In-Depth NONPOINT SOURCE SUCCESS STORY

Highlighting the People Behind the Progress

Efforts to Restore Watershed Builds Community and Yields Environmental and Economic Benefits

CHEAT RIVER WATERSHED, WEST VIRGINIA

Since the 1970s, the heavily mined Cheat River watershed in West Virginia has been severely affected by acid mine drainage (AMD). After two mine blowouts in the mid-1990s severely degraded water quality and aquatic life, community members and experts came together to restore the Cheat River and its tributaries. Through the hard work and continued efforts of dedicated local leaders, significant remediation of AMD has been achieved. The Cheat River watershed has returned to a valuable fisheries habitat and is an internationally recognized recreational resource.

Partners in Success

Madison Ball, Friends of the Cheat

Program Director Engages and Inspires

As director of the conservation program, Madison gathers data, educates watershed residents and visitors, and inspires others' love of the river.

Martin Christ, West Virginia Department of Environmental Protection

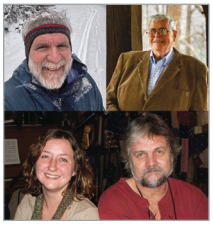
State Contact Encourages Action

Martin works with partners to support restoration and watershed protection projects.

Charlie Walbridge, River Advocate

Whitewater Paddler Protects River

As an FOC board member and lifelong outdoorsman, Charlie works hard to bring about change, raise the river's visibility and share the successes with others.



Leaders, Past and Present

Advocates Bring Change

Many leaders, including Dave Bassage, Bill Thorne, Keith Pitzer and Amanda Pitzer, have made many contributions to the Cheat River restoration effort .

Success Story *Highlights*

Pollutants of concern: acid mine drainage, pyrite, dissolved iron, sulfuric acid, pH/acidity, turbidity, manganese, aluminum.

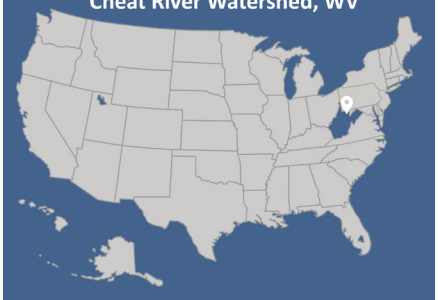
Practices implemented: Open limestone channels, limestone leach beds and fines, mushroom compost beds, limestone separation dams, steel slag leach beds, settling ponds, wetlands, AMD-specific active treatment plants, riparian revegetation, erosion control.

Waters restored/improved: Water quality has improved in Cheat River watershed, thanks to on-the-ground restoration efforts.

Key elements of success:

- Passive water treatments
- Private and government partners and funding
- Volunteer sampling
- Local landowner buy-in
- Community support and participation

Cheat River Watershed, WV



Basin Description

The Cheat River watershed originates deep in the Monongahela National Forest and drains 1,422 square miles in northeastern West Virginia, southwestern Pennsylvania and western Maryland. Five headwater streams (the Blackwater River, Shavers Fork, Dry Fork, Glady Fork and Laurel Fork) join to form the Cheat River near Parsons, West Virginia. These major headwater tributaries are well-known coldwater fisheries supporting healthy fish populations. Situated in a coal-rich region of West Virginia, the lower watershed became a hub for mining in the nineteenth century. Despite the pollution, it was used recreationally and became the first commercially rafted river in the state.

Water Quality Challenge

Mining exposed iron- and sulfur-rich minerals to air and water. The interactions released acidic chemicals into the water, forming AMD. The dissolved heavy metals in AMD increased acidity, harming fish, other forms of aquatic life and the entire river ecosystem. AMD also caused a buildup of toxic sludge in streambeds, impacting benthic species.

Photo: FOC

AMD pollution affecting the Cheat River.

Although polluted for decades prior, the Cheat River grabbed national attention after two blowouts at the active T&T coal mine in 1994 and 1995 poured millions of gallons of very acidic water into the river. The river's pH dropped to 4.5 on a scale of 14. For perspective, pure water has a neutral pH of 7, while a pH of 2 is equivalent to vinegar. After the blow outs, no aquatic life was found alive in the water.

Community Cultivates Remediation

Immediately after the pollution events in the mid-1990s, concerned locals and stakeholders founded the Friends of the Cheat (FOC). The nonprofit group went on to form River of Promise (ROP), a coalition of government agencies, academic entities and conservation groups focused on restoring the watershed.

A 2005 Lower Cheat River Watershed Based Plan (WBP) allowed FOC and partners to acquire Clean Water Act Section 319 funding for monitoring and building AMD treatment systems. Several projects tackled severely polluted streams but didn't bring fish back. After the 2011 Cheat River Total Maximum Daily Load was completed, FOC developed a series of more narrowly focused WBPs: the North Fork of Greens Run and Big Sandy Creek in 2019 and Muddy Creek in 2020. These WBPs led to projects that support fish communities and help the streams meet water quality standards.

FOC also engages watershed residents and visitors. The Cheat River Festival, launched in 1995, is an annual fundraiser and outreach effort that gathers thousands of visitors. Families, boaters and music lovers enjoy live music, dancing, art, vendors, races and other fun events. The festival, held the first Saturday in May, connects people with FOC and the river while raising funds to support FOC's work year-round.

Photo: FOC

Children engage in a learning activity during Cheat Fest 2024.

Water Quality Improvements

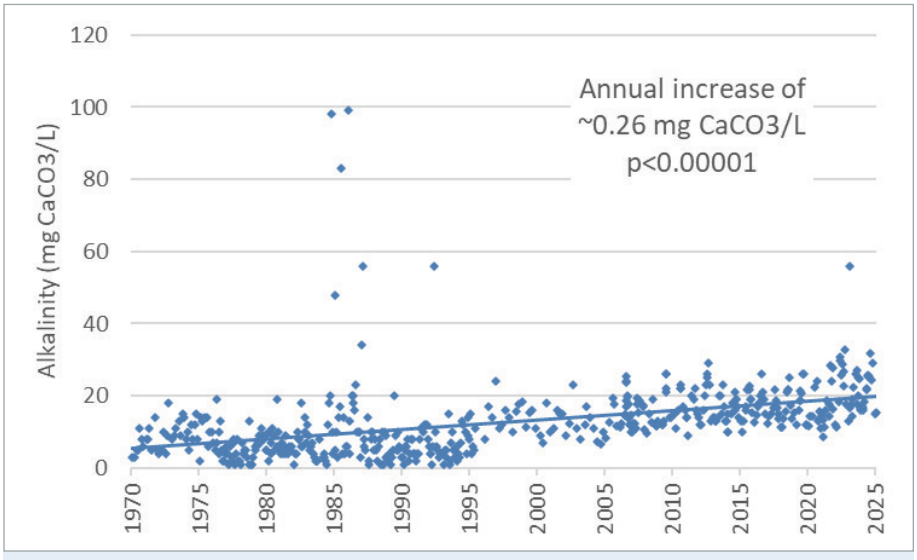
Since 1995, FOC and its partners have implemented 20 AMD treatment systems on private and abandoned mine lands within the watershed. These projects require the volunteer participation of landowners, and some systems are 10 acres or more in size. Most of these projects are passive treatment technologies using naturally occurring chemical and biological processes that do not require the continuous addition of chemicals. These passive treatment systems often include open limestone channels, limestone leach beds, settling ponds and constructed wetlands.

Photo: D. Bassage

Dave Bassage navigates the clean waters of the Cheat River.

Step by step, tributary by tributary, these private-public partnerships are paying off. In 2006, limestone treatment in the Greens Run and Pringle Run tributaries were already helping to improve pH levels in the lower Cheat River watershed (see the 2006 NPS Success Story). As a result of passive treatment alone, residents began to see the return of fish to Sovern Run, a Cheat River tributary (see the 2013 NPS Success Story). In 2019, the West Virginia Department of Environmental Protection (DEP) completed a large-scale, active treatment system (see the 2021 NPS Success Story) that remediates AMD from various abandoned and forfeited mines along Muddy Creek.

A 2022 NPS Success Story highlights the overall improvements seen in the larger Cheat River watershed, including rising pH levels, decreasing metal levels, and the ongoing recovery of sport fish and other aquatic species. Anglers have caught walleye in upstream areas where AMD previously prevented their migration, and scientist Madison Ball discovered a rare aquatic salamander species, the Eastern Hellbender, in the river. In 2022, FOC completed a study showing that freshwater mussels, a pollution-sensitive species dependent on clean water, were once again able to survive in the Cheat main stem after being eliminated for over 100 years. These successes have been possible thanks to the many dedicated and passionate people who have cared for the river over the past decades.



The long-term alkalinity levels continue to increase in the Cheat River, indicating the acidic effects of AMD are being mitigated.

Section 319 Funding Played a Key Role in the River's Restoration

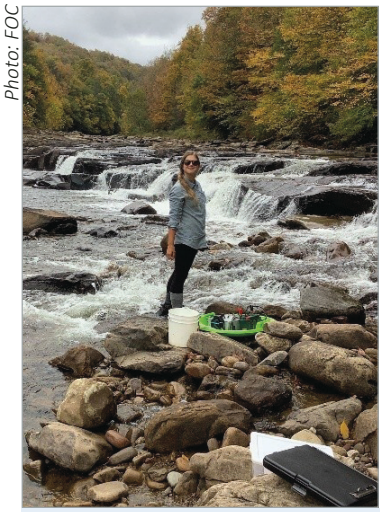
The U.S. Environmental Protection Agency's (EPA's) Clean Water Act Section 319 funding has played a pivotal role in restoring the Cheat River. View the DEP's EPA Watershed Project Tour to hear more about how Section 319 program funding helped river partners jump-start and maintain efforts to treat AMD.

THE PEOPLE BEHIND THE PROGRESS

"We continue to carry the spirit of the river protection effort forward."

Madison Ball

Photo: FOC



Madison conducts a survey for aquatic life.

Photo: FOC

A hellbender peeks out from under a rock.

Madison Ball, Friends of the Cheat

Program Director Engages and Inspires Others

Madison grew up near the water in Michigan and began working in West Virginia's Monongahela National Forest after college. She served as a watershed technician for Trout Unlimited and the U.S. Forest Service before joining FOC in 2018. In her current role as FOC Conservation Program Director, Madison works on projects reducing AMD, restoring riparian areas, protecting aquatic life and connecting people with the river.

- ***What role has FOC played in the Cheat River watershed?***

Madison: Hearing about FOC's formation is like hearing a family story filled with memories and emotion. The community came together after the Cheat's condition became unacceptable. We continue to carry the spirit of the river protection effort forward, serving as the squeaky wheel that gets the grease. It takes a group, a steward, to make progress in a polluted area.

- ***What has made FOC's efforts so successful?***

Madison: Our open-hand versus closed-fist approach to partnerships separates FOC from other groups. Our first meeting for the River of Promise included government agencies, local groups, and a coal company, Anker Energy, who helped fund an AMD passive treatment site. No one has been turned away from helping us find solutions to the problems.

- ***How has FOC approached the restoration of such a degraded basin?***

Madison: Our watershed has over 340 AMD seeps; even more remain undiscovered. We systematically address these areas with guidance from DEP and the Clean Water Act Section 319 program. We focus on specific subwatersheds instead of scattering efforts across a larger area. As a result, stream systems like Muddy Creek and North Fork of Greens Run have improved.

- ***What inspires you about the story of the Cheat River?***

Madison: I'm motivated by looking at pictures of the severely degraded Cheat River in the 1980s. I have the privilege of seeing the river teem with life due to our group's past efforts. FOC has achieved restoration goals that were unthinkable 30 years ago. That knowledge has been rewarding. It has changed my perspective to know that what I consider impossible now might be achieved over the next 30 years.

- ***What successful projects have been especially important to you?***

Madison: Species restoration. People are catching walleye again, and we thought they'd been eliminated by the pollution. DNA analyses also showed evidence of hellbenders, so we snorkeled at sites with strong sample results. They're camouflaged, but we saw some poke their heads out of their nest rock! Finding them in the watershed is monumental, as they are disappearing in other parts of the country.

Martin Christ, West Virginia Department of Environmental Protection

State Contact Encourages Action

Martin is the DEP's Northern Watershed Basin Coordinator. He helps organize local efforts to implement watershed restoration and water quality improvement projects. His responsibilities include supporting volunteer watershed associations and other organizations, educating citizens on nonpoint source pollution issues, identifying local stakeholders and partners, helping to develop watershed-based plans and facilitating project teams.

- ***What do you love about the Cheat River?***

Martin: It's beautiful. The Cheat River is a huge resource for everybody. Different communities come together in certain areas, such as in the upper watershed along the Cheat Narrows. The locals swim there because it is a stretch of calmer water amidst the rapids, and rafters and kayaker from all over float through the area. Everyone appreciates the river's clear and clean waters.

"Everyone appreciates the river's clear and clean waters."

Martin Christ

- ***Do other watershed groups look to FOC for inspiration?***

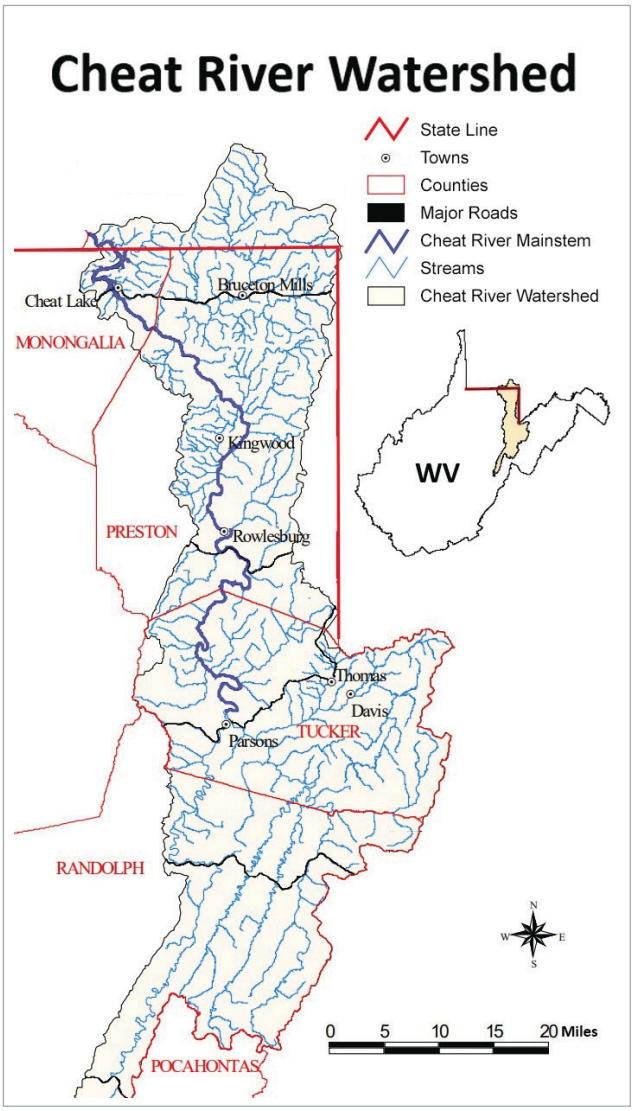
Martin: Yes. FOC has a staff of around six people, and they have an active volunteer community. Other groups express interest in emulating FOC's annual "Cheat Fest," which generates revenue for FOC's programs. Two groups in the state have also started holding annual festivals.

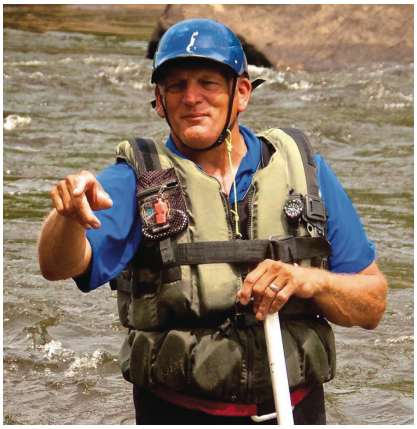
- ***Has FOC inspired changes on the state level?***

Martin: Many groups go to FOC for advice on administering state and federal money. Staff at FOC and other watershed groups devote weeks to learning the funding procurement systems only to complete a few administrative tasks throughout the year. FOC and DEP are discussing how to help connect small groups with procurement experts so they can implement projects more easily. DEP has proposed offering a resource of this type through the West Virginia Watershed Network.

- ***What has impressed you about FOC's efforts?***

Martin: When FOC implements a Clean Water Act Section 319 project, they plan ahead so they can accomplish all tasks. They've branched out and received grants from places that are not strictly governmental; for example, they connected with a Michigan-based resource to help with plans to remove the Albright Dam, which is blocking fish passage. FOC engages the community and reaches out to landowners who might not be receptive. They make the process look easy, but it's hard work.





"If you want a river to last, you must work to protect it."

Charlie Walbridge

Charlie Walbridge, FOC Board Member

Whitewater paddler protects river

Charlie is a longtime member of FOC's board of directors and experienced whitewater paddler. He's had an extensive career focused on whitewater and outdoor recreation and has worked as an author, consultant, entrepreneur and business owner.

- ***What motivated you to become involved in conservation?***

Charlie: I grew up in New York and Pennsylvania, spending countless hours outdoors. I began as a paddling guide and instructor on the Cheat River in 1976. You can't run rivers and not appreciate their value and recognize the risks and endangerments that threaten them. If you want a river to last, you must work to protect it.

- ***What compelled you to become involved with FOC specifically?***

Charlie: FOC is a community organization founded by local people who prioritize the environment. It has never been a confrontational organization; instead, it's built relationships.

- ***Could you speak about the changes you've seen in the river?***

Charlie: A longtime resident told me that Muddy Creek, a Cheat River tributary, was clean before he went to war in the 1940s; when he returned, he noticed the pollution. When I began as a river guide in 1976, I saw significant pollution during low water levels; the eddies had brown foam, and the water didn't smell or taste good. Then, the mine blowout happened and created a 5- to 10-foot-wide orange bathtub ring down the canyon. It was a huge disaster, but it brought people together to form FOC. Muddy Creek was incredibly polluted — I never believed it could be cleaned up, but it has been. When others feel discouraged about the work that still needs to be done, I remind them of how far we've come.

- ***Why is the Cheat River restoration story special?***

Charlie: It shows what ordinary citizens can do. FOC founders included a Trout Unlimited officer, a retired coal miner, and a chief engineer at the Albright Power Station; they were regular people who believed in FOC's purpose.

- ***Are there any other individuals we should acknowledge?***

Charlie: Yes! Dave Bassage, the first executive director of FOC, started the River of Promise. He committed to the idea of FOC being a community-focused environmental organization that worked cooperatively. Keith Pitzer continued Dave's work. Keith could talk to anybody—a government employee, a university professor, or a landowner—and make them comfortable. Keith transformed FOC from a one-person show to an organization with a handful of staff. Finally, Amanda Pitzer, the current FOC director, has further expanded the organization's size and scope.

Photo: FOC

Photo: FOC

Charlie investigates an eroding area (top) caused by a blocked culvert leading to water pooling on an access road (bottom) used by paddlers. Charlie is part of the FOC Whitewater Access Maintenance Team.

Thirty Years of Advocating for the Cheat River

Many people have contributed to the success of the Cheat River restoration over the past three decades. Here, we spotlight more key "people behind the progress."

Bill Thorne (1938–2024), river advocate: Bill was a lifelong member of Trout Unlimited and an FOC board member. He cared deeply about environmental health. Overcoming many obstacles, Bill worked with humor, dedication, and a hands-on approach. His efforts resulted in cleaner waterways and the return of several fish species. Bill's friend Susan Gordon shared that he "walked every ridge and ravine of all those mountains, waded every creek, and cast a line for his wily, feisty brookies." Bill's daughter summed it up best in a note to Susan: "When I look at the clean running waters, I know my dad was an integral part of making those waters beautiful again." Read more about Bill: *Into the Canyon*.

Dave Bassage, first FOC director: As a whitewater paddler, Dave experienced the Cheat's pollution first-hand and witnessed the mine blowouts in the 1990s. Dave started FOC from his kitchen table alongside other concerned community members and launched the enduring legacy of FOC's nonconfrontational approach to remediation. To emphasize this cooperative approach, Dave asked to acknowledge four other early contributors to the Cheat River restoration effort: Scott Rotruck, vice president of Anker Energy; Bob Uram, director of the Office of Surface Mining; and Jim Snyder and Randy Robinson, original FOC board members. Hear more from Dave: How we started Friends of the Cheat.

Keith Pitzer (1954–2009), second FOC director: Keith secured millions of dollars for FOC. Under his guidance, the group acquired rights to river access points and trail segments, implemented water improvement projects, helped fish return to a Cheat River tributary, and established far-reaching programs connecting people with the river. Keith's community approach continues to inspire others. Learn more about Keith: Remembering Keith Pitzer.

Amanda and Keith Pitzer have been key contributors to the restoration effort.

Amanda Pitzer, current FOC director: Amanda is expanding FOC and furthering the work of her predecessors, including her mentor, the late Keith Pitzer. Under her leadership, the group engages in community outreach and watershed protection while addressing AMD and other pollution. More waters have improved, including Muddy Creek, the site of the 1990s mine blowout. Amanda is also establishing the Cheat as a stronghold for outdoor recreation by improving river access and supporting the Cheat River Rail-Trail. She's committed to assisting other watershed groups working to protect waterways. Hear more from Amanda: A conversation with Amanda Pitzer.

Moving Forward

Thanks to the many creative and hard-working people over the past few decades, the Cheat River community remains strong and active. FOC has expanded its work far beyond AMD-related restoration, forging connections between the river and people near and far. The group has reached out to new partners and private and public funding sources. Over the past decade alone, the group has:

- Made considerable progress on their Cheat River Rail-Trail project, with 3 miles of trail now open to the public.
- Started a youth snorkel club to help young people see the river up close.
- Developed a comprehensive trail plan for Preston County as part of the Mountaineer Trail Network.
- Created a sensitive species monitoring program for Eastern hellbenders and freshwater mussels.
- Offered a no-cost riparian reforestation assistance program for watershed landowners, in partnership with the U.S. Department of Agriculture.
- Launched an aquatic organism passage program to restore and protect brook trout streams.
- Planned and secured funding to remove the defunct Albright Power Station Dam.

For More Details

To learn more about the Cheat River and its supporters, see:

- *Into the Canyon*, FOC's quarterly newsletter.
- FOC's YouTube channel.
- West Virginia Public Media's 2018 report, From Polluted to Playground: It's Taken 25 Years to Clean Up the Cheat River.
- Muddy Creek story map.
- Rebirth of the Cheat River: An EPA Healthy Waters Blog.
- DNR's Eastern hellbender story map.
- FOC's Watershed Project Implementation Guide.
- The Friends of the Cheat Story, a 2022 film directed by Robert Tinnell, an artist-in-residence working with the students and alumni of George A. Romero's Filmmaking Program.

Photo: FOC

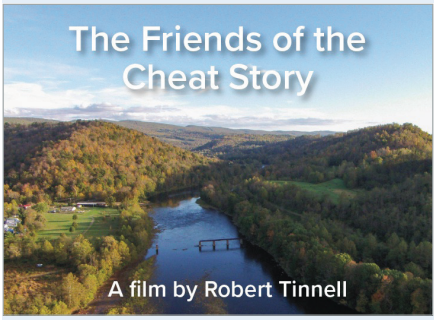
FOC staffer Lisa Maraffa displays a water penny to a youth snorkel club participant.

Photo: FOC

A child explores benthic life up close during a visit to the river.

Photo: Jill Utrup, USFWS

Eastern hellbenders, a pollution-sensitive species, is once again thriving in the Cheat River.



The Friends of the Cheat Story describes the successful restoration of the Cheat River.

U.S. Environmental Protection Agency
Office of Water
Washington, DC

EPA
June 2025

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