



# NONPOINT SOURCE SUCCESS STORY

## West Virginia

### Improving the Cheat River Restores a Biological and Recreational Treasure

#### Waterbody Improved

Friends of the Cheat (FOC) was formed after a mine illegally discharged pollution into Muddy Creek, a Cheat River tributary. FOC organized partners from corporations, foundations, citizens, and local, state, and federal government to undertake projects necessary to restore water quality and transform the Cheat River into a recreational resource for Preston and Tucker counties and the international whitewater paddling community. After decades of severe impairment by acid mine drainage (AMD), the Cheat River and many of its tributaries now provide clean water and support diverse communities of fish and other aquatic species due to the efforts of FOC. The river is becoming an economic resource as the growing recreation industry creates new jobs in Preston and Tucker counties. Although waters in the Cheat River watershed do not yet consistently attain water quality standards, data show improvements.

#### Problem

The Cheat River is in a coal-rich area of West Virginia. Most local coal contains pyrite, which reacts with air and water to form acid mine drainage (AMD)—a chemical soup made of sulfuric acid, dissolved iron, and more. AMD eliminates aquatic life by making the water toxic and clogging streambeds with sludge. There was no federal law against discharging AMD to surface water until the 1977 Surface Mine Drainage Control and Reclamation Act, which required stricter regulation of mine discharges. Some companies abandoned mines where they could not or would not treat the pollution. The AMD leaking from abandoned mines is considered to be nonpoint source pollution. In the Cheat River watershed, one of the mines diverted its drainage into another mine that had shut down before the 1977 cut-off date. The polluted drainage water leaked out, appearing to be abandoned mine drainage—until a 1994 storm caused flooding that led to a blowout of polluted water through a hillside into Muddy Creek and the Cheat River. Although the Cheat River was the first West Virginia river to support a commercial whitewater industry (Figure 1), many of the boating companies took their business elsewhere after the 1994 blowout event.

Thousands of stream miles remain on West Virginia's list of impaired streams due to AMD. Many large streams and some rivers have no fish or only pollution-tolerant fish. In some streams, stones are stained orange and stream-bed gravel is filled in with mine drainage sludge.



Figure 1. Whitewater boaters enjoy running the Cheat River Canyon.

#### Story Highlights

Residents and whitewater boaters formed FOC after the 1994 blowout event. FOC established the River of Promise partnership, through which government agencies, businesses, foundations, and individuals cooperate to secure resources for restoration projects. FOC also established "CheatFest," an annual festival bringing together people who love the river, including residents, boaters from all over the world, musicians, and visitors.

Since 2003, FOC has built 20 AMD treatment projects, including passive-treatment practices, such as lime-stone leach beds, steel slag leach beds, and compost and limestone beds, as well as active-treatment projects, which rely on machines that dispense small amounts of limestone and other materials according to how much water is flowing through the river segment (Figure 2). As a result of passive treatment alone, area residents began to see the return of fish to Sovern



Figure 2. The North Fork Greens Run Railroad Refuse project passively treats AMD.

Run, a Cheat River tributary (see [2013 Success Story](#)). In 2019, FOC and the West Virginia Department of Environmental Protection (WVDEP) dedicated a large, active AMD treatment plant (see [2021 Success Story](#)) treating pollution from a variety of abandoned and forfeited mines in one of the tributaries.

FOC has grown into an organization that can manage all aspects of the treatment projects. The organization uses donations and modest disbursements from operating funds to employ a staff of six who maintain projects, track water quality in the watershed, and ensure quality assurance project plans are followed. FOC has recently expanded its work from AMD issues to include other conservation projects, such as planting trees to restore streambanks, monitoring and posting *Escherichia coli* bacteria counts in stretches of the river most popular for casual boaters, and working to remove a dam once used by the now-retired Albright Power Station. Long-term monitoring confirms continuing water quality improvements.

## Results

As a result of restoration efforts undertaken by FOC and its partners, fish and other aquatic species are returning to the Cheat River. Walleye are being caught further upstream where AMD previously prevented their migration, and DNA from a rare species, the Eastern Hellbender, has been detected in the river. Measurements of pH, aluminum, and iron, all of which indicate mine drainage, show decreasing trends over the decades since the 1994 blowout. Regular measurements from the 1970s to 2022 demonstrate decreasing iron concentrations and increasing alkalinity (Figures 3 and 4).

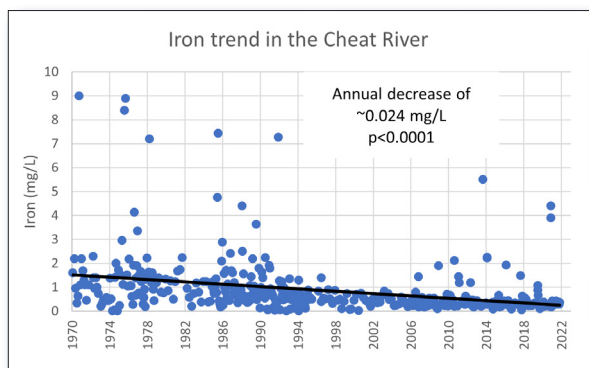


Figure 3. Long-term iron concentrations are decreasing in the Cheat River watershed.

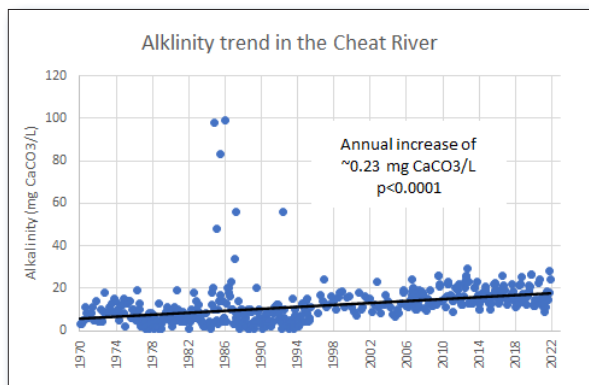


Figure 4. Long-term alkalinity levels are improving in the Cheat River watershed.

Preston County leaders are realizing they have a world-class outdoor recreation (swimming, fishing, boating, and biking) nexus and an opportunity for economic development in the tourism industry. FOC is developing two rail-trail corridors, and FOC and partners have assembled a Master Trail Plan to market water trails, hiking trails, and bike trails in the county and across the northern part of the state. The Cheat River's environmental success is also becoming a recreational and economic success.

## Partners and Funding

Major funders include the WVDEP Nonpoint Source Program (\$4.2 million), the Office of Surface Mining Reclamation and Enforcement (\$1.8 million), the WVDEP Office of Abandoned Mine Lands and Reclamation (\$1.3 million). Patriot Mining Company (now a subsidiary of Arch Coal) and Southwest Energy also made major contributions to water treatment projects.



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