

Chesapeake Stories

The Bay in Words and Pictures



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Photo: Megan Quesnel
Cover photo: Luke Butler

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Preserve and Restore

Conservation Organizations Work to Save the Bay
----Nathan Grauel, Nathan Little, Connor McClain



Blackwater National Wildlife Refuge

Photo: Nathan Little

Located in Annapolis, Maryland and founded in 2006, the Chesapeake Conservancy is a non-profit organization that believes the Chesapeake Bay is a national treasure that should be available for use

Preserve and Restore (continued)

by everyone, including the animal residents that call its watershed home.



Chesapeake Conservancy headquarters Photo: Nathan Little

According to the Conservancy's Senior Vice President of Communications Jody Hedeman Couser, "The original overarching goal of this not-for-profit organization was to conserve and restore the rich and vibrant environmental and cultural landscape of the Chesapeake Bay watershed for the enjoyment, education, and inspiration of current and future generations. While this original goal has always remained the same, we have also expanded our work into other sectors. We founded the Conservation Innovation Center (CIC), a geospatial mapping division of Chesapeake Conservancy, which has allowed us to become a pioneer in high resolution imaging & mapping."

At the Conservation Innovation Center they utilize cutting-edge technology to create a much faster pace in conservation efforts than in the past. The partnerships, both national and international, that the Conservancy has created allow for this technology to be shared on a large scale and allow for "precision conservation." This means that they can focus their efforts in the right place, at the right time, and use as few resources as possible. It is one of their most recent and most notable achievements in conservation efforts and technology.

Partnerships Communications Coordinator Michael Bowman adds, "Launching the

Conservation Innovation Center is one of the major accomplishments of the Chesapeake Conservancy. Since the founding of this department, we have been able to track, analyze, and map parts of the Chesapeake Bay watershed that are in need of conservation, restoration, or special focus. When finding these tracts of land, we are able to partner with local conservation groups, individuals, agencies, organizations, and more groups to work on a strategy to conserve & restore the land to better the Chesapeake Bay watershed."

The Conservancy is also involved in the building and maintaining of parks, trails, and public access sites for the public to use as a way to engage with the beautiful environment that is the Chesapeake's watershed. Some of their previous projects have benefited Blackwater National Wildlife Refuge, Harriet Tubman Underground Railroad National Historical Park, and Fort Monroe National Monument.



Blackwater NWR entrance

Photo: Nathan Little

Bowman said that the goal of one current Conservancy campaign is to bring the Chesapeake Bay up to par with the other natural treasures of the United States. "Just like the Grand Canyon, Yosemite, or Yellowstone, the Chesapeake Bay is a national treasure worthy of recognition," he said. "With this [project], we are working with a variety of local, state, Federal, and private partners to push for a legal designation of the Chesapeake Bay as a National Recreation Area. This

Preserve and Restore (continued)

designation would allow for people from all walks of life to access and enjoy the Chesapeake Bay."

Commenting on why the Bay is so important and why so much effort goes into conserving its beauty, Bowman said, "The Chesapeake Bay is the largest estuary in North America, with its expansive 64,000 square mile watershed touching six states (New York, Pennsylvania, Delaware, Maryland, Virginia, and West Virginia) and Washington D.C. With a growing population of 18 million people, over 3,600 species of animals and plants, and 100,000 streams, creeks, and rivers, the Chesapeake Bay region is a hotbed for life, biodiversity, and history. The Chesapeake Bay is a National treasure and boasts some of the country's most important & beautiful landscapes.

"When people explore and enjoy nature, we believe that they'll be more apt to respect it and protect it. The Chesapeake Bay deserves to be respected, protected, and celebrated"

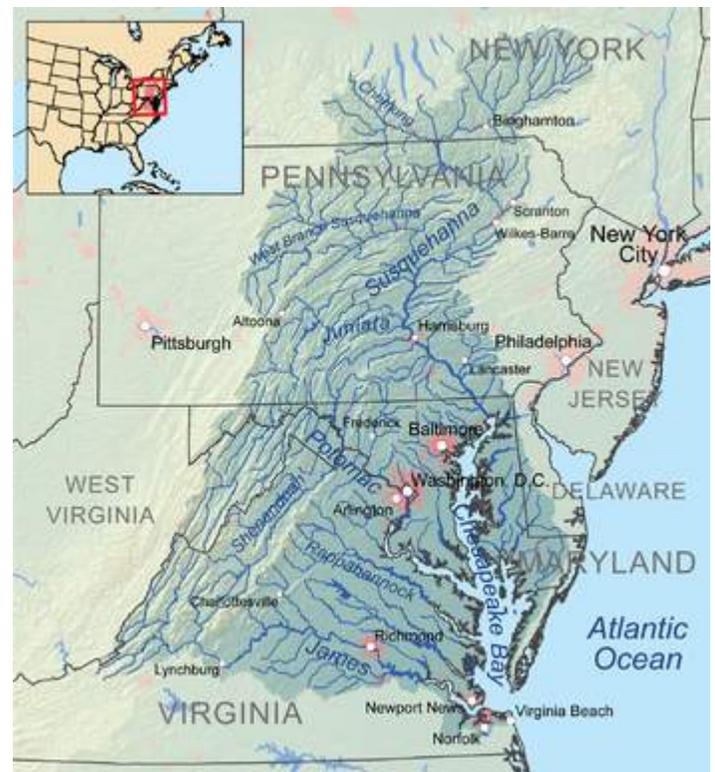


Key Wallace Trail, Blackwater NWR Photo: Nathan Little

The Board of Directors for the Chesapeake Conservancy is composed of people from all along the shores of the Bay. Members such as Vice Chair Molly Joseph Ward, the former Virginia Secretary of Natural Resources, and Treasurer Leslie Delagran, senior fellow at the World Wildlife Fund offer an expansive

conservation network because of their ties to the public sector. This allows them to tackle the conservation concerns of the watershed while being able to recognize what each region's specific needs may be. Chief G. Anne Richardson of the Rappahannock Tribe, who is the first elected woman chief to lead a tribe in Virginia since the 18th century, is also a partner of the Chesapeake Conservancy.

With connections such as these, they have already created 153 new public access sites along the watershed.



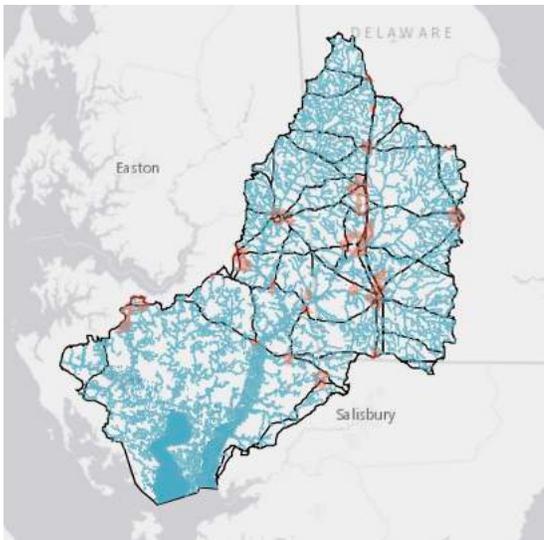
Chesapeake Bay watershed Map: Chesapeake Conservancy

While they work to conserve the watershed as a whole, the bulk of their efforts are focused on the Susquehanna River. Bowman said, "The mighty Susquehanna and its West Branch deliver nearly 20 billion gallons of freshwater into the Chesapeake Bay each day, making it responsible for nearly half of all of the freshwater entering the Bay. As the lifeblood of the Chesapeake, much of our work in precision

Preserve and Restore (continued)

conservation--using data and Technology to identify the right place, the right practice, the right size, and the right time to maximize success while using less resources such as time and money—is focused on the Susquehanna.”

An additional area of interest for the Conservancy is the Nanticoke River, which begins in southern Delaware, flowing southwest to the Bay through Maryland’s Eastern Shore. Known for being one of the Delmarva’s healthiest rivers, the Nanticoke provides 720,000 acres of habitat for both plants and animals.



Citing "the encroachment of development, sea level rise, habitat degradation, and fragmentation" as threats to the river, Bowman explained that the Conservancy brought together a team of partners including NGOs and state and federal agencies to create a corridor of protected land that would retain the value of the existing resources and meet the long-term view of conserving 50% of the Chesapeake Bay watershed by 2050.” They are also creating public access sites along the river to allow ease of access for more people.

* * *

In June of 1992, several Maryland and Delaware conservation organizations teamed up to form the Nanticoke Watershed Alliance.

Almost 40 other organizations now lend support and aid to the N.W.A, with the common goal of making sure the Nanticoke River remains in good health.

NWA President Lisa Wool of the NWA said that most important factor of the Nanticoke Watershed Alliance’s plan is to help create “good strong relationships with a wide variety of people that can help improve the water quality and habitat in and along the Nanticoke River and its tributaries.”

Wool said the reason for her involvement is that “the Nanticoke is one of the last wild rivers in this area, so I really want to make sure we keep it that way. It’s a stunning area that is just teeming with wildlife, and I really love taking people out to see it.”



Nanticoke Marina, Seaford DE

Photo: Nathan Grauel

Once relationships are formed between people and the Nanticoke, they are able to commit to helping. Wool said that joining the “creekwatchers” program (which is run through the NWA) is a fantastic way to help the Nanticoke. Participants simply monitor

Preserve and Restore (continued)

and report on river health. Issues are then brought to the attention of the organization and solutions can be formed. There are still plenty of opportunities to volunteer, even with COVID-19 disrupting some operations.

Wool also emphasized the importance of supporting the organization financially: "Right now," she said, "One of our main limiting factors is that funds are needed to match grants, so donations are always helpful."



View of Nanticoke River

Photo: Nathan Grauel

In a constantly changing world the Nanticoke is often adjusting to new conditions and dodging new threats. However, Wool said that the number one threat remains the development of land, and that no matter what it is being built, proper water quality safeguards must be followed. While the river contains a variety of buffers and conserved areas to help protect it, these are not enough to insure river health.

At the end of the day the NWA was established to help protect the Nanticoke River. However, this doesn't mean a person can't

have fun along the way. The organization often has events where people can sign up and enjoy an activity on the river, building the personal relationships Wool believes are so important to have.

Her own favorite event was "a paddle trip where you can launch from Riverton, cross the Nanticoke, wind through some wetlands, connect to Big Timber Creek, then turn onto the Marshyhope and then circle back around to the Nanticoke. We got lost several times and had to climb over a ton of downed trees, but it was an amazing trip. It felt like we were in a very remote jungle, where no one had been for 100 years."

* * *

The Wicomico Environmental Trust, or WET for short, is a local nonprofit organization that has dedicated themselves to "conserving, celebrating, and protecting the natural resources in Wicomico County and to contribute to the restoration of the Chesapeake Bay in order to promote a healthy environment for current and future generations."

WET aims to achieve this goal by protecting local water resources and ecosystems as well as by promoting sustainable agriculture methods.

By utilizing its members, which consist entirely of local volunteers, to take action in their communities through a variety of coordinated efforts, this organization has played an important role in preserving the wellbeing of



WET logo

Credit: wicomicoenvironment.org

Preserve and Restore (continued)

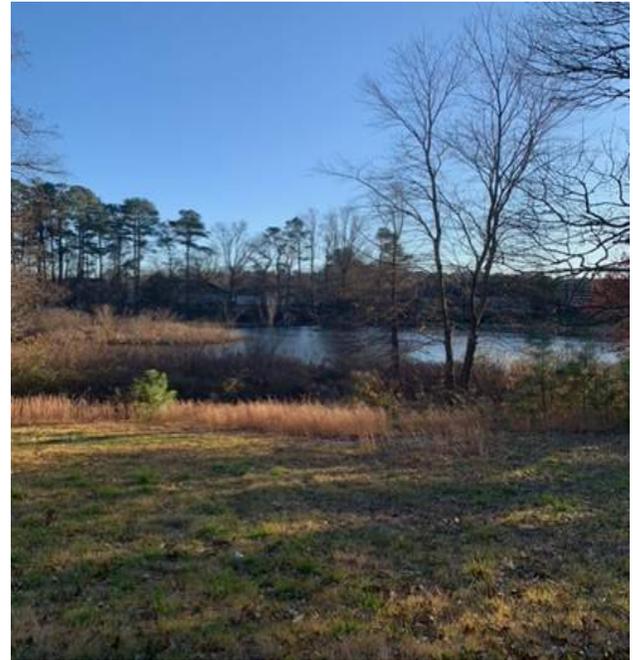
local environments so that they can continue to thrive.

The Wicomico Environmental Trust was founded in 1989 by a small group of concerned residents who were unsatisfied with what they deemed the county's ineffective environmental policies. The organization's main goal at the time was community education, where they would reach out to local schools and businesses and explain the importance of having a healthy watershed and the necessary actions needed to maintain it.

This vision was changed in 2005 when the organization turned its focus to the increasing urban sprawl of the area and monitored how this was impacting environments within the Wicomico County area. In 2011 WET turned their attention to monitoring water quality and the health of the Wicomico River and its watershed. They worked with the local governments and other non-profit organizations in the area to develop a watershed management plan for the river.

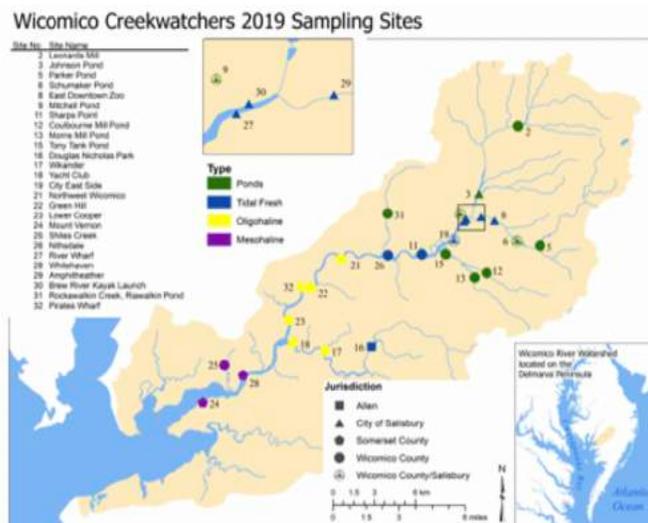
volunteers to monitor the waters of the Wicomico River and its tributaries and obtain viable samples.

WET board member Dr. Gina Bloodworth,



Wicomico River

Photo: Nathan Grauel



Map credit: wicomicoenvironment.org

Like the Nanticoke Watershed Alliance, WET has a creekwatchers program, which was officially added in 2016 and has made it their mission to collect credible water quality data by utilizing a workforce of around 250 local

who teaches Geography and Environmental Studies at Salisbury University, said, "We have an army of 56 volunteers that are local citizens, who go out to 26 sample sites all along the watershed (creeks, ponds, several sites along the river) every other Tuesday between March and November to collect water samples in small glass jars."

By having volunteers spread throughout the Wicomico watershed, the Creekwatchers can acquire reliable data concerning the quality of the water from all over the area in a relatively short amount of time.

The Creekwatchers program is not just limited to water quality monitoring, but also helps in the restoration process of threatened and endangered regional species. Bloodworth said that WET has planted over 5000 trees within the city and county at various locations and

Preserve and Restore (continued)

times over the last decade.

WET also assists local community leaders to construct and promote an ever-increasing amount of community gardens, so that these communities may have access to fresh and healthy foods.

Events such as organized trash cleanups and K-12 environmental education programs help WET to raise awareness in local communities about environmental concerns that are impacting their area. Informed citizens can then take action to preserve regional ecosystems for generations to come.



Wicomico shoreline

Photo: Nathan Grauel

Trees in Trouble

Spotted Lanternfly Endangers Regional Forests
---Michaela Mitchell, Bradley Reiber, Jessica Sharp



Spotted Lanternfly (*Lycorma delicatula*)

Photo: Penn State / Greg Hoover

While the country continues to monitor the spread of the coronavirus, several counties in the Chesapeake Bay region have been implementing their own quarantines. However, instead of a virus, these quarantines are for the invasive species *Lycorma delicatula*, better known as the spotted lanternfly.

Trees in Trouble (continued)

The spotted lanternfly is a planthopper originating from Asia in the countries of China, Vietnam, and India. The insect was first found in the United States in 2014 in the state of Pennsylvania.

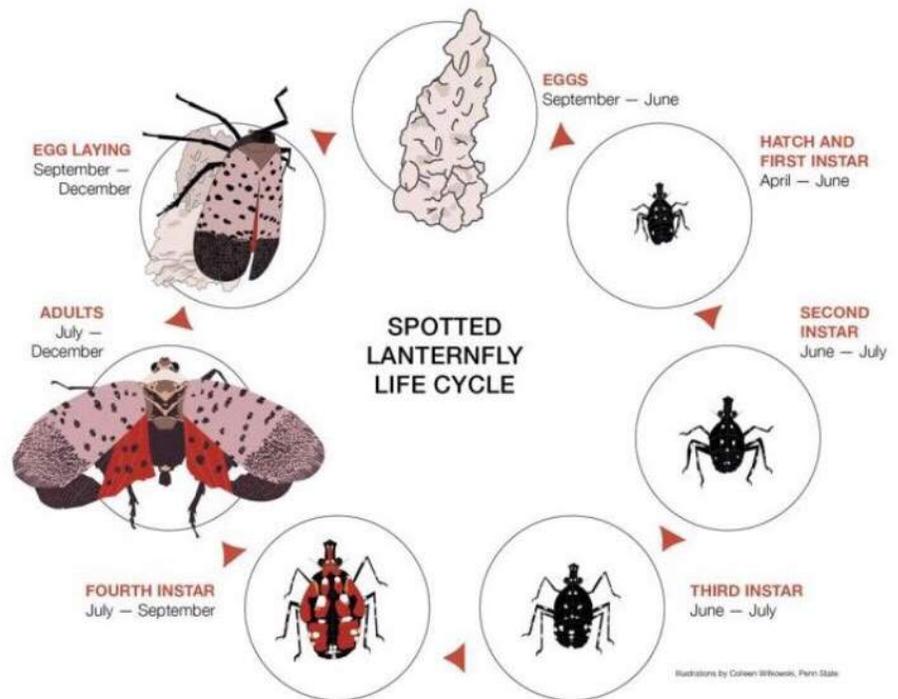
While how it got here still remains unclear, there is no documentation stating it was introduced on purpose. Some people believe the spotted lanternfly may have been here as early as 2012 when a stone shipment arrived from a host country.

Regardless, this species has proven its nickname, “hitchhiker bug,” to be true. Today, the spotted lanternfly can be found in the states of Pennsylvania, Delaware, New Jersey, New York, Virginia, and Maryland.

The lifecycle of this insect begins in the spring. In early April to late May, the spotted lanternfly will hatch from its egg. As soon as it hatched, the insect is called a nymph (juvenile form). From there it undergoes four stages called instars, all of which are wingless and flightless. In as early as July, after about two months of growing, the spotted lanternfly is considered an adult.



Insect sizes have been enlarged to show detail.



Illustrations by Colleen Whitlock, Penn State

Spotted Lanternfly life cycle

Source: Delaware Home Association

The Delaware Department of Agriculture website states, “The spotted lanternfly adult is 1” long and 1/2” wide at rest. The forewings are grey with black spots, and the hind wings are red with black spots. The head and legs are black, and the abdomen is yellow with broad black bands. Immature stages are small, round, and black with white spots and develop red patches as they grow.” The spotted lanternfly’s total life expectancy is up to a year.

The peak of spotted lanternfly activity occurs in the cooler seasons. As the year transitions into fall

Trees in Trouble (continued)

and winter, the adults will begin to mate and lay eggs within the trees. Since they will lay eggs on any smooth surface, egg masses have been found on people's cars, RVs, firewood, tiles, outdoor furniture, and boxed materials. They lay between 30 and 50 eggs at a time.



Unhatched Spotted Lanternfly eggs

Photo: Delaware Department of Agriculture

The spotted lanternfly mainly feeds on woody plants, but it has been reported to feed on non-woody plants as well. According to Delaware's department of agriculture, the plant and tree species that can be affected include almond, apple, apricot, basil, blueberry, cherry, cucumber, fig, grape, hickory, hops, horseradish, hydrangea, maple, nectarine, oak, peaches, pine, plum, poplar, raspberry, rose, sycamore, walnut, and willow.

Plants who have been exposed to the spotted lanternfly may exhibit symptoms of branch dieback, wilting, and death if heavy feedings have occurred. Susceptible tree species like tree of heaven, walnut, and willow can develop weeping wounds. These wounds appear as greyish to black trails along the trunk.

Overall, the spotted lanternfly causes both external and internal damage to trees. Its egg masses attached to the tree cause the bark to break down. When feeding, the insect pierces the bark of the tree with its

The Diabolical Tree of Heaven

According to Delaware's Department of Agriculture, "Officials believe the spotted lanternfly requires feeding on the tree of heaven (*Ailanthus altissima*) to reproduce..."

The tree of heaven, like the spotted lanternfly, is an invasive species from Asia. While the name alone makes it seem like a beneficial species, the tree has been known to cause damage to local ecosystems.

First introduced to the United States in the late 1700s, the tree was sought after for urban landscapes because of its rapid growth, ease of establishment, and immunity to many pests and diseases. However, those same traits that made it desirable have now become a curse.



Tree of Heaven

Photo: The Nature Conservancy

Ailanthus has spread rapidly, crowding out many vital native species across the U.S. Not only that, but the tree also secretes a chemical into the soil that often harms and kills all other plants around it, leading to massive disruption in the ecosystem, and at times the extirpation of some native plant and animal species.

In addition, the tree's aggressive root systems have been found to damage pavement, sewers, and building foundations.

Trees in Trouble (continued)

mouthpart and excretes a sugary water, known as honeydew, to the site. This substance can cause mold growth to the puncture sites, which can further damage the internal structure.

Also, other insects like wasps and ants are attracted to feed which could cause an infestation.



Spotted Lanternfly tree damage

Photo: USDA APHIS

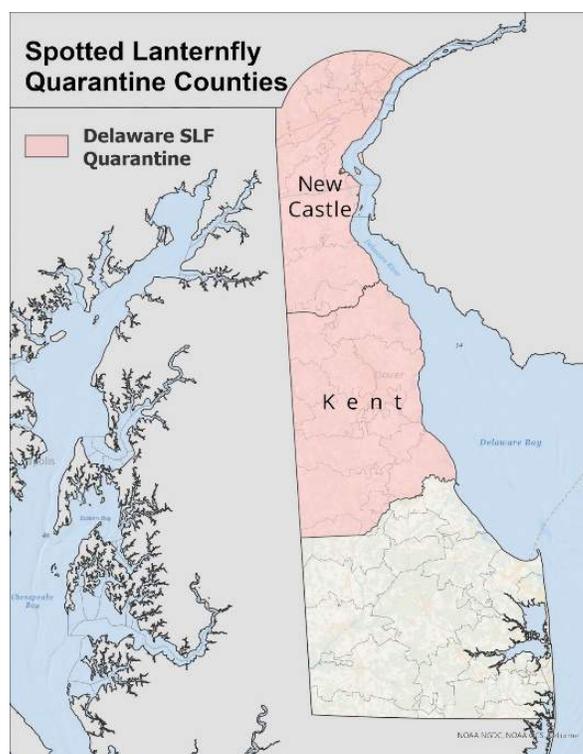
Some of the places that are having these issues are Cecil County and Harford County, Maryland. These two counties are in quarantine for spotted lanternflies. New Castle County, Delaware, which is located adjacent to Cecil County, has had more reports of spotted lanternflies in the area. A few were spotted at Iron Hill Park in Newark.

Wildlife officials are watching the area to see if any more flies spawn in the area. The trail manager at Iron Hill Park, Ray Johnson, has witnessed these flies for himself. "They are hard to spot when they are at an early stage in their life cycle," he said. "However, when they are bigger you can notice more of the red on them." He said that he has noticed a few egg masses on trees in the park, so the park is trying to keep an eye out in the local area.

The Delaware Department of Agriculture has "detected and confirmed populations of spotted lanternfly within Kent County, including Smyrna, Dover, and Harrington. Due to this recent finding, effective October 30, 2020, the Spotted Lanternfly Quarantine has expanded to include all of New Castle County and Kent County. The quarantine can expand

if the pest is determined to have established a population in a previously non-quarantined area."

What do these quarantines consist of? In Delaware, the quarantine means that any material or object that the spotted lanternfly may occupy in all stages of life cannot be moved without taking precautions to prevent the spread of the pest. Some of the major regulated articles include vehicles, RVs, firewood, construction materials, outside patio furniture, and much more.



Quarantine map of Delaware

Source: Delaware News

The Delaware Department of Agriculture requires all citizens living in a quarantine zone to check items for spotted lanternfly life stages before leaving the area. They have come up with a compliance checklist for residents to complete (see last page of this article).

Few measures of action have been taken against the spotted lanternfly. Mechanical

Trees in Trouble (continued)

control includes scraping the eggs off of the tree and putting them in a bag. It is suggested to put hand sanitizer in the bag because it will kill the eggs faster. Chemical control includes introducing herbicides to spray on trees to prevent the spotted lanternfly from invading it.

In a previous interview with Artika Casini, University of Delaware's extension specialist in ornamentals and integrated pest management, Brian Kunkel said systemic insecticides are currently the most effective tool to kill the spotted lanternfly. Systemics are normally sprayed around the base of the tree and can last months. However, systemics could pose problems to helpful pollinators. Kunkel said that caution should be used near flower-producing plants.

Kunkel also talked about another possible solution, which is introducing natural predators. At the USDA Beneficial Insect Research Lab, located on the University of Delaware's campus, researchers have been working on rearing natural predators to some recently problematic invasive species. Currently, researchers are looking at two species that help control the spotted lanternfly population in its native home of China. While this research is still very early, and the two species would need to be further researched on how they would impact local ecosystems, it is possible that one day these enemy insects could be released to combat against the spotted lanternfly.

Legislation has been put in place as well to deal with the current uprising of the tiny invaders. In addition to Delaware's quarantine restrictions, Pennsylvania's Department of Agriculture banned the transport of firewood, outdoor chairs, lawn mowers, and trucks.

Katie Bielicki, Delaware's Spotted Lanternfly Project Coordinator, discussed how quarantine efforts are going. She said "The Delaware Department of Agriculture likes to believe that the quarantine is helping slow down the

down the spotted lanternfly's spread. Since the expansion of the quarantine from New Castle County to Kent County, we have been working hard to get businesses involved with inspection of their cargo and transportation vessels. Since both New Castle's [quarantine] is only a couple years old, and Kent County's is about a couple months old, it really is hard to tell if it has an effect on the spotted lanternfly population."



Captured (headless) Spotted Lanternfly
Photo: Jessica Sharp

Bielicki also shared concerns over transportation and possible reports in nearby Sussex County. "Our public reporting has gone up about 2,000% since last summer," she said, with a higher reporting rate in Sussex County, especially at the beaches. DDA needs about 3 adults in a certain location to be accepted as a population. We have found three separate populations of six adults in Harrington, Dover, and Smyrna, enacting the new quarantine. When the population of the New Castle County spotted lanternfly increases, we are going to see a flood gate of spotted lanternfly open, because of their ability to cling to people's cars, and stow away in luggage, for those who are beachbound."

She added, "The spotted lanternfly population is not going to slow."

Trees in Trouble (continued)

What can you do to help? If you find a live spotted lanternfly, report the sighting and location to your local Department of Agriculture or wildlife officials. After notifying the correct authority, it is recommended to capture and/or destroy the specimen whenever possible.

If you find a dead spotted lanternfly, bag it and date it with the location. Once done, you should report it to wildlife officials so they can check for nearby infestations.

If there is an egg mass on a tree you should scrape it off and put it in a bag. Notify wildlife officials about the egg mass, as there could more spotted lantern flies in the area. Delaware Department of Agriculture has issued a spotted lanternfly fact sheet for homeowners to reference. In the sheet, a brief overview of the spotted lanternfly, as well as what to do if you see one was provided. This sheet, and other helpful resources, can be found at [Spotted Lanternfly - Delaware Department of Agriculture - State of Delaware](#).

Have You Spotted Me?

Living in Spotted Lanternfly Quarantine Areas

IMPORTANT: Before you move outdoor items check for spotted lanternfly egg masses, adults, and nymphs. Make sure all items are pest free before you move them. Help keep this pest from spreading by removing and killing them.

Check before you move:

Recreational or Camping Items

<input type="checkbox"/> Backpacks <input type="checkbox"/> Basketball backboards <input type="checkbox"/> Bicycles <input type="checkbox"/> Boats/Boat trailers <input type="checkbox"/> Campers	<input type="checkbox"/> Firewood <input type="checkbox"/> Grills <input type="checkbox"/> Ice Chests <input type="checkbox"/> Motorcycles <input type="checkbox"/> Motor homes	<input type="checkbox"/> Recreational vehicles <input type="checkbox"/> Snowmobiles <input type="checkbox"/> Tarps <input type="checkbox"/> Tents <input type="checkbox"/> Other
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Other Household Items

<input type="checkbox"/> Barrels <input type="checkbox"/> Cardboard or wooden boxes <input type="checkbox"/> Firewood <input type="checkbox"/> Flag poles <input type="checkbox"/> Outdoor furniture	<input type="checkbox"/> Plant containers <input type="checkbox"/> Propane or oil tanks <input type="checkbox"/> Refrigerators/Freezers <input type="checkbox"/> Shutters <input type="checkbox"/> Storage sheds	<input type="checkbox"/> Storm/Screen doors and windows <input type="checkbox"/> Trash cans <input type="checkbox"/> Window awnings <input type="checkbox"/> Other
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Building Materials

<input type="checkbox"/> Bricks/Cinder blocks <input type="checkbox"/> Cement mixing tubs <input type="checkbox"/> Lumber	<input type="checkbox"/> Pipes <input type="checkbox"/> Roofing materials <input type="checkbox"/> Skidsteers/Forklifts	<input type="checkbox"/> Tools and toolboxes <input type="checkbox"/> Workbenches <input type="checkbox"/> Other
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Yard and Garden Items

<input type="checkbox"/> Backhoes <input type="checkbox"/> Barbecue grills <input type="checkbox"/> Carts <input type="checkbox"/> Cold frames <input type="checkbox"/> Dog houses, chicken coops, rabbit sheds, etc.	<input type="checkbox"/> Fencing <input type="checkbox"/> Garden tillers <input type="checkbox"/> Garden tools <input type="checkbox"/> Lawnmowers <input type="checkbox"/> Signs and posts	<input type="checkbox"/> Storage sheds <input type="checkbox"/> Tractors and trailers <input type="checkbox"/> Trees, shrubs, and plants <input type="checkbox"/> Other
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Children's Playthings

<input type="checkbox"/> Bicycles, scooters <input type="checkbox"/> Kiddie pools	<input type="checkbox"/> Play houses <input type="checkbox"/> Sandboxes	<input type="checkbox"/> Swingsets <input type="checkbox"/> Other
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By signing this checklist, I am confirming that I have inspected my vehicle and those items I am moving from the spotted lanternfly quarantine area, and do not see any egg masses or insects in or on anything I am moving.

Signature _____ Address _____ Date _____

Please sign, date, and keep this checklist in your vehicle with you - use it each time you need it.

**For more info, visit: de.gov/hitchhikerbug
Stop and Report a #HitchHikerBug**



DELAWARE DEPARTMENT OF
AGRICULTURE

Photo Essay: Prepping for Pintails

Pre-Season Work Pays Off for Waterfowl Hunters

---Luke Butler

Photo Credits: Luke Butler, Will Fehrenbacher



With the encroaching winter forcing waterfowl populations to migrate down the Atlantic flyway, the marshlands of the Chesapeake Bay watershed are a frequent rest stop for many species of ducks

Prepping for Pintails (continued)

and geese. However, the birds aren't the only ones scouting out a stake in the marsh. The waterfowl hunter has been preparing for their arrival.

Waterfowl hunting is a staple of Maryland culture and history along the Eastern Shore. With a plethora of suitable marshland and tributaries such as Deal Island, Blackwater, and the Nanticoke River, migrating waterfowl species have ideal habitat, which in turn provides great hunting opportunities. However, it isn't as simple as walking into to the marsh and getting on the birds.

An experienced waterfowl hunter understands that to ensure a safe and successful hunt there is a quite a bit of preparation. Obtaining the correct licensing, possessing the proper equipment, as well as locating the birds and understanding their behavior are all vital factors that form the foundation of a memorable and ethical hunt.

Unlike hunting many other types of game, hunting waterfowl requires additional licensing on top of a general hunting license, in the form of stamps. This includes the federal duck stamp and migratory gamebird stamp. The revenue generated from these stamps goes directly back into acquiring and protecting wetland habitat and purchasing conservation easements for the National Wildlife Refuge System.

The Migratory Bird Hunting and Conservation Stamp, better known as the Federal Duck Stamp, is a conservation revenue stamp. President Franklin D. Roosevelt signed the Migratory Bird Hunting Stamp Act in 1934 requiring all waterfowl hunters 16 years of age and older to annually purchase and possess a Federal Duck Stamp.

98 percent of all funds raised from the purchase of duck stamps goes directly into the Migratory Bird Conservation Fund. Since its conception, over 800 million dollars has been raised to protect and acquire more than 5.7 million acres of habitat for national wildlife refuges.

Duck stamps not only serve as a hunting license but also double as tickets of free admission into any National Wildlife Refuge that charge an entrance fee. Hunters, birders, conservationists, collectors, and outdoorsman alike purchase duck stamps to protect and fund wildlife habitat for generations to enjoy.

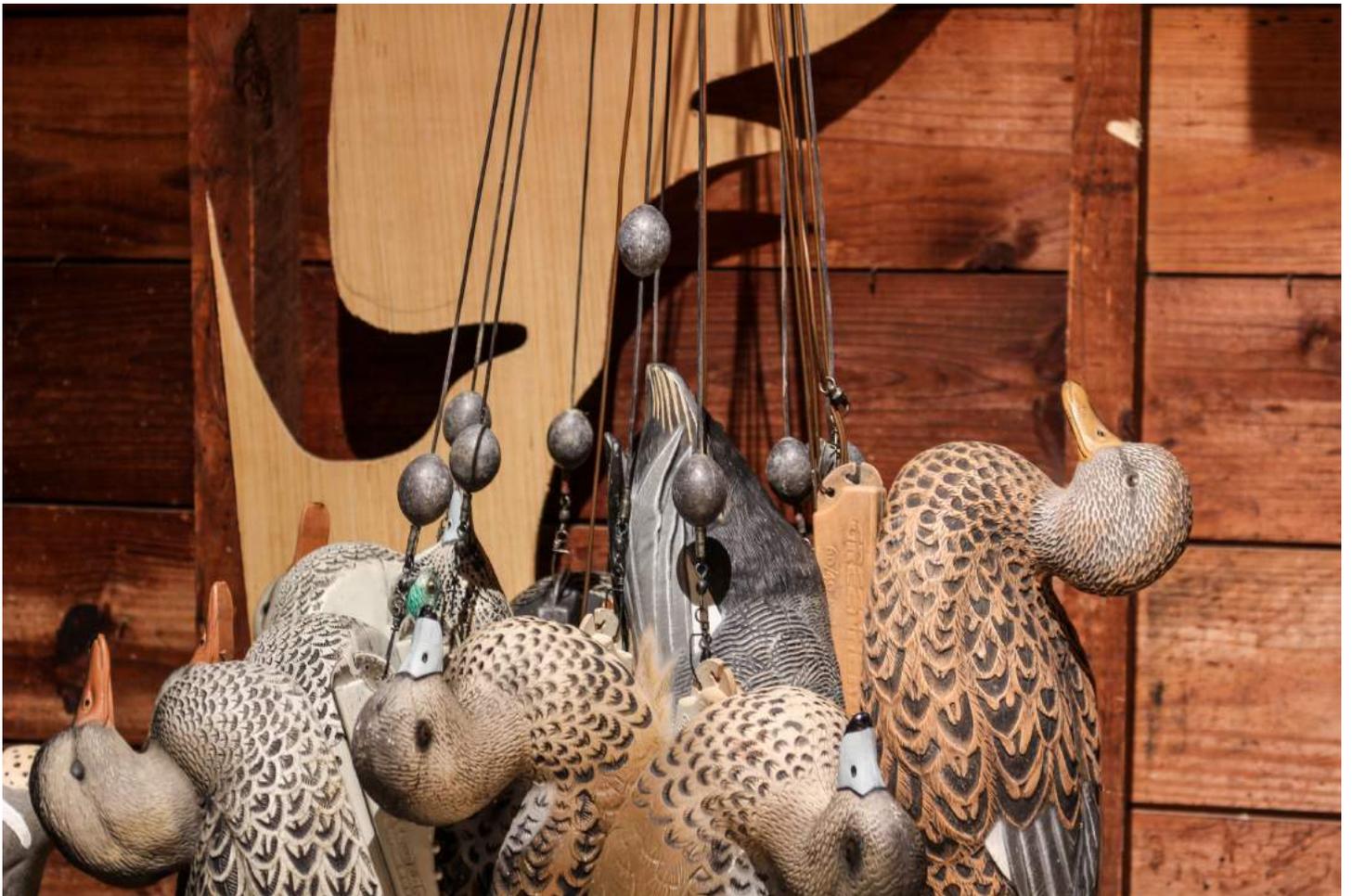


The unique aspect of the Federal Duck Stamp is that the U.S. Fish and Wildlife Service holds an annual art contest to determine the artwork featured on the stamp. Anybody 18 years of age or older may enter the contest, and judges determine the piece that will be featured on the stamp for the following year. The top placing entries are exhibited throughout the nation at museums and refuges.

The highly intricate and detailed designs of the duck stamp combined with its 86-year-old history make it highly collectable among stamp collectors and waterfowlers. Collectors primarily collect mint-condition stamps; however, some collect signed stamps, art printouts, hunting licenses, and other duck stamp related memorabilia. A full collection of the duck stamp can be viewed online on the U.S. Fish & Wildlife Service Federal Duck Stamp Gallery.

Prepping for Pintails (continued)

The equipment needed is often dependent on many factors such as weather, location, and species being targeted, however there is general equipment that every waterfowl hunter possesses. A shotgun, either 12 or 20 gauge is the workhorse of the hunter. A collection of calls to mimic the diverse specification of waterfowl is also commonplace. Decoys of various species are also an important piece of equipment that when spread correctly portray real birds and entice live birds to give them a visit.



Prepping for Pintails (continued)

On the Eastern Shore, water is often a factor; therefore, waders and a boat are often needed as well.



In order to locate the birds and monitor their behavior it is necessary to scout. Scouting enables a hunter to understand where the birds are, how many are there, and which species are present. All these factors contribute to planning which equipment will be needed on the hunt. It is often necessary to scout a potential spot several times before the hunt to ensure the birds are still active in the area.

Prepping for Pintails (continued)

Will Fehrenbacher, an Environmental Studies major at Salisbury University, understands the intricacies and beauty of waterfowl hunting. From the age of three, Will has been enveloped in the world of waterfowling, a practice in which he inherited from both his father and grandfather--a typical case of the craft being passed down from generation to generation on the Eastern Shore. Below, Will (right) and his brother Erik (left) accompany their grandfather on one of their first goose hunts as children.



Prepping for Pintails (continued)

Fehrenbacher believes locating the birds and understanding their behavior is arguably the most important part of prepping for a hunt. He says, "It's crucial to know how the birds are acting, how you will set your decoy spread, how the birds will react with the weather. Scouting plays a massive role in this and is honestly the most important part of having a good hunt."



Piloting his jonboat through Monie Bay, Fehrenbacher keeps a keen eye on the horizon, scouting for ducks within the surrounding marshes. Trips like these are crucial in identifying the location of waterfowl, population numbers, and behavioral patterns when preparing for a hunt.

Prepping for Pintails (continued)

The marshes of Deal Island not only provide ideal habitat for various species of waterfowl, but also present incredible scenes to the observant eyes of scouting waterfowl hunters.



Not only does locating the birds inform you where they are, but understanding their behavior in relation to one another affects which decoys and other equipment you will bring on a hunt, "It's all about mimicking how you saw them when you were scouting," Fehrenbacher says.

Prepping for Pintails (continued)

"How were they sitting? Were they in big groups or separated? Are they feeding or loafing? All these factors influence the composition of your decoy spread."



Wading off the shore of little Deal Island, Fehrenbacher prepares to set his spread.

Prepping for Pintails (continued)

As the rising sun casts its light across the expansive marsh at Dames Quarter, a spread of decoys lingers just beyond the marsh grass.



Prepping for Pintails (continued)

The vegetation serves as concealment and a natural “blind” for the waterfowlers to hide in, as the author does below.



Prepping for Pintails (continued)

The art of waterfowl hunting is a combination of generational knowledge, hard work, and appreciation for the birds. Immersion into nature to understand every facet of how the birds operate and behave is what keeps hunters coming back season after season.

The satisfaction and gratitude from a successful hunt bear true testimony to the love and dedication waterfowlers have to the craft and to continuing an Eastern Shore cultural tradition.



Nautical Past and Present

In St. Michaels, It's All About the Boats

---Jake Clapsadle, Erin Lee, Megan Quesnel



Boat restoration at the Chesapeake Bay Maritime Museum

Photo: Megan Quesnel

In St. Michaels, Maryland, the nautical roots run deep throughout the streets. Originally known because of its harbor as "Shipping Creek," the settlement was chosen by the Church of England as the site for Christ Church--St. Michael's Parish. The town that grew around the harbor and church

Nautical Past and Present (continued)

came to be known as St, Michaels.



Christ Church

Photo: Megan Quesnel

In 1778, a Liverpool agent named James Braddock came into the area, buying land grant properties from auctions that amounted to around 127 acres. Braddock used his land wisely and fostered the development of a prosperous shipbuilding and seafood harvesting town. St Michaels was officially incorporated in 1804.

The location, a pocket of land between the Miles River and Broad Creek, creates a natural environment for commerce. In the early days, St Michaels acted as a trading post for local tobacco farmers and trappers. But from the little city's start, the craft of building ships was its specialty.

With the steady decline of shipbuilding after

the War of 1812, oystering and crabbing trades played a larger role in the growth of the town we know today.

With the soft salty breeze going through your hair, and the hot, red-bricked sidewalk under your summer shoes; learning the history of the town is the cherry on top. According to the St. Michaels official website, many of the area's homes date back to the late 1700s and the 1800s.

A visitors center employee, Heather Allen, gave insight on some of the history of specific buildings within St Michaels. "Some of the oldest buildings include the Wickersham, the Snuggery, and the Bruf-Mansfield's House," she said. "The Wickersham was built in 1750, and was moved in 2004 to save it from demolition due to the building of the Easton Airport. Originally, it was known as Hardwood's Hill, which is part of a large plantation owned by Robert Hardwood.

"The Snuggery, which is a log cabin, Victorian-style home, was owned by Henry Dodson ... as



Downtown sidewalk

Photo: Megan Quesnel

Nautical Past and Present (continued)

early as 1784. Henry Dodson was [also] the owner of the Victorian Inn, a highly regarded establishment at the time.

"The Bruf-Mansfields house was owned by a shipbuilder by the name of John Bruff, who purchased the land directly from James Braddock. These buildings are all open for tours in the summer season, fully restored and back to their original beauty."

Each of these buildings has been moved, most of them only a few blocks from their original locations, because of increased danger from rising water levels. For a place like St. Michaels, climate change is something that they can see. Allen said "If we don't act now, St. Michaels will most likely be underwater within our lifetime, due to increased flooding each year."

She added, "St. Michaels' weather is very inconsistent! Mainly, it's a minute-to-minute forecast because of the scattered weather patterns, and that is not a good sign. Again, the flooding is getting worse each year."

* * *

With a rich history of trading and shipbuilding dating back to the 1630's, St. Michaels is the oldest town in Talbot County, and its maritime and fishing culture are still prevalent today.

The St. Michaels official website says, "Shipbuilding was St. Michaels' original industry. Many of the ships built in the early days of St. Michael's were used to defend the town itself, as well as the Chesapeake Bay as a whole, against the British Navy."

Shipbuilders in the early days of St. Michaels built fast schooners, which were later called Baltimore Clippers. These ships were able to



Historic schooner

Photo: CBMM

outrun pirates and foreign navy vessels while maneuvering around blockades. Some of these schooners were later used as private armed vessels carrying a letter of marque. A letter of marque was a government license that authorized the owner of the vessel to attack and capture enemy vessels and bring them back for condemnation or sale. It was considered an honorable act of patriotism to do this with a letter of marque, though unlicensed piracy was considered extremely dishonorable and illegal.

When shipbuilding declined, a growing oyster industry revived the town. By the late nineteenth century, most households in St. Michaels had at least one person engaged in some aspect of this fishery, either tonging oysters from the nearby waters of the Miles River and Eastern Bay, or engaged in the shucking houses that lined the waterfront.

The St. Michaels website notes, "One of these businesses, Coulbourne and Jewett, founded in the early years of the twentieth century, is notable as a black-owned enterprise, and it early came to specialize in crabmeat. As a means of marketing crabmeat, Frederick Jewett, the owner of Coulbourne and Jewett which is an early 20th century black-owned enterprise specializing in crab meat, devised a

Nautical Past and Present (continued)

five-level grading system (regular, claw, special, backfin, lump) which is still used by the industry today."



Oystering equipment

Photo: Megan Quesnel

St. Michaels' fishing and maritime culture is still thriving. Just ask Beau Harrison, a modern-day charter boat owner and captain out of St. Michaels who has been fishing in this area for as long as he can remember. The Harrison family has been commercial fishing in the St. Michaels area for over a century.

"Since the Chesapeake Bay and the St. Michaels area in particular have such a large estuary," he said, "it allows us as charter captains to have options on what we take our charters out to do. There are some parties that will end up catching up to five or six different species of fish in a single day."

"I will normally target rockfish, also known as

striped bass, which is the Maryland state fish. We will fish for them the entire season from when it begins in April until December.

"In the early Spring it is known as the 'Trophy Season' where we target the large migrating rockfish. During that time, they have to be 35" or larger to keep. The rest of the year we can target the typical school-sized rockfish, which stay in the bay until they are large enough to migrate."

"In the Spring, a migration of Black Drum travel through the bay. Then, later in the Spring when the water temperature starts to rise a bit more, we will start catching Norfolk Spot, White Perch, Croaker, Bluefish, Black Sea Bass and Spanish Mackerel.

"Around August-October a migration of Cobia will come about halfway up the Bay, and during that time I will fish about 30 miles south of St. Michaels to chase the big, elusive species. This is probably my favorite time of the year other than the striper Trophy Season."



Capt. Beau Harrison with a red drum Photo: Jake Clapsadle

Nautical Past and Present (continued)

St. Michaels is a prime example of a historic town whose original industry has had a lasting effect on the town's character and how it is still known today.

The Chesapeake Bay Maritime Museum is located at the heart of St. Michaels on Navy Point. The scenic property of the Chesapeake Bay Maritime Museum safeguards cultural artifacts and maintains a historical record of the Chesapeake Bay region. The museum's website says the 18-acre interactive museum was founded in 1965 and was originally the "site of a busy complex of seafood packing houses, docks, and workboats."

There are ten exhibition buildings that "display the economical, social, and geological history of Chesapeake Bay" and give a timeline of maritime developments portraying "what life was like from the time of sailboats, to the steamboat era, to the advent of gas-powered engines."

Highlights Tour (90 minutes or less)
Suggested itinerary of highlights for an express tour

- Working Shipyard:** Work and interact with our shipwrights as they restore and build Chesapeake Bay boats.
- 1879 Hooper Strait Lighthouse:** Climb to the top and experience the life of a lighthouse keeper.
- Waterman's Wharf:** Pull up an net job, catch some blue crabs, or bring for oysters.
- Oystering on the Chesapeake:** Climb aboard a real oystech and step into the world of a Chesapeake Bay oysterman.
- Floating Fleet:** Check out the largest collection of Chesapeake Bay watercraft in the world. (During winter months, boats are stored around the harbor.)

Enhanced Tour (3-4 hours)
Add these engaging exhibitions to your highlights tour

- Then-Side car play:** See the play in the gift house of this 1942 hotrod.
- At Play on the Bay:** Explore how the Bay has changed over the last 100 years from a place of work to a place of play.
- Small Boat Shed & Maryland Crab Meat Company:** Discover the recreated interior of a crab packing plant, and a collection of boats once used in the fisheries.
- Seawall Building:** Features two special exhibitions, check the Welcome Center for schedules.
- Mitchell House:** Engage in history at Frederick Douglass' sister's home, and our Anneses Monarch Butterfly gardens.
- Saw Cuts:** Storage for Shipyard lumber and small craft.
- Waterfowling:** Learn why the Bay attracts flocks of migrating birds and the sport, industry, and art they have inspired.
- Bay History/Waterfowling:** Examine the role the Chesapeake Bay has played in the nation's history. CBMM's Point Lookout works on needed boat projects. Also home to our temporary sail lift.
- The Lenny Auctions:** Check out one of our rotating special exhibitions.

Additional historical structures

- Point Lookout Ball Tower:** Point Lookout Lighthouse and its accompanying ball tower were gilded jewels into the Potomac River.
- Tobaccoer Beach Bandstand:** Formerly located at one of the Bay's most popular summer resorts, Tobaccoer Beach.

MAP KEY

- Highlights Tour (90 minutes or less)
- Enhanced Tour (3-4 hours, includes Highlights)
- Welcome Center, Museum Store, Administration Buildings
- Family Activities
- Restrooms
- Water Features
- First Aid Kit
- On-the-Water Activities & Boat Rides
- No-conditioned / heated buildings (See listing of buildings in exhibit area for the full.)

ADDITIONAL INFORMATION

- Landmark points are accessible, but not guaranteed inside exhibits or during special events and holidays, call the reception or certified service staff. Clean-up bags and water are available.
- Access is handicapped accessible with the exception of the Hooper Strait Lighthouse, and the observation deck in the Shipyard.

After your visit, follow Sunnyside Bridge to the steps of St. Michaels' Visit st Michaels.org for more information.

The exhibits explore many facets of life on the water including occupations, industries, and recreation. The ten main exhibits include a working shipyard, 1879 Hooper Strait Lighthouse, Mitchell House, At Play on the Bay, Small Boat Shed, Maryland Crab Meat Company, Waterfowling, Bay History, Waterman's Wharf, and Oystering on the Chesapeake.

Waterman's Wharf, Maryland Crab Meat Company, Oystering on the Chesapeake, and Waterfowling exhibit show the occupations and industries linked to the Bay. Play on the Bay exhibit explores changes in the Chesapeake Bay over the last 100 years and the shift (for some people) from a place of work to a place of recreation. The shipyard brings a working waterfront to life as CBMM's shipwrights and apprentices demonstrate the skills of boatbuilding. Visitors can interact with the shipwrights as

Nautical Past and Present (continued)

they restore and build Chesapeake Bay boats. The shipyard strives to maintain and pass on the trade of wooden boatbuilding through their educational programs and their historic floating fleet docked at Navy Point for the public to see.

The Hooper Strait Lighthouse is a historical landmark that has been preserved by the museum. Visitors can climb the lighthouse and “learn how 19th century lighthouse keepers tended their station in the middle of the Bay.”

Along with the exhibitions, the Maritime Museum has a comprehensive collection of “material culture relating to the Chesapeake’s tidewater region.” Their archive includes watercraft, decoys and waterfowling objects, marine engines, maritime models, paintings/prints/photography, objects of maritime trade, and historic structures.



Former workboat *Winnie Estelle*, now used for educational programs

Photo: Megan Quesnel

Nautical Past and Present (continued)

The Chesapeake Bay Maritime Museum frequently takes on small-scale projects of traditional wooden boat building in conjunction with their apprenticeship program. However, the shipyard is now concentrated on a larger-scale, two-year contracted project. Jeff Reed, a shipwright for the museum, talks about the museum's undertaking of replicating the *Maryland Dove*. Reed says, "This *Maryland Dove* is a replica of the boat that came over here from England in 1634. It arrived with another ship that was ten times larger named the *Arc*. They came here to establish the Maryland colony and they ended up at Saint Mary's--that's how the historic city of Saint Mary's came to be."

The replica they are making now is going to replace the current model that is at St. Mary's City because it has become antiquated. Reed said, "The state of Maryland actually commissioned the boat; I think it's about a \$5,000,000 project over the course of 2 1/2 years. The museum lobbied to show that through this building we're able to get some apprentices and interpret the project as we are right now to educate the public about the history and actually the trade as well, being a shipwright."



CBMM Boatshop

Photo: Jake Clapsadle

"We're trying to put things together traditionally and use traditional materials," Reed added. "People ask, 'are you doing it the way they did it in the 1600s?' and I say, 'well the biggest difference is we have electricity and we have combustion engines as well.' So we can use chainsaws, we can use bandsaws, we can use table saws, and power planes...we have a huge advantage with forklifts and all the modern tools we're using. But once the boat comes together you know we're trying to just keep it traditional."

The goal is to make the ship as authentic as possible while also passing Coast Guard regulations so the public can be taken out on it. Reed explains, "We're building it relatively traditionally; we have a double sawn flooded frame and it's all wooden fastenings. There are some metal fastenings for Coast Guard regulations and we have 18,000 pounds of lead bolted to the keel which creates stability, and we need those stability calculations so that the Coast Guard will say you can take the public out on it."

Nautical Past and Present (continued)

"Also, we'll have two diesel engines in it for propulsion." Reed also talked about the technique used to prepare the wood for building the frame and shape of the ship. The process of fitting the wood is the slow part of construction as it requires the wood to be steamed so it can become flexible enough to shape to the frame. Reed says, "There are some live oak trees we got from the state of Georgia for the framing and they tend to grow right out of the ground, they kind of grow like broccoli--when they cut the logs there is already the shape in them and so we take our patterns and we kinda try to get a flitch--what they call a piece of tree that's been filleted--and follow the grain for strength and get the shape that way for this frame.

"But then just yesterday we took some white oak and we steamed it. We actually built a fire, we built a boiler with a radiator hose, and we bagged it. In the old days they would build a box, put a timber in there, and put steam in the box, called it a steam box. The trouble with that is this is such a large scale. If you're framing a small boat you can stick frames in and pull frames out. These timbers are 4 by 8, 25 feet long, so there's a lot of weight to them. So what we can do is we get it ready, we bring the timber almost up to where it's gonna go and we hang it with ropes and then we pull a bag over and put the hose in the bag and steam it right there. When it's ready we take the bag off and the clamps are all there and we pick it up and start putting clamps on it and bending it around that shape of frame."

The museum is anticipating a large turnout for the maiden voyage and christening of the new and improved Dove the summer of 2021.



Reconstruction of the *Maryland Dove*

Photo: CBMM

Coping with Covid

Farm-Related Businesses Respond to the Pandemic

---Michael Collins, Nathaniel Kapler, Taylor Smithhisler



Chicken on Newark, MD farm

Photo: Taylor Smithhisler

During the Covid-19 pandemic, some agricultural businesses are thriving while others are dying out. Some have even had to close their doors. The Maryland Department of Agriculture has developed a Covid-19 relief program to assist farmers impacted by the pandemic. Those who

Coping with Covid (continued)

are eligible for aid from the department of agriculture include many agriculture businesses and contract poultry growers. Poultry growers who are eligible for direct payments received \$1,000 per poultry house. This aid is capped at five poultry houses, which are eligible for an additional \$1,500 per house. MDA has been providing this aid to all contract poultry farmers who aren't eligible for the Coronavirus Food Assistance Program (CFAP).

Others get aid from other organizations, such as the Maryland Agricultural & Resource Based Industry Development Corporation Organization. The MARBICO corporation helps the small family-owned farms with grants and loans. They have been continuing to provide Maryland agri-businesses with the resources they need to continue and remain sustainable during the pandemic

The Pandemic Recovery Equipment and Working Capital Loan Fund is one of MARBICO's new programs that assists agri-businesses by providing low interest loans to purchase new equipment. So far they have funded over 705 farm and rural businesses, many of which have just been established by new farmers.

* * *

Some farm-related businesses have been able to thrive during the pandemic, such as Bluebird, a local farmer's market providing produce and other items in Ocean Pines, Maryland. Owner Nancie Corbett said that in the eight years that she has had her business, this year has been her busiest.

She had to make some changes such as selling some items online and offering no-contact pick up from the porch of the Bluebird store.

The open front door allows air to move freely throughout the store, all employees wear masks, and extra cleaning is done to keep

customers safe and healthy.

Corbett said, "I was glad we didn't have to close down as we were considered an essential business. In early spring when the pandemic started, produce items were [the biggest sellers]. I stocked up on them until late spring when supermarkets became more set up to



Bluebird Market storefront

Photo: Taylor Smithhisler

handle Covid-19."

Now Bluebird's best selling items are jams and jellies, eggs, shrubs, rose bushes, and other gardening items. Corbett said, "A lot of people decided to work in their yard because they were stuck at home."

Later in the year, Corbett sold seasonal items such as Christmas trees online and had them delivered to customers' doors.

* * *

Another agribusiness that has been thriving during the pandemic and supporting its local community is Mr. Pepper's Pumpkin Patch in Laurel, Delaware

Pepper's farm has been serving in the area for 80 years. The farm has been passed down from father to son for 3 generations. The current Mr. Pepper has grown up on the Eastern Shore with the rest of his family their entire life.

The primary focus is the annual pumpkin patch, but the farm also features corn mazes,

Coping with Covid (continued)

hayrides, a BBQ pit, and little storefronts for baked goods.



The pumpkin patch

Photo: Michael Collins

Pepper said, "This was a good year for us! The pumpkin patch did better than in previous years. I believe it's all these people kept in quarantine lockdown. Everyone seemed to be looking for a fun & safe activity to do. We followed all safety precautions and protocols for this interesting holiday season."

Pepper and his family also grow corn, soybeans, and grains during the year. Typically their crops will be used for livestock or simple household products.

When it comes to Pepper's prized pumpkin patch, this year they planted the perfect amount of pumpkins. Pepper said, "The first week we opened the patch I was scared we didn't plant enough pumpkins. I saw such an increase in people [compared to] previously. But by the end of the patch season we had only a couple of pumpkins left over. This season was the biggest demand we had for pumpkins in a long time!"

Pepper is proud to show people the farm he has created and wants to share the joys of community agriculture with others. He doesn't like the new protocols and regulations, but he said one thing he does like is the extra money to spend with his family during the holiday season!

* * *

When a couple gets married, it is a very big deal, which means the venue they choose must

be beautiful. Rosewood Farms in Cecil County, Maryland is one of those beautiful places. Rosewood was started in 2017 by Rick Biddle, an entrepreneur in the real estate and restaurant businesses. He sought an opportunity to open a place focused on weddings and events, and that's exactly what he did.

Like many businesses on the Eastern Shore Rosewood Farms has been affected negatively by Covid-19. Weddings and photo shoots for couples, as well as social events for other businesses and corporations, are difficult to host when you have to social distance.

Due to the nature of the pandemic, big events that concentrate a large number of people in one place can simply not happen. There has been a major loss in revenue for this business because of the virus and its restrictions. They remain open, but they have to abide by the regulations set for Maryland.



Inside the Rosewood Farms "Rustic Barn"

Photo: Rosewoodsfarmsmd.com

Rick Biddle's son Matt, Rosewood's construction operations manager, said, "Covid-19 has made it very hard for us to get business. Weddings and events involve lots of people, but with this virus, it is unsafe to operate our business like normal." Nevertheless, he has high hopes for the future of Rosewood Farms.

Triple Threat

Pollution Hinders Bay Cleanup from North to South
----Holly Drury, Kailyne Johlitz



Locked gate at Conowingo Dam

Photo: Kailyne Johlitz

Water in the Chesapeake Bay flows from the Susquehanna River in the north, past the cities of the Western Shore and the farmland of the Eastern Shore, and out into the Atlantic Ocean in the

Triple Threat (continued)

south. Pollutants from six states and the District of Columbia enter the Bay along the way, causing major issues for the overall water quality.

Imagine you and your family have spent the day in Pennsylvania and are heading back to your home in Saint Mary's County, Maryland. While you're driving along the top of Conowingo Dam, you notice an empty soda bottle by the side of the road. It's a windy day, and passing cars stir up the dust. The bottle blows over the side of the dam, heading straight for the water. What happens to that bottle next?



Conowingo Dam from the Cecil County (eastern) side
Photo: Kailyne Johlitz

Conowingo is a large hydroelectric dam in the lower Susquehanna River. The dam sits about 10 miles from the river mouth at the Chesapeake Bay, 5 miles south of the Pennsylvania border, and 45 miles northeast of Baltimore, on the border between Cecil and Harford counties. The dam has a total of 53 flood gates that are opened as needed to let water through to prevent flooding.

Conowingo Dam has collected much of the Susquehanna's sediment and nutrient runoff



Conowingo Dam from the Harford County (western) side
Photo: Kailyne Johlitz

for decades and has stopped it from reaching the Bay. But the area behind the dam has become blocked by silt at an alarming rate. At any time, the sediment can get stirred up by big storms and washed downstream when the flood gates are opened.

If fully implemented, the Chesapeake Clean Water Blueprint will ensure pollution reductions in the Chesapeake Bay by 2025 that will lead to fishable and swimmable waters promised by the Clean Water Act of 1972.

The Chesapeake Bay Foundation's website states that "the blueprint does three things: ensures everyone shares in the responsibility for cleaning up our waterways; sets two-year, incremental pollution-reduction goals, to keep progress on track; and imposes consequences for failure, ensuring states and localities will meet their responsibilities."

According to Jenna Schueler, a water quality research assistant at CBF, "Pennsylvania achieved this milestone (needed to stay on track for the Chesapeake Clean Water Bill) by including pollution limits for wastewater

Triple Threat (continued)

treatment plants in their National Pollutant Discharge Elimination System (NPDES) permits, which regulate water pollution. The Commonwealth continues to cut pollution through the Wastewater Optimization Program, which encourages wastewater plants to make low-cost operational improvements that decrease phosphorus and nitrogen pollution.”

Schueler went on to explain this still isn't enough and Pennsylvania still needs to do more to reduce their pollutants from entering the Chesapeake Bay. She added that “Pennsylvania could require further pollution reductions from wastewater plants, but even the best available treatment technology will not make up for lagging progress in the agriculture and stormwater sectors.

“Pennsylvania and New York must do more to reduce sediment, phosphorus, and nitrogen entering the Susquehanna as required by the Chesapeake Clean Water Blueprint. Pennsylvania is significantly off track in reducing nitrogen, phosphorus, and sediment pollution from both agriculture and urban/suburban runoff. New York is behind in meeting its nitrogen and sediment reduction goals.”

She explained that even though it does not seem directly affected, Pennsylvania has a major impact on the Bay. She also noted that “just above the dam, Lancaster County has major farming and animal waste run-off that comes into the Bay all of the time and is affecting our wildlife species.”

Our attempts to research more specific information about the Conowingo Dam were

unsuccessful. We received no response to an interview request from Exelon, the operators of the dam. We also discovered that, apparently due to COVID-19 concerns, the walking paths and visitor center at the dam are closed, making it challenging to even get near the dam for more investigation.



Sign at the (now closed) Conowingo Dam visitor center
Photo: Kailyne Johlitz

Our plastic bottle, along with other pollutants from upstream, will sooner or later travel from the Conowingo Dam to enter Chesapeake Bay. It might reach a shorefront house or public beach and be picked up by a conscientious citizen. Or it might continue to travel southward.

If it goes far enough, the bottle could make it to Baltimore, where it might wind up being fed to the Wheelabrator incinerator.

The Baltimore Wheelabrator burns a large percentage of the city's garbage. It is the single largest source of industrial air pollution in Baltimore.

The plant, whose smokestack rises above I-95 near the Baltimore sports stadiums,

Triple Threat (continued)

also burns trash from Anne Arundel and Howard counties.



The Wheelabrator from above.

Photo: WJZ-TV

According to the Chesapeake Bay Foundation's website, the plant produced about 1,100 tons of nitrogen oxides (NO_x) in 2016. The outputs can irritate the respiratory system with soot and smog.

A CBF-commissioned study concluded that living near the Baltimore incinerator is similar to living with a smoker. Fine particles from smokestack emissions fall outside the region, causing health problems that can cost up to \$55 million annually. NO_x and other sources of nitrogen cause a chain reaction of algae formation, oxygen loss, fish killing, and other catastrophic effects when it falls into the waters of the Bay.

The airborne contamination totals about one-third of the nitrogen entering the Harbor. It is estimated that Wheelabrator NO_x emissions lead to the deposition of about 47 tons of nitrogen per year to the land and waters of the Chesapeake Bay watershed.

In 2016, Wheelabrator was Maryland's fifth-largest emitter of nitrogen oxides and is only one of many sources of NO_x emissions in the state. The Lehigh Cement plant in Carroll

County (2,700 tons) was the largest producer of NO_x in Maryland in 2016. And unlike the Wheelabrator, pollution regulations are currently not up for renewal by MDE for other facilities.

The Wheelabrator's requirements, referred to as NO_x RACT, had not been updated in more than 20 years until the end of 2018.

A former employee of the Baltimore Wheelabrator who wishes to be unnamed said, "I worked at the wheelabrator for about 10 years. Working there and around all of the contaminants has compromised my health drastically over the years. The smell when you walk in the door is overwhelming."

He went on to explain how over the years, he developed asthma, which he believes is due to the emissions being released by the plant.



Trash on a beach in Baltimore County, Maryland

Photo: Kailyne Johlitz

Triple Threat (continued)

If our soda bottle is still floating southward, it may reach St. Mary's County, the southernmost county on the Western Shore of Maryland. St. Mary's lies between the Potomac and the Patuxent rivers, two of the five substantial rivers feeding into the western half of the Bay.

Because of its unique geographical location, St. Mary's county is surrounded by water on three sides. The county can be a catch-all for pollution flowing downstream from Washington, DC, and Baltimore.

There are numerous waterfront parks, landings, and beaches for recreational use in St. Mary's county. All public landings are managed by St. Mary's County Recreation and Parks. Rec and Parks are also in charge with keeping these areas clean. Since the outbreak of Covid-19, these parks have remained open for limited public use.



St. Mary's Recs and Parks truck

Photo: Holly Drury

John Lowe has worked with St. Mary's County Recreation and Parks for fourteen years. Every Monday and Friday he drives to Abel's Wharf and Piney Point Launch to pick up trash left behind by visitors. Lowe said, "It's not that

hard to clean up after yourself, but here I am again." In the summer season, May to September, Lowe picks up about 5 buckets of trash a day at Abel's Wharf, between the parking lot and the shore line.



Pollution at Abel's Wharf (note the soda bottle)

Photo: Holly Drury

He also picks up 2 to 3 bags of trash each day from Piney Point Launch in the summertime. Lowe said, "The strangest thing I've ever pulled out of the water was probably a full size mattress."

Most of the trash pulled off the shore is recyclable, and Lowe believes that the majority of it is being thrown off of boats and into the water. "It kind of makes the multiple recycling cans on shore seem redundant," he said. The St. Mary's County Health Department is in charge of public beach water quality management. During the summer months, the department reports current water quality statuses regularly from sixteen different beaches in the county.

Early this year there was a local report filed that a county resident found high levels of PFAS (Poly-fluoroalkyl) in a tidal creek near his home. PFAS can be traced to military and

Triple Threat (continued)

industrial sites worldwide. Naval Air Station Patuxent River (PAX) and Webster Field are two waterfront Navy bases located in St. Mary's County. The report came from St. Inigoes Creek, a short distance from Webster Field. Both PAX and Webster Field have used and sprayed fire fighting foam, containing PFAS, in the past. The Health Department sent the report to the Maryland State Department of the environment for further investigation.



Aerial view of PAX River airstrip.
Photo: Southern Maryland News

PFAS is an incredibly harmful, lab-created chemical that is used to make coatings and products that are resistant to heat. It is also found in fire-fighting foam. PFAS does not break down in the environment and easily travels through water, soil, animals, and people. The chemical is known to have adverse health effects for humans and animals such as fertility issues and a decreased ability to fight infections and disease.

Due to Covid-19, access onto these Naval bases is very limited. We were able to speak to an anonymous source from PAX who works for emergency services on base. He said that "all of our trucks (fire trucks) are outfitted with a fire fighting foam which contains PFAS, but we are in the process of phasing it out." To his knowledge, the PFAS foam has not been used

in over fifteen years because it is so damaging to the environment, but has remained on the trucks as a precaution. There are two firehouses on PAX and one on Webster Field.

The state Department of Environment has plans to sample and test St. Inigoes Creek and St. Mary's River for the presence of PFAS when Covid-19 restrictions get lifted. Further action will be taken if necessary.

There are many ways that you and your family can become active in the cleanup of the Chesapeake Bay. Many organizations and local community centers often host clean ups around neighborhoods and parks.

Due to COVID-19, these events are becoming less frequent, but you can still make a change on your own. Once a month, take a walk with your family and collect all items of trash and recyclables you see on your walk.



Maryland Rock at Abel's Wharf Photo: Holly Drury

Triple Threat (continued)

Organizations like the Chesapeake Bay Foundation offer many volunteer opportunities like stream and shore line restoration. Planting native trees and shrubs along the banks of waterways is one of the most effective ways to keep polluted runoff out of streams.

Creating living shorelines with native wetland plants and grasses helps restore habitat for wildlife, capture sediment, and filter pollution. Maryland Department of Environment offers many cleanup and restoration activities that are expected to continue when distancing guidelines are lessened.



Pollution at Abel's Wharf

Photo: Holly Drury

Staff

Previous issues of this magazine have featured a group photo of class members in this space. This time the group photo was not possible because of the pandemic. Instead, enjoy this photo of sunrise near Deal Island.



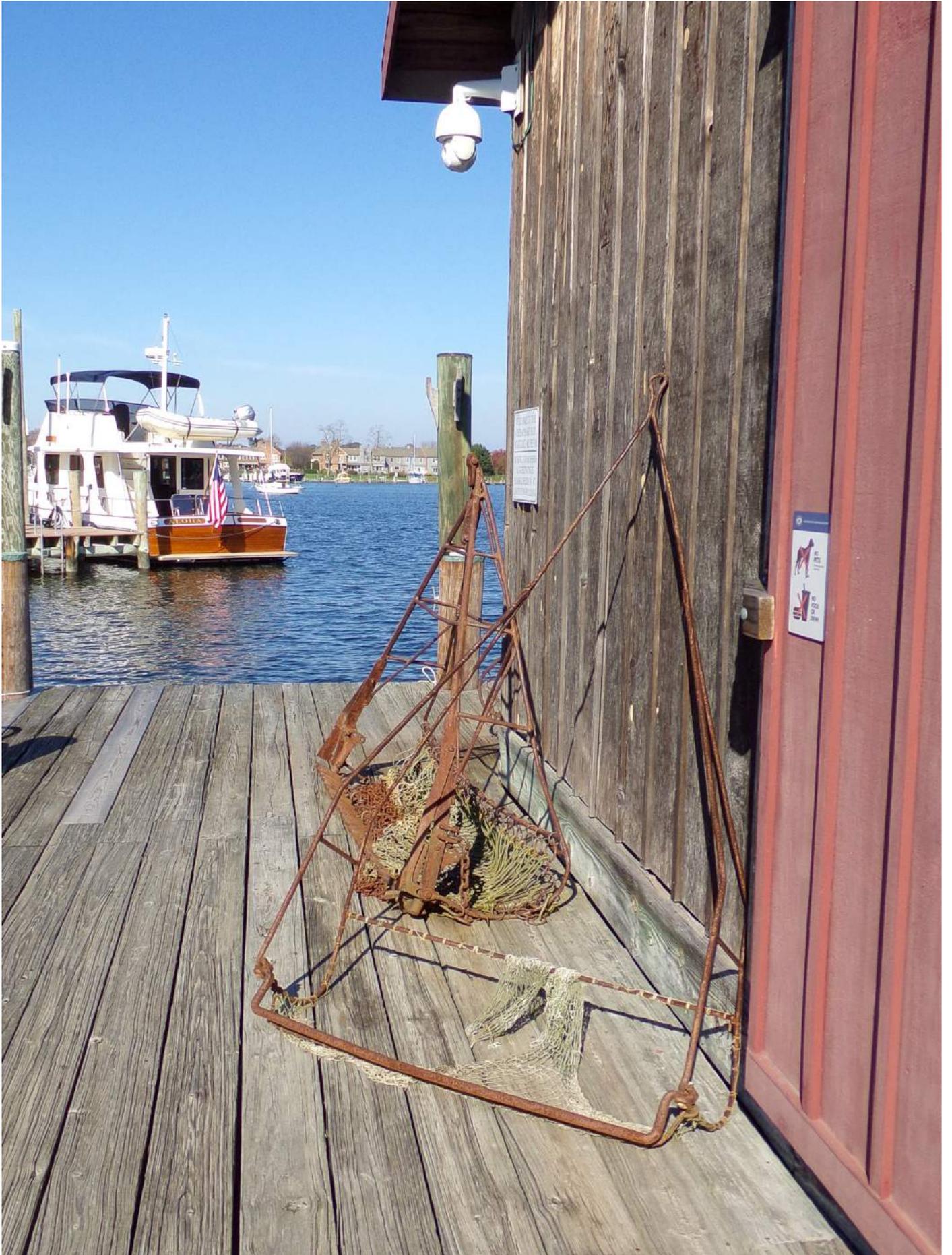
Photo: Luke Butler

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St. Michaels Harbor from the Chesapeake Bay Maritime Museum

Photo: Megan Quesnel