

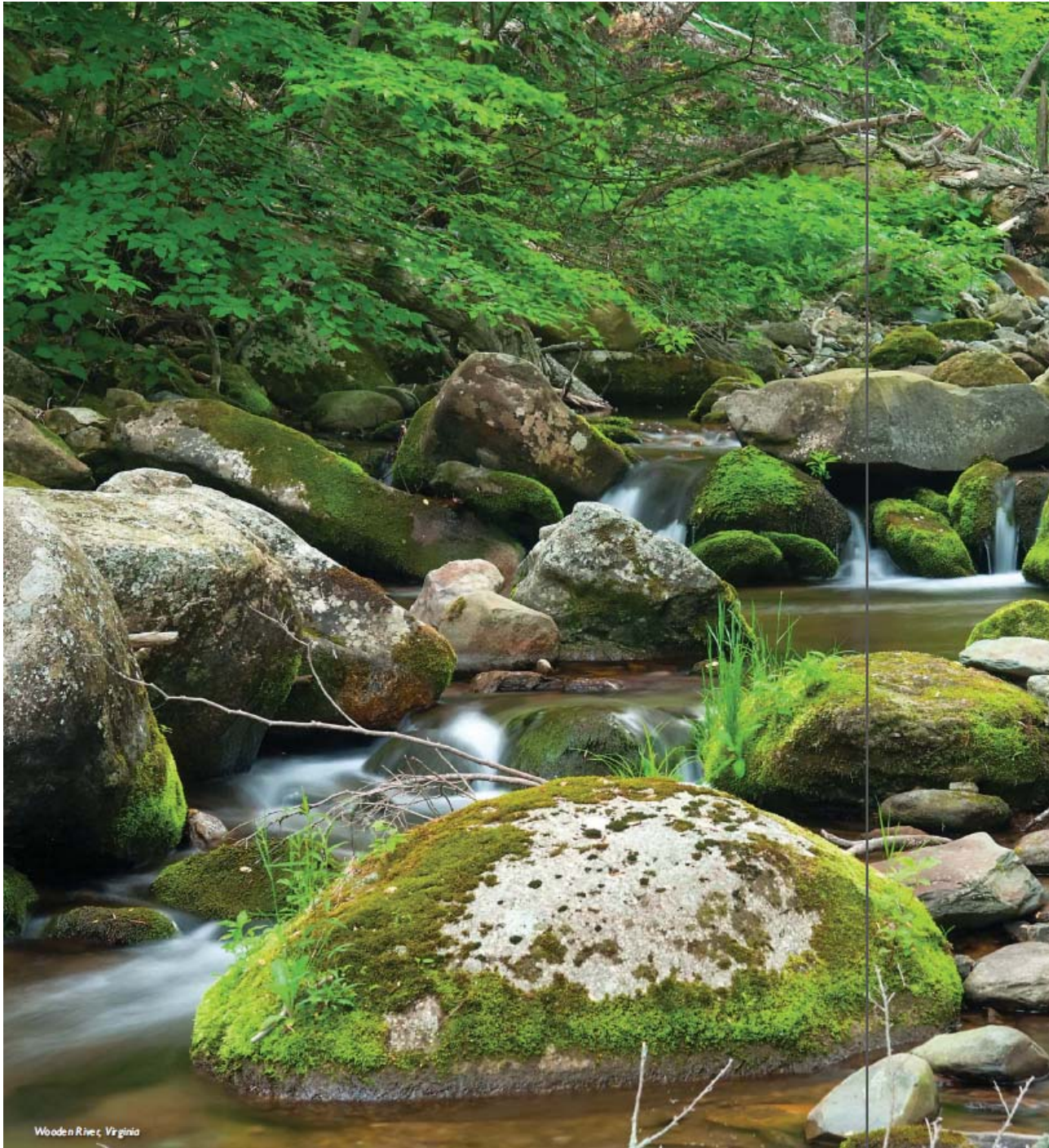


TROUT, Summer 2012

Brook Trout Get a Reprieve

Acid levels are dropping in Virginia brook trout streams

BY DAVID HART



Wooden River, Virginia

Virginia's brook trout—and brook trout anglers—can breathe a little easier.

Results from the most recent Virginia Trout Stream Sensitivity Study showed an overall decrease in sulfate levels in monitored streams from 1987 to 2010. Acid levels dropped an average of 18 percent and acid neutralizing capacity, a measure of a watershed's ability to buffer harmful chemicals, increased 82 percent during the same period. That means more native brook trout streams are healthier than they have been in decades. The turnaround is the direct result of amendments to the Clean Air Act passed by the Bush administration in 1990, which required coal-fired power plants to reduce sulfur dioxide emissions through the use of scrubbers and other technology.

The VTSSS began in 1987 when scientists at the University of Virginia Department of Environmental Sciences tested water samples from 379 brook trout streams throughout Virginia. Most were on public land. The study is a spin-off of the Shenandoah Watershed Study, which examined the effects of acid deposition on streams in the Shenandoah National Park. The initial results were alarming. Nearly half the 379 streams sampled under the VTSSS were classified as substantially impaired by acidification.

Although it's difficult to measure the direct effect of increased acidity on brook trout populations, VTSSS project leader and UVA senior scientist Rick Webb says the St. Mary's River serves as a case study of the effects of high acidity. The St. Mary's is a high-gradient native brook trout stream that spills out of the George Washington and Jefferson National Forest in Augusta County. It used to be one of the best trout streams in the state. That gradually changed when pH levels dropped from 6.8 to as low as 4.9 in recent years due to acid deposition. At least eight species of fish were eliminated from the river since populations were first monitored in 1976. Brook trout and blacknose dace, two of the most acid-tolerant coldwater fish species in Virginia, saw notable declines as well, and the Macroinvertebrate Aggregated Index for Streams, a score used by the US Forest Service to assess aquatic ecosystem health, declined from "Good" to "Poor/Fail."

"The St. Mary's was on the verge of losing its brook trout," says Webb.

It was so bad, scientists with the Forest Service, the Virginia Department of Game and Inland Fisheries and James Madison University moved forward with a plan to distribute lime in the river's upper reaches. In 1999, helicopters dropped 140 tons of lime into the St. Mary's and its tributaries and another 230 tons in 2005. Trout and insect populations have responded favorably, but liming is a short-term and expensive fix to a long-term problem, notes Webb.

"The only reasonable solution is to decrease emissions from coal-burning power plants," he says.

The improvements in the St. Mary's water quality were noticeable almost immediately, but scientists didn't see much of a change in the hundreds of other monitored streams when they were sampled again in



ARON FETTERSON

2000. Webb says the delayed response to reduced power plant emissions was likely due to accumulation of harmful compounds and loss of buffering capacity in soil surrounding the watersheds. As it turns out, a slow recovery is better than no recovery.

A 1998 report by Webb and other scientists at UVA determined that had the Clean Air Act (CAA) amendment not been passed, the number of Virginia's brook trout streams classified as chronically acidic—which can not support brook trout—would have jumped from 6 percent to 35 percent by 2041. The CAA amendments did pass, of course, and more than three-quarters of the sampled streams have been designated as suitable for reproducing brook trout populations, up from just 55 percent when the first samples were taken in 1987. (Data from the first round of sampling was used to convince Congress to pass the amendments.)

"There is no other plausible explanation," says Webb. "Sulfur emissions declined 64 percent between 1990 and 2009, so it would make sense that there is a direct correlation between decreased sulfate levels in streams and a decrease in power plant emissions."


Surprisingly, many of the watersheds that are not in danger from acid rain are just a ridge or valley away from a stream that has been significantly impacted by acid deposition. Webb says that's due to the geology surrounding individual streams: Bedrock in some watersheds has more neutralizing characteristics than others. The St. Mary's River is surrounded by quartzite, which does not have the acid neutralizing capability of other types of bedrock. In all, about a third of Virginia's trout streams are similar to the St. Mary's and have a low acid neutralizing capacity, which means without even further decreases in acid deposition, trout and other aquatic life in those waters will continue to struggle. Some streams may never fully recover.

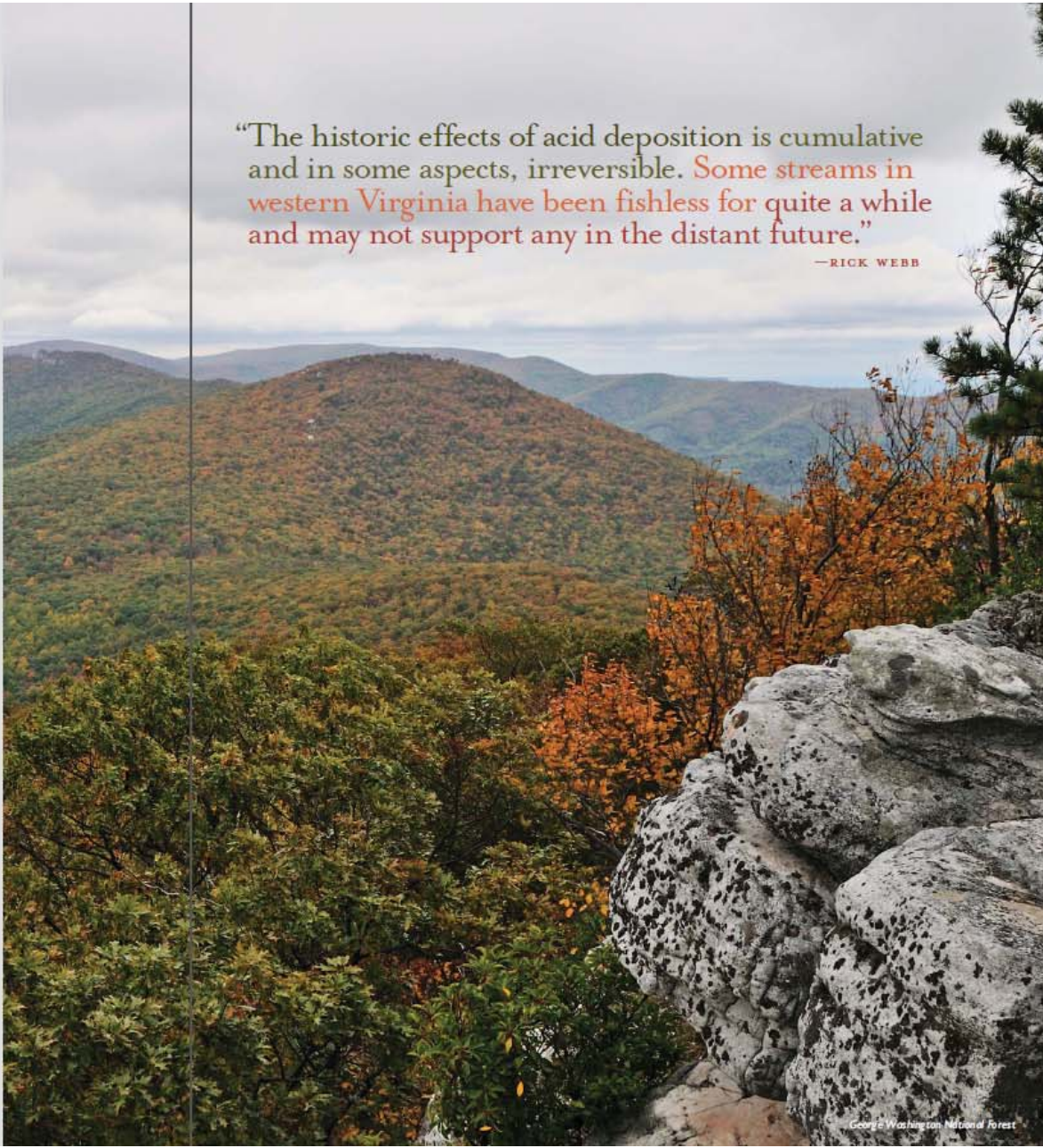
"The historic effects of acid deposition is cumulative and in some aspects, irreversible," says Webb. "Some streams in western Virginia have been fishless for quite a while and may not support any in the distant future."

The potential long-term damage by acid rain has galvanized Virginia's trout fishing community, says Marcia Woolman, who has served as the VTSSS volunteer coordinator since 2000 and was named TU's outstanding volunteer leader in 2009. In 2010, 165 volunteers, mostly TU members, invested 1,577 man-hours collecting samples from 384 streams.

Not only have TU members assisted in gathering important data for the ongoing study, the study has been vital in generating support for TU, particularly at the local level. Woolman says new members in particular are enthusiastic about playing a role in chapter activities, especially VTSSS sample collections.

Webb has been equally impressed by the enthusiasm from Virginia's TU members and adds the study would not have been possible, at least not on such a large scale, without help from concerned anglers.

"Volunteers, especially TU members, have been the backbone of this study. It's been remarkable how well they have responded to the call for volunteers," says Webb, a TU member and trout angler. "It's a testament to how much they value these streams." 



"The historic effects of acid deposition is cumulative and in some aspects, irreversible. Some streams in western Virginia have been fishless for quite a while and may not support any in the distant future."

—RICK WEBB