

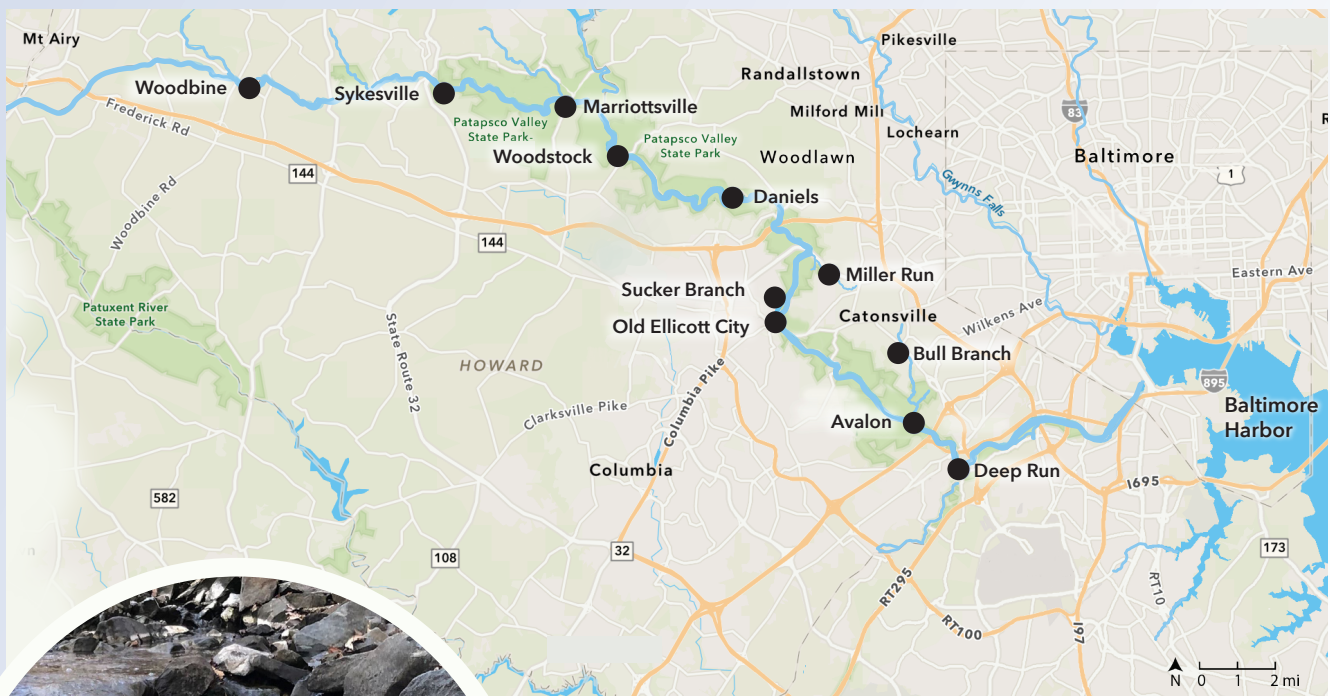
Non-Tidal
Patapsco River
2022 Report Card



About Patapsco Heritage Greenway

Patapsco Heritage Greenway (PHG) is a nonprofit organization dedicated to preserving the natural and cultural value of the Patapsco River and its valley. The Patapsco River gained economic significance in the 1700s because of its rich iron deposits, but with industrialization came environmental degradation. Patapsco Heritage Greenway was founded in 1980 with aims of both environmental stewardship and appreciation of the area's rich history. The Patapsco Valley is a certified Maryland Heritage Area, a designation by the Maryland Historical Trust that supports collaboration between individuals, nonprofits, businesses, and governments to protect the region's environmental and historical value. Through its management of the Patapsco Valley Heritage Area, PHG is working towards a river valley of protected lands where the public can experience and appreciate the Patapsco's natural beauty and heritage.

The waters of the Patapsco are vital to both the environment and the communities within its watershed. Monitoring the Patapsco's water quality gives us valuable information for long-term planning, including identifying pollutants, protecting human health, and ensuring that the bugs, fish, frogs, and other plants and animals that call the Patapsco home are able to thrive. In April 2021, PHG began collecting water quality data on the river and its tributaries. Since September 2021, PHG has monitored 11 sites from Woodbine to Elkridge, twice a month. Parameters include air and water temperature, dissolved oxygen, pH, conductivity, nitrite, phosphorus, turbidity, and *E. coli* bacteria counts. Twice a year biological data are collected on the benthic macroinvertebrate community. This report card focuses on four parameters: bacteria, conductivity, turbidity, and biology. The data are publicly available at the Chesapeake Monitoring Cooperative's Data Explorer website.

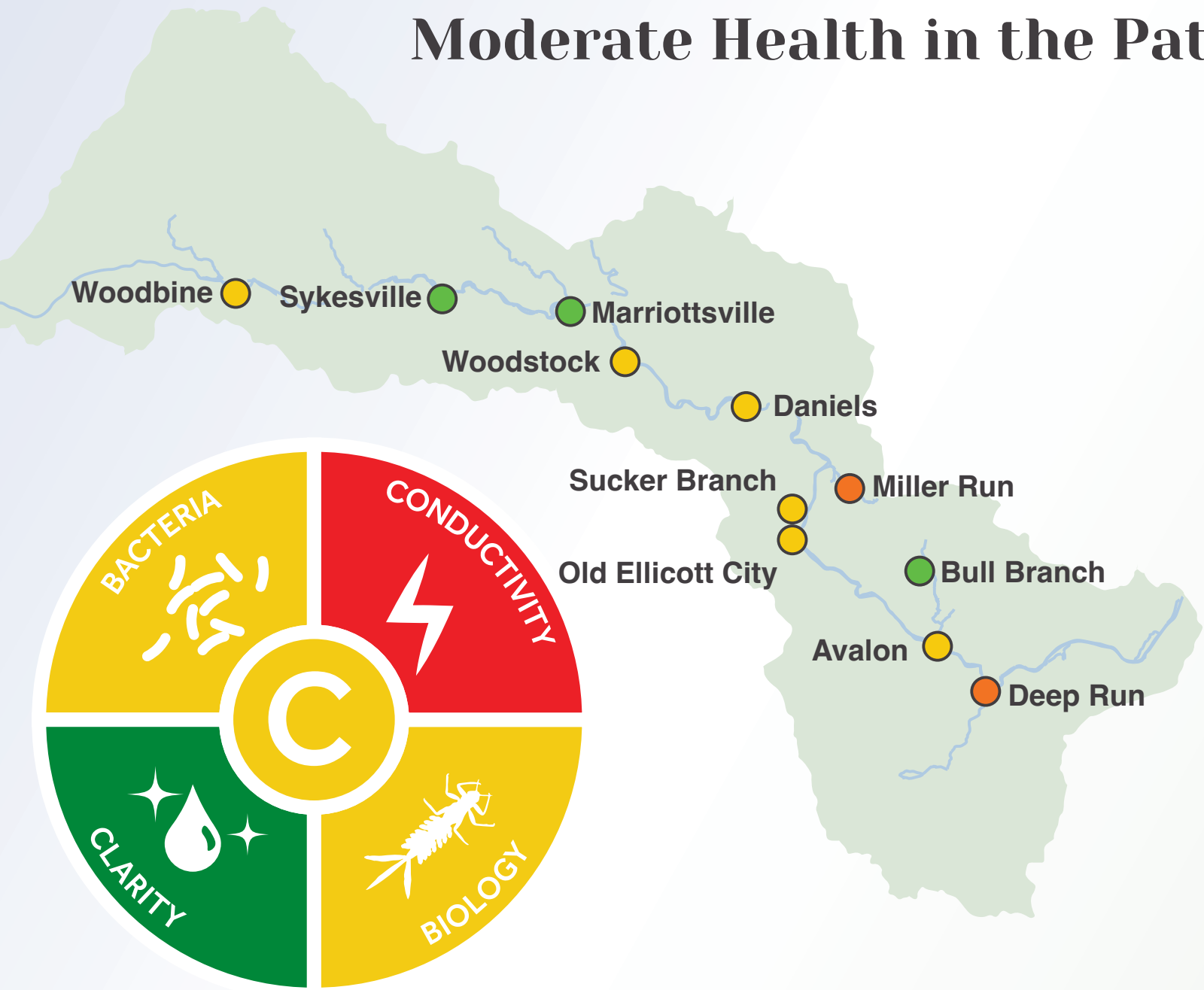


Locations of monitoring sites along the Patapsco.



High conductivity levels are plaguing streams around the region and the country. Of the waterways sampled for this study, the Patapsco's tributaries are experiencing the highest conductivity levels, much higher than the main stem of the river. Several of the small streams that appear to be in good condition based on initial physical and visual assessment are actually scoring low biologically, possibly due to near-toxic levels of salts and other charged particles in the water.

Moderate Health in the Patapsco: Clear but Complex Water



The Patapsco River earned an overall C grade (53%), reflecting moderate health in the Patapsco. Its highest-scoring indicator was clarity, which was very good at nearly every site year-round. Bacteria levels were moderate to moderately poor, reflecting some human risk of getting sick from swimming in the river. The biology score was moderate overall. The macroinvertebrate community ranged from being acceptable at four sites to unacceptable at four sites, and unable to be determined at three sites. This may relate to the conductivity scores, which are very poor across the region and especially problematic in our tributaries.

By site, scores ranged from good (B) to poor (D). The highest-rated streams are upstream in the watershed on the South Branch Patapsco. The Marriottsville and Sykesville stations had B scores, with Woodbine scoring just slightly lower. Bull Branch was the only other stream that scored a B. The lowest scoring sites were Deep Run, with a very poor bacteria score, and Miller Run, with low scores in both biology and conductivity.

Sykesville

The station near Sykesville was one of the two highest-rated streams, earning a B (72%). The South Branch Patapsco at this location yielded good ratings for turbidity, bacteria levels, and biology. The conductivity was moderate. The furthest upstream sites are well-buffered along their edges with forests, shrubs, and grasses, and development is more sparse. Biologically, the macroinvertebrate community was both diverse and sensitive to pollution. Additionally, sculpins were among the fish species observed at this site.



Sculpins are bottom-dwelling fish that depend on benthic invertebrates for food.

Sucker Branch

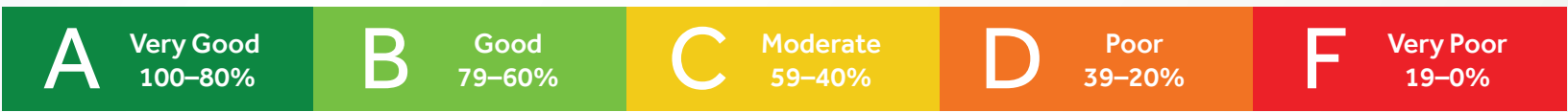
Sucker Branch is a small tributary that feeds into the Patapsco River north of Old Ellicott City. It is wooded and winds through sections of Patapsco Valley State Park but also drains a large swath of the Route 40 business district. The Sucker Branch site appears to be fairly undisturbed, as access to it is limited. Although it scores well for turbidity and bacteria, the conductivity scores here are very poor year-round. The overall score for Sucker Branch was a C- (43%).



Sampling water at Bull Branch.

Avalon

The monitoring site at the Avalon area of Patapsco Valley State Park is the most downstream main stem station. This area is heavily used for recreation, such as swimming, tubing, hiking, and biking. The turbidity score was very good. The water is very clear, and the risk of getting sick from bacteria in the water is low. Overall, the site scored a C+ (59%), due to very poor conductivity scores and a moderate biology score. The benthic community here has adapted to high pollution and only a few types of organisms thrive. However, many frogs, turtles, birds, fish, and bugs have been observed during educational and social events held here.



Indicators Describe Ecosystem Health



Biology

The biology indicator is an assessment of the benthic macroinvertebrates that live on the stream bottom—organisms such as mayfly larvae, worms, and snails. Many benthic macroinvertebrates are sensitive to pollution, so a diverse community is a good indicator of a healthy stream. They are also a food source for birds, fish, and other animals. In order to assess the health of this community, volunteers search for, identify, and record the different kinds of organisms they find at a site. The Patapsco Watershed scored a C for benthic biology.



Clarity

Water clarity is the highest-scoring indicator across the Patapsco Watershed. Clear water is important for the growth and survival of aquatic plants and animals. A high number of particles in the water cause it to be cloudy or turbid. Sediment in the water can smother the benthic organisms living on the bottom of the stream, and keep aquatic plants from getting the light they need to photosynthesize. Turbidity can be caused by stream erosion, runoff from agriculture or construction sites, stormwater, and excess algal growth. All sites received an A except for Deep Run, which had slightly more turbid water and scored a B.



Surveyors examine material for macroinvertebrates (above). A hellgrammite, or larval dobsonfly (below).



Conductivity

Conductivity is the ability of water to conduct electricity, which is based on charged particles, such as dissolved salts, in the water column. If a freshwater stream suddenly receives a pulse of charged particles, like snow melt mixed with road salt, fish and other organisms may not be able to survive. The main sources of conductivity are road salts, wastewater treatment plants, stormwater runoff, and human waste pollution. Conductivity levels in our area are high at all of our stream monitoring sites, and the Patapsco overall scored an F. Conductivity levels are higher in the smaller streams (tributaries) than the main body of the river, but all stations often score poorly. High conductivity is an issue in freshwater ecosystems across the US and globally.



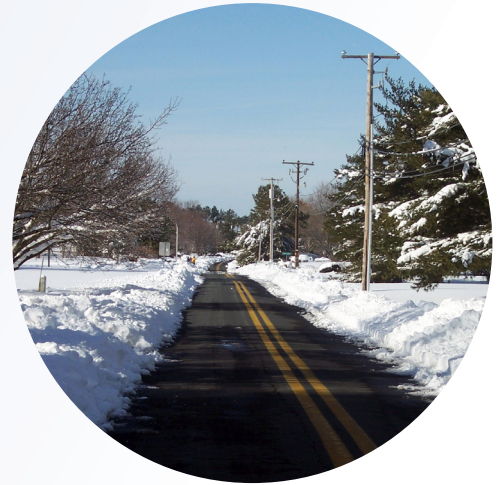
Bacteria

Bacteria are everywhere in our environment. Most are harmless, but some bacteria can make water unsafe to drink or swim in. We measure a bacteria called *Escherichia coli* that is commonly found in the intestines of people and animals. Some kinds of *E. coli* are pathogenic, or sickness-inducing, and can cause symptoms like diarrhea and stomach pain. Most of the sites in the Patapsco watershed had moderate to moderately poor bacteria scores, meaning that there is some risk of getting sick from swimming. Many factors affect bacterial concentration, including rainfall and dry weather. High-intensity storm events can carry bacterial runoff into our waterways, making them polluted and unsafe for swimming. The Maryland Department of the Environment recommends that people do not swim for 48 hours after rainfall greater than one inch.

What Can You Do To Help?

Use alternatives to road salts

Residents can take action to reduce conductivity by being strategic with salt use during icy weather. Shoveling sidewalks and parking lots first decreases the amount of salt needed. To make the most out of your salt crystals, scatter them evenly and thinly; a 12oz mug of salt is enough to cover a 20ft driveway. Sweep it up to reuse if possible. Consider alternatives such as sand, kitty litter, coffee grounds, or sugar beet juice.



Reduce fertilizer use

While we can celebrate our successes in relation to turbidity, we should note that in order to keep our water clear we should be mindful of fertilizer use in our yards, as increased nutrient loads will lead to higher turbidity. High nutrient loads are common in the Chesapeake Bay region and are the source of many problems in our waterways. Fertilizing strategically, based on soil testing, will help keep nutrient and turbidity levels in check. Experts recommend not fertilizing or fertilizing in the fall only.

Pick up after your pet

Fecal bacteria and pathogens can come from a variety of sources including humans, wildlife, pets, and soils. Animal owners in the region can do their part to reduce bacteria by picking up and properly disposing of pet waste and gently encouraging others to do the same.



Acknowledgements

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