

Chesapeake Stories

The Bay in Words and Pictures



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Ducks, Decoys, and Dogs

Waterfowl Festival Benefits Community and the Bay

---Chris Carson, Caroline Graf, Zack Odachowski



Downtown Easton during the Waterfowl Festival

Photo: Zack Odachowski

The 49th annual Waterfowl Festival took place November 8-10 in multiple locations throughout Easton, Maryland. Festival features included exhibits, competitions, beer and wine tasting, and vendors offering an assortment of local foods.

Ducks, Decoys, and Dogs (continued)

In recent years festival attendance has ranged from 18,000 to 20,000 visitors; approximately 1,500 volunteers are needed to make the festival run smoothly. This year the festival brought in about 14,000 people, according to Margaret Enloe, the executive director.

Created by sportsmen and women, the first festival was held in 1971, and was planned to coincide with the opening of goose hunting season. The festival's website, www.waterfowlfestival.org, offers information on the history, explaining how, "the creation of the Bay Bridge in 1952 made access to the usually isolated Easton Shore easier." Because of this access, the festival was able to grow from just a few vendors to more than a dozen different locations around Easton. The total economic impact of the festival on the surrounding community is estimated to be around six million dollars.

In order to attend the festival, guests must purchase a \$15 ticket ahead of time, or a \$20 ticket at the door. Children under 10 are allowed free entrance, and every guest upon entering is given a complimentary map that helps them navigate the numerous locations of the festival.

Waterfowl Chesapeake Incorporation (WC) is the conservation entity most closely associated with the Waterfowl Festival. Founded in 2011, the corporation's goal stated on the festival's website is to, "create, restore, and conserve waterfowl habitat throughout the Chesapeake Bay watershed and nearby coastal bays by engaging in collaborative, strategic initiatives." This entity is responsible for awarding grants to conservation groups for the funding of conservation projects. The festival's website states that, "more than \$5.7 million in conservation grants [are awarded] to hundreds of projects by more than 50 organizations."



Jake McPherson and David 'T-Bone' Handley of Ducks Unlimited
Photo: Caroline Graf

Ducks Unlimited is one of the non-profit organizations that benefits from the festival's grants. According to Jake McPherson, DU's regional biologist in Maryland, Delaware, and West Virginia, "Most recently, Waterfowl Chesapeake Inc. awarded DU a \$20,000 grant in 2017, which partially funded a 50-acre wetland restoration project at Blackwater National Water Refuge."

Ducks Unlimited has been present at the festival for many years. DU's website states that their mission is to, "conserve, restore, and manage wetlands and associated habitat for North America's waterfowl." At DU's table at the festival this year, there were pamphlets and graphics that helped portray their activities.

McPherson believes that the festival benefits the Bay in several ways as it "helps sustain and perpetuate the waterfowl/water fowling culture that so many Eastern Shore towns had." He also believes that this festival helps

Ducks, Decoys, and Dogs (continued)

keep the Bay and waterfowl at the forefront of people's minds. DU hopes that this attention will help get the community involved in restoration efforts.

The festival also supports educational programs in Delmarva. Two programs that are being supported this year can be found at the Ward Museum and at the University of Delaware. The Ward Museum has classroom visits and other educational opportunities that they will offer to local students through this grant. The University of Delaware has a program that helps connect graduate students with career opportunities in waterfowl ecology.

In addition to granting money to organizations, WC also offers scholarship opportunities for the festival's youth volunteers, who help make sure the vendors have what they need while they are managing their tables. Students pursuing the William A. Perry Scholarship can find the application and details on the festival website.

Another organization present at the festival was the Horn Point Laboratory, part of the University of Maryland Center for Environmental Science. The lab conducts research that includes large-scale restoration efforts for the Bay.

The three representatives for the Laboratory included Prian Esquivel, Gretchen Nnessick, and lab director Suzanne Skelley. Skelley was glad to represent the lab at the festival because organizations like this laboratory, "encourage research entities to educate the public." Horn Point Laboratory offers tours to help educate visitors on water quality, oceanography, coastal resilience, and much more.

The Bay Journal, a monthly publication of news relating to the Chesapeake region, was

represented at the festival by marketing and development director Jacqui Caine. The *Journal's* table had a sign-up sheet for anyone wishing to receive a free copy of each issue.

Since the festival brings in well-recognized carvers and artists from around the country, visitors can find carvings and paintings ranging from hundreds to thousands of dollars.

Richard Clifton, an artist who specializes in painting with acrylics, has been named the 2019 Ducks Unlimited Artist of the Year for the second year in a row. Clifton's winning painting, named "Sunshine Wigeon," was on display inside the Avalon Theater in Downtown Easton. Clifton's website states that



"Sunshine Wigeon" by Richard Clifton
Used by permission of the artist.

Ducks, Decoys, and Dogs (continued)

“he lives on a historic family farm adjoining the Prime Hook National Wildlife Refuge (DE), where he is surrounded by inspiration for his art.”

The festival named local Easton artist Nancy Tankersley the featured artist of the year. Tankersley created a piece named, “Podgin’ for Oysters” as a “homage to the Eastern Shore and the balance between environmentalists and the Watermen who make their living on the water,” according to the festival’s website. Tankersley’s painting was available for sale for \$12,000.



"Podgin' for Oysters" by Nancy Tankersley
Used by permission of Waterfowl Chesapeake

The diving dogs competition (see cover photo) also drew in many visitors. According to *The Star Democrat*, this year the competition attracted about 200 visitors. The dogs during this event attempt to jump as far as possible into a pool of water after their trainer throws something for the dog to retrieve.

Competitors are given four minutes each on the dock, and are allowed to take one practice jump. The longest jump recorded for the dogs is taken for their qualifying score. Guests who stand close enough to the water could sometimes be caught in the splash zone.

Close to the jumping dogs event, visitors could hear the noises from people using duck or goose calls. At the festival there is a calling competition that attracts approximately 600 viewers. Competitors competed for prizes ranging from 5,000 to 12,000 dollars.

The World Waterfowl Calling Championship draws judges from all over the country. The website states that, “our master of ceremonies is Chad Belding, the host of ‘The Fowl Life’ and owner of Jargon Duck and Goose Calls.” Belding got involved in hunting growing up in Nevada, and has gained a true appreciation for waterfowl, much like many of the attendees at the festival.

In addition to that competition, the World Waterfowl Callmakers Championship competition was recently introduced to the festival to complement the original calling championship. The new competition allowed people to showcase their custom-made calls. Judging was based on the fit, or how the call feels, the finish, or how it looks, and most importantly how the call sounds.

When guests got hungry at the festival, if they were in downtown Easton they could find a number of restaurants or stop by a vendor on

Ducks, Decoys, and Dogs (continued)

the street. Guests could find anything from crab cakes, oyster fritters, and soft crab sandwiches to holiday dog biscuit wreaths for dogs. According to festival organizers, “Purchasing from these official food vendors, you are supporting a local non-profit organization in our community, since every food vendor is either part of a non-profit or is donating its proceeds to one—while offering a small percentage to the festival, too.”

The festival also offers two special events, which guests can purchase tickets for ahead of time. “Yappy Hour” is a Craft Beer Tent at Easton’s Elk’s Lodge, and each ticket includes two craft beers and an appetizer. If guests had

a dog with them, they were gifted a bandana and treats so they could enjoy the festivities too. The Elk’s Lodge also sold tickets for a “Sportsman’s Party” where food, craft beer, oyster shooters, and raffles could all be found.

To celebrate the history of the Easton Waterfowl Festival, the Harry M. Walsh Waterfowling Artifacts Exhibit offers a look at the region’s history. Through this exhibit, which took place in the High School, visitors are able to “learn about the evolution of waterfowling, from an economic necessity to the sport of today.” This exhibit contained many vintage decoys and other items from museums and private collectors.



Harry M. Walsh Waterfowling Artifacts Exhibit at Easton High School

Photo: Zack Odachowski

Ducks, Decoys, and Dogs (continued)

Executive Director Margaret Enloe was pleased with the turnout at this year's festival. She hopes that next year will be even better, as it is the festival's 50th anniversary.

In Enloe's press release about the festival, Festival President Kevin Greaney says, "The Waterfowl Festival owes a great deal of thanks to our many corporate, business, and promotional and non-profit partners for their new or continued support this year."

Greaney goes on to mention how the festival is greatly volunteer-run and is very appreciative of everyone who is involved in the process. The festival also receives funding from the Maryland State Arts Council.

Students from Salisbury University could be found at the festival, as many of them drove up to Easton together.

One such Salisbury student, Chris Gibbs,

enjoyed the different vendors and the art that was showcased. Gibbs believes that this festival is beneficial to the Chesapeake Bay because "[the festival] shows people from different places that there are many things to appreciate around the Bay, and how it affects people's everyday lives." Gibbs also said he plans on attending again next year, as he really enjoyed his time there this year.

Another Salisbury student, local Easton resident Jake Conlon, said, "I like attending the waterfowl festival because of the crowds it draws to Easton. Duck hunting is my favorite activity and I enjoy all of the waterfowl art and hunting history behind the festival."

Conlon said that he and his family have made attending the festival every year a tradition, and added that the Waterfowl Festival "benefits the Chesapeake Bay by bringing awareness to critical Bay issues and boasting the local economy that contributes to a lot of Bay awareness."

Common Types of Decoys

Decoys are one of the main components of waterfowl hunting, as they mimic a real flock of ducks or geese, which attracts birds flying overhead. Decoys are made in all species, in different types: field decoys, floating decoys, and motion decoys.



Field decoys are used when hunting over an open field, such as a cornfield. These decoys are usually larger than life-size, and have much larger feet so they do not blow over in the wind.



Floating decoys are used when hunting over water. In the past these decoys have been carved out of materials like wood and cork, but in recent years companies have been making them out of a tough plastic material, making them lighter and less likely to sink. These decoys also have a line with a weight that acts as an anchor to keep them from floating away.



Motion decoys are the most modern type. These decoys come in several different styles, but they all have the same purpose: motion. The MOJO decoy shown sits on a pole and has two wings that spin very fast, making it look like a bird landing.

Photos: Zack Odachowski

Anywhere But Here

Kent County Residents Oppose New Bridge
---Noah Brack, Jack Reaves, Patrick Freeman



Signs in Rural Kent County

Photo: Patrick Freeman

With traffic congestion on the Chesapeake Bay Bridge at an all time high, public officials are looking for alternatives, including the construction of a new bay bridge, introduction of public transportation, and the formation of a third lane on the current bridge. The Maryland Transportation Authority plans to release a

Anywhere But Here (continued)

narrowed-down list of possible alternatives in the coming months, with the final decision being made in December of 2020. One of the possible locations for an additional bridge to be constructed is Kent County.

Kent County officials and local citizens are currently urging the Maryland Transportation Authority to explore other options rather than build in their county.

stay that way." Johnson also said current residents don't want people moving into their towns in droves and acting like they own the place. Their primary concern is not so much "the kind of traffic where you're at a standstill for 2 hours waiting to pay your toll," but the traffic of new development.

Residents are worried that if the new bridge gets built, then more people are going to call the Kent County area home because of easier



Graphic: Kent County Conservation and Preservation Alliance

George Johnson, a resident of Kent County for the past 40 years, said, "We don't need the bridge. We [Kent County Residents] want our small towns and county to remain how they are. Everyone knows everyone and it should

access to the land. They also believe that the more people that call it home, the more companies will want to develop the area, thus leading to even more congestion and drastic changes to the local job market.

Anywhere But Here (continued)

Kent Countians don't want all of this new development because they believe it can easily mess up the 'Shore' vibe. People like coming to the Shore because of the *lack* of development and the pure natural beauty that it has, and facilities and public services that are already overextended during the tourist season will only get worse if a new bridge is built, according to a handwritten letter [sender's name redacted] written to Heather Lowe of the Bay Crossing Study and published in the "Public Comments" section of the Study's website.

Alternatives to a third span could be a middle ground to allow residents of both Kent County other Shore counties to be happy. One possible alternative proposed by some residents would be a ferry. A slow moving boat that carried hundreds of people along with their cars would be helpful, and if ferry services were available, they might be very appealing to older travelers and people with young children. "It could give the younger generation an experience that they may never have anywhere else," said Chestertown resident, Melissa Jones. "Adding a ferry seems to be the most logical to me. I have lived in Kent County for 40 years and would hate to see the population and traffic increase." But ferries were tested in the early 2000's, and in a *Maryland Reporter* article, Heather Murphy stated that ferries "only managed to cut 917 vehicles, less than 1% of peak summer congestion."

A second option proposed to the Maryland Department of Transportation was a railway or transit system connecting Annapolis to Kent Island and /or Washington D.C. to Ocean City. "A rapid transit bus service or rail system could siphon off about 1,250 vehicles from the bridge's eastbound lanes during busy summer weekends," Murphy said, citing a 2007 MDTA report. The cost of such a project may be prohibitively expensive, however. The rail from Annapolis to Kent Island is estimated to cost around \$400 million and D.C. to Ocean City around \$30 billion, according to a *Maryland Reporter* article by Jeremy Cox.

Adding a third lane to the already existing eastbound bridge could be a substitute that could satisfy both sides of the dispute. With another lane added, the bridge would be able to hold more cars and lessen traffic enough so commuters would not have to put up with two-way traffic on the westbound bridge.

Adding on to the eastbound bridge, which was built in 1952, may expose problems such as poor construction and damage that has happened over time that, once repaired, will extend the lifetime of the bridge. Governor Larry Hogan is apparently on board with this option. "There is only one option I would accept: adding a third span to our existing Bay Bridge. This option would maximize congestion relief and minimize environmental impact," Hogan stated on Twitter.



Photo: Patrick Freeman

Farmers Reduce Runoff

Nutrient Management Supports Bay Health

---Brooks Holloway, Dylan Parks, Andrew Southworth



Chicken Farm in Delmar

Photo: Dylan Parks

The Chesapeake Bay watershed supports over 3,600 different species of plants and animals and over 17 million people. It's also home to the workplaces that employ those people, including the multimillion-dollar seafood and tourism industries. In order to keep these industries and the region thriving, the Bay needs to stay healthy. One crucial contributor to the health of the Bay is the control of agricultural runoff.

Farmers Reduce Runoff (continued)

The watershed is home to over 85,000 farms. If left uncontrolled, the runoff from these farms would halt the productivity of the Bay, in essence destroying the vast ecosystem that depends on it.

Nutrient-rich runoff spurs the growth of algae blooms which cloud the water and prevent the growth of underwater grasses that provide important habitat for crabs, waterfowl, and juvenile fish. In addition, runoff feeds algae blooms that deplete oxygen in the water that other aquatic life depends on, creating oxygen-deprived dead zones. Nutrient management plans are set in place to help prevent this runoff from entering the Bay.



Algae Bloom

Photo: MD Dept. of Agriculture (MDA)

According to the University of Maryland Extension website, a Nutrient Management plan is “a document that combines soil test results, yield goals, and estimates of residual nitrogen in order to field by field directions,” for the purpose of “helping producers reduce nutrient pollution by balancing nutrient inputs with plant nutrient requirements, while at the same time optimizing farm profits.” In other words, these plans are formed to use natural plant nutrient requirements to help absorb the excess nutrients so that they do not leave the farm as runoff.

When coming up with a nutrient management plan, six elements are considered: soil tests, maps of all the properties in production, operator records, manure information, tests of compost and other organic nutrient sources, and a tissue test.

After all these elements are analyzed, a nutrient management consultant will come up with a plan that works best for the individual case. Each of the six elements are considered when composing a nutrient management plan, because each one helps show what the land specifically needs. Individualizing the plans enables the amount of nutrient pollution that enters Chesapeake Bay to be more efficiently controlled.

Nutrient management plans are designed in a way that aims for all parties involved to benefit. The plans help farmers maintain the quality of their soil while maximizing their yields and limiting the amount of nutrient pollution in the Bay.

These plans come from the 1998 Water Quality Improvement Act, which directed for nutrient management techniques to be adopted. Some of the techniques listed in the Water Quality Improvement Act include reduction of phosphorus in manure via feed, provisions regarding the transportation of manure to certain fields, and increased record keeping.

Keri Grant is one of the few people on the Eastern Shore who creates Nutrient Management plans as a profession. She serves as a Nutrient Management Advisor and works at the University of Maryland Extension Wicomico County Office. “I give recommendations for nitrogen, phosphorus, potassium, magnesium, and lime, but mostly focus on nitrogen and phosphorus,” she said. All of the excess nutrients the plant does not consume go directly into the watershed, which

Farmers Reduce Runoff (continued)



Keri Grant

Photo: Andrew Southworth

causes a nutrient surplus and often leads to algal blooms. Although many different nutrients are needed for plant growth, according to Grant it is phosphorus and nitrogen that are the leading contributors to the algal blooms occurring in the Chesapeake Bay.

“The nutrient management plans are based on what a crop needs, and what is already in the soil. We use yield goals to calculate what the plant has used, and look at what’s already in the soil to figure out what’s missing,” Grant explained. These personalized crop-specific plans ensure that the minimum amount of fertilizers are used, resulting in less excess nutrients in the watershed. These plans are actually appealing to many farmers, because they are cost-effective as they help the farmer use less fertilizer and maximize yields.

Science has allowed us to effectively measure the amount and type of nutrients in soil and rates of any accompanying nutrient runoff. There are no simple guidelines for these plans because farmlands have different soil types

and raise different crops. People like Grant make these specific recommendations for the farmers, personally and legally.

The plans depend on factors like the size of the farm, how close it is located to a tributary and what natural buffers are already there. Grant said, “I essentially tell farmers, within the regulations, these are the nutrients you are allowed to supply.”



Native Plants in Buffer Zone

Photo: MDA

The amount of fertilizer is not the only thing that Grant is tasked with regulating. Locations where the fertilizer is applied are also regulated. Grant said “Mostly what we’re working with is best management practices, or BMP’s, so that things are hopefully easy to implement like a buffer strip, or saying you can’t apply fertilizer “x” amount of feet from a stream. “This prevents the nutrient runoff that is present from easily slipping into the nearest waterway, by creating a longer path of travel and allowing a greater variety of plants to absorb the excess nutrients.

These practices are not just for farms, either; any landowner can have and is encouraged to have a nutrient management plan. Management plans can be utilized at a corporate and residential level as well as at

Farmers Reduce Runoff (continued)

farms. The plans help any type of business keep their soil in optimal condition, which will improve the overall health of the entire property and the surrounding water systems.



Planning Nutrient Management

Photo: MDA

For residential properties, Grant said, "I think with households, normally the biggest issue as far as nutrient pollution goes is lawns--lawn fertilizers and stuff like that."

She added, "The program is designed to maximize yields and the cost-effectiveness of the fertilizer you buy," all the while prioritizing what is best for the surrounding environment, including the Chesapeake Bay.



Extension Office, Wicomico Co. Photo: Andrew Southworth

Runoff Facts

Each year, plans are written to guide how fertilizer and manure should be applied on more than 2.25 million acres of farmland in the Chesapeake Bay watershed.

Nitrates and phosphates introduced ... from fertilizer runoff during a storm can cause rapid algal growth.

Red tides in coastal areas are a type of algal bloom. Some types of algal blooms can be toxic to humans.

A fish kill of 500 million fish was reported from a red tide in Florida in 1947.

Algal blooms are a characteristic symptom of eutrophication--the excessive richness of nutrients in ... a body of water, frequently due to runoff from the land, which causes a dense growth of plant life and death of animal life from lack of oxygen.

The magnitude of eutrophication reached a high point in the 1960s where Lake Erie, the smallest and shallowest of the Great Lakes, was considered a dead lake.

About 70 percent of the Chesapeake Bay estuary is impaired or polluted, according to the U.S. Geological Survey.

The Chesapeake Bay is on the EPA's "dirty waters" list.

----Chesapeake Bay Foundation

Flooding Threatens Shore

Local Governments Take Action

---Ajay Draper, Max Milligan, Kirk Williams



Flooding on Fitzwater Street, Salisbury

Photo: Max Milligan

Climate change, erosion, poor construction planning, and poorly maintained drainage

Flooding Threatens Shore (continued)

systems all have been blamed for flooding on the Chesapeake Bay region. Since the Eastern Shore has a low surface elevation, it is very prone to flooding--which causes road closures, economic losses, and damage to businesses and homes, leaving residents upset and demanding action.

One local business in Salisbury, Maryland, that has been seeing the effects of flooding is The Ugly Pie bakery. Located on West Main Street near Lake Street in downtown Salisbury, the company has been struggling due to the increased amount of tidal flooding right in front of their door.

The Ugly Pie has been affected by the water in a variety of ways. The building has been flooded on several occasions, which requires the bakery to close down until the flooding stops and the damages are all fixed from the water inside the building. This can cause the business to lose money due to closure time as well as maintenance work to the building.

Much of the blame for the flooding has been attributed to the town of Salisbury itself. Liam Hennon, an employee of The Ugly Pie, said he believes that Salisbury could do more in order to address this issue of flooding, but adds, "I am not sure what they can do."

Companies such as The Ugly Pie and the Brew River Restaurant across the street also have trouble getting access to their places of business due to the flooding. Hennon said, "The flooding causes a lot of [backed-up] traffic. Since I ride my bike, I don't notice it as much, but my co-workers say sometimes they wait very long periods of time to pull out of our parking lot when they are trying to leave."

The flooding and resulting traffic congestion can discourage customers, further harming these Salisbury businesses. Hennon notes that the situation could also potentially lead to injuries when people attempt to drive through



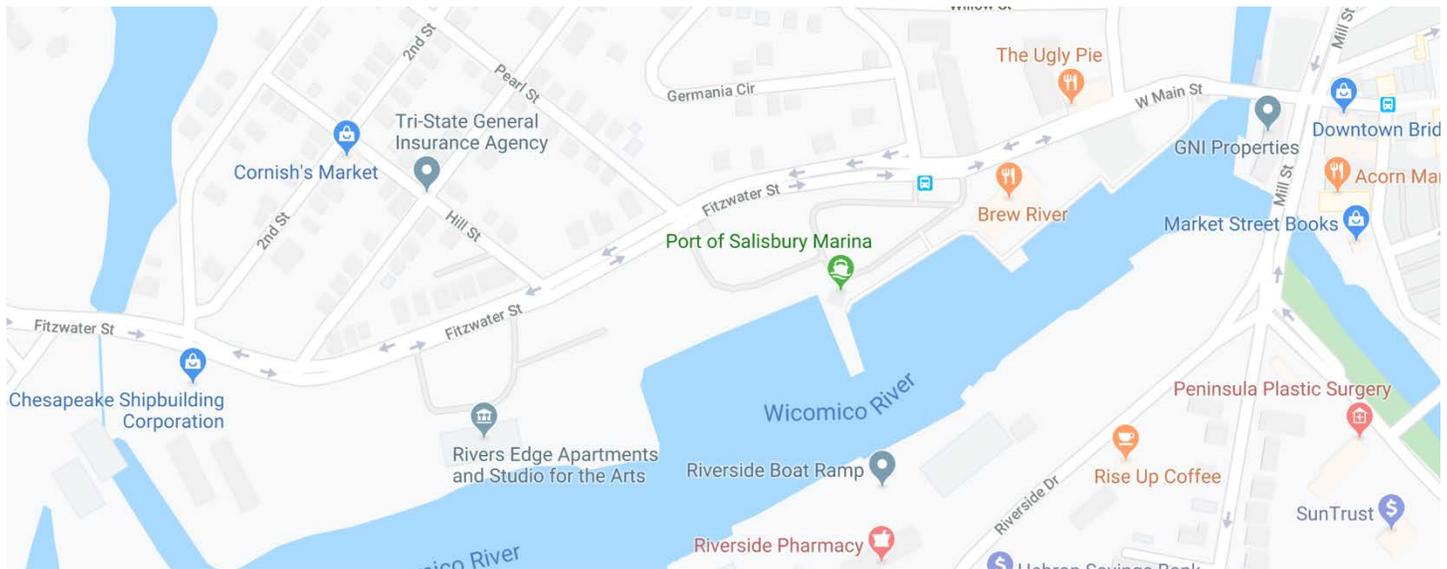
Liam Hennon Working at The Ugly Pie Photo: Max Milligan

the flooded roads.

To address the flooding problem in this area of the city, Salisbury Mayor Jake Day said work has begun on a "two year, six million dollar [project] ... to totally rebuild Fitzwater Street, the second largest project the city has taken on."

The construction will take up to two years to complete, but Day believes the results will outbalance the inconvenience caused by the construction. "[The flooding] 100% affects local businesses," he said, "whether it is because of limited access to the parking lot or people just

Flooding Threatens Shore (continued)



Fitzwater Street and West Main Street, Salisbury

Map: Google Maps

not wanting to drive their car through to eat.”

According to Mayor Day, Fitzwater Street “should have never been placed there and would not have passed today’s regulations to become a street.”

Day says the Fitzwater project will be “tearing up all the water, sewer, stormwater, creating new rain gardens, flooding migration areas, area for flood water to go into to be retained, new pavement, sidewalks, streetscape, ... everything..., totally rebuilding everything.”



Salisbury Mayor Jake Day

Photo: Max Milligan

In addition to high tides, the Eastern Shore’s flat geography and low elevation can also lead to flooding from heavy rainfall. When excessive rainfall combines *with* high tides, the result can be devastating to the environment and cause financial loss and even destruction of roads and buildings.

Flooding is also having negative effects on Chesapeake Bay ecosystems. Flooding can pollute rivers by increasing the amount of harmful materials and chemicals entering runoff. For the city of Salisbury, Day says that asphalt from parking lots and streets is the city’s main issue from flooding runoff that pollutes the Wicomico River.

The City of Salisbury has also been implementing new natural barriers which help keep flooding down as well as prevent

Flooding Threatens Shore (continued)

runoff from going into the river. The good thing about natural barriers is that they are relatively cheap to build since they consist mainly of native plants.



Natural Buffer in Downtown Salisbury Photo: Max Milligan

Flash flooding isn't rare in the region, but Mayor Day stated that there hasn't been any major flooding in downtown Salisbury since the city created a new dam in City Park. When heavy rainfall occurs, the dam restricts the flow of water downstream to downtown Salisbury.

However, this blockage leads to rapidly rising waters in the area of the Salisbury Zoo.

In 2016 the flooding resulted in the death of one of the zoo's main attractions. Zoo employees came in to find one of their oldest animals, a fifteen-year-old alpaca, dead.

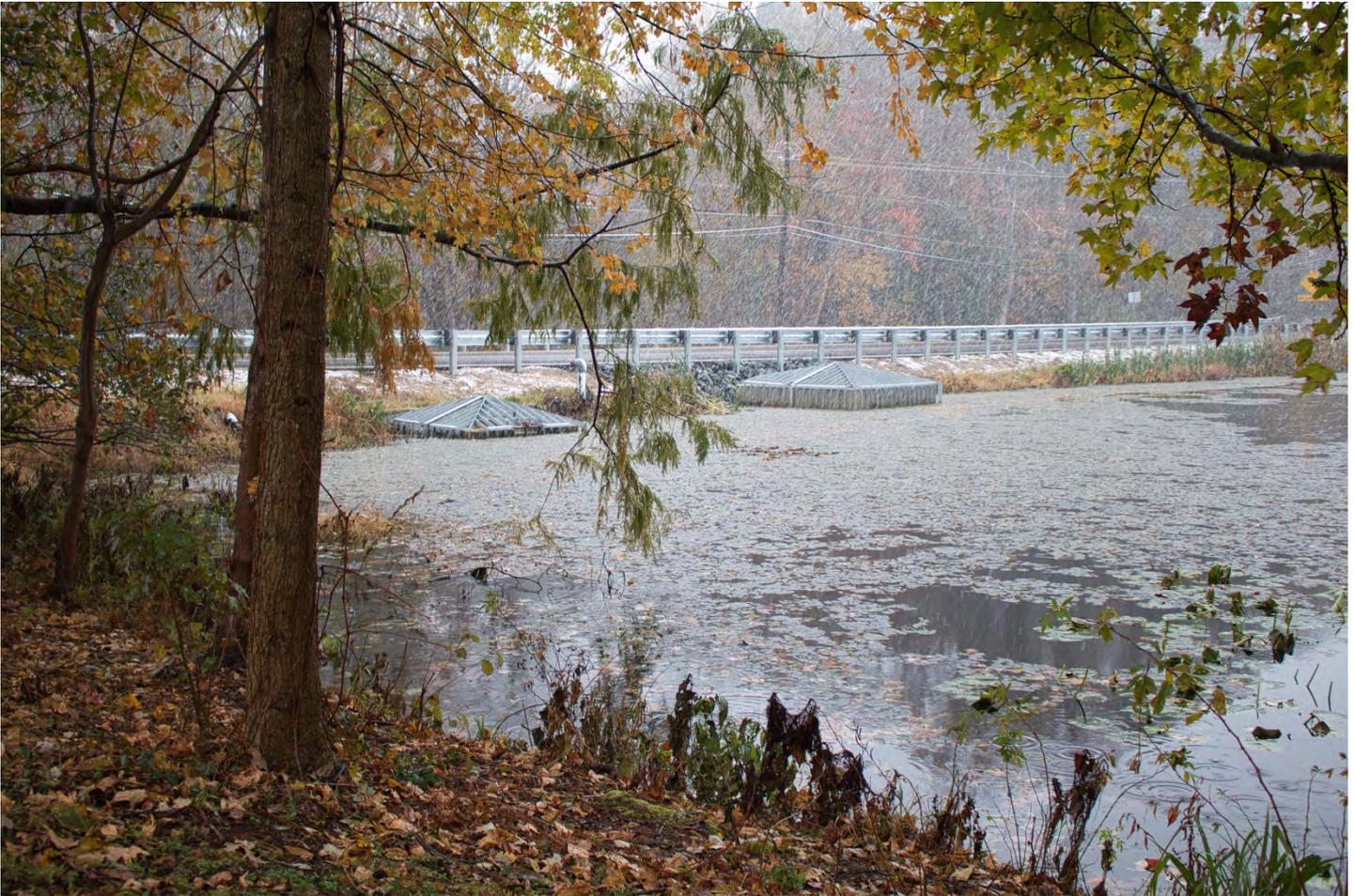
According to WBOC News, an autopsy found liquid in the alpaca's lungs, which led veterinarians to believe that it died because the water levels got too high for the elderly animal to stay above the water. In 2018, the Salisbury Zoo again witnessed an abundance of heavy rain in a very short period of time due to Tropical Storm Michael. That storm caused the zoo to shut down for several days, and again it put the animals' lives in danger.

A zoo that floods just about every year and loses animals due to drowning has high potential to be shut down due to the Animal Welfare Act, which was created to protect the well-being of zoo animals.

In 2018 the government of Wicomico County decided new actions were needed in order to combat the rising number of floods. Dalla Baker, the county's Public Works Director, proposed a new drainage system to reduce the amount of flooding. The project would span three hundred thirty acres throughout the Wicomico County watershed and protect some of the most flood-susceptible areas in the county. The project is set to cost "nearly \$700,000," according to an article in *The Maryland Coast Dispatch*.

West of Salisbury, in 2016, a large section of Nanticoke Road (MD Route 349) at Riawakin Pond washed away during a heavy rainstorm. The state repaired the road over a two-month period at a cost of over \$400,000 only to have the same section wash out again during Tropical Storm Michael in October of 2018. This time the road was closed until May of 2019 while repairs and additional flood control measures were put into place.

Flooding Threatens Shore (continued)



Flood Control Structures in Riawakin Pond at Nanticoke Road

Photo: Max Milligan

Flooding problems can sometimes be hard to solve because their sources are controversial. Earlier this year, environmental journalist Tom Horton teamed up with Dave Harp and Sandy Cannon-Brown to make the documentary, *An Island Out of Time*, inspired by a book that Horton wrote in 1996 about his experiences living on Smith Island, a community of nearly 200 people about ten miles west of Crisfield in Tangier Sound.

Over the last few decades, many areas of Smith Island have been permanently flooded. Today, some of the older members of the community can barely recognize parts of the island, due to alterations to the land caused by the surrounding water. When the film was premiered in Salisbury on March 6th, 2019, one Smith Islander who attended told the audience

that his community does not believe in climate change or sea level rise, and that they attribute all of the changes on Smith Island to the effects of erosion.

Scientists, however, are expecting the water level of Chesapeake Bay to increase as much as 2.1 feet by the year 2050 due to human-caused climate change. According to Michael Scott, director of the Eastern Shore Regional GIS Cooperative, "The Chesapeake Bay region is one of the places that is ground zero on the planet for sea level change."

After Louisiana, Maryland is expected to have "the second highest number of communities that will experience chronic inundation from flooding," according to a 2017 report from the Union of Concerned Scientists.

Flooding Threatens Shore (continued)

Floods Push Saltmarsh Sparrow Toward Extinction

Humans are not the only creatures dealing with the effects of flooding in the Chesapeake Bay region. The Saltmarsh Sparrow is a bird species that is native exclusively to marshland ecosystems along the East Coast. The Saltmarsh Sparrow uses areas in the Chesapeake Bay as breeding grounds.

Rising sea levels caused by climate change are flooding Saltmarsh Sparrow's breeding nests. According to the New York Times, over long periods of high tides, newborn Sparrows drown in their nests. This is happening frequently to Sparrows; in fact, as reported in *The Auk*, researchers found that 82% of a population of almost 200 Sparrow nests had experienced fatal nest flooding.

For animals like the Saltmarsh Sparrow, flooding from rising sea levels is happening too rapidly for many individuals to adapt for survival, resulting in population declines. One study reported in *The Condor* suggests "that Saltmarsh Sparrows are likely to become locally extinct over the 42-year modeled time period." It's possible the species may save themselves by relocating to new habitats like they have done in the past; however, the Saltmarsh Sparrow might be the first bird species to go extinct "as a direct result of rising sea levels."

Losing biodiversity from flooding will hurt the vitality of Chesapeake marshlands, an ecosystem that provides many benefits to humans including water filtration and erosion control.



Credit: nebirdsplus via Flickr

Saltmarsh Sparrow

Photo: PBS Nature

Profile: Blackwater Refuge

Marsh Habitat Endangered by Tide and Invasives

---Sophia Durán, Ben Law, Jaden Ross



Wetlands at Blackwater Refuge

Photo: Jaden Ross

As the landscape of Blackwater National Wildlife Refuge changes over the decades, so does the battle to preserve its ecosystem. The Refuge consists of 28,000 acres of tidal marshes, pine forests, freshwater wetlands, and croplands.

Profile: Blackwater Refuge
(continued)

The Refuge's Visitor Center provides informational displays and brochures on subjects ranging from seasonal waterfowl to the native flora and fauna.



Blackwater Refuge Visitor Center

Photo: Ben Law



Displays in the Visitor Center



Photos: Sophia Durán

Profile: Blackwater Refuge (continued)

Tom Miller, a ranger who has worked at the Refuge for 18 years, has noticed changes over the past decades such as the death of trees along the edges of the water. The trees begin to degrade and then disappear completely.



Ranger Tom Miller

Photo: *The Kent Island Bay Times and Record Observer*

Along the Wildlife Drive, Miller described the forest as a “ghost forest.” Miller said the changes experienced at the Refuge are larger than climate change events. He explained how land subsidence and invasive species contribute to changes throughout the Refuge.



“Ghost Forest”

Photo: Jaden Ross

“[It’s] more complex than just the sea level rising,” he said.

Due to the construction of roads and manipulation of the land, the overall hydrology of the Refuge has been affected. “Destruction of the marsh changes the makeup of it,” explained Miller. The increase in impervious surfaces and land changes delays the retreat of flood waters; therefore, increasing the amount of saltwater intrusion in the wooded areas.



Fragmentation of the Marsh

Photo: Jaden Ross

Not all hope is lost, though. the Refuge has made many efforts to try to improve the health of the ecosystem. For example, water quality has decreased across the Chesapeake Bay marine region and thus, many grasses have disappeared. However, the Refuge tries to improve the water quality of the Bay in order to bring back the marine grasses.

“Marshes will do very well once you plant grasses... but you need money,” said Miller.

A lot of factors have caused changes throughout the Refuge. “So many changes [in Blackwater] it’s hard to tell what changes are manmade and what’s natural,” said Miller.

It takes the participation of many individuals to sustain the current health of the Refuge. The

Profile: Blackwater Refuge (continued)

biologist on staff, Matt Whitbeck, specializes in invasive species, and can more closely monitor the ecological effects caused by them. The Common Reed, *Phragmites australis*, has been taking over the marshes of the Chesapeake Bay for years.



Phragmites

Photo: USDA

The Refuge tries to preserve as much natural habitat as possible, but a big problem on the refuge is that when the trees die back, the invasive phragmites moves in. The phragmites “pushes out native species,” which contributes to the loss of biodiversity throughout the Refuge. It contributes to biodiversity loss and impacts the health of the wetland habitats. “[The] only benefit of [phragmites] is it holds soil in place,” said Miller.

The nutria, a non-native rodent, has also contributed to the destruction of the marsh. Nutria were first introduced to Maryland in 1943 during the fur trade. The nutria has no natural predators and reproduces at a rapid rate; therefore, the Refuge has had a difficult time eliminating the nutria. Nutria feed on marsh plants, as well as the plant’s roots, damaging the plant’s ability to regrow.

Although some invasive species have harmed the ecosystem, others have been at least

somewhat beneficial. At the Refuge, the sika deer, originally native to southern Japan, has been integrated into the environment. The sika deer is a “big [component] of the economy,” according to Miller. Hunting sika deer has become quite popular because of the uniqueness of the trophy, the flavor of the venison, and the challenge of hunting this wary prey. Since the deer causes no ecological damage and adds to the local economy through hunting, the Refuge has not taken action to eliminate the animal.

According to Miller, the main goal of the Refuge is to “preserve as much as possible,” and to prepare “for where the marsh will be down the road.” “[The Refuge] tries to target areas that we would like to buy, areas where the marsh could migrate to,” he said. “Marshes close to sea level are very sensitive to little changes.”

Educational tours at Blackwater allow individuals to learn about the environment and experience the natural world. According to Ranger Michele Whitbeck, “We have folks that help with our environmental education program. We get all fourth and sixth grade students in Dorchester county to come out to the Refuge, and they use the Refuge as an outdoor classroom.”



Ranger Michele Whitbeck

Photo: Ben Law

Profile: Blackwater Refuge (continued)

Friends of Blackwater

According to the Friends of Blackwater website (<https://friendsofblackwater.org>) the program was established in 1987 as a nonprofit support group for assisting Blackwater National Wildlife Refuge. The goal of the program is to help achieve their educational, interpretive, and public use missions.

According to Ranger Whitbeck, there are around 150 to 200 volunteers that help out at the Refuge. Whitbeck spends most of her time coordinating volunteers. “We do have a lot of folks helping behind the scenes, helping do some wildlife monitoring, bird surveys, nest box monitoring [and] habitat restoration work,” she said. “We’ve done some tree plantings lately and some pollinator plantings.”



Volunteers Sue Fischer and Reenie Rice

Photo: Ben Law

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