SCORE | GRADE





Key Conclusions:

- The overall grade of the State of the James has improved to a B with a score of 66% from its failing health decades ago. Although the pace of progress has slowed, a grade-A James River is possible if we keep up our collective efforts and continue to address key issues together.
- Underwater grasses expanded to their highest total on record and tidal water quality also returned to its recent high. Both of these indicators are largely influenced by pollution from upstream sources, so their collective improvement signifies broader progress.



- The James River's American shad population remains at zero. To save this iconic species and other migratory fish in the James, Virginia must take swift action to address the threats identified in the American shad recovery plan due to the General Assembly in 2023.
- Strong investments by Virginia in clean water programs for wastewater, agriculture and urban stormwater has yielded direct improvements in pollution controls and helped to improve the overall health of the river. The more we invest in the river, the more improvement we see in the river's health.
- Climate change is making future progress for the State of the James more difficult. We all must do our part to safeguard the James River for future generations.



2023 Benefits of a Healthy River:



Drinking Water

2.7 million people rely on the James River for water, making it Virginia's largest source of drinking water.

Seafood Production

4.1 million pounds of commercial fish and shellfish were landed from the James in 2022, a total dockside value

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of \$11.9 million. The James is home to some of the largest oyster reefs in the world - 754,650 pounds of oysters were harvested in 2020, a total value of \$9.4 million and more than 24% of Virginia's total oyster harvest.



Riverside Park Visitation

Riverside parks offer opportunities for outdoor recreation and enjoyment. Riverside parks along the James and its tributaries saw over **7 million visitors** in calendar years 2021 and 2022.



Public River Access

There are hundreds of places to enjoy the James and its tributaries. At least **52 public access sites** have been added in the watershed since 2013.



Hunting, Fishing & Boat Licenses

539,510 people registered boats and purchased hunting and fishing licenses in the watershed in 2022.

Troubled Travelers Migratory Fish in the James

There are many different species of migratory fish that call the James River home including American Shad, Atlantic Sturgeon, Striped Bass, Blueback Herring, Alewife, and American Eel

These migratory fish complete incredible journeys related to their spawning runs. Spending part of their lives in the ocean and part of their lives in freshwater rivers. These fish not only require healthy waters and habitat, but also open rivers where they may freely migrate. Threats to migratory fish include:



Change the James and the James Will Change You

Volunteering with the James River Association provides a unique opportunity to connect with nature, foster a sense of community, and make a positive impact on the environment. Engaging in activities like advocacy outreach, water quality monitoring, and boat patrols enhances personal fulfillment and conservation awareness. The increase in the health of the James River would not be possible without the James Changer community, whose commitment of both time and resources plays a crucial role in preserving and improving the health of the river. JRA volunteers directly contribute to cleaner water, habitat restoration, and a more sustainable river ecosystem, ensuring the long-term well-being of one of Virginia's most precious natural resources and the wildlife that calls it home. For more information about the various JRA volunteer programs, please visit <u>www.thejamesriver.org/what-you-can-do/</u>

River Health

The River Health score consists of ten indicators, identified in blue, related to the ecological health of the James. They include fish and wildlife species native to the river as well as the habitat features that help these species thrive. Overall, the River Health score rose two points from 2021 to a B at 67%. The score for fish and wildlife species declined by three points from 2021, however the overall habitat score increased by seven points. This suggests that while habitat is improving for fish and wildlife species in the James, there are other factors that are influencing the scores for some of our important indicator species. The most troubling news continues for American shad, which hit an all-time low score of 0% in 2021 and 2023. Responsible management decisions will be critically important for restoring this foundational species. Additionally, we saw decreases in the scores for Smallmouth Bass and Juvenile Striped Bass signifying a need to keep close watch on these important fish species.

River Restoration Progress

The River Restoration Progress score increased by one point from 2021 to an overall score of B at 66%. The eight River Restoration indicators, identified in green, track our progress as a watershed to complete the restoration actions outlined in Virginia's Chesapeake Bay Cleanup Plan and reduce the amount of pollution entering the James River by 2025. The score assessed to determine the overall pollution reductions that have occurred decreased by one point from 2021. Most significantly, progress with nitrogen, phosphorus, and sediment continued a downward trend. However, bacteria measured throughout the watershed demonstrated progress since 2021. The score for protection and restoration actions increased three points from 2021 to a score of B at 68%. Continued investment in clean water programs for wastewater, agriculture and urban stormwater has yielded direct improvements in pollution levels which have helped to improve the overall health of the river. Most notably, wastewater pollution controls increased to 100% and agriculture pollution controls increased by one point. However, where investments have lagged behind with stormwater pollution controls, the score declined by one percent to a D at 33%.

Fish and Wildlife

Brook Trout: 74% ⇒ ±0%

This vividly pigmented member of the salmon family is Virginia's official freshwater fish and once thrived in dozens of cold headwater streams in the watershed. Extremely sensitive to water quality and rising temperatures, the brook trout's range has been reduced due to changes in land use, competition with non-native fish species, warming streams, and acid rain. Brook trout currently occupy 74% of the desired habitat targeted by the Chesapeake Bay Program. In the face of future threats posed by climate change and land use disturbances, we must invest in riparian buffers to keep our streams cool, and advocate for sufficient state-level funding to build resiliency into remaining brook trout populations.

- Tell your elected representatives to make funding for natural resources a priority.
- <u>Apply for a forested buffer on your property or volunteer to plant trees at</u> <u>JamesRiverBuffers.org.</u>

BROOK TROUT HABITAT IN THE JAMES RIVER WATERSHED



Smallmouth Bass: 76% -13%

This lively sport fish entertains anglers across the Mountains and Piedmont, with the highest surveyed abundances on the Jackson and Maury Rivers. On the whole, smallmouth populations saw modest decreases over the last couple of years, with the lowest population numbers in the Middle James region. While some population fluctuations can be expected due to natural conditions, it's possible that the declining numbers, especially in the Middle James reaches, are related to warming water temperatures and loss of spawning habitat. Tools like riparian buffers, agriculture best practices, and robust state-level funding for these practices are needed to protect water quality, shade and cool the riverbanks, and make sure that smallmouth numbers stay consistently high. We also need anglers to be vigilant in preventing the spread and reporting sightings of invasive Alabama bass. Alabama bass can outcompete smallmouth bass, and their establishment is very likely to result in further declines of smallmouth abundance in the river.

Be a James Changer:

• Tell your elected representatives to make funding for natural resources a priority.

- <u>Apply for a forested buffer on your property or volunteer to plant trees at</u> JamesRiverBuffers.org.
- Help prevent the spread of invasive Alabama bass.



Bald Eagle: 100% ⇒ ±0%

Since the United States banned the pesticide DDT in 1972 and passed the Endangered Species Act in 1973, the James River's Bald eagle population has rebounded in a dramatic way. There were no known nesting pairs along the James from 1974 through 1978. Today, the James supports one of the densest populations in North America with 352 breeding pairs nesting in the watershed in 2021. Bald eagles require large mature trees for roosting, perching, and foraging. Restoring and protecting riparian forest buffers ensure Bald eagles have habitat to support them into the future.

Be a James Changer:

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Juvenile Striped Bass: 86% -6%

Striped bass are a favorite recreational sportfish and one of the most valuable commercial fisheries in the Chesapeake Bay. Overfishing, habitat loss and pollution caused a significant population decrease during the 1970s and 1980s, but a fishing moratorium helped the population rebound by 1995 and in the following decade. In the last few years, rising temperatures and in 2022 a dramatic increase in recreational fishing for striped bass have squeezed the population from both sides. The most recent Atlantic States striped bass stock assessments concluded that the striped bass stock was overfished, and an emergency declaration to protect maturing striped bass has been extended through 2024. The James acts as a nursery for juvenile striped bass populations and data indicates that there is an average number of fish reaching the juvenile stage. Protecting nursery habitat and careful management is necessary to protect striped bass and ensure populations have the opportunity to recover again. Forage fish like menhaden are an essential food source for striped bass, but Virginia needs strong limits in place for the commercial menhaden fishery to preserve a balanced food chain and healthy striped bass population.

Be a James Changer:

• <u>Support responsible wildlife management by purchasing a license or membership through the</u> <u>Department of Wildlife Resources.</u>



American Shad: 0% ⇒ ±0%

American shad, often called America's Founding Fish because of their important historical and cultural role, face a gauntlet of threats during their migrations to and from spawning grounds in the James River. These intrepid swimmers are blocked by dams, sucked up in water withdrawals, preyed on by invasive catfish, and caught in nets set for other species. Virginia has long tried to restore shad in river systems across the Chesapeake Bay. From 1992 to 2017 Virginia stocked nearly 126 million hatchery shad to give the species a leg up. A fishing moratorium has been in place in Virginia since 1994, and significant work has taken place to provide fish passage at existing dams, or to remove dams entirely. Despite these efforts, the James River shad population reached an all-time low of 0% in 2020 and has stayed there ever since. Given the dire situation, JRA fought for funding to develop an emergency recovery plan that identifies immediate actions that can be taken to improve the American Shad fishery in the James. This plan will be delivered to Virginia Legislators in Fall of 2023, with more actions to follow, but it will take a long-term and sustained effort to bring American shad in the James River back from the brink of collapse.

- Join JRA's Action Network or RiverReps program to help us advocate for an American shad recovery plan.
- <u>Support responsible wildlife management by purchasing a license or membership through the</u> <u>Department of Wildlife Resources.</u>



Oysters: 75% +1

Oyster reefs provide valuable structure and habitat for a wide variety of aquatic organisms, and an adult oyster can filter 50 gallons of water per day. With a fully healthy oyster population, these bivalves would filter the entire volume of the James River estuary every six days. In the 1960s the public oyster fishery collapsed in the James River, as a result of a decimated population affected by overharvest, pollution and disease. With time, improvements to water quality, and disease resistance in wild stocks, the James River has seen a remarkable comeback with marked population increases from 2006-2020. Careful fishery management, including the establishment of a 585-acre oyster sanctuary in 2009, has also helped buffer the James River from some of the more dramatic population losses seen elsewhere in the Chesapeake Bay. In 2018, record precipitation sent a surge of freshwater into the river that ultimately caused significant oyster die-offs. However, in just two years the James River public oyster grounds grew by 25% reaching a new record high for this recovery period. Strong management of the James River public oyster grounds remains critical to restoring a fully healthy oyster population that benefits overall water quality and biodiversity in the James River estuary.

Be a James Changer:

• <u>Tell your elected representatives to make funding for natural resources a priority.</u>



Habitat

Underwater Grasses: 60% 1+14%

Underwater grasses have made a major comeback in the James River, now covering 60% of the goal set for the James. The presence of these grasses, which provide essential habitat for juvenile fish, crabs and waterfowl, is a positive sign that water quality is improving. Because sunlight is the most important factor in the growth of underwater grasses, improving water clarity is a key step in reaching the goal of 3,663 acres of underwater grasses in the James River. Continued restoration of streamside buffers and reductions in sediment and nutrient runoff from agriculture and development are needed in order to meet this goal.

- <u>Tell your elected representatives to make funding for natural resources a priority.</u>
- <u>Apply for a forested buffer on your property or volunteer to plant trees at</u> <u>JamesRiverBuffers.org.</u>



PERCENTAGE OF UNDERWATER GRASSES GOAL REACHED

Source: Virginia Institute of Marine Science

Tidal Water Quality: 62% 1+8%

Dissolved oxygen, algae levels, and water clarity serve as crucial metrics, each conveying significant information regarding the quality of tidal waters. Adequate dissolved oxygen is vital for the well-being of aquatic life, and typically, the James River maintains healthy levels of it. However, the persistent issues of algae overgrowth and reduced water clarity persist in many areas of the tidal James. These challenges arise from an excess of nutrients and sediment pollution in the water, a problem exacerbated during particularly rainy years.

In 2022, the James River registered the highest levels of tidal water quality of any major tributary of the Chesapeake Bay, with significant improvements seen in water clarity compared to other river systems. When averaged together, the James was 41% above the mean for dissolved oxygen, algae levels, and water clarity.

- Tell your elected representatives to make funding for natural resources a priority.
- Help us monitor underwater grasses in the James.
- <u>Check the water quality conditions at JamesRiversWatch.org</u>



Stream Health: 59% 1+6%

As of 2023, 59% of streams and creeks surveyed in the James River watershed were classified as being in good or excellent condition according to the Virginia Stream Condition Index. The Clean Water Act, which celebrated its 50th anniversary in 2022, has been vital in protecting the 25,000 miles of tributaries that flow into the James. It sets limits on the amount of pollution released by wastewater facilities and requires municipal stormwater systems to reduce polluted runoff. However, our existing water infrastructure and regulatory requirements are not designed to handle climate change along with increased development. To return all the James River's tributaries to good health and prepare for our changing environment, we need to strengthen our regulatory protections, like our stormwater pollution controls. We need to implement more restoration actions, like healthy riparian buffers. And we must promote better stewardship of our natural resources by providing the local, state, and federal funding needed to support these efforts.

- <u>Tell your elected representatives to make funding for natural resources a priority.</u>
- <u>Apply for a forested buffer on your property or volunteer to plant trees at</u> <u>JamesRiverBuffers.org.</u>
- Prevent stormwater pollution at home with our River Hero Home program.

STREAM HEALTH



Source: Virginia Department of Environmental Quality

Riparian Forests: 78% ⇒ ±0%

Riparian forests are forested areas within 100 feet of the James River and its tributaries. These areas play an important role in streambank stabilization, erosion control, and pollution reduction. They also provide important habitat for wildlife. An analysis of high-resolution land cover data conducted by the Chesapeake Conservancy in 2021 indicates 78% of riparian areas in the watershed are forested with trees and shrubs. Virginia's Cleanup Plan calls for an additional 27,000 documented acres of forested riparian buffers across our watershed by 2025. Through restoring and conserving riparian buffers, the James River Association and its partners across the watershed are working together through the Upper & Middle James Riparian Consortium to help reach this goal through the <u>Upper and Middle James River Consortium</u>.

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FOREST COVER WITHIN 100 FEET OF THE JAMES RIVER & TRIBUTARIES

Pollution Reductions

Nitrogen Reductions: 80% -1%

Major sources of nitrogen include wastewater, agricultural runoff, and urban stormwater. Excess nitrogen and phosphorus in the water can lead to algal growth, which decreases water clarity, lowers dissolved oxygen, and harms critical habitats for fish and aquatic life. As of 2021, we are at 80% of Virginia's Chesapeake Bay Cleanup Plan nitrogen pollution target. Recent progress has declined due to heavy rainfall in 2018 resulting in more polluted runoff. The good news is that long term levels of nitrogen are decreasing, helping us get closer to our pollution reduction goals in the James River. Wastewater treatment plant upgrades have benefited the James, but more work remains. Moving forward we need to secure additional funding for upgrading our outdated stormwater and wastewater infrastructure and implementing agricultural BMPs.

Be a James Changer:

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Phosphorus Reductions: 65% -2%

Phosphorus levels in the James River have fallen since the 1980s due to wastewater treatment plant upgrades, fertilizer management plans, and bans on phosphates in detergents and other products. Similar to nitrogen, elevated phosphorus levels can lead to algae blooms which cause poor water clarity, fish kills, and habitat reductions for many aquatic organisms. Rapid phosphorus reductions were seen in the late 1990s and early 2000s, though reductions have slowed since. Record rainfall in 2018 caused further setbacks. Pound-for-pound, phosphorus is the most impactful source of nutrient pollution, and it is critical that the James River and other Virginia waterways reach the targets identified in the Chesapeake Bay Cleanup Plan. To reach these goals, we must plant more riparian buffers and implement more best management practices on agricultural and developed land.

- Tell your elected representatives to make funding for natural resources a priority.
- <u>Apply for a forested buffer on your property or volunteer to plant trees at JamesRiverBuffer.org.</u>



Sediment Reductions: 45% 4-6%

Sediment poses a significant and long-term threat to water quality on the James River. Agricultural practices and land development are the two main sources of sediment in the James. Regulations for development and construction and agricultural best management practices have helped to address sediment issues, however sediment remains the greatest ongoing pollution problem in the James. The lack of overall improvement in sediment pollution indicates that more investments must be made and stronger measures taken to target the primary sources of sediment. And these measures serve the additional purpose of reducing nutrient and bacterial pollution, creating a healthier, more diverse James River.

- <u>Tell your elected representatives to make funding for natural resources a priority.</u>
- <u>Check the water quality conditions at JamesRiverWatch.org</u>
- Patrol the river with our RiverRats program.
- Prevent stormwater pollution at home with our River Hero Home program.



Bacteria Reductions: 61% +4

Bacteria levels in the James River can fluctuate quickly, but they are consistently highest during and just after heavy rain, when *E. coli* and other fecal bacteria can pose a significant health risk to swimmers. Major sources of bacteria include unfenced livestock, combined sewer overflows, and pet waste. Bacteria testing has been consistent in the past few years, but only 61% of our sites meet state standards. To raise this score we need investments on many levels. This includes major actions, such as additional funding for livestock fencing and increased investments in our sewer and stormwater infrastructure, as well as individual actions, like regular septic inspections and picking up after your pet.

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- Check the water quality conditions at JamesRiverWatch.org
- Prevent stormwater pollution at home with our River Hero Home program.



BACTERIA SITES MEETING STATE RECREATION STANDARD



Source: Virginia Department of Environmental Quality

Protection and Restoration Actions

Land Protection: 78% ⁽¹⁾ +1%

Land protection actions in the James River watershed ensure natural and cultural resources are protected in perpetuity and can provide us with open spaces in which to recreate. The acreage of public lands in protective management and private lands in conservation easements in the James River watershed has consistently increased since the release of the first State of the James in 2007. For the 2021 State of the James, the James River Association adopted a new land protection benchmark that is consistent with the 30 by 30 initiative announced by President Biden shortly after he took office in 2021. 30 by 30 is an initiative to protect 30 percent of lands and waters in the United States and around the world by 2030. As of 2023, 1,539,194.88 acres of 6,569,707.53 acres in the James River watershed are protected. This is 78% of the 30 by 30 benchmark, which is 1,970,912.26 acres.

Be a James Changer:

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PROTECTED LANDS IN THE JAMES RIVER WATERSHED



Source: Virginia Department of Conservation and Recreation

Stormwater Pollution Controls: 33% -1%

Stormwater runoff occurs when rain falls and snow melts on impervious surfaces like rooftops, roads, or sidewalks. Stormwater runoff can pick up pollutants like dirt, nutrients, bacteria, or chemicals, as it flows across impervious surfaces and pollute our waterways. This is stormwater pollution. Installing best management practices that temporarily store stormwater runoff and allow it to infiltrate into the ground reduces stormwater pollution and localized flooding. As of 2023, we are 33% of the way to meeting our pollution plan for stormwater, which we measure by the amount of pollution reaching the river from each acre of developed land. Unfortunately, new development is outpacing the installation of stormwater best management practices, complicating the work. Climate change will continue to make progress more challenging because our regulations have not been updated to account for heavier and more frequent rainfall. As a consequence, stormwater is not consistently improving at the pace needed to reach success by 2025 as the Chesapeake Bay Cleanup effort requires. Bold investments in stormwater pollution controls, like those that we have secured for wastewater, can help boost our score, improve water quality, and reduce localized flooding.

- <u>Tell your elected representatives to make funding for natural resources a priority.</u>
- Prevent stormwater pollution at home with our River Hero Home program.



Wastewater Pollution Controls: 100% ⁽⁾ +9%

Over the past 38 years, Virginia's wastewater treatment faciltiies have made commendable progress, including significant reductions to nitrogen pollution. These accomplishments are due in large part to substantial investments made by the state on behalf of tax payers. However, in our commitment to stewarding the land and water, it is imperative that we adapt to the challenges posed by our expanding population and the ever quickening pace of development in the James River watershed.

To safeguard the health of our beloved river, we must ensure that wastewater treatment plants embrace the most advanced technologies available. In the year 2022, the James River reached the goal of 100% of the Enhanced Nutrient Removal Certainty Program and in fact exceed the benchmark of the Chesapeake Bay WIP II Plan with a mark of 112%.

More rigorous treatment technology standards have allowed for purer drinking water and more suitable habitat for wildlife, but significant threats remain in the form of PFAS and other forever chemicals. While JRA celebrates reaching the 100% mark, we will continue to advocate for investments in wastewater infrastructure in order to ensure the long term health of the James and the people who rely on it.

Be a James Changer:

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Agricultural Pollution Controls: 60% ⁽¹⁾ +1%

Farmland covers almost 12% of the James River watershed and is one of the largest sources of runoff pollution. Fortunately, agricultural pollution controls, like conservation tillage and stream fencing are cost-effective improvements and effective. With technical assistance from Virginia's Soil and Water Conservation Districts, farmers have made notable progress installing conservation practices and reducing agricultural runoff to the James River through the Virginia Agricultural Cost-Share Program. Unfortunately, this program has not historically received reliable levels of funding for cost-share or technical assistance. Our James River Buffer Program, in partnership with Virginia's Department of Forestry and the Chesapeake Bay Foundation, helps interested landowners install and monitor forested buffers to slow agricultural runoff and take up excess nutrient pollution. As Virginia enters the final phase of its efforts to achieve Bay cleanup goals, time is of the essence.

- Tell your elected representatives to make funding for natural resources a priority.
- <u>Apply for a forested buffer on your property or volunteer to plant trees at</u> <u>JamesRiverBuffers.org.</u>



Acknowledgements

The James River Association would like to thank the following organizations for their contributions to this report: Chesapeake Conservancy, College of William and Mary – Virginia Commonwealth University Center for Conservation Biology, Eastern Brook Trout Joint Venture, Virginia Department of Conservation and Recreation, Virginia Department of Environmental Quality, Virginia Department of Wildlife Resources, Virginia Environmental Endowment, Virginia Institute of Marine Science, University of Maryland Center for Environmental Science, Integration and Application Network, United States Environmental Protection Agency Chesapeake Bay Program, and United States Geological Survey.

About the James River Association

The James River Association is a member-supported nonprofit organization founded in 1976 to serve as a guardian and voice for the James River. Throughout the James River's 10,000 square mile watershed, the James River Association works toward its vision of a fully healthy James River supporting thriving communities. The James River Association believes that "when you change the James, the James changes you". With offices in Lynchburg, Scottsville, Richmond, and Williamsburg, the James River Association is committed to protecting the James River and connecting people to it.