunt them much like you would a deer. This takes time and lots of listening, watching, and searching for sign to determine what routes a gobbler usually takes.

"If you know a bird is in the area, but he doesn't respond well to calls, your best bet might be to figure out his travel pattern and get between him and his hens and just let him walk to you," advised Kline.

Look for watering holes and feed areas such as grass pastures and clover or wheat fields. Search for tracks, leaves pulled back where birds have scratched for food, dusting areas, and strutting zones. These are often found at small openings

Left: Depending on their experiences, some toms choose to be silent. Above: Matt Kline lured in this quiet tom by using a few clever tactics.

in forests, field edges, logging roads, or benches and saddles in mountains.

The idea is to predict the turkey's movement patterns, then get on that route and wait. You can call lightly with soft clucks and just a couple of quiet yelps, or simply wait.

Don't expect to hear the gobbler sounding off as it marches in. We're talking "quiet toms" here. These birds will slip in like a wisp of fog. Be keenly alert. Watch intently, without moving. I waited patiently for two hours before a tom slinked in silently using this approach on a recent hunt in central Virginia.

Try Locator Calls

Some hunters hoot occasionally at dawn with an owl call, others never use them at all. But a variety of different locator calls can be valuable for "startling" or "shocking" a gobble out of quiet toms.

Once you know where the bird is, based on that one give-away gobble, then you can move in close and use your best calling efforts to lure him in. Alternately, you can judge by your knowledge of the terrain where the bird is likely to head, then move there and wait for him, suggested Kline.

Good locator calls include woodpecker, crow, hawk, predator, "shock," and coyote calls. Blow them loud and hard, especially from mid-morning on.

Try Cutting

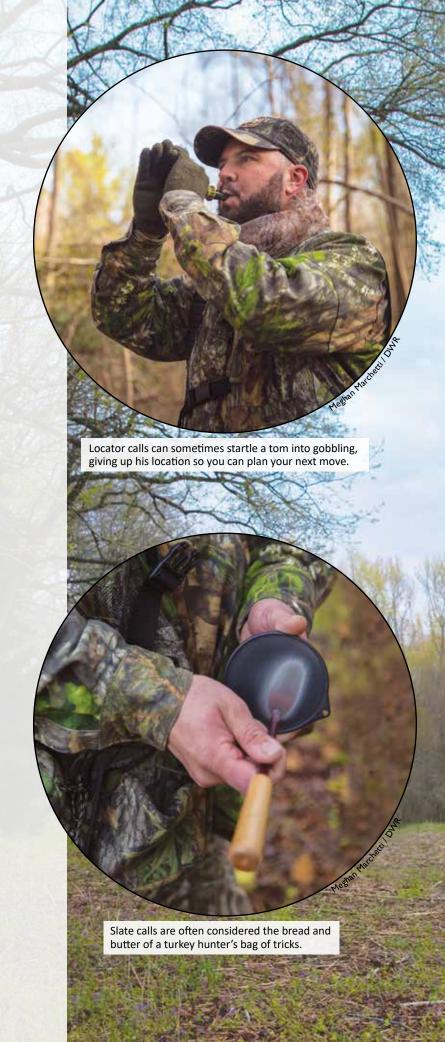
Most hunters yelp, cluck, and purr. But the best turkey hunters also use a fourth call quite often—the cutt. It's a series of sharp, loud, strident yelps in quick succession. A good mouth-caller can make excellent cutts on a diaphragm. Even a novice, with a bit of practice, can make great cutts on a box. Hammer the paddle against the box with sharp, short strokes in quick succession. Attack the call instead of stroking it softly.

The aim is to sound like an excited or scolding hen—loud and forceful. You may just elicit one faint gobble. Other times the bird will be so excited he'll come running. But the cutt should get him talking.

Try Different or Multiple Calls

Sometimes something different is all it takes to stir toms out of their silence. If you mainly use a mouth call, try a box, slate, or push-pin call.

Even more effective at times, use several calls at once. A tom might be willing to ignore one lone yelping bird. But if he hears what he thinks are two birds or a small flock of hens yelping, clucking and making a racket, it may prove more than he can resist.







He might sneak in silently to check out the commotion. Or he might just gobble back and at least give away his location. A long-beard did just that for Rob Keck, former Executive Director of the National Wild Turkey Federation, and me on a recent hunt.

Keck knew there were turkeys all around us from previous scouting. But none would sound off. Then he showed his world-champion calling skills by using three calls at once. We sat in that one position for an hour and right before we were ready to give up, a big tom walked down a logging trail toward us in clean shooting range. I won't admit what happened next, but at least his multiple call approach had worked to lure in a stubborn, non-talking tom. (Nobody shoots straight all the time!)

Go Soft and Quiet

The opposite approach can also be effective. Try low-volume, soft calling when toms won't talk.

Walk 50 or 75 yards, and then call quietly like birds might do if they were spooked from heavy hunting pressure. A shut-mouth tom might not gobble back at you, but simply give his presence away with a coarse yelp or just by clucking. Continue working him with soft calls and you can often lure in such birds with a scaled-back, low-key approach.

Mimic Other Turkey Sounds Besides Calls

If birds are quiet from hard hunting pressure, Kline likes to pull back or scratch leaves sharply to simulate a hen scratching for food. Also try flapping a turkey wing carried in your vest to imitate a hen stretching her wings. Be sure no other hunters are around when you employ these tricks. For extra safety place some blaze orange cloth near your set-up spot.

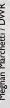
Try Kee-Kee Runs

Sometimes you can get non-talking gobblers to sound off with this call, normally used by lost young turkeys wanting to regain contact with their group. It's generally thought of as a fall call, but it will often draw answers from gobblers in spring, too.

Roost Him

If you can hear a tom's flapping wings as he flies up to roost or get him to gobble one last time with a hen or owl call, your chances for taking a quiet tom improve dramatically.

Get in tight to the bird on its roost the next morning well before first light, setting up 50-75 yards away. Give him just one or two clucks or maybe a few soft tree yelps. Then remain silent. Show him you're





Tackling a **Tight-Lipped Gobbler**

Last spring, Matt Kline was hunting with a friend on private property, easing along some hardwoods between a swamp and planted agricultural fields. They stopped about every 100 yards to make a series of calls, but never got a response.

Before turning back to the truck, Kline made one more call, and in the middle of the call a gobbler sounded off. Kline and his friend agreed on the direction, but since the tom gobbled mid-call, they couldn't decide just how far the bird was from their location.

They decided to sit tight in hopes he would gobble again. After a few soft calls and no response, the friend was getting antsy and wanted to go after the bird. Kline remembered telling him, "Let's wait a little longer. He may be coming this way."

Sure enough, a few minutes later Kline saw the tom easing their way, going in and out of strut. The tom got in behind some thick stuff and moved five yards in a period of 30 minutes.

He gobbled one time at a passing woodpecker. As he began to walk off, Kline made one soft purr and scratched in the leaves. The tom's head immediately colored back up, and he went into strut. He circled them at about 35 yards and presented a shot opportunity.

Kline emphasized that having patience was the only reason he was able to harvest that tightlipped gobbler.

A hunter patiently waits for his quiet quarry. Putting in extra time and effort in your hunt can reward you with a gobbler.

the same type of non-talkative bird he is. Often the tom won't utter a sound but will fly down and land in shotgun range or make a few steps your way after he leaves the roost. That's all it takes. This worked for me recently on a 20-pound shutmouthed gobbler in Shenandoah County.

Approach From a Different Direction

All too often toms are quiet because they somehow sense that a hunter has moved into the area. They may not spook and fly off, but they'll remain silent. Try taking a longer, more circuitous route than most hunters do, or you normally would, so you come in from a new direction.

"Patience, Patience, Patience"

This is Kline's most important final advice for harvesting toms that aren't talking. "Turkey hunting in general requires a fair amount of patience," he said. "But when dealing with a shutmouth tom, patience is the key. Patience has harvested more turkeys than any high-dollar call."

Gerald Almy lives in the Shenandoah Valley but travels widely for his work as a full-time outdoor writer. Among his many accomplishments, he is currently a columnist for Sports Afield and a contributing editor for Field & Stream.

A Walk in the Woods Column and photo

Toads Sing in the Spring

mere mention of the word "toad" immediately conjures up thoughts of witches' brew, warts, and children's books like The Wind in the Willows. Most gardeners consider toads a natural means of controlling harmful insects, whereas some mothers see the homely amphibians as unwelcome pets brought home by their mischievous little boys. To me, hearing the resonating calls of toads singing from the grassy shallows of our farm pond is a sign that spring is right around the corner. Regardless of whatever perspective one might have of toads, they are designed by nature to fulfill the role of secondary consumer, which makes them a valued piece of our environment's puzzle.

Of the four species of "true" toads inhabiting Virginia, the Eastern American toad (*Anaxyrus americanus americanus*) and Fowler's toad (*A. fowleri*) are, geographically, the most widespread. And while the American toad is sometimes confused with its somewhat smaller relative the Fowler's toad there are several key markings that help with identification.

First, the dark blotches on the American toad's back contain one or two warts; those of the Fowler's have three or more. The parotid glands (an enlarged gland located directly behind each eye) are another distinguishing factor; the American's is separated from the postorbital ridge while the Fowler's make contact. In addition, the Fowler's toad lacks the large, warty protuberances found on the American toad's lower leg.

Mythbuster:

Contrary to the old wives' tale, you cannot contract warts from a toad.

Regarding biological nomenclature, all toads are technically frogs and belong to the order —Anura. Yet, to differentiate frogs from toads, they are separated scientifically by family distinctions.

Outside of the breeding period, adult toads are primarily terrestrial creatures; most species of "true" frogs (i.e. bullfrogs, leopard frogs, etc.) inhabit aquatic environments. Another major difference is that toads have rough, dry skin; frogs have a smooth, moist skin.



A male American toad sings his presence to attract a mate.

In Virginia, toads begin breeding during late March, immediately upon departing their hibernation burrows. Males are first to arrive at wetlands, swamps, ephemeral pools, ponds, and puddles where they extend their choral invitations. Females respond to the calls within a few days. Having a relatively small geographical home range, toads exhibit a high degree of fidelity to the water sources from which they hatched.

Vocally, the breeding calls of the American toad are starkly different from those of the Fowler's toad. The American's mating solicitations are best described as a pleasant, vibrating trill, while the Fowler's is a nasal-like bleat that can be compared, with a bit of imagination, to a crying baby.

"Hop toads" lack the jumping prowess of frogs, but they have several remarkable physiological features. The tongue, which is attached to the front of the mouth and nearly one-third as long as the animal's total body length, is extremely soft and made up of two specialized muscle groups—extenders and retractors. When a toad is within range of its prey (arthropods, slugs, earthworms, and such), the tongue flicks out in less than a tenth of a second. Blink and you'll miss it! If the toad's aim is true, the long, sticky lingua wraps around the hapless bug and is instantly draws it back into the mouth. American toads can consume 1,000 insects a day; ants perhaps, but 1,000 grasshoppers seems doubtful!

by Mike Roberts

When attacked, toads can secrete a distasteful, milky-looking bufotoxin from their parotid glands and skin. It's what causes dogs and cats to foam at the mouth after catching them. If this chemical defense fails, the toad then inflates its lungs to full capacity, which makes it more difficult for the predator to swallow. Problem being, some mammalian predators have learned to flip toads onto their backs and go for the belly. Also, the bufotoxins have little or no effect on garter snakes and Eastern hog-nosed snakes, which are predators of toads.

To attract these beneficial, camouflaged creatures to your gardens and flowerbeds, partially bury cracked or discarded flower pots on their sides in shady margins. Add some leaf litter and keep the containers damp during summer. The toads will adopt your offerings!

A lifelong naturalist and accomplished wildlife photographer, Mike Roberts enjoys sharing his knowledge and photographs with others. You can contact him at: return2nature@aol.com.



By John Page Williams



For 20 years, John Page Williams' 17-foot, 1993 Boston Whaler Montauk, First Light, has successfully traveled all over the Chespeake Bay.

lways choose the maximum power for a new boat or a re-power." That's what a lot of boaters (and some dealers) say. Here are their arguments:

- The largest engine(s) will let the hull perform up to its potential.
- It's important to have enough power to accelerate quickly onto plane with the maximum number of passengers aboard, especially if the boat is pulling skis, wakeboards, or tow toys.
- The engine(s) won't have to work as hard as a smaller one, saving fuel and reducing internal wear.
- When you trade in the boat, it won't be worth as much or sell as quickly if the engine is smaller than the maximum.

Sound convincing? Sure. It's not smart to under-power your boat. But is there a range of horsepower—from minimum to maximum—that fits the specific ways that you will use your boat? Also, where will you run your boat? Now, the answer is not so simple. Consider:

• What does "performing up to its full potential" really mean, especially on the Chesapeake's open waters or

Virginia's big rivers and large lakes? The realistic answer on them is not the highest possible top speed. The Bay's often windy, shallow waters throw up steep, choppy waves that can turn almost any hull into a lurching, scary buckboard if the skipper runs it too fast for the conditions. On many days, top speed becomes irrelevant if skipper and passengers want to stay safe and comfortable. What counts in the real world is the boat's range of efficient cruising speeds.

- That range depends on not only hull form and power but also how well the boat balances fore-and-aft and side-to-side. The trick is to be able to slow down until the boat rides smoothly over the seas, without wallowing down in them. The largest possible engine may actually destroy that balance, making the boat ride stern-heavy, so you have to run faster than is safe or comfortable in order to get up onto plane on a windy, choppy day.
- To get the most from your rig, develop a feel for how it behaves best in different conditions; learn how to "dial her in." Take a sea trial, preferably on a windy day. As the boat accelerates, watch at what speed it rises onto plane

and the wake begins to flatten out astern. Note the engine rpm and the speed. By all means, throttle up to wide-open if conditions permit and note both rpm and speed. Then throttle back and watch how the boat behaves.

The ideal performance profile is easy cruise at 60-80 percent of full throttle rpms with the most common load of people and gear you expect to be aboard, at which point the engine is running easily. If you study the rpm/speed/fuel flow profiles in magazine sea trials and on manufacturers' web sites, you'll note that nearly all boats of 17' or more with engines from 50 horsepower on up reach peak efficiency at speeds of 17-26 knots (20-30 mph) in that 60-80 percent rpm range. For smaller skiffs, aluminum V-hulls, and johnboats with 9.9-40 horsepower, that peak efficiency range will be more like 12-20 knots (14-24 mph). Those speeds will let you cover plenty of water in a day, especially if you choose the launch location and itinerary carefully.

- Here's a purely subjective rule of thumb for minimum planing speed, though it's based on a lot of time on the water: if the boat is 20' or less, look for a minimum of no more than 13 knots. For a 17-18' boat, 10-11 knots is even better, and 9-10 for a small boat.
- Getting reasonable acceleration (also known as hole shot) is dependent not only on choosing enough power but also mounting the best propeller for the ways you plan to use your boat. As a basic rule, make sure that engine(s) can turn to the top end of the manufacturer's specified operating range (generally 6,000-6,300 rpm on most modern four-strokes, 5,500-5,800 on direct-injection two-strokes). Your dealer or service technician should be able to help you make a good propeller choice for your uses. It may be useful to go to a four-blade propeller instead of three and install trim tabs for extra lift and trim control that give you more tools for dialing in, especially in rough waters. Incidentally, it is also possible for max-rated horsepower to supply too much acceleration. Some standard twinengine combinations can actually cause passengers to lose their grips on grab handles and T-top rails.
- If your boat/engine combination passes these tests, your engine is going to be happy, especially if you use the manufacturer's oil in its crankcase or fuel. That oil can be more expensive, but it's a tiny element in a boat's budget, and a cheap investment in its longevity. (Be sure also to feed the engine a stabilizer to counter the effects of ethanol if you fuel up at on-land gas stations, along with an additive to clean carburetor jets or fuel injectors and prevent carbon build-up.)

• If the boat performs well, the trade-in question becomes irrelevant. If it satisfies your needs, why worry about selling it now? And if it does its job well, that performance should be its strongest selling point, no matter the size of the engine.

In the end, choosing power carefully can save serious cost—in the initial purchase, fuel efficiency, and even maintenance.

Full disclosure: *First Light*, the author's 17', 1993 Boston Whaler Montauk, is rated for 100 hp, but she has never had more than 90 on her transom. For the past 20 years, she has worked successfully all over the Chesapeake and its rivers with a wide range of jobs and loads, pushed by 60-hp four-stroke outboards with oversized gearcases and four-blade propellers. Top speed is 27 kt. /31 mph, with a minimum planing speed of 10 kt. /11.5 mph. Fuel burn averages less than 1 gal. /hr. What's not to like?

In more than 40 years at the Chesapeake Bay Foundation, Virginia native John Page Williams championed the Bay's causes and educated countless people about its history and biology.

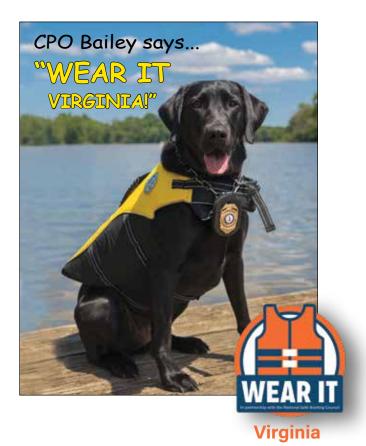


PHOTO TIPS

Column and photo by Todd Pusser



A Moth by Street Light



A luna moth proves the perfect subject for a nighttime, urban wildlife portrait.

ver the years, luna moths have revealed their presence from time to time in our urban neighborhood in Virginia Beach. The first one I observed was fluttering beneath the florescent lights of a nearby gas station on a humid, summer night. While walking our dogs through the neighborhood, we found the remains of another—a pair of tattered, lime-green wings lying in the middle of the street beneath a towering sweet gum, a favorite food tree for caterpillars of this species.

So I was not entirely surprised to find this beautiful adult on the trunk of a front yard tree, freshly emerged from its cocoon, early one evening last spring. Pumping fluid from its abdomen through the veins of its wings, the insect had climbed the first vertical object it encountered. The moth remained motionless as it completed the process of fully expanding its beautiful wings.

Unsure of how far along the moth was in this life process, I ran inside to

grab my camera, all the while trying to figure out a way to capture a unique image of this extraordinary creature. I had photographed lunas many times over the years, both as caterpillars and adults, and immediately knew I wanted to capture something other than a standard portrait or a "field guide" image of this magnificent insect.

I decided to try and capture a photograph that highlighted not just the moth, but also the urban environment that it chose to call home. I grabbed a camera that handled low-light scenes well, in this case a full-frame Canon 5D III, and coupled it with a wide-angle 16-35 mm lens.

Mounting the camera on a tripod, I composed and metered my image. In Aperture Priority Mode, I set my camera's ISO at 800, which rendered a relatively noise-free image on the full-frame camera. I then locked up my camera's mirror to ensure a sharp image from the 20-second exposure that Aperture

Priority gave me for a proper exposure.

Finally, I added a small bit of light, from an off-camera flash held slightly off to the left and above the moth. To soften the light, I enclosed the flash in a small softbox and powered it down to a low setting. Finally, I added a warming gel to the front of the flash head so the color of the flash would more closely match the light emanating from the streetlight. I took a series of images, slightly varying my aperture, exposure time, and flash output. The specs on my favorite image of the night ended up being a 20-second exposure at an aperture of f16 and ISO 800.

I checked the next morning and the moth was gone. With an adult lifespan of just one week, hopefully this individual lived long enough to ensure a new generation of these spectacular insects.

Todd Pusser's photography focuses on natural history both near and far. To see more of his work, visit www.ToddPusser.com



Smoked turkey served atop cleaver pasta with garlic mustard pesto.

love smoked turkey. Smoking is just a great way to prepare such lean, mild meat. It's easy to like and is extremely versatile in meal planning—make some sandwiches, serve with gravy, use in salads, wraps, pot pies, anything really.

This method adds a step of using a sous vide device to the smoking of the turkey in order to get the perfect texture and doneness. The issue with cooking a whole turkey breast with traditional heat application in a smoker is due to the breast's shape. Because the breast is tapered, one end is much thicker than the other. With traditional methods, the thin side will be overcooked by the time the thicker part is done. Sous vide solves this issue by only applying the target temperature of heat to the meat. This means the meat never goes over 147°F while in the sous vide.

The target temperature, 147°F, is preference, but in my opinion it's the ideal temperature for turkey breast. Yes, it is under the recommended temperature of 165°F for poultry, and no, you won't get sick. By cooking for a longer time at a lower temperature, you achieve the same level of food safety as if you had brought the meat all the way up to 165°F for 15 seconds. At this temperature, the meat is tender, but lacks the appearance of being undercooked, and doesn't have that rubbery bounce of overcooked turkey.

The turkey in the above photo is served over cleaver pasta with some garlic mustard pesto, both greens that were foraged while out scouting for birds.

Perfect Smoked Turkey

Basic Brine:

4 cups water

1/4 cup salt

1/8 cup sugar

1 tsp instacure #1

1 tbsp black peppercorns, whole

1 bay leaf

1 tsp red pepper flakes

1 tsp juniper, whole

Method:

Combine all ingredients and bring to a simmer to dissolve salt and sugar. Allow to cool completely before use.

Submerge breast in brine and refrigerate for 48 hours. Preheat cold smoker, smoke breast for two to four hours. Place breast in vacuum bag, add 1 tbsp neutral oil and seal. Cook in sous vide set at 147°F for 90-120 minutes. (~60 minutes per inch of thickness).

Remove from the bag and broil with the skin side up for two to three minutes to crisp up.

What is Sous Vide?

"Sous vide" translates to "under vacuum" from the French, and refers to a cooking method involving vacuum sealing the food to be cooked in a bag, then cooking it in a water bath at a very precise temperature. This results in consistent cooking of the food regardless of variations of thickness and keeps the food moist.

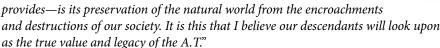
As sous vide has become a more popular method in the average cook's kitchen, user-friendly and affordable sous vide immersion circulators that clip to the side of a pot of water are readily available for purchase.



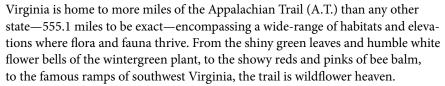
Wildflowers of the Appalachian Trail

3rd edition – By Leonard M. Adkins, Joe Cook, Monica Sheppard 2017 Menasha Ridge Press, an AdventureKEEN imprint Color photos www.menasharidge.com

"The longer I study the environment of the Appalachian Trail, the more convinced I become that the greatest importance—much more than the recreational opportunities it



-Leonard M. Adkins



This reference guide contains more than 100 full-color photographs, and detailed descriptions and background information on 99 species. Packed with interesting sidebar discussions concerning each plant's habitat, history, and lore, the volume is still small enough to carry conveniently in a backpack when walking the trail, or when exploring other parks and trails where varieties of wildflowers are generally encountered.

Organized around color groups, within each group the plants are presented in the order in which they flower. Each wildflower depiction includes:

- A short physical description of the plant's blossom and key characteristics
- The overall maximum flowering time limits for each plant
- A description of the plant's leaves and stem
- A broad overview of the range where each wildflower can be found.

The photographs are large and full of detail, which makes for a more accurate and satisfying plant identification experience. Additionally, the guide provides photos of related or similar species, a glossary of plant components, a helpful bibliography, and a state-by-state guide to native plant societies. Enjoy!

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2020/2021 Excellence-in-Craft, High School & Collegiate Writing Contests

The Virginia Outdoor Writers
Association annually sponsors three
writing competitions for Virginia
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students (grades 9-12), and undergraduate students attending a Virginia
college or university. Cash awards are
offered for winning entries. For more
info: https://www.vowa.org

VOWA Contest Announcement: Due to the ongoing COVID-19 issues, our contest deadline has been extended for all of the categories to June 1, 2021.

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www.dwr.virginia.gov/fishing/trout/trout-heritage-day www.gravesmountain.com/events-calendar/heritage-day





Please consider supporting essential research and management of Virginia's native birds, fishes and nongame animals.

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Dominion Energy Adds Pollinators to

Project Plant It!

To celebrate the 15th annual observance of Project Plant It! in spring 2021, Dominion Energy will give all Project Plant It! participants a free packet of wildflower seeds that attract bees and other pollinators, in addition to free redbud tree seedlings. Project Plant It! includes new lesson plans and educational resources to help students learn about the important role of pollinators in environmental sustainability, including instructional materials, games, and lesson plans about the benefits of trees. Happy planting for Arbor Day on April 30 and National Wildflower Week in May 3-9!

For more info: projectplantit.com



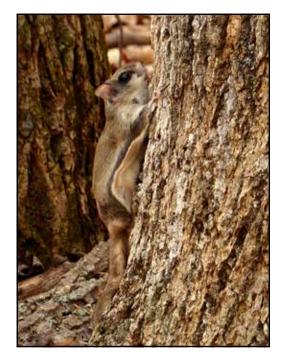
JUST HOPPED OFF THE PRESS!

Don't miss the second edition of the popular "A Guide to the Frogs and Toads of Virginia,"

available in early April! The second edition will feature expanded species information and more photos. This guide helps you identify Virginia's frogs and toads, provides insights into their ecology, distribution, and behavior, provides answers to frequently asked questions, and suggests what you can do to assist with the conservation of these fascinating animals. Get the second edition of the guide at shopdwr.com in April.

All proceeds go to the Virginia Wildlife Grant Program.





PICS FROM THE FIELD

Congratulations to **Patti Black** of Goode for her amazing photograph of a Southern flying squirrel spotted while hiking in the woods near her home. She spotted the flying squirrel when it ran out from a hollow log and froze on a tree trunk, allowing her to grab this shot! Flying squirrels are nocturnal so it is rare to see them during daylight hours. Great spotting Patti and thank you for sharing!

You are invited to submit up to five of your best photographs for possible publication in *Pics from the Field*. Please include contact information and send only high-resolution (300ppi, 8X10 min size) jpeg, tiff, or raw files on a CD, DVD, or flash drive and mail to: Pics from the Field, *Virginia Wildlife* magazine, P.O. Box 90778, Henrico, VA 23228-0778.

We look forward to seeing and sharing your best work!





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