

A woman wearing a white cap and a brown shirt is crouching on a wooden dock, holding a fishing line. A young boy is sitting next to her, also holding a fishing line. They are on a river with a large brick house and a dock with white chairs in the background. The water is calm and blue.

Midshore Rivers Report Card 2014

Executive Summary

Nature is loved by what is best in us.

Ralph Waldo Emerson

Midshore Riverkeeper Conservancy (MRC) is pleased to release our fifth annual River Report Card, produced through our Water Quality Monitoring Program. As part of this program, over fifty volunteer Midshore Creekwatchers sample and test from over 100 strategic sites monthly. These volunteers also serve as our eyes on the river, alerting MRC to pollution issues that need to be addressed. Additionally, our Riverkeepers and staff patrol our rivers every week collecting data and observing trends.

In 2014 we added a bacteria testing component to our program. MRC undertook that responsibility because neither our local or state governments test our rivers for bacteria where swimming is frequent. We chose a dozen sites frequented by swimmers and bathers and tested those sites monthly, as well as after major rain events. We then posted the results on our website under our Health Alerts tab. We intend to continue this practice in 2015.

The data we collect and analyze is essential to accurately understand the pollution trends in our tributaries, to identify the sources of pollution that threaten river health, and to support policy advocacy and pollution-reducing solutions throughout our watersheds. At MRC we don't just collect and observe. We act on this data to reduce pollution.

One aspect that stands out from our five years of testing is that the farther we travel up our rivers, all of our rivers, even beyond the tidal zones, the worse the water quality becomes. This is illustrated in the graphics displayed over the next few pages. What this tells us is that the pollution in our rivers is coming from the land use within the watershed; it is not coming from the main stem of the Bay, or from northern rivers. To make real improvements in water quality, we need to curtail the pollution that is coming into our rivers from the land, from our communities, from all of us. That is what MRC is working to achieve!

Thank you for your support!

Tim Junkin



Cover photo and photo competition winner: Tracey Munson

A Year of Projects and Education

This past year MRC completed various different remediation projects throughout our watershed to help clean up our rivers. Our education program continued to expand and engage more students in Talbot, Queen Anne's, and Dorchester Counties. Through this program, with the help of 600 high school students, MRC planted 4,000 trees in critical stream side (riparian) habitat. These trees will both absorb nutrients and create more habitat for the critters that call our Midshore home.

In the Wye River watershed MRC collaborated with Queen Anne's County to develop projects on public land that will help slow down runoff, create wetland habitat, and help stop nutrients entering our waterways. More projects are in development at Chesapeake College as well as on other properties that border our waterways.

MRC partnered with the Town of Easton to create a wetland in RTC Park planted with native trees and shrubs. This project was funded by the Chesapeake Bay Trust and involved 25 2nd graders who were taught the importance of wetlands by our MRC educators. If you walk around town you may notice small plaques placed on storm drains that say "drains to river." These indicate places where MRC installed 255 storm drain filters that help stop oil, trash, and phosphorus from escaping through our sewer system. There are more projects planned for 2015 that will be placed on public land throughout town.

In the Choptank River watershed MRC continued to expand its agricultural outreach, building three new woodchip bioreactors, one in Caroline County, and two in Talbot County. The two bioreactors in Talbot County represent the first woodchip bioreactors that tie into ditches in Maryland. MRC is expanding the application of this best management practice to more areas in our watershed and throughout the Chesapeake Bay. Recently, for example, Talbot County sent out bid requests to construct two "in-ditch" woodchip bioreactors in the watershed.

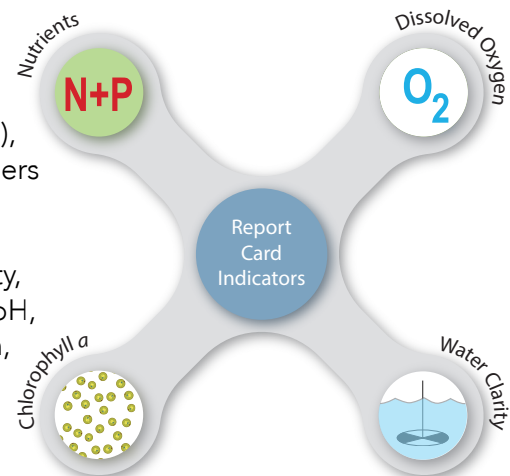


Grading our rivers



Our data was collected by our Riverkeepers and scientists and over 50 Midshore Creekwatchers (acknowledged on the next page), who are trained by our Riverkeepers in methodology and protocols.

Our testers measured water clarity, dissolved oxygen, temperature, pH, salinity, and sampled for nitrogen, phosphorus, and chlorophyll a. Observations of flora and fauna were also recorded, and unusual occurrences or observable sources of pollution were reported to our Riverkeepers.



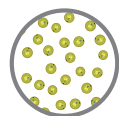
Nutrients, such as nitrogen and phosphorous, are essential for development of all organisms. Nutrients naturally enter our waterways through the atmosphere and soil, but human activity has caused excess nutrients to enter our rivers. Primary sources include agricultural fertilizers, lawn fertilizers, septic systems, and wastewater. Excess nutrients cause excessive growth in algae and declines in dissolved oxygen concentrations.



Oxygen is essential for life and is a key indicator of ecosystem health. Underwater, oxygen is found in the form of dissolved oxygen and without it, aquatic wildlife can become stressed or die. Low levels of oxygen in the water are most often a result of eutrophication: excess nutrients in the water, causing excessive algae growth. As the algae die, decomposing bacteria deplete the available oxygen.



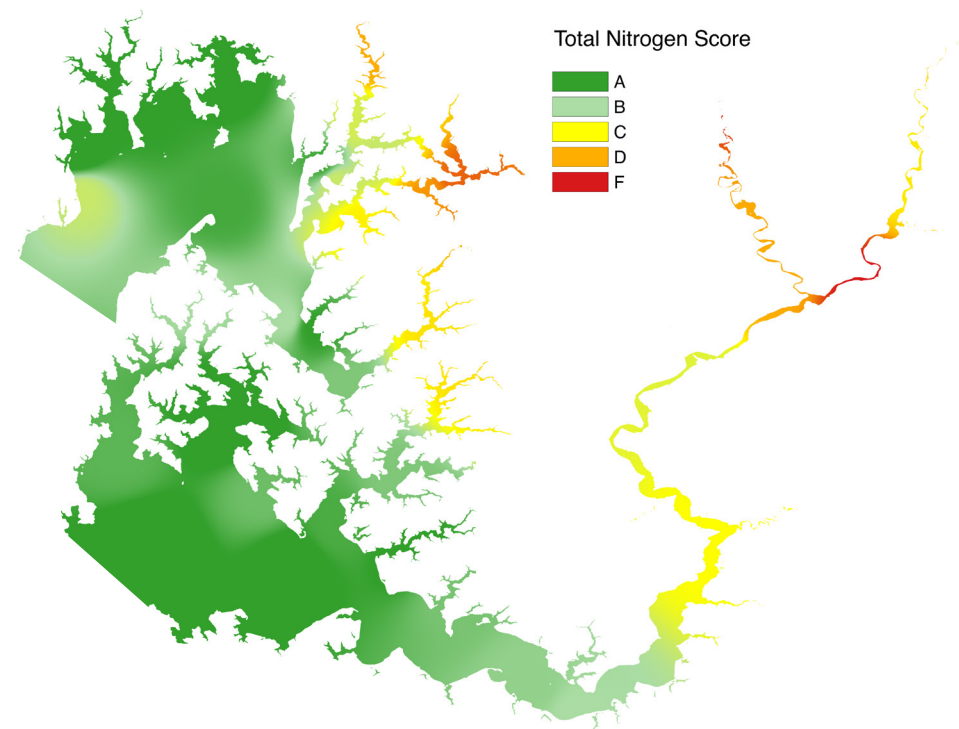
Clear water is essential for the life of underwater grasses. Sunlight must be able to reach these plants in order for them to grow. Our rivers become murky when excess nutrients and sediments are washed into the waterways and fuel algae growth.



Chlorophyll is the green pigment found in all plants that use the sun for photosynthesis. Measuring the amount of this pigment (as chlorophyll a) in our rivers measures the amount of phytoplankton present. When fed by excess nutrients, phytoplankton can quickly bloom, blocking out light from reaching underwater grasses and leading to oxygen depletion. The best way to reduce the amount of phytoplankton in our rivers is to minimize the amount of nutrient pollution entering our waterways.

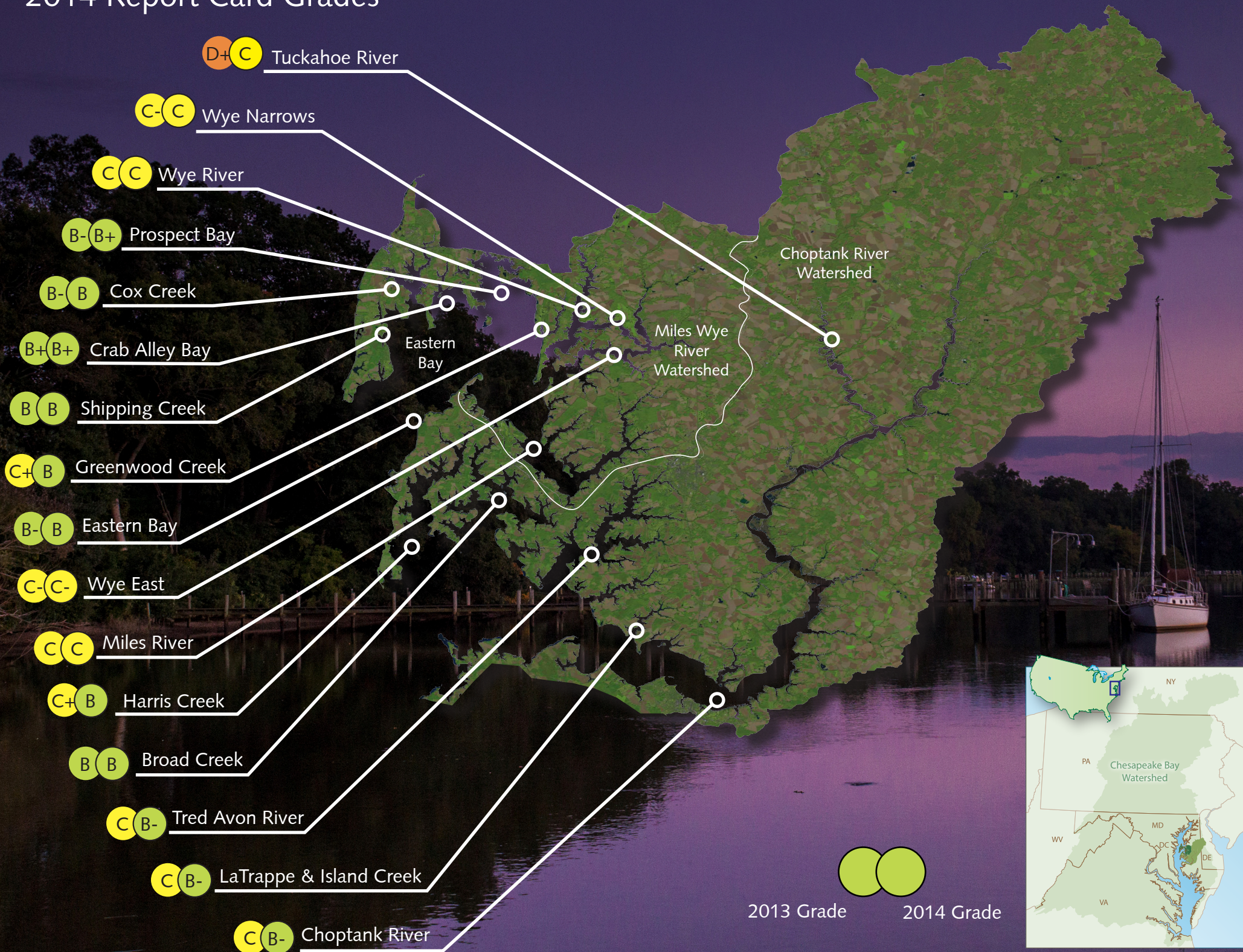
What did our indicators tell us?

The map below clearly demonstrates that as we move up our rivers the water quality gets worse. This can be attributed to run-off from the dominant land-use, agriculture. This is why MRC focuses its efforts on working with the agricultural community to reduce its polluted run-off.



MRC thanks our Midshore Creewatchers:
Dick Bemis, Mike Bilek, Maura Bollinger, Roger and Jane Bollman, Bruce Boyd, Rick Brandes, Tony and Betty Brunetti, Andy Coombs, Peter Dunbar, Roger Galvin, Brice Gamber, Dennis and Nancy Greene, Barry Gillman, Peter and Susan Hale, Janet and Jay Harford, Joe Jelich, Ron and Annabel Leshner, Lois Lindsley, Sue and Tom Marquardt, Mel and Marlies Mraz, Brian O'Hare, Carmen Perry, Bob Petizon, George Strother, Kevin Sullivan, Mario and Elaine Tama, Buck Waller, Bob Wolfe, Karen and Bud Wood, Earle Young.

2014 Report Card Grades



Miles and Wye Rivers and Eastern Bay

The 2014 sampling season had its share of highs and lows throughout the Miles, Wye, and Eastern Bay. As with many of our monitoring stations, Creekwatchers were surprised by the generally good water clarity. One station on the outer portion of the Wye River main stem recorded a water clarity depth that exceeded 8 feet! Despite the good water clarity, other monitoring sites along the main stem of the Wye River experienced multiple low bottom dissolved oxygen events (< 3 mg/l) as well as an increase in nitrogen pollution. This again caused the Wye River, Wye East, and Wye Narrows to have the poorest water quality of any of the tributaries we monitor. Additionally, the trend over the four years of data collection has been of declining water quality on the Wye River. The mainstem of the Wye has declined from a B to a C and the Wye East from a C to a C-.



The 2014 season saw the Miles rebound from 2013, with the largest improvements coming from phosphorus and chlorophyll a concentrations. Both indicators scored a 50% improvement over last year. Nitrogen was slightly better than 2013 (10% better), but was still very high in the upper reaches of the Miles River. Water clarity and dissolved oxygen did not show much change from last year, but as with many of our tributaries, our Creekwatchers commented on the good water clarity at some monitoring locations. Unlike the Wye River, the Miles has improved from a C- to a C over the last 4 years.

Eastern Bay, Cox, Greenwood and Crab Alley Creeks all scored B or better and had some site-specific high clarity readings as well last summer. Over the last three years of testing, Eastern Bay and the Creeks have displayed stable and moderately good water quality.

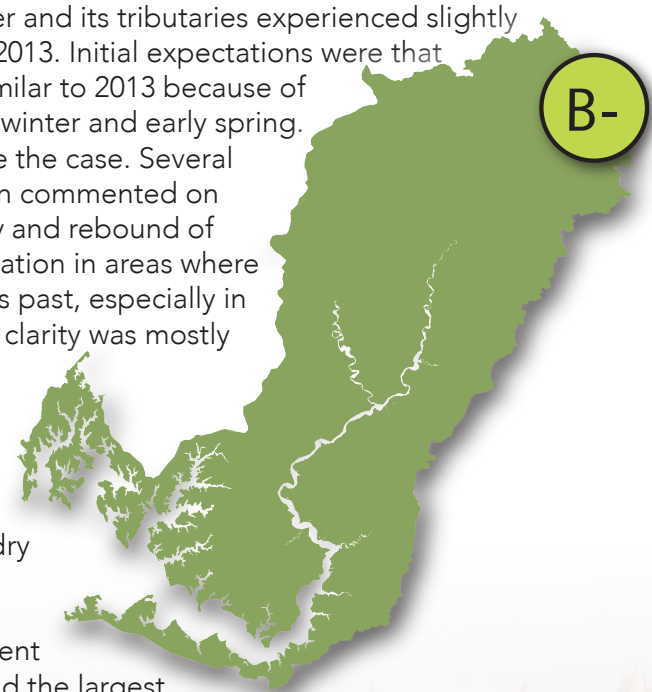


Jeff Horstman
Miles-Wye Riverkeeper



Choptank River

In 2014 the Choptank River and its tributaries experienced slightly better water quality than 2013. Initial expectations were that water quality would be similar to 2013 because of the wet conditions in late winter and early spring. This did not turn out to be the case. Several of our Creekwatchers even commented on the improved water clarity and rebound of submerged aquatic vegetation in areas where it has been absent in years past, especially in Island Creek. Good water clarity was mostly observed in the lower portions of our tributaries and the mainstem of the Choptank River. This is an encouraging sign, but could be due to a rather dry spring - autumn period.



When assessing the different indicators, phosphorus had the largest improvement, with all the tributaries having better phosphorus levels than in 2013. Broad Creek, the mainstem of the Choptank River, and the Tred Avon had the best phosphorus levels since testing began at MRC in 2011. Nitrogen also had improvements in all the tributaries except the Tred Avon River. As with previous years, stations further upstream had worse water quality. This demonstrates that the source of the pollution is the surrounding land, rather than the Chesapeake Bay. The Tred Avon and La Trappe and Island Creeks experienced low bottom dissolved oxygen events in July and August (below 3.0 mg/l) at upstream monitoring stations. This is a common occurrence during summer as water temperature increases and algae blooms proliferate. As with last year the Tuckahoe had the worst water quality of any of the areas we monitor in the Choptank watershed. Even with these very poor water quality events, there were many encouraging signs this past year, and we hope that the positive trend continues for years to come.

Tim Rosen
Watershed Scientist



Photo credit: David Harp

Are our waters safe for swimming?

Every year in the USA, 3.5 million people get sick after swimming in water containing harmful bacteria (pathogens), according to an Environmental Protection Agency estimate. Pathogens can be found in our rivers, and these pathogens pose a human health risk. The bacteria we sample, Enterococci, indicate the presence and concentration of pathogens, which may cause human illness. They come from a variety of sources, including failing septic systems, sewer overflows or leaks, pet waste, manure, and livestock. During significant rainfalls, the possibility always exists for elevated and unsafe bacteria levels.

In 2014, MRC undertook bacteria sampling for Enterococci along recreational locations in the Miles, Wye and Choptank Rivers and Eastern Bay. There were 12 sites tested in total. Each site was sampled monthly from June to September.

We will continue bacteria testing in 2015 in the sites that had borderline or bad results. These include: Tunis Mills Bridge, St Michael's Harbor, The Strand – Oxford, Wye Landing, Windy Hill Landing and Drum Point. The Strand, Oxford was the only site to exceed 104 cfu/100 mL (levels dangerous to health) and this was only once out of the 4 monthly samples.



Critical species

In addition to the physical and chemical parameters that we at MRC assess, another important indicator of stream health is the wildlife dependent on the habitat. On the Midshore, five representative iconic species that are of concern are blue crabs, oysters, American shad, and striped bass. These species were once prevalent in the Choptank River and throughout the Chesapeake Bay, but have all diminished due to habitat loss, overharvesting, pollution and disease.



American shad

American shad once comprised one of the most valuable finfish fisheries in the Bay. In an effort to restore the decimated populations, the shad fishery has been closed, and efforts to install fish ladders and improve habitat have helped shad recovery. Despite modest recovery in the Chesapeake Bay, shad recovery in the Choptank is still slow and sporadic.



Blue crab

The Chesapeake Bay blue crab stock is currently depleted. Approximately 68.5 million female adult (age 1+) crabs were estimated to be present in the Bay at the start of the 2014 crabbing season. This number is below the recommended target and just below the recommended threshold number of 70 million female spawning-age crabs. The estimated abundance in 2014 was lower than observed in 2012 and 2013.



Oysters

Habitat loss, disease, and historic over-harvesting have reduced Bay oyster populations to less than 1% of historic levels. Yet, with diseases MSX and Dermo at below-average levels, oyster survival rate has risen to 92% in the past year. As a result, oyster harvests have rebounded as well. In the Choptank they are the highest they have been in the past 10 years.



Rockfish

Striped bass, also referred to as rockfish, are the top recreational sportfish and one of the top predatory species in the Chesapeake Bay, which is the largest striped bass nursery on the Atlantic Coast. After recovering from a fishery collapse in the 1980s, the fishery stabilized. However, concerns about rockfish health remain. Mycobacteriosis, a slowly progressing bacterial infection, results in a variety of external and internal symptoms including skin lesions, stunted growth, inflammation, and tissue destruction. According to the Maryland Department of Natural Resources and the Virginia Institute of Marine Science, more than 70% of striped bass in the Chesapeake Bay may have this disease.



Midshore Riverkeeper
Conservancy
24 N. Harrison Street
Easton, MD 21601
443 385 0511

The issue

What can you do?

Fertilizer is rich in nitrogen,
major source of pollution.



Reduce lawn fertilizer. Plant
with native grasses to create
natural habitats and a healthy
lawn.

Oysters, which filter pollution
and create important
habitat, are in decline in the
Chesapeake Bay.



Participate in oyster restoration
efforts. There are several
opportunities to raise juvenile
oysters at your home that can be
added to local sanctuary reefs.
Ask MRC for details.

The health of our rivers will
never improve without the
support of our community
leaders.



Engage with your county and
state political leaders. Email
them, write them, call them, and
tell them relentlessly that you
want them to support clean water
initiatives.

Inadequate pump-out
systems on our rivers
result in thousands of
boats discharging waste
into our rivers.



If you are a boater, only discharge
your waste into pump out
facilities. Never discharge in the
river.

Water quality and
habitat in our Midshore
rivers are degraded.



Support, donate to, and
volunteer for a local watershed
organization. Midshore
RIVERKEEPER® Conservancy
has opportunities to help from
water quality monitoring to
administrative/office support,
letter writing, fundraising event
assistance, oyster restoration,
education, and legislative
engagement.