

StreamWatch

Report Summary

Mission

StreamWatch monitors and assesses Rivanna basin streams and rivers to help the community maintain and restore healthy waterways.

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www.streamwatch.org

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David Hannah, *Executive Director*
Rose Brown, *Program Manager*
John Murphy, *Science Advisor*

Community Partners

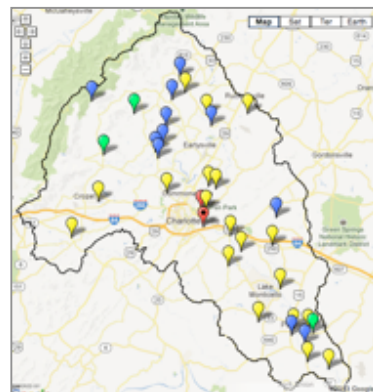
- Albemarle County
- City of Charlottesville
- Fluvanna County
- Rivanna Conservation Society
- Rivanna River Basin Commission
- Rivanna Water and Sewer Authority
- The Nature Conservancy
- Thomas Jefferson Soil and Water Conservation District
- Thomas Jefferson Planning District Commission

StreamWatch Reports

StreamWatch monitors 50 sites throughout the Rivanna watershed twice per year. By studying the variety of aquatic organisms living on the bottom of the streams, we can determine the health of our local streams. We regularly report to the community about the health of our streams, and we also conduct special studies to learn more about the factors affecting our waterways. Our latest reports are listed below.

Overall Stream Health

StreamWatch has been monitoring our Long-Term sites since 2003. Through our regular assessments, we know that about 70% of our streams are failing the state standard for aquatic health. Most of these sites are only slightly impaired, so they might be returned to good health if the community takes action. Learn more about our assessments at streamwatch.org/stream-conditions.



The Rivanna Watershed with StreamWatch sites

Land Use Study

In 2011, StreamWatch released the Land Use Study, which made connections between how land is used, stream habitat, and stream ecology. Our major findings were:

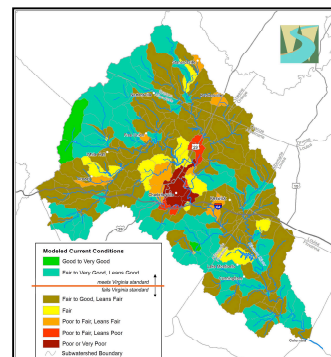
- Stream health declines predictably when surrounding forests are removed and impervious cover increases. Examples of impervious cover are roads, houses, and parking lots.
- Rural and exurban (semi-rural) streams decline rapidly with increased development. This means that they are particularly sensitive to changes in the landscape.

Through this study, we developed a model that helps us to predict stream health based on land use. This means that we can predict what might happen to a stream when certain activities begin or end in the surrounding landscape. Learn more about the Land Use Study at streamwatch.org/lus.



Citizen Science

- 130 active volunteers, giving 1500+ hours of work per year
- 70+ macroinvertebrate (aquatic insect) samples per year
- 100+ bacteria samples per year
- Enhanced volunteer resources to expand citizen involvement



Long-Term Monitoring Program and other Projects

- Added 13 bacteria sites in summer 2012
- Added 13 benthic sites in fall 2012 and spring 2013
- Land Use Study - education and outreach
- Annual assessments and reports
- Rivanna Watershed data center houses decades of local data



Collaboration

- Ongoing Level III status with VA Dept of Environmental Quality - StreamWatch data are used directly by DEQ
- New bacteria monitoring program - Rivanna watershed and Moores Creek watershed in support of Moores Creek TMDL Implementation Plan
- RWSA's Watershed Protection
- Partner meetings to make data more accessible and useful to community partners



Leveraging Funds

- \$40,000 equivalent of volunteer labor
- \$40,000 CACF grant for new Bacteria Monitoring Program
- \$29,000 from local foundations in support of making the Long Term Monitoring Program more sustainable and secure
- \$28,000 from other local partners



Stream Health Follows Land Use

Key findings from StreamWatch's Land Use Study in the Rivanna watershed

Beginning in spring 2007, StreamWatch set out to study relationships between land use, stream habitat, and stream ecology in the Rivanna River watershed. For more than two years, we collected stream-dwelling organisms and habitat data at 51 sites. We then compared these data with land use in the watershed. Here is what we found:

- **Stream health is closely related to land use**

Landscapes with lots of forest have healthy streams. Areas with lots of paved surfaces have unhealthy streams. In between, health declines as development of the land intensifies. The relationship is so strong that we can predict stream health based on the amount of forest and development in the surrounding area.

Cattle operations, quantified at the watershed scale, did not have a big impact on overall stream health. However, we did not study the effects of cattle operations on adjacent or nearby streams.

- **Rural and exurban stream health declines rapidly with increased development or deforestation**

Most of the Rivanna basin is semi-rural (exurban). In this exurban landscape, roughly 70% of the land is forested, and there are about 17 acres for every house. This amount of disturbance may seem mild, yet more than half of exurban streams failed the biological standard for aquatic health. In urban areas, stream health is already poor. Therefore, urban streams do not respond dramatically to additional development.

- **70% of streams in the Rivanna watershed are failing Virginia's standard**

Based on land use and monitoring data, we estimate that 70% of Rivanna streams fail the Virginia biological standard for aquatic health. This standard tells us whether streams support a variety of life forms. Streams with more diversity and variety have better water quality, and can provide better services to humans. Such services include drinking water supply, recreation, and aesthetic enjoyment.

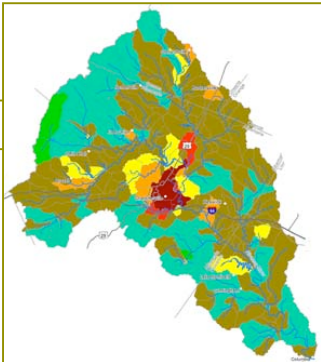
Based on our model, we predict that within 20 years, increased development in non-urban areas could reduce the number of healthy streams by about a third.

- **Many of the failing streams might meet the health standard with better care**

Fortunately, only 5% to 10% of our streams are severely degraded. Most streams sit near the pass/fail cusp and might meet the standard with better care.

- **Unstable stream banks and excess sediment appear to affect the health of many Rivanna streams**

- **Forested buffers alongside streams can protect and improve stream health**



To learn more about the StreamWatch Land Use Study, visit streamwatch.org/lus

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