

## Save Our Streams Annual Report, 2021

Water input to the lake comes from more than just the Roanoke and Blackwater rivers. Many smaller streams can carry pollutants and a significant amount of sediment into SML. Monitoring the health of these streams is critical to the understanding of the quality of stream water that drains into SML. SMLA collaborates with the local Virginia Save Our Streams Program (VA SOS) and the Blue Ridge Foothills and Lakes (BRFAL) Chapter of the Virginia Master Naturalist Program to conduct water quality monitoring of small streams that feed into the lake. Certified volunteer monitors (“citizen scientists”) collect and identify fresh water aquatic macroinvertebrates (a.k.a. “bugs”) that live on the bottom of a stream (benthic area) on a semi-annual basis. Information on the diversity and number of bugs found is used to determine the quality of water flowing through the streams and to monitor water quality over time. The data collected is entered into Virginia’s SOS database and used by the Virginia Department of Environmental Quality in assessing the overall quality of Virginia’s streams and rivers and to identify specific problems that may need to be addressed. The VA SOS data from streams feeding into Smith Mountain Lake complements the SMLA/ Ferrum College Water Quality Monitoring Program (WQMP) that has set the standard across the nation for a volunteer lake monitoring program for over 35 years. Expenses for our SOS project, generally for equipment replacement, came from the same sources as Water Quality Monitoring funds.

According to our SOS Program’s founder, Dr. Don Kelso, while “there is no single way of encapsulating the quality of the water, the quality of the habitat, or the robust-ness of the community of organisms...,” our monitoring protocol is considered one of the best available. Moreover, our data is accepted by Virginia’s Department of Environmental Quality and will become part of their annual report. However, since DEQ won’t be publishing its statewide report until early next year, the data for our watershed as depicted below should be seen as preliminary.

This year, 16 streams in our watershed were included in SOS’s annual survey. Three- and four-person teams of certified monitors, who base their findings on a count of macroinvertebrates, conducted a total of 32 monitoring events. Their ratings are based on the relative numbers of pollution-tolerant and pollution-intolerant species identified. Scores run from 0 to 12, from low to high, with a score of 7 and below considered unacceptable; 8 in the gray area zone; and 9 and above acceptable.

<b>Year</b>	<b>2019</b>	<b>2021</b>
Sites Monitored	16	16
Acceptable (9-12)	3	6
Gray Area (8)	9	5
Unacceptable (0-7)	4	4
Unable to Determine*	0	1

\*Based on insufficient data, since fewer than two valid monitoring events took place

N.B. The 2020 monitoring season was cancelled by DOE due to the pandemic.

<b>Area Results</b>	<b><i>Acceptable</i></b> 2019/2021	<b><i>Gray Area</i></b> 2019/2021	<b><i>Unacceptable</i></b> 2019/2021	<b><i>Unable to Determine</i></b> 2019/2021
SML Northern Shore (Bedford Co.) (3 sites)	2/1	0/1	1/0	0/1
Gills Creek Area (3 sites)	0/1	2/1	1/1	0/0
Hardy Road Area (3 sites)	0/0	3/1	0/2	0/0
Upper Blackwater (2 sites)	0/2	2/0	0/0	0/0
Lower Blackwater (3 sites)	1/1	1/2	1/0	0/0
Pigg River (2 sites)	0/1	1/0	1/1	0/0
Total	3/6	9/5	4/4	0/1

**Notes:**

1. Overall, the number of fully acceptable sites doubled from 2019 to 2021, while the overall average of 8.2 remained almost unchanged.
2. The fall 2021 samplings yielded lower scores than in the spring, as the drought noticeably decreased water flow rates. Clearly, aquatic bugs need water to survive.
3. The high ratings for the Upper Blackwater sites are notable, because they reinforce the conclusion that the Blackwater River upstream from the MVP pipeline crossings is in good ecological condition.
4. The Lower Blackwater sites, including one just downstream of the planned MVP pipeline crossing, showed some increased sedimentation, possibly resulting from the earthmoving activity associated with the ongoing pipeline construction.

**Conclusions**

- The general health of the streams in our watershed is good.
- Fluctuations in the rating of a given stream can be due to a variety of factors, such as an abnormal shift in stream conditions (i.e., a temporary construction project; a nutrient spill from a farm or golf course; or cattle straying into a stream).
- Fluctuations in the ratings of multiple streams are most often caused by weather variability, such as a result of flood or drought.
- In most of the above cases the stream or streams have proven resilient and reverted to their mean the following year.
- As degradation of water quality due to major construction, water pollution, or climate change is an ever-present possibility, our best defense is to continue a vigorous water monitoring program to identify downward trends before they become both more difficult and more costly to address.