Our Mission
Protection of the Rivanna River and its tributaries through community involvement, conservation, education, recreation, restoration, water-quality monitoring and reporting.

Our Vision
A healthy, thriving community that values its rivers and streams.
Why Monitoring is Important

RCA helps the community make sound water stewardship decisions by providing high-quality information about stream health. RCA monitors health in streams throughout the watershed over multiple years. Streams are influenced by both natural and human factors. RCA monitors several indicators of stream health to detect changes related to human activity.

Our local streams give us recreational opportunities, aesthetic pleasure, vital drinking water, and many other benefits. Streams also flow to downstream communities and the Chesapeake Bay. We owe it to ourselves and our neighbors to care for our streams as much as possible.

RCA Organizational Timeline

- 1990: Rivanna Conservation Society established
- 2003: StreamWatch established
- 2005: Benthic monitoring program certified by VADEQ at Level III
- 2013: Rivanna Conservation Society and StreamWatch merge to become the Rivanna Conservation Alliance
- 2016: Bacteria monitoring program certified by VADEQ at Level III
- 2017: RCA moves into new location on River Road
Virginia Department of Environmental Quality (VADEQ) Certification Levels

**Level III:** Volunteer monitoring data are used by VADEQ for decision making as if the samples had been collected by state and other government officials.

**Level II:** Volunteers collect samples, but the data must be verified by local or state government professionals.

**Level I:** Collected data may be used for educational purposes and to notify government professionals of possible pollution.

RCA’s **BENTHIC** and **BACTERIA** monitoring programs are certified by VADEQ at Level III. The benthic monitoring program evaluates the macroinvertebrates (bottom-dwelling bugs) that live in our streams. Macroinvertebrates are biological indicators of stream health. Bacteria monitoring provides data about the health of our watershed by monitoring for *E. coli* levels in local streams.

“RCA is the only citizen monitoring organization in Virginia that collects and reports data on benthic macroinvertebrates and *E. coli* at the same level of quality as VADEQ. With RCA’s help, the Rivanna River is one of the best monitored watersheds in the Commonwealth.”

- James Beckley, Virginia Department of Environmental Quality

RCA’s **RIVER STEWARDS** survey the Rivanna River weekly during the paddling season to monitor physical conditions of the river and document pollution sources. The information they collect is reported to local officials, community partners, and other stakeholders.
Benthic Monitoring Results

How We Rate the Health of Streams

Benthic macroinvertebrates (bottom-dwelling bugs) are sampled with a net twice yearly.

The bugs are sorted and identified. All samples are processed in accordance with a quality assurance project plan approved by VADEQ.

Each sample produces a score that is determined by factors such as the number, types, pollution sensitivity, and diversity of bugs.

Three years of scores are analyzed and averaged to obtain an overall rating for the site.

Learn more at: www.rivannariver.org/long-term-monitoring-program

Why do site ratings vary?

You may have noticed that some streams rated as “fair” in this assessment were rated as “good” in previous assessments, or vice versa. This is not uncommon; a large portion of Rivanna basin streams lie between fair and good. These streams stand a good chance of regaining robust health with better stewardship. Three sites changed from fair to good and one site changed from good to fair since the last report.

Stream Score (100-point scale) Health Rating

<table>
<thead>
<tr>
<th>Stream Score</th>
<th>Health Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>70 and over</td>
<td>Very Good</td>
</tr>
<tr>
<td>60 - 69.9</td>
<td>Good</td>
</tr>
<tr>
<td>40 - 59.9</td>
<td>Fair</td>
</tr>
<tr>
<td>25 - 39.9</td>
<td>Poor</td>
</tr>
<tr>
<td>0 - 24.9</td>
<td>Very Poor</td>
</tr>
</tbody>
</table>
What do the ratings tell us?

Using data on land-use patterns, RCA's 50 benthic sampling locations were chosen methodically to represent the Rivanna watershed as a whole. The stream health ratings of these 50 sites help indicate overall watershed health. Ratings are assigned to each site based on an analysis of multiple samples. Streams rated as "very good" and "good" meet Virginia's water quality standard for aquatic life. Those that rate as "fair" or "poor" do not meet Virginia's standard. Nearly half of the streams RCA sampled from 2015 to 2017 (48%) failed to meet this important benchmark.
Bacteria Monitoring Program

The bacteria monitoring program was launched in July 2012. Bacteria levels are one indicator used to determine if water is safe for swimming or other recreation. RCA monitors fecal bacteria levels specifically *Escherichia coli* (*E. coli*), which originate in the intestines and fecal matter of warm blooded animals. The bacteria data collected through 2017 were analyzed using the Level II (Coliscan®) Method. In September of 2017, VADEQ certified RCA’s Bacteria Monitoring Program at Level III, the highest certification level available. RCA started collecting bacteria data using the Level III (Colilert™ Method) in 2018.
Pick up after your pet

How you can help lower bacteria levels:

- Fence animals out of streams
- Plant riparian buffers along streams
- Maintain your septic system
- Report illicit discharges

For the most up-to-date bacteria information visit: www.rivannariver.org/bacteria

Urban sites monitored

Water samples collected

Volunteers

Sites where more than 10% of samples exceed 235 CFU (Colony Forming Units)/100mL fail to meet Virginia water quality standards for recreational use set by VADEQ. These sites are shown in grey on the map and table.

## Sites where more than 10% of samples exceed 235 CFU fail to meet Virginia water quality standards for recreational use by VADEQ.

<table>
<thead>
<tr>
<th>Site #</th>
<th>Site Name</th>
<th>Percent of Samples Exceeding Standards</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Meadow Creek - SE Brandywine Dr.</td>
<td>3%</td>
</tr>
<tr>
<td>2</td>
<td>Biscuit Run</td>
<td>7%</td>
</tr>
<tr>
<td>3</td>
<td>Lodge Creek - Southeast of 5th St.</td>
<td>10%</td>
</tr>
<tr>
<td>4</td>
<td>Rock Creek - Southeast of 5th Street</td>
<td>14%</td>
</tr>
<tr>
<td>5</td>
<td>Rivanna River - Riverview Park</td>
<td>15%</td>
</tr>
<tr>
<td>6</td>
<td>Moores Creek Upper - Azalea Park</td>
<td>17%</td>
</tr>
<tr>
<td>7</td>
<td>Rivanna River - Darden Towe Park</td>
<td>17%</td>
</tr>
<tr>
<td>8</td>
<td>Rivanna River - Crofton</td>
<td>22%</td>
</tr>
<tr>
<td>9</td>
<td>Meadow Creek - Meadowbrook Rd.</td>
<td>23%</td>
</tr>
<tr>
<td>10</td>
<td>Meadow Creek - Copeley Rd.</td>
<td>23%</td>
</tr>
<tr>
<td>11</td>
<td>Eastern Trib. to Lodge Creek</td>
<td>23%</td>
</tr>
<tr>
<td>12</td>
<td>Western Trib. to Lodge Creek</td>
<td>23%</td>
</tr>
<tr>
<td>13</td>
<td>Lodge Creek - South of JPA</td>
<td>29%</td>
</tr>
<tr>
<td>14</td>
<td>Meade Creek - Meade Park</td>
<td>34%</td>
</tr>
</tbody>
</table>

2015 - 2017 Stream Health Report
Impacts of Flooding on Bacteria Levels

On May 31, 2018, the Rivanna River experienced a historic flood, with waters cresting eight feet above flood stage at Palmyra. Volunteers were able to test for E. coli levels two days after the flood when the water had receded enough for safe access. The resulting data showed that bacteria levels were ten times higher on average across the sites, as compared to the rest of the year. This spike in the E. coli levels was likely because flooding can cause wastewater systems to overflow, and heavy rains can result in runoff which often carries bacteria from waste into the waterways. However, water’s fluctuating nature allowed the E. coli levels to return to below the recreational limit within the next week.

Reference Streams

Reference stream sites have no significant human disturbances. They drain the least disturbed areas in the Rivanna watershed and receive the highest RCA assessment scores. All RCA reference sites are in the “very good” assessment tier, and fit the definition of a true reference site. Streams are rated from “very poor” to “very good” using the Virginia Stream Condition Index, with streams in our watershed covering the entire range. Pristine streams are surrounded by forest and do not experience extreme runoff from development or agricultural sites. In contrast, poor quality sites typically lack riparian buffers and are degraded by runoff from lawns, parking lots, and storm drains. This erodes stream banks and carries pollution into receiving streams.

The Importance of Stream Habitat

The May 2018 flood occurred after the spring benthic monitoring season, so its impacts on the macroinvertebrate communities in the watershed are not yet clear. The floods did cause significant damage to riparian buffers and streambanks in many areas of the watershed, which can affect the macroinvertebrate habitat. RCA plans to conduct stream habitat assessments at the existing benthic monitoring sites using a protocol developed by the US Environmental Protection Agency (USEPA).

Stream habitat assessments help relate habitat to other physical, chemical, or biological factors that describe stream health conditions. The assessments evaluate a wide range of parameters, including sedimentation, bank stability, and riparian buffer width and composition. These factors influence the benthic macroinvertebrate communities and can be critical components in insect diversity, making the assessments an important part of RCA’s long-term monitoring evaluations.

Conducting stream habitat assessments is also important because habitat quality is strongly impacted by human land-use activities. Identifying streams with impaired habitat, or habitat that is being degraded, can help point to areas where stream restoration, buffer plantings, or stormwater controls are needed to improve stream conditions.
**Our Role**

RCA currently serves as a member of the Cunningham Creek TMDL (Total Maximum Daily Load) Advisory Committee, convened by VADEQ. As a component of their deliberations, the Advisory Committee determined that additional and up-to-date monitoring data would be necessary to make informed decisions about how VADEQ would move forward. To provide this data, RCA monitored bacteria, benthic health, and water chemistry at three Cunningham Creek sites: South Fork (Sites 1 and 2) and Middle Fork.

**Where do we go from here?**

Monitoring results helped determine that a full TMDL was unnecessary. An alternative plan is under review by the USEPA. When the plan is approved, RCA will participate in efforts to clean up the creek and monitor water quality over time.

**Understanding the Results**

**ASCI**

“Adapted Stream Condition Index.” This index allows RCA to calculate overall stream health based on the types of macroinvertebrates found in the stream. RCA uses ASCI in our benthic monitoring.

**CFU**

“Colony Forming Units.” This unit is used by RCA to estimate the number of *E. coli* found in a 100mL water sample. Samples exceeding 235 CFU/100mL fail VADEQ water quality standards.

**E. Coli**

A type of bacteria found in the intestines of animals and humans. The presence of *E. coli* in water is a strong indication of recent sewage or animal waste contamination. RCA tests for *E. coli* in our bacteria monitoring program.

**TMDL**

“Total Maximum Daily Load”, the maximum amount of a pollutant that a body of water can receive while still meeting water quality standards. TMDL is a term used in a plan for restoring impaired waters.

**2017 Cunningham Creek Sample Results**

<table>
<thead>
<tr>
<th>Site Code</th>
<th>Benthic* (ASCI Score)</th>
<th>Benthic Assessment</th>
<th>Bacteria** (CFU/100ml)</th>
<th>Bacteria Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Middle Fork</td>
<td>70.6</td>
<td>Very Good</td>
<td>34</td>
<td>Meets VADEQ standards</td>
</tr>
<tr>
<td>South Fork, Site 1</td>
<td>60.0</td>
<td>Good</td>
<td>267</td>
<td>Fails to meet standards</td>
</tr>
<tr>
<td>South Fork, Site 2</td>
<td>77.6</td>
<td>Very Good</td>
<td>34</td>
<td>Meets VADEQ standards</td>
</tr>
</tbody>
</table>

*Score is average of one spring and one fall sample

**Results are from one 2016 fall sample, verified by VADEQ**
Goals of the Rivanna River Stewards

- Provide RCA with a presence on the river
- Assist with maintaining Rivanna River boat ramps and access points
- Work with local partners to promote river safety
- Monitor water quality of the Rivanna
- Remove trash and document potential pollution sources
- Interact with community members on and around the river including providing guided paddles for the public
- Share information about the native flora and fauna

The stewards removed a significant amount of trash and debris from the Rivanna River, including a large trailer.

Rivanna River Stewards’ reports can be found at: www.rivannariver.org/river-stewards
Why Stream Conservation Matters

All living things depend on water. 70% of Earth is composed of water, yet only 2.5% of Earth’s water is fresh water that humans can use for everyday life. Fresh water is an extremely valuable and limited resource that must be protected. Healthy streams support our fisheries, provide recreational opportunities, supply reliable drinking water, and support our overall economy. It costs less to keep our streams clean than to restore polluted streams. Water is essential for all living things, please help keep it clean.

What you can do:

Volunteer with RCA
Install Rain Barrels
Reduce chemical use

Meet the Staff

Robbi Savage
Executive Director
Lisa Wittenborn
Deputy Executive Director
Jessica Dodds
Benthic Monitoring Manager
Julia Ela
Bacteria Monitoring Manager
Justin Altice
River Steward
Dan Triman
River Steward and Education Manager
Brittany Olenslager
Program Assistant

Please support RCA’s important work
If you can help, contact exec@rivannariver.org

www.rivannariver.org/donate

To learn more about RCA’s professional staff visit:
www.rivannariver.org/staff
Thank you!

Individual Donors and Organizational Funders

- Albemarle County
- Anonymous
- BamaWorks Fund of the Dave Matthews Band
- Charlottesville Area Community Foundation
- Chesapeake Bay Restoration Fund
- Chesapeake Bay Trust
- City of Charlottesville
- Fluvanna County
- Grace Church Keswick
- J&E Berkley Foundation
- Luck Companies
- National Fish and Wildlife Foundation
- The Nature Conservancy
- New Belgium Brewing
- Northrop Grumman
- Patagonia
- Rivanna Garden Club
- Royal Bank of Canada
- Rivanna Water and Sewer Authority
- Virginia Environmental Endowment
- Virginia Department of Environmental Quality

Community Partners

- Albemarle County
- City of Charlottesville
- Fluvanna County
- The Nature Conservancy
- Rivanna Water and Sewer Authority
- The Rivanna Master Naturalists
- Thomas Jefferson Planning District Commission
- Master Gardeners
- Thomas Jefferson Soil and Water Conservation District
- University of Virginia

2015 - 2017 Volunteer Monitors


Land Owners who Allow River Access

![Rivanna Conservation Alliance](https://example.com/Rivanna_Logo.png)