



RESTORATION HIGHLIGHT T&T FUELS MINE SITE



Over the past year, major progress has been made towards the restoration of lower Muddy Creek. The center of this activity is WVDEP's active treatment system at the T&T Fuels mine site along Route 26 north of Albright. Completed in late 2017, the treatment system combines traditional acid mine drainage neutralization methods with tools from the wastewater treatment world and the latest in remote sensing and telemetry.

The system receives polluted water from four different locations: raw mine water from the vast, underground T&T Fuels complex, water collected from WVDEP's Viking Coal and "Ruthbell #3"/Preston Energy bond forfeitures sites, as well as water emanating from the Fickey Refuse and Portals abandoned mine land. These heavily polluted waters are first treated with a high pH lime slurry, created by mixing hydrated lime with unpolluted water. The lime slurry drastically raises the pH which causes the dissolved iron, aluminum, and manganese to precipitate out of solution. A special polymer is also added to speed up the flocculation of these metals so they stick together, becoming heavier, and settle to the bottom of the large clarifier units. The clean, clear water stays near the surface, moving away from the center of the clarifiers to the outside edge where it is collected. The sludge is swept into the center of the clarifiers where it is pumped back into the T&T mine, or in extreme treatment scenarios, pumped into large perforated bags on site. Clean water, regulated by a NPDES permit, is discharged back into Muddy Creek.

WVDEP is dialing in this new system, working out the challenges that come with a large, complex treatment system and the implementation of new technology. Not surprisingly, significant improvements to Muddy Creek's water chemistry were immediate. However, FOC was surprised to notice water clarity had also improved immediately downstream of Muddy Creek in the Cheat Canyon.



Top: 1 of the 2, 80 foot diameter clarifiers used to collect AMD sludge - a byproduct of treatment

Bottom: The T&T treatment system's NPDES-permitted outlet discharges treated water into Muddy Creek

T&T AMD TREATMENT SYSTEM - BY THE NUMBERS

4200 gallons per minute, maximum treatment capacity

180 gallons of lime slurry per minute, maximum delivered

100 ton silo of hydrated lime

2 - 80 foot clarifiers hold 1.2 million gallons of treated water

8,700 feet of Fickey Run AMD pipeline

3.4 miles of Muddy Creek to be restored from AMD

WHAT IS pH?

pH is a measure of how acidic or basic a solution is, with the pH scale ranging from 1-14. Acidic solutions like AMD have a low pH and basic solutions have a high pH. Clean water has a pH around 7, which is neutral.

Muddy Creek Then and Now

JUNE 1996 pH 3.2
JUNE 2013 pH 4.9

JUNE 2007 pH 3.7
JUNE 2018 pH 7.17



MARK YOUR CALENDARS FOR THE



25TH ANNUAL CHEAT RIVER FESTIVAL - MAY 3-4, 2019!

Since 1995, tens of thousands of Cheat Fest attendees have come together each May, through every type of weather known, to raise awareness and much-needed funds for the restoration of the Cheat River.

The first Cheat River Festival, held on May 6, 1995, was hosted by Friends of the Cheat, West Virginia Rivers Coalition, and American Whitewater Affiliation - promising that 100% of the proceeds would be used to help protection and restoration efforts within the Cheat watershed. Notably at the first Cheat Fest, the River of Promise agreement was signed and a coalition was created: a group of state and federal agencies, academia, industry, and environmental groups endorsed a private-public partnership which dedicated resources to address the acid mine drainage issues in the Cheat River watershed.



The newly formed Friends of the Cheat, led by Executive Director Dave Bassage, began its mission to restore, preserve, and promote the outstanding natural qualities of the Cheat River watershed. Bassage shared his vision of success in the first newsletter: "We envision the future Cheat Canyon to be a multiuse wilderness recreation area, with clear flowing water and access for fishing, camping, hiking, biking, paddling, and cross country skiing. So far much of the efforts of FOC have involved organizational and information gathering activities. There is an incredible amount of work to be done if we are to make a real difference, but a lot of people care and many are willing to direct their energies towards making a positive difference."

The response to the first Cheat Fest was unprecedented, with over 1,500 in attendance. Gates opened at 4:00pm - attendees enjoyed a night of local music, great food, and a marketplace. The Cheat River Massacre'ence race debuted at the 2nd annual Cheat Fest on May 4, 1996, along with a silent auction and conservation booth spaces. Bassage issued an update in the 2nd newsletter: "Last year, the river conservation organization American Rivers ranked the Cheat eighth on their list of most endangered rivers in the United States. This year (1996), they dropped the Cheat to their twenty most threatened list, not because the river is in noticeably better condition, but because they were impressed by the significant progress we have made toward initiating a comprehensive restoration effort. We have leveraged our limited time and money into significant commitments, but so far we have collected more good intentions than actual reclamation. We have to keep the momentum going."



And it did. FOC and the River of Promise partners kept working toward restoration, and each annual Cheat Fest came and went with more good news and new features. The first Cheat Fest 5k was held at the 10th annual in 2005, with 96 racers participating! Fast forward to the festival as it exists today - Cheat Fest Massacre-ence, Cheat Fest 5k, 2 days of amazing music, beautiful Art Market, great food, kid's tent activities, silent auction, educational workshops, VIP party, and more! Join FOC and our partners at the 2019 Cheat River Festival for a special celebration of 25 years of hard work and persistence, the recently reborn Cheat River mainstem, and exciting new challenges ahead.

CONTACT US!

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Celebrating 25 Years



Friends of the Cheat



Friends of the Cheat

STATE OF THE CHEAT RIVER WATERSHED FALL 2018

Based in Kingwood, WV, Friends of the Cheat (FOC) is a non-profit organization dedicated to protecting and promoting the Cheat River watershed. Directing the majority of its work towards the lower, northern part of the watershed, where acid mine drainage (AMD) pollution is the biggest challenge, FOC is dedicated to restoring the Cheat's water quality, preserving its natural beauty, and promoting recreational opportunities that showcase the region's assets.

FOC formed in 1994 in response to a pollution event that brought the river national attention: water from the large, illegally-sealed, underground T&T Fuels coal mine complex poured tens of thousands of gallons of concentrated AMD into Muddy Creek - entering the main stem of the Cheat River just upstream of the Cheat Canyon. This blowout turned the river orange for miles, leaving a bathtub ring of iron sludge along the rocks. Concerned citizens and stakeholders organized FOC to address the problems resulting from over a century of coal mining.

FOC's Cheat River Restoration program monitors water quality throughout the lower watershed and uses this data to devise restoration strategies and AMD treatment systems. FOC works with private landowners and state and Federal agencies to fund and construct remediation systems that restore water quality of impaired streams. Through these efforts, the Cheat River main stem, once completely devoid of life, is no longer considered impaired for pH, and aquatic communities have returned, including pollution-sensitive walleye. Fish can be found throughout the entirety of the river and populations in Cheat Lake show continued growth and diversity. In 2015, FOC was named one of American Rivers "River Champions" and in 2016 FOC was showcased as one of the "Faces of Success" in the EPA's National Nonpoint Source Program Report.

FOC is involved in a myriad of recreation and land stewardship projects that build the river and community's potential to support outdoor recreation and reap the benefits from its economic impacts. As West Virginia's first commercially-rafted river, the Cheat River has a legendary reputation for its whitewater. Paddlers come from around the world to challenge themselves on local creeks and at the annual Cheat River Canyon Massacre'ence, one of the largest mass start whitewater races in the country. FOC maintains five whitewater public access points, through our Whitewater Access Campaign, which in 2018 raised over \$10,000. These funds repair critical access roads and improve usability for local and visiting recreationalists. FOC also develops local trails, including the Upper Cheat Water Trail (CRWT), which features nine public access sites along nearly 40 miles of Class I water, from Hendricks to Rowlesburg. In June of 2018, the annual Meet the Cheat events brought over 400 paddlers to the CRWT. Project partners have begun designing the first phase of the Cheat River Rail-Trail, which, when completed, will follow the river from Rowlesburg north towards Albright and the Cheat Canyon, providing unparalleled access to the Cheat River Narrows for walking, biking, paddling, fishing, and more.

Through our Education and Outreach program, FOC introduces thousands of people to the Cheat River each year. FOC teaches students of all ages through informal presentations, hands-on learning, and special events including 2018's new snorkel program partnership with the Monongahela National Forest. Hundreds of college students are exposed to the Cheat River community through service-learning projects such as litter clean ups, water sampling, and trail maintenance. FOC staff educate local service clubs and other lifelong learners throughout the region. FOC's annual fundraiser, the Cheat River Festival, attracts 4000 attendees to the banks of the Cheat river each year - raising nearly 40% of FOC's operating costs. FOC will host the 25th Cheat River Festival in 2019!

RESTORE

Big Sandy Creek hosts a viable fishery and is nationally renowned for river recreation. Sovern Run, a tributary to Big Sandy Creek, is impaired by acid mine drainage (AMD). As such, the watershed has been a target for restoration projects for Friends of the Cheat since the early 2000s with several passive AMD treatment systems already implemented in partnership with West Virginia Department of Environmental Protection, Office of Surface Mining Reclamation and Enforcement, and numerous private landowners. In 2013, restoration progress in Sovern Run was highlighted by EPA as one of their Success Stories.

During the summer of 2016, West Virginia Department of Environmental Protection Office of Abandoned Mine Lands and Reclamation (OAMLRL) completed land reclamation of an abandoned mine land site known as Sovern England, near Valley Point. The nine-acre site of both underground and surface mining from 1957 to 1961 discharged AMD from two collapsed portals and a large coal refuse pile. Through OAMLRL's land reclamation project, the coal refuse pile was used to backfill the highwall and was capped with top soil, and wet seals were installed to convey mine drainage to a single point.

Following land reclamation, FOC implemented a passive system to treat acid mine drainage. Hedin Environmental (Pittsburgh, PA) was contracted to complete the design-build project in June 2018. The mine drainage (average water quality: pH ~ 4.1, acidity ~ 22 mg/L, dissolved aluminum ~ 0.8 mg/L, dissolved iron ~ 1.8 mg/L) was redirected to a drainable limestone bed. The reactions between the acid mine drainage and the high-calcium content limestone increases the pH and precipitates the aluminum and iron. Treated water (average water quality: pH ~ 7.9, acidity ~ -43 mg/L, dissolved aluminum ~ 0.1 mg/L, dissolved iron ~ 0.0 mg/L) discharges from the drainable limestone bed, down a limestone riprap channel, and through a natural wetland before entering Sovern Run.

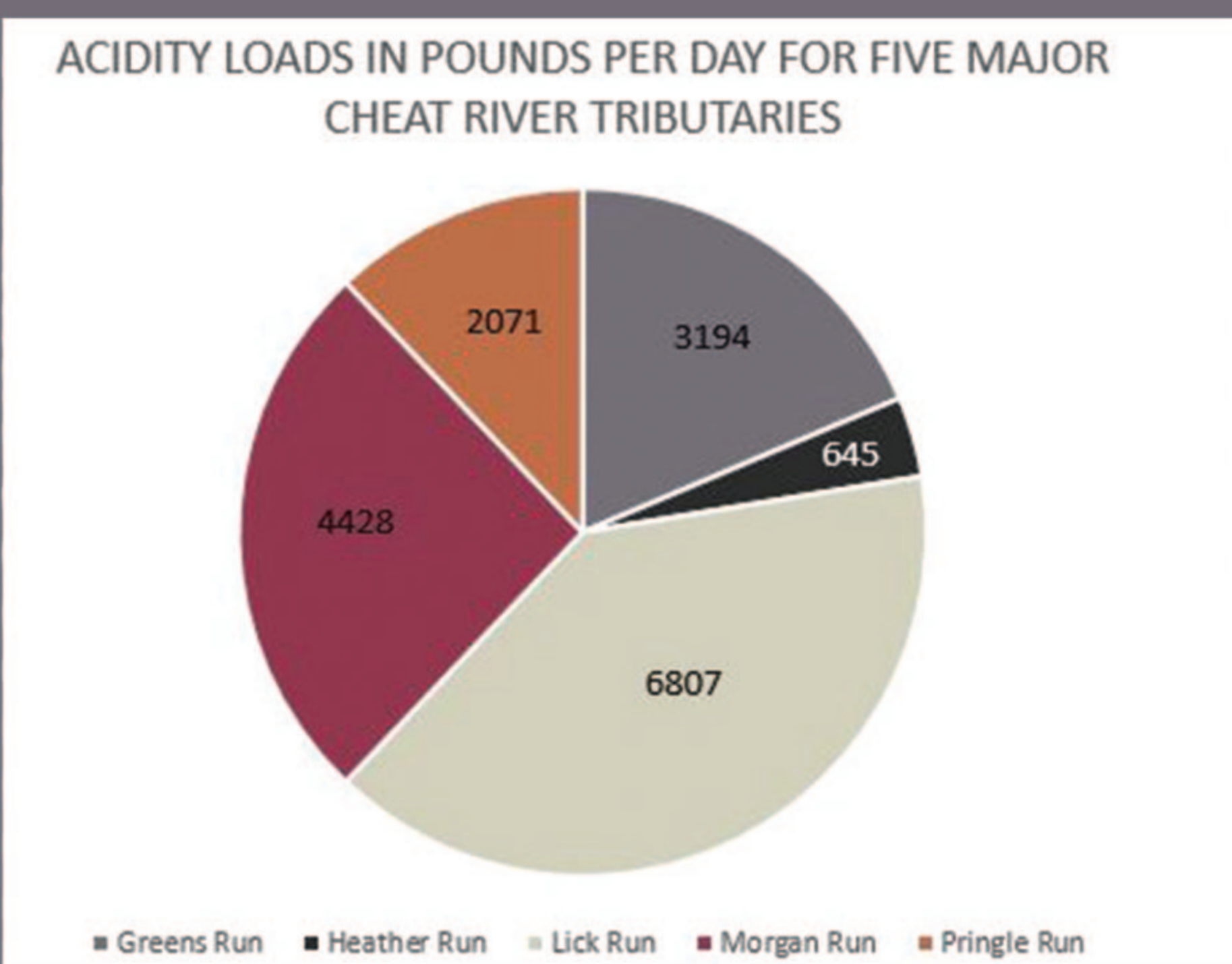
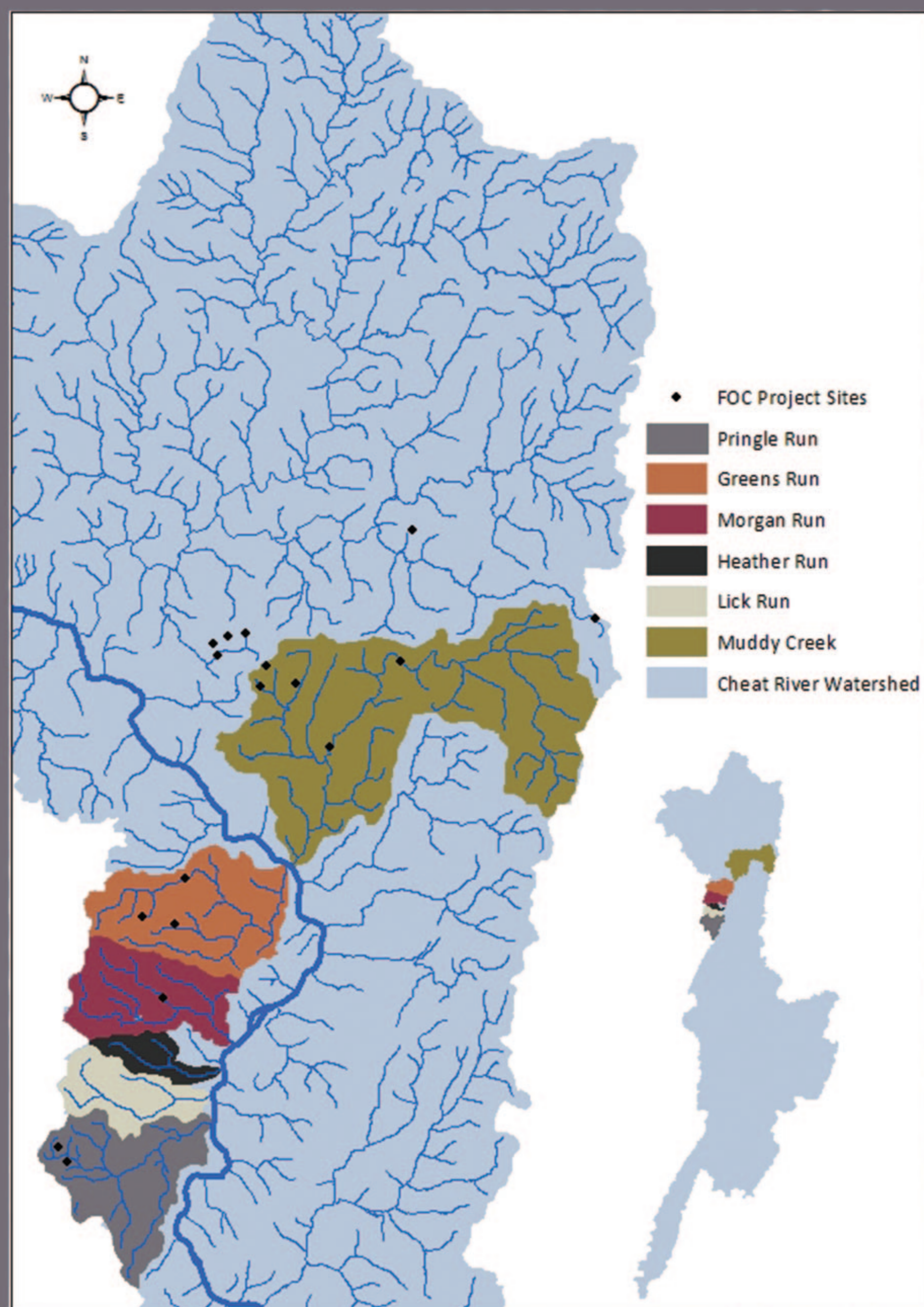
In the first few months since the project was completed, the system has been very successful in treating the acid mine drainage. Recent water quality monitoring shows that the pH has increased from 3.77 to 7.91, that the acidity load was reduced from 5.32 lbs/day to -10.14 lbs/day (290%), the aluminum load was reduced from 0.22 lbs/day to 0.01 lbs/day (95%), and that the iron load was reduced from 0.72 lbs/day to 0.00 lbs/day (100%). The system is discharging excess alkalinity to Sovern Run which will help combat additional acid sources in the watershed.

As with all of FOC's projects, success relies on positive relationships with landowners and coordination with state and federal project partners. FOC thanks West Virginia Department of Environmental Protection's Watershed Improvement Branch and Office of Abandoned Mine Lands and Reclamation, Office of Surface Mining Reclamation and Enforcement, and private landowners for their continued support of FOC's projects.

Friends of the Cheat's next AMD treatment system will also be in the Big Sandy Creek watershed, on a tributary to Beaver Creek, near Cuzzart, West Virginia. Final engineering plans have been developed by Civil & Environmental Consultants, Inc. (Bridgeport, WV) and construction will be completed in early 2019.

A FEEL GOOD MOMENT, 25 YEARS IN THE MAKING

Due to the construction of the new T&T Fuels DEP treatment system, FOC's most recent sampling effort revealed Muddy Creek had a negative acidity load of -1123 pounds per day on June 8th, 2018. This is a ground breaking moment for the Friends of the Cheat community as the data show Muddy Creek is no longer a major contributor of acidity in the Cheat River Watershed. In fact, this negative loading means that Muddy Creek is actually contributing alkalinity loads of approximately 2978.86 lbs/day, which will help offset some of the acidity loads from other AMD impacted tributaries.



PRESERVE

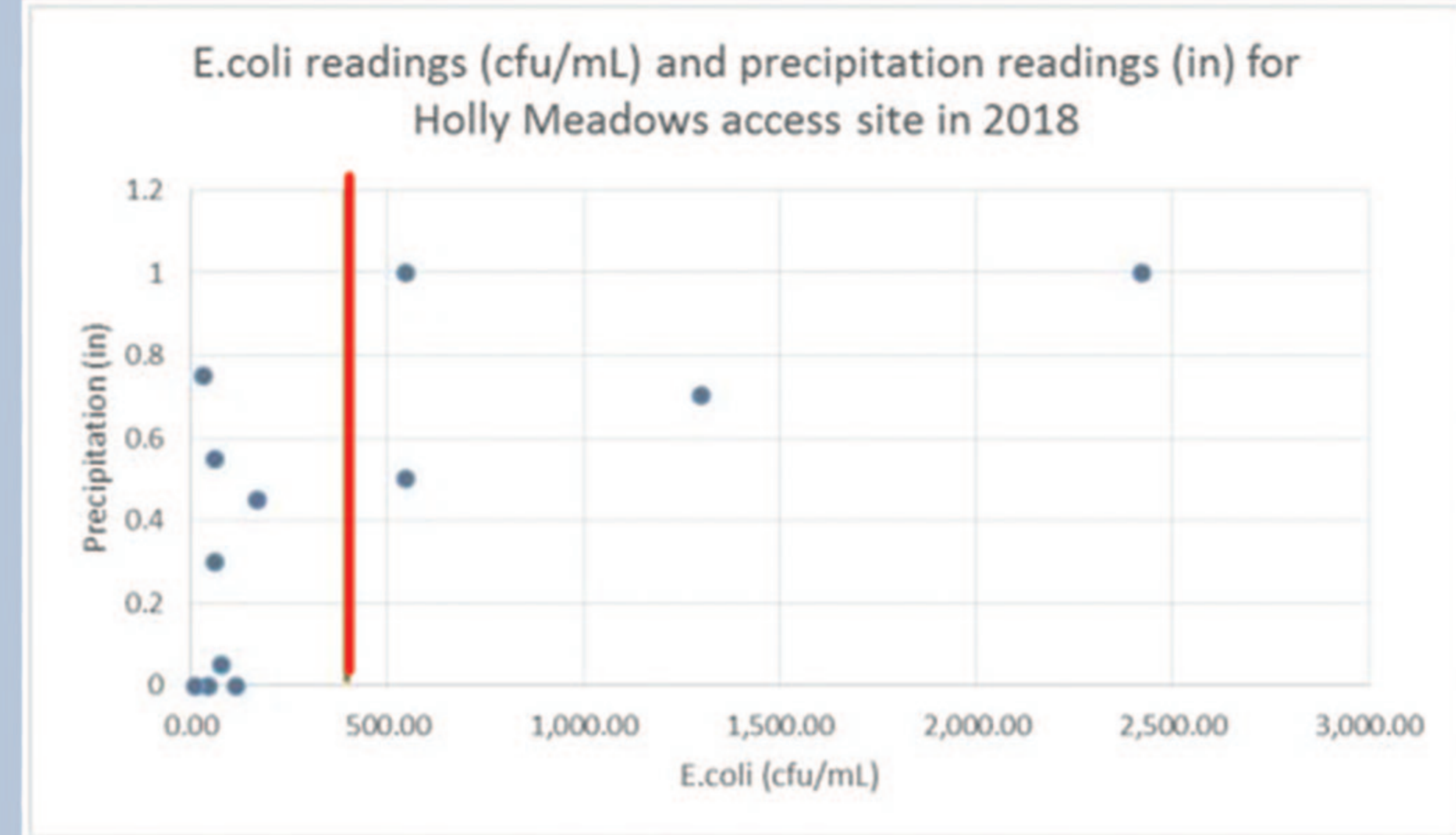
DID YOU KNOW?

Friends of the Cheat monitors 10 popular recreation access sites along the Cheat River for harmful bacteria, every two weeks April – August, and monthly September – March. Check to see if your favorite watering hole is on the list and our sampling results at: www.theswimguide.org/affiliates/friends-of-the-cheat/

PERCENT OF SAMPLES COLLECTED THAT PASSED FOR E.COLI TESTING IN 2018

HOLLY MEADOWS	64%
HANNAHSVILLE FORD	80%
RIVERVIEW LOUNGE	82%
ROWLESBURG PARK (UPPER)	82%
ROWLESBURG PARK (LOWER)*	55%
NARROWS (THE CAVES)	91%
NARROWS (FASCINATION ALLEY)	91%
CHEAT FESTIVAL SITE	73%
JENKINSBURG	82%
CHEAT LAKE BEACH	73%

* The Rowlesburg Park (Lower) site on the Cheat Water Trail is closed and not recommended for recreation due to its low score and the combined sewage overflow (CSO) pipe located just upstream of this access point.



The above graph illustrates that in days following high precipitation—0.5" of rain and above—the Holly Meadows river access site is much more likely to be over the threshold level of E. coli. E. coli readings above 410 cfu (colony forming unit)/mL are considered not safe for recreation, as illustrated by the red vertical line. Play it safe by avoiding river recreation directly after or during high rain events—this will help with avoiding dangerous flows as well.

FLUNKING FAVORITES

Why are some of our favorite Cheat River hangouts not making the grade? While typically safe to recreate in during low flows well after rain storms, some of our local sites are impacted by old and failing sewer infrastructure, livestock in streams, and high flow rain events. FOC's Bacteriological Monitoring Program aims to discover the sources through extended sampling efforts in 2019.

HOW CAN YOU HELP?

Sponsor a bacteria sample for your favorite location above! For \$10, you will help assist Friends of the Cheat in monitoring for harmful bacteria in our beloved recreation areas of the Cheat! Sponsors will have their name written on the sample and posted on our Facebook Page as our dedicated 'Friend of the Cheat', as well as receive a FOC swag bag.

For questions or more information about bacteria sampling within the Cheat River Watershed, contact FOC's Monitoring Coordinator Madison at madison@cheat.org

BECOME A MEMBER!

Visit www.cheat.org/get-involved/membership-info to contribute to our mission, or contact Beth Warnick at bwarnick@cheat.org for donation assistance. Memberships and donations keeps the lights on!



HOW DO WE ALLOCATE FUNDS?

73%	RESTORATION
15%	ADMINISTRATIVE
12%	FUNDRAISING

PROMOTE

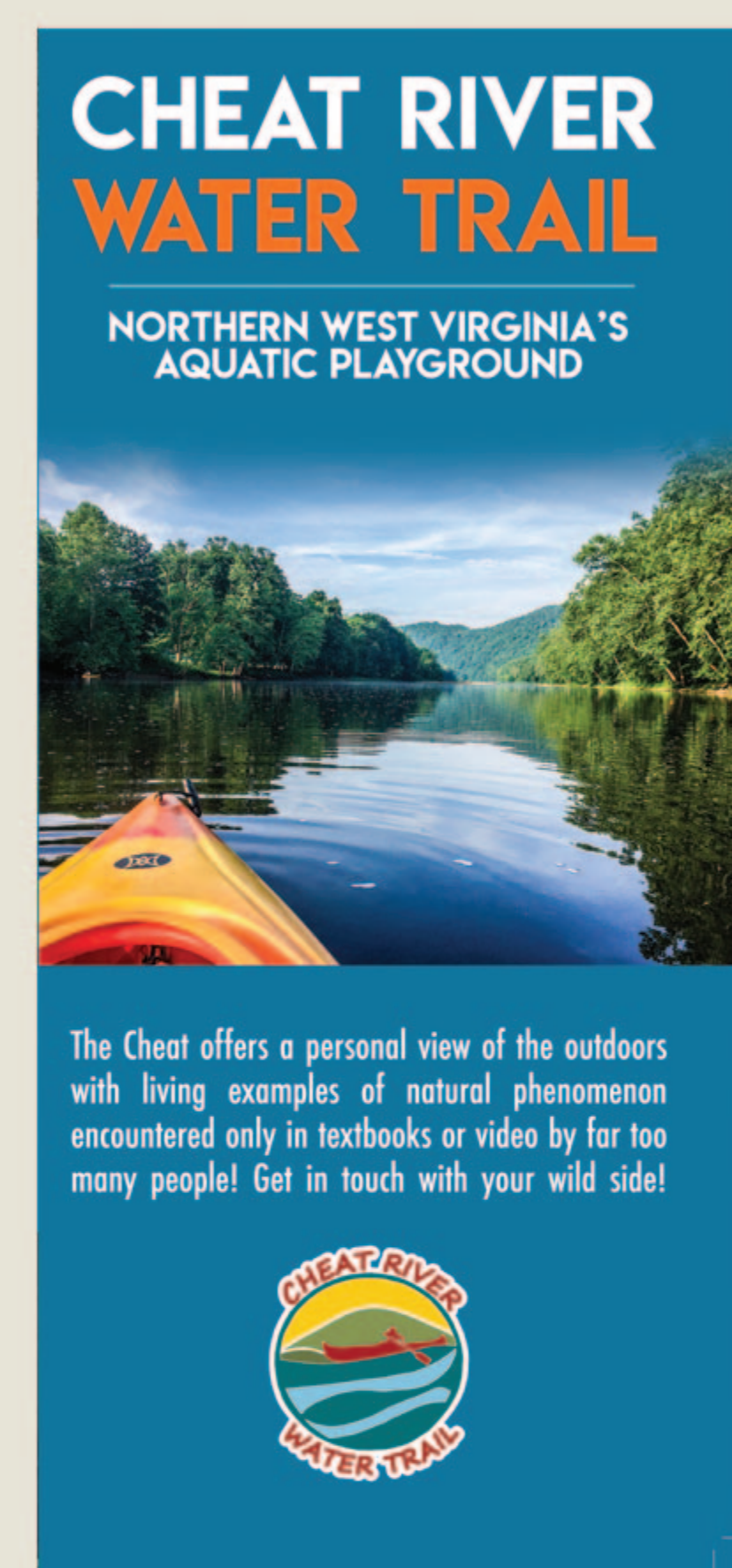
In Tucker County, the confluence of Shavers Fork and the Black Fork forms the Cheat River near Parsons. This area is also the origin of the Upper Cheat River Water Trail. The trail covers nearly 40 miles of beautiful water through calm, flat pools and wide, shallow riffles. Currently, nine public access points allow for trips of various lengths and scenery. The Cheat River valley is a hotspot for biodiversity so expect seasonal displays of the region's flora and fauna as you meander through the Water Trail's scenic valleys, open pastures, and forested mountainsides. The Water Trail passes by many historically significant sites from the Civil War era such as Cannon Hill in Rowlesburg as well as areas with rich local lore like the Minear Massacre Historic Site and the mysterious "Murder Hole".

New during the summer 2018 paddling season - the new Cheat River Water Trail map! This easy-to-use folded map lays out the 9 public access points with additional information about each point, plus a checklist for your trip, water level guide, attractions and historic sites, and local amenities. You can pick one up at the Friends of the Cheat office or Blackwater Outdoor Adventure's outpost. Big thanks to Rowlesburg native, Donnie Riggs, for designing the map! More information about the CRWT can be found at cheatriverwatertrail.org.

ALLEGHENY TRAIL NEWS

During the Fall of 2017, in partnership with the West Virginia Scenic Trails Association, Friends of the Cheat adopted the northernmost 28 miles of the Allegheny Trail (AT), West Virginia's longest foot trail. The AT snakes 330 miles from the Mason-Dixon Line in Bruceton Mills south to the WV-VA border, where it ends at a junction with the Appalachian Trail on Peters Mountain. The entire Section 1 portion of the Allegheny Trail lies within the Cheat River watershed, from the PA state line to Blackwater Falls State Park where Section 2 begins. While the majority of the Section 1 trail follows county roads, a portion of true hiking trail follows the Cheat River Canyon from the Jenkinsburg Bridge to Beech Run Road (nearly to the Cheat River Festival site) in Albright, 9 miles of which run through the Cheat Canyon Wildlife Management Area (WMA) and Charlotte Ryde Nature Preserve. FOC is dedicated to the maintaining the trail through blazing and landscaping, and also sustainably improving the trail within our means.

FOC is very excited to unveil the completion of our first project improving the AT near the trailhead off Beech Run Rd. FOC, with student volunteer support from WVU's Adventure WV program, constructed sections of raised turnpike to allow hikers to easily traverse sections of the trail with little to no water drainage. This project was made possible through a grant awarded by the American Hiking Society, which funded the supplies necessary for turnpike construction, as well as a litany of trail tools for to allow for large volunteer groups to assist in future maintenance.



STAFF

AMANDA PITZER, EXECUTIVE DIRECTOR (2010)
OWEN MULKEEN, ASSOCIATE DIRECTOR (2013)
DAVID PETRY, RESTORATION PROGRAM MANAGER (2015)
MADISON BALL, MONITORING COORDINATOR (2018)
CHRIS BERN, FIELD TECHNICIAN (2013)
GARRETT THOMPSON, FIELD TECHNICIAN (2013)
BRIAN HURLEY, FIELD TECHNICIAN (2016)
BETH WARNICK, OUTREACH & MEDIA SPECIALIST (2015)
VALORIE DIXON, BOOKKEEPER (2014)

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