stream WATCH
Community water monitoring for a healthy Rivanna

Biological Health of Streams and Rivers of the Rivanna River Watershed

Executive Summary

THE RIVANNA RIVER and its tributaries flow through the heart of our neighborhoods and communities, supplying our drinking water and giving us abundant opportunities for fishing, swimming and boating. The value of safe water supplies cannot be overestimated nor should be taken for granted in light of recent hazardous materials spills elsewhere in Virginia, West Virginia and North Carolina.

Here on the eastern slope of the Blue Ridge, we in the Rivanna watershed enjoy a high quality of life, due in large part to our proximity to forests, waterways and open spaces. Yet a three-year StreamWatch assessment of the ecological health of the Rivanna and its tributaries tells a different story: nearly 70% of our local streams are failing the Virginia state standard for aquatic health.

Since 2003, StreamWatch volunteers have been monitoring river health and reporting findings to the community and our government leaders. Our high standards for data quality are recognized by the Virginia Department of Environmental Quality.

Failing to take care of our streams means failing to take care of ourselves. We believe we can and should be doing better as a community to protect our water resources. With modest improvement in land and water management practices, such as planting tree buffers along our streams, and by supporting sound land-use policies and decisions, many of these failing streams can be returned to good health. Our goal as a community should be to return our streams to full health.

2011–2013 Stream Health Report

Since 2003, StreamWatch has monitored the ecological condition of local streams to provide information that can help the community protect the Rivanna River watershed and its water quality. Working with a large and dedicated team of volunteers, we monitor conditions at dozens of sites on the Rivanna River and its tributaries such as the Moormans and Mechums rivers. StreamWatch began publishing water-quality reports in 2004, and this report is a continuation of that series. In addition to reporting on the most recent three years of data collection (2011–2013), this report includes four retrospective assessments covering a full 10 years of monitoring. Results are provided in the table on page 2.

Water quality and stream health are vital community interests. Streams reflect the condition of the land through which they flow. The Rivanna River and its tributaries provide many benefits to the region, including recreational opportunities, wildlife habitat, and scenic beauty. The Rivanna River itself is a heavily used waterway, providing drinking water to many thousands of Central Virginia residents while also receiving stormwater runoff and treated wastewater.

To evaluate stream health, StreamWatch uses a technique called benthic macroinvertebrate sampling. Benthic organisms—insects, crayfish, worms, snails, and other creatures—live on the bottom of streams. Healthy streams have a wide variety of benthic organisms. In degraded streams, fewer are able to survive. In essence, StreamWatch monitors our waterways' capacity to support aquatic life. Our sampling method was developed in close collaboration with the Virginia Department of Environmental Quality, which uses StreamWatch data to identify streams in the Rivanna watershed that do not meet water-quality standards for aquatic life.

From 2011 through 2013, we collected multiple samples at 45 sites throughout the Rivanna watershed (see map on page 3). Each site was sampled an average of four times during the three-year period. The sampling locations are broadly representative of the Rivanna watershed in general; factors such as adjacent land use and topography are used in selecting sites.

After analyzing the samples, each site was rated on a scale ranging from "very good" to "very poor." Streams rated "good" or "very good" meet the Virginia state water-quality standard for aquatic life; streams rated as "fair" or worse fail the standard. Sixty-nine percent of the streams we sampled from 2011 through 2013 failed the Virginia standard.

Many of the streams rated in "fair" condition are located in rural or sparsely developed areas. Previous studies by StreamWatch and others suggest that some "fair" streams can recover good health with modest changes in management practices. Streams rated in "poor" condition are located in more highly developed areas and are unlikely to achieve the state standard without extraordinary interventions.

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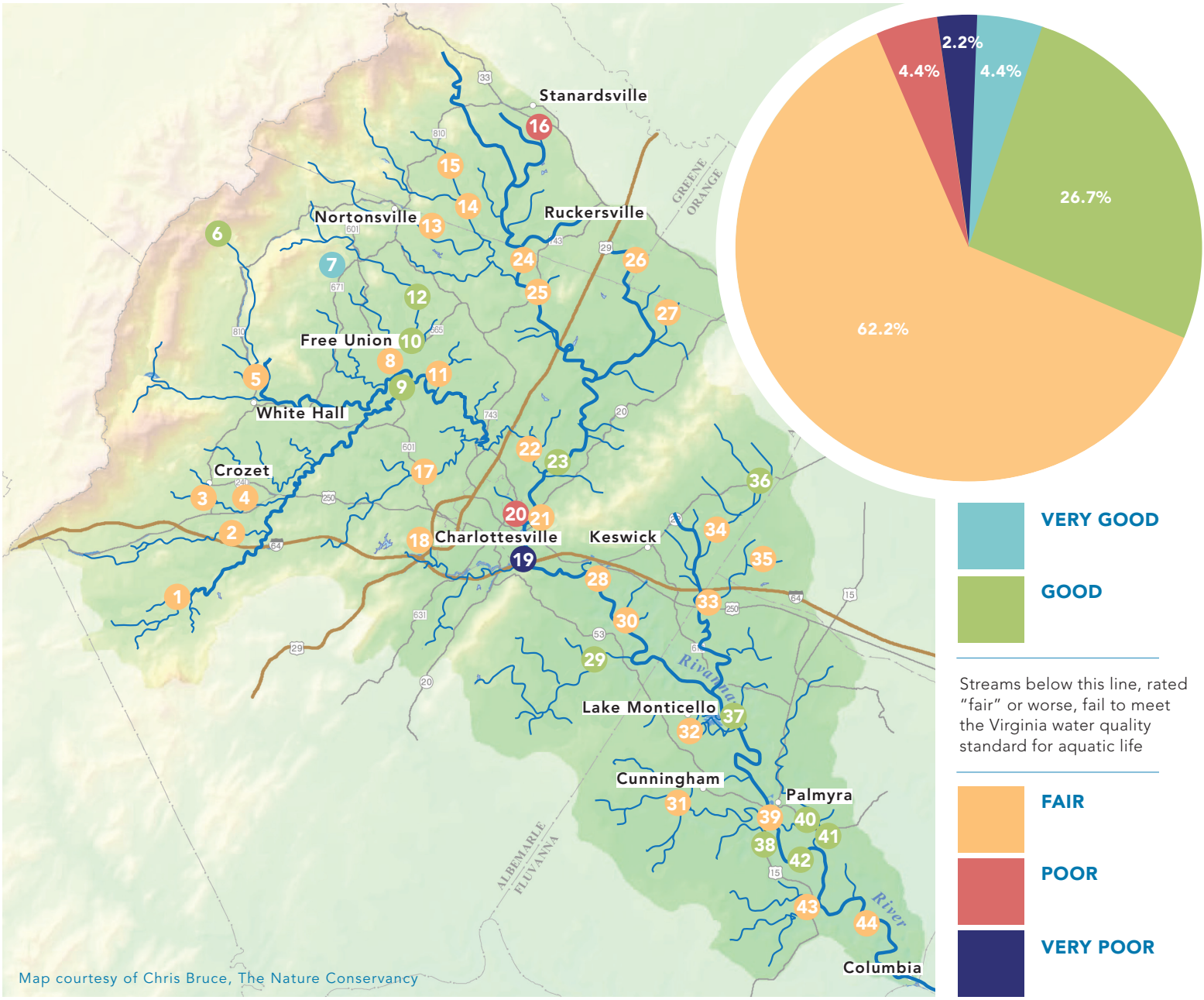
Health of Rivanna Watershed Streams, 2004 through 2013.

A majority of streams fail the state aquatic life water quality standard (fair condition or worse). Over this time period, StreamWatch has not detected a trend of improvement or further degradation for the Rivanna system as a whole.

SITE #	SITE NAME	2004–2006	2005–2007	2007–2009	2009–2011	2011–2013
1	Mechums River @ 692 - B				FAIR	FAIR
2	Stockton Creek upper @ 683				FAIR	FAIR
3	Powells Creek ~80 meters above Lickinghole			GOOD		FAIR
4	Lickinghole Creek south of Fairwinds Lane	FAIR	FAIR	FAIR	FAIR	FAIR
5	Doyles River @ 674	GOOD	GOOD	GOOD	FAIR	FAIR
6	Doyles River upper @ National Park Boundary			VERY GOOD	GOOD	GOOD
7	Albemarle County reference stream #2			VERY GOOD	VERY GOOD	VERY GOOD
8	Moormans River @ 601	FAIR	FAIR	FAIR	GOOD	FAIR
9	Mechums River @ 601	FAIR	FAIR	GOOD	GOOD	GOOD
10	Buck Mountain Creek @ 665 - A	GOOD	FAIR	FAIR	GOOD	GOOD
11	Fishing Creek west of Willwood Dr				FAIR	FAIR
12	Buck Mountain Creek upper west of 666 - A	GOOD	GOOD	GOOD	GOOD	GOOD
13	Lynch River @ 603	GOOD	GOOD	GOOD	FAIR	FAIR
14	Roach/Buffalo River north of 648	GOOD	FAIR	FAIR	GOOD	FAIR
15	Parker Branch @ 633	FAIR	FAIR	GOOD	FAIR	FAIR
16	Stanardsville Run upstream of N. Ridge Way					POOR
17	Ivy Creek @ 601	FAIR	FAIR	FAIR	FAIR	FAIR
18	Morey Creek south of Bellair	POOR	FAIR	FAIR		FAIR
19*	Moores Creek near Woolen Mills	VERY POOR	VERY POOR	VERY POOR	VERY POOR	VERY POOR
20	Meadow Creek west of Locust Lane Ct	VERY POOR	POOR	POOR	POOR	POOR
21	Rivanna @ Darden Towe	FAIR	GOOD	GOOD	FAIR	FAIR
22	South Fork @ Forks of Rivanna	FAIR	FAIR	FAIR	FAIR	FAIR
23	North Fork @ Forks of Rivanna	FAIR	FAIR	FAIR	GOOD	GOOD
24	Swift Run @ 605	FAIR	FAIR	FAIR	FAIR	FAIR
25	North Fork @ Advance Mills	FAIR	FAIR	FAIR	FAIR	FAIR
26	Preddy Creek west of Rosewood Drive	FAIR	FAIR	FAIR	FAIR	FAIR
27	Burnley Branch @ Burnley Station Road					FAIR
28	Rivanna @ Milton	FAIR	FAIR	FAIR	FAIR	FAIR
29	Buck Island Creek @ 729	GOOD	FAIR	FAIR	FAIR	GOOD
30	Carroll Creek in Glenmore	FAIR	POOR	POOR	FAIR	FAIR
31	Cunningham Creek Middle Fork upstream of Bell Farms Ln	FAIR	FAIR	FAIR	FAIR	FAIR
32	Lake Monticello trib #1 emptying to Jackson Cove			POOR		FAIR
33	Mechunk Creek @ 759	GOOD	GOOD	FAIR	FAIR	FAIR
34	Mechunk Creek upper @ 600	FAIR	FAIR	FAIR	GOOD	FAIR
35	Beaverdam Creek East Prong upstream of 600					FAIR
36	Turkeysag Creek @ 22				GOOD	GOOD
37	Rivanna @ Crofton - A	FAIR	FAIR	FAIR	FAIR	GOOD
38	Raccoon Creek @ 15	GOOD	GOOD	GOOD	GOOD	GOOD
39	Cunningham Creek @ 15	FAIR	FAIR	GOOD	FAIR	FAIR
40	Ballinger Creek downstream of 625	FAIR	GOOD	FAIR	GOOD	GOOD
41	Long Island Creek @ 601	GOOD	GOOD	VERY GOOD	GOOD	GOOD
42	Rivanna 5.2 km downstream of Palmyra			GOOD	GOOD	GOOD
43	Carys Creek @ 15	FAIR	FAIR	FAIR	FAIR	FAIR
44	Rivanna @ Rivanna Mills	FAIR	FAIR	GOOD	FAIR	FAIR
	Cedar Branch near Crofton (not shown on map)			VERY GOOD	GOOD	VERY GOOD
	Naked Creek @ 844			FAIR		
	Rivanna @ Palmyra	FAIR	GOOD			

*StreamWatch did not gather enough samples to assess the Moores Creek site during the 2011-2013 window. The rating reflects assessments from earlier time periods, the most recent of which ended in 2011.



Map courtesy of Chris Bruce, The Nature Conservancy

StreamWatch completed a Land Use and Stream Health Study in 2011 using our own stream data and 2009 land-use data from the Rivanna watershed. The study results were consistent with previous studies from other geographic regions that show a strong link between land use and stream health. Our study indicates the two most critical factors affecting stream health in the Rivanna watershed are the presence of impervious surfaces (e.g., pavement, buildings, roads) and the amount of forest cover. Impervious surfaces prevent rainfall from being absorbed by the land, causing much greater runoff into streams and leading to erosion problems. Conversely, forests soak up the rain and slow its movement into waterways.

The general picture of stream health over the last decade has been fairly consistent. According to our assessment methodology the benthic health of the Rivanna stream network has not significantly declined or improved. Given our community's growth, the lack of dramatic changes in the overall Rivanna system and in any individual stream is both surprising and encouraging.

There is much potential for improving overall stream health in the Rivanna watershed. A number of streams fluctuate between "fair" and "good" condition (see table on page 2). These borderline streams are those with the greatest likelihood for improvement. Restoring degraded streams means implementing better management practices whenever possible. One of the simplest yet most effective things we can do is buffer our streams with vegetation, both by planting trees and other native vegetation where none exist and by refraining from clearing existing trees and vegetation alongside streams.

As a community, it is important to understand that our streams are not in good health, and that our few remaining healthy streams are vulnerable to increased development and deforestation. We should not be content with the continuing status of almost 70 percent of our streams failing to meet Virginia state water-quality standards for aquatic life.

Changes in land use are inevitable, but we can protect our healthy streams if we exercise care and good judgment. We hope that the information we provide in this assessment helps our community value and take steps to protect critical water resources. We also hope this report will motivate the community to take concrete actions to improve the health of our local waterways.

The pie chart above displays the following percentages:

Very Good — 4.4% (2 of 45 streams sampled)
Good — 26.7% (12 of 45 streams sampled)
Fair — 62.2% (28 of 45 streams sampled)
Poor — 4.4% (2 of 45 streams sampled)
Very Poor — 2.2% (1 of 45 streams sampled)

What You Can Do

SUPPORT STREAMWATCH AS WE CONTINUE MONITORING OUR LOCAL WATERWAYS IN THE FUTURE:

- Tell your friends and neighbors about this report and the need to improve our water quality
- Get your feet in the water and volunteer to monitor the health of a local stream
- Make a donation to support our work

TAKE ACTION TO IMPROVE OUR STREAMS AND RIVERS. MANY ORGANIZATIONS, INCLUDING OUR NINE PARTNERS, ARE WORKING TO IMPROVE WATER QUALITY. SOME OF THE WAYS YOU CAN ASSIST THEM INCLUDE:

- Help with on-the-ground conservation by participating in work days or other events such as riparian buffer plantings, stream/river clean up days, stream restoration projects, and non-native invasive species removals.
- Get involved with land-use policies and resource management efforts. Let elected officials and agency staff members know that improving local water quality is critically important.
- Help with programs to educate and encourage landowners to become better stewards of the land.
- Support programs that will improve stream health, such as improved stormwater management and wastewater treatment.

Enthusiastic volunteers sampling a site on the Rivanna River in Fluvanna County

Thank You

Thanks to all of those who have helped protect stream health in the Rivanna River watershed.

STREAMWATCH PARTNERS:

Albermarle County, City of Charlottesville, Fluvanna County, The Nature Conservancy, Rivanna Conservation Society, Rivanna Water and Sewer Authority, Rivanna River Basin Commission, Thomas Jefferson Planning District Commission, Thomas Jefferson Soil and Water Conservation District

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Women Who Care

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