West Virginia Department of Environmental Protection
Division of Water and Waste Management
Watershed Improvement Branch

West Virginia §319 Program
2020 Annual Report
March 2021

The US EPA allocates Clean Water Act §319 funding to states and territories in support of the protection and restoration of waters threatened or impaired by nonpoint pollution.

http://www.dep.wv.gov/nonpoint

west virginia department of environmental protection

Division of Water and Waste Management
Watershed Improvement Branch
Nonpoint Source Program

Nonpoint Source Program Annual Report

Submitted March 2021. Revised and re-submitted following USEPA comments May 2021.

Statement of policy regarding the equal opportunity to use and participate in programs.

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West Virginia's Nonpoint Source (NPS) Program is funded by a Clean Water Act §319 Grant administered by the U.S. Environmental Protection Agency (USEPA).

Report prepared by
Timothy Craddock, NPS Program Coordinator

Acknowledgements: The *Watershed Improvement Branch* (WIB) §319 Program acknowledges the efforts of all staff, partners and multiple stakeholders that contributed information in this report, and those who have played roles in projects, monitoring, outreach etc. The names and organizations are too numerous to mention but if you would like to know more about organizations in your area contact: *timothy.d.craddock@wv.gov*.

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Tables

Figures

This report summarizes activities that occurred primarily in calendar year 2020. It is important to note that projects and programs are multi-year efforts so those highlighted in this report were completed in 2020 but in some a portion of the implementation occurred in earlier years.

Introduction

In 2020 West Virginia's NPS Program provided technical and financial support to more than 100 programs and projects ranging from general administration to outreach, planning, monitoring and a wide variety of implementation. Most of the projects focus on priority areas identified within our watershed based plans (WBPs), but other partners and stakeholders implement projects in non-priority areas using their required matching funds, or by taking advantage of periodic *additional grant opportunities* (AGOs). *Table 1* provides a summary.

Table 1. §319 Program status.

FFY	NPPF	WPF	AGOs	Total	Complete	%
2016	5	8	12	25	19	76.0%
2017	5	10	9	24	8	33.3%
2018	3	9	12	24	4	16.7%
2019	4	8	6	18	0	0.0%
2020	4	9	0	13	0	0.0%
Totals	**21**	**44**	**39**	**104**	**31**	**29.8%**

NPPF: Nonpoint Program Funds
WPF: Wateshed Project Funds
AGOs: Additional Grant Opportunities

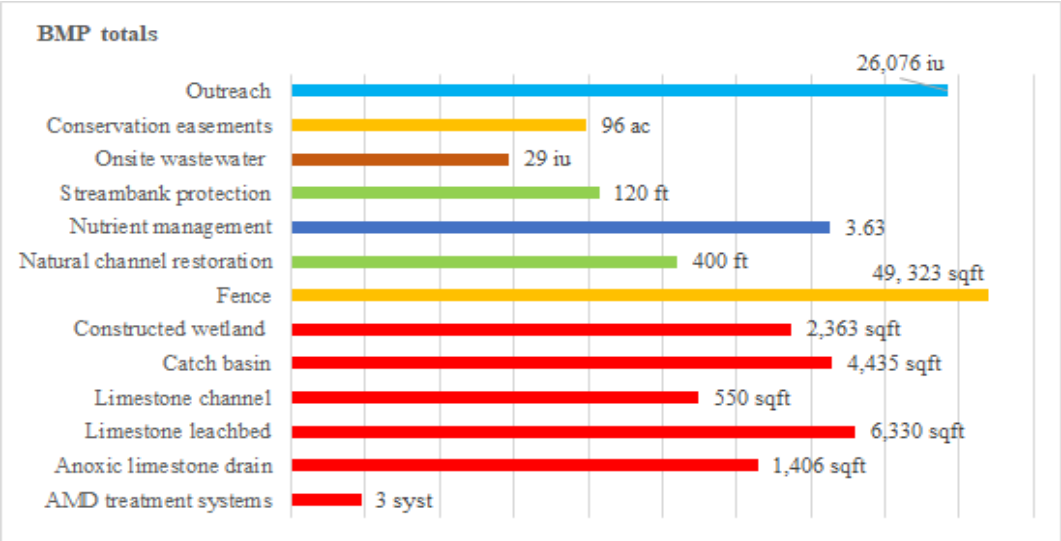
The percent complete was less than previous years especially for grant years nearing the end of their performance period. This is directly attributed to the challenges brought on by the Covid-19 pandemic. A one-year extension was granted by USEPA for fiscal year 2016 and West Virginia has requested the same for 2017. *Appendix 3* provides additional details on project status. In addition, further discussion on the many challenges brought on by the *Covid pandemic* is discussed later in this report.

Implementation

Best management practices (BMPs)

BMP implementation and NPS pollutant reduction are the major goals of our watershed projects. The efforts of our dedicated staff, partners and local stakeholders have made significant impacts in restoring and protecting our watersheds impacted and threatened by NPS pollution. In 2020 BMP implementation occurred in 30 different HUC12 watersheds (*Figure 3*). BMP implementation is represented graphically and compared using a log(n) calculation in *Figure 1*. Additional details are provided in *Appendix 1*. WV Conservation Agency (WVCA) significantly contributions through their statewide Agriculture Enhancement (AgE) Program. Although not funded with §319, AgE provides match and often is a vehicle for additional BMPs in project watersheds.

Figure 1. §319 and AgE BMP implementation.



Units

iu (individual units)
ac (acres)
ft (feet)
sqft (square feet)
syst (systems)

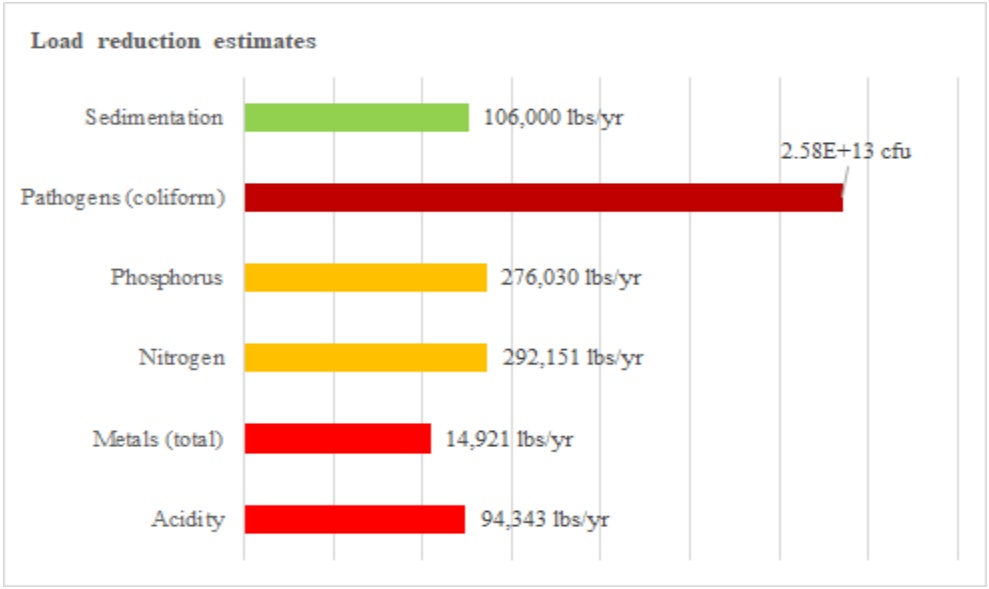
Typically, outreach is reported in GRTS but has not been a focus of past annual reports. However, this pandemic year brought outreach to the forefront. WVDEP's WIB, WVCA, WV Rivers Coalition (WVRC) and many others performed above and beyond taking full-advantage of multiple virtual formats reaching more participants than ever before.

Pollutant load reductions

In West Virginia bacteria and pollutants associated with acid mine drainage (AMD) are the two largest contributors of nonpoint sources accounting for approximately 70 percent of the impairments. Most of the bacteria loads come from agriculture and failing septic, whereas the AMD pollutants (acidity and heavy metals etc.) are associated with abandoned mining. In addition to the West Virginia priorities, USEPA's National §319 Program promotes the reduction of nutrients and sediment, which are the leading causes of NPS impairment nationwide. Although nutrients and sediment are not our primary focus, we exceeded our 2014 Management Plan goals. WV's *NPS Management Plan* was revised in 2019 and will not be discussed in this report since it is too early in the five-year cycle to accurately judge progress. An update will be provided in the 2021 annual report.

Load reductions are represented graphically and compared using a log(n) calculation in *Figure 2*. Additional details are provided in *Appendix 2*. Most §319 projects do not require nutrient load reductions; however, due to WVCA's AgE Program contributions nutrient reductions and sediment reductions are significant statewide.

Figure 2. §319 and AgE load reduction estimates.



Chesapeake Bay Program

Nitrogen and phosphorus reductions are needed for restoration of the Chesapeake Bay (CB) watershed. Despite the pandemic, West Virginia's Chesapeake Bay Tributary Team continued to implement wastewater and nonpoint source strategies from the *Phase 3 Watershed Implementation Plan* (WIP3) and is generally on-track to meet West Virginia's portion of the CB TMDL by 2025. These strategies, such as riparian forest buffers and Green Infrastructure practices, were chosen to help achieve local benefits while reducing nitrogen and phosphorus loads. CB partners produce and share a quarterly e-newsletter, found *here*, to document projects and encourage others in similar actions.

Table 2 shows historic, recent and WIP3 loads of total nitrogen and total phosphorus. Implementation during the 2020 progress year (July 2019-June 2020) appears to have rebounded from the effects of heavy rain events in fall 2018 (progress year 2019). Modeled progress is still dampened due to the expiration of some practices once they reach their modeled lifespan. CB partners are renewing efforts to verify and maintain these older practices to keep them active in the model.

All results are from the CAST 2019 model, available at: *http://cast.chesapeakebay.net*

Table 2. Progress towards reducing CB pollutants.

Pollutant	Category	2013 Progress (Baseline)	Progress 2019	Progress 2020	WV WIP3
Nitrogen	Agriculture	3.31	3.44	3.40	not specified
	Urban Runoff	1.20	1.19	1.20	
	Natural+Deposition	2.60	2.58	2.57	
	Septic	0.34	0.35	0.35	
	Wastewater+CSO	0.70	0.52	0.43	
	All Sources	**8.15**	**8.07**	**7.96**	**7.79**
Phosphorus	Agriculture	0.14	0.14	0.14	not specified
	Urban Runoff	0.06	0.06	0.06	
	Natural+Deposition	0.22	0.21	0.21	
	Septic	0.00	0.00	0.00	
	Wastewater+CSO	0.14	0.04	0.04	
	All Sources	**0.56**	**0.45**	**0.44**	**0.40**

WV's progress toward reducing CB pollutants; units: million lbs/yr.

Covid challenges

The Covid pandemic was an experience unlike any other. It affected every aspect of our lives and was an ever present danger/concern. Each of us have personal stories to share but the focus of this section is the impacts on §319 program and project management. Having to shift locations to a home environment and not being able to interact in-person, or on-site had dramatic impacts, but Covid's impact on supply chains, ordering time, volunteer labor and more slowed multiple levels of program/project performance. USEPA provided an extension for fiscal year 2016 and 2017, which were the two most vulnerable federal fiscal years of impact. Below are comments from select watershed groups, NGO partners and our Assistant Director.

Teresa Koon, Assistant Director WVDEP-WIB

2020 had its challenges for West Virginia's nonpoint source program but we rose to that challenge. As we very quickly transitioned to working from home, we also very quickly began to communicate more and identify ways we could transfer our work to a virtual environment. WVDEP's Basin Coordinators and our other §319 partners focused on outreach and other ways we could safely stay connected and pursue our missions. From virtual workshops, camps and training to watershed meetings and project planning, we learned all the nuances of Zoom, TEAMs, GoTo meeting and on. The physical distancing has made our monitoring and project implementation work different and, in some cases, significantly delayed. We look forward to the

WVU Tech students volunteer to sample Piney Creek during Covid pandemic.

days when we can physically reconvene with our partners to share stories, laughter, and hard work. Thank you to our staff and partners, who have safely progressed their outreach and projects during this challenging time.

Corey Lilly, Piney Creek Watershed Association

Initially, COVID, played a paralyzing role in operations. However, the association and our partners quickly adapted to the virtual workplace, which led to significant productivity and multiple projects' progress. Fortunately, the community held these environmental projects in high regard and were receptive to our outreach when needing to communicate and visit project sites. Resilience and perseverance, just as the streams we work to protect and improve, defines this era of our association.

Madison Ball, Friends of the Cheat

1. *In the beginning*: Knowing if we can proceed to construction and how to safely do so.
2. *Procurement*: Holding COVID safe pre-bid meetings.
3. *Site visits*: COVID safe field and site visits, having individuals drive separately often challenging due to parking restraints, also only one FOC vehicle meaning more staff are driving their personal vehicles. Communication lags due to not being able to meet all at once on site when challenges occur.
4. *Materials*: Struggles documented in procuring tree stock due to effects of COVID on nursery industry. Volunteer work: Much of our volunteer work (which we use as project match) was greatly reduced if not completely unavailable.
5. *Financial management*: Difficulty or concern of "floating" large invoices or expenditures before being reimbursed due unknown future donor contributions.
6. *Landowner interactions*: Many of our landowners prefer in person contact and do not respond to phone calls, emails, etc. Less in person interaction with our partners which leads to meaningful conversation, new opportunities for partnership, etc. (Zoom Fatigue).

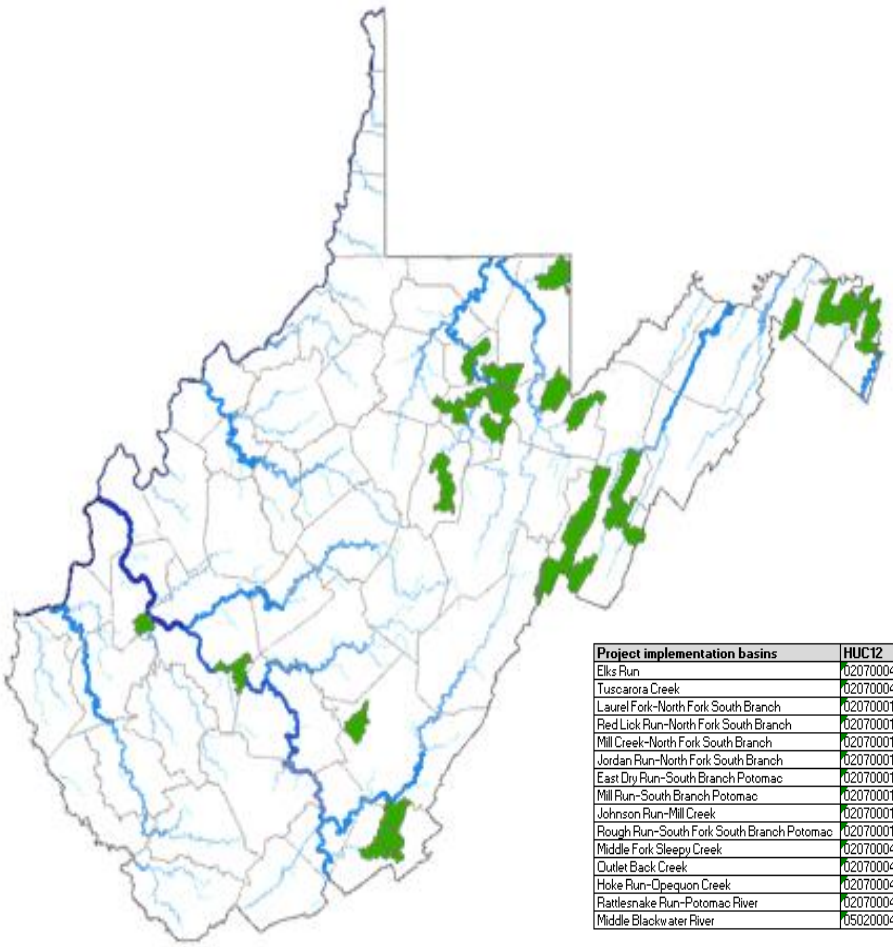
Angie Rosser, WV Rivers Coalition

Not surprisingly, the pandemic is having a significant effect on maintaining watershed groups capacities in West Virginia. In addition to the inability to do in-person outreach and events, the demands, and distractions the pandemic presents on everyday life has stretched those small, often volunteer-led organizations even thinner than usual. The pandemic put a lot of strain on our organization's capacity, with most of our staff having young children and no childcare options, requiring them to toggle between work/parenting for an extended time.

Covid rain barrel workshop.

Figure 3. BMP/load reduction HUC basins.

Map created by Martin Christ.



Project implementation basins	HUC12
Elks Run	020700041107
Tuscarora Creek	020700040907
Laurel Fork-North Fork South Branch	020700010101
Red Lick Run-North Fork South Branch	020700010103
Mill Creek-North Fork South Branch	020700010106
Jordan Run-North Fork South Branch	020700010107
East Dry Run-South Branch Potomac	020700010303
Mill Run-South Branch Potomac	020700010308
Johnson Run-Mill Creek	020700010402
Rough Run-South Fork South Branch Potomac	020700010505
Middle Fork Sleepy Creek	020700040202
Outlet Back Creek	020700040409
Hoke Run-Opequon Creek	020700040909
Rattlesnake Run-Potomac River	020700041106
Middle Blackwater River	050200040202

Project implementation basins	HUC12
Beaver Creek-Little Sandy Creek	050200040603
Browns Creek-Coal River	050500090608
Burnside Branch	050500020701
Hughes Creek-Kanawha River	050500060306
Lower Second Creek	050500030703
Mill Creek-Meadow River	050500050605
Tenmile Creek-Buckhannon River	050200010304
Upper Indian Creek	050500020703
Left Fork-Sandy Creek	050200010502
Little Laurel Run-Tygart Valley River	050200010701
Teter Creek	050200010704
Hackers Creek-Tygart Valley River	050200010705
Wickwire Run-Tygart Valley River	050200010707
Headwaters Elk Creek	050200020202
Horseshoe Run	050200040501

Note: The list above is also in *Appendix 4.*

WIB and partner highlights

This section highlights the activities of WIB staff as well as the WV Conservation Agency. Their contributions are critical to the success of our programs but without participation from a diverse group of partners and individuals' projects cannot move more and be successful. ***Appendix 5*** captures a list of most active partners in 2020.

WV Conservation Agency

Despite a global pandemic the *WV Conservation Agency* (WVCA) has been more productive than the past several years. Although there have been challenges managing projects the statewide Agriculture Enhancement (AgE) Program continues to be productive. WVCA staff used the AgE to implement nutrient management

plans, grazing plans, alternate water and other BMPs that reduced nutrient loads throughout West Virginia. See *Appendix 1* and *Appendix 2*. WVCA's most significant accomplishment was in the education and outreach arena. WVCA committed staff resources to the various virtual platforms and held a wide variety of events resulting in > 60% increase over last year. The table below provides multiple examples, but there is much more. Contact Jennifer Skaggs for more details.

Table 3. WVCA 2020 outreach examples.

Starting seeds in baggies. How to start seeds soil less and talk about recycling	Multiple Facebook live classes focusing on conservation methods for Ag, water quality and more	Multiple virtual curriculum design and lessons for many local schools
Soil Tunnel Trailer walk through events	Many tips/hints from Conservation Districts on social media	Urban soil and water conservation video series
EPCD YouTube Channel	Grow This! West Virginia	Paper pots - recycling
Agriculture Innovation Showcase	The hillside gardener	Small farms virtual conference

Divisional fencing examples.

WIB Basin Coordinators

WVDEP-WIB Basin Coordinators (BCs) contribute to the WIB mission by providing technical support and expert knowledge in a wide vareity of subjects. They are the local contacts for most WVDEP-WIB programs and their skills are critical for enabling watershed group participation in the §319 process. To help get improvements on the ground, BCs have roles in:

- Fostering and supporting volunteer watershed associations and other organizations.
- Educating citizens on nonpoint pollution issues.
- Identifying local stakeholders and partners.
- Assisting with the development of watershed based plans.
- Facilitating project teams to implement water quality improvement projects.

Martin Christ - Northern BC

The Northern (NBC) supported several watershed groups with their projects to decrease nonpoint source pollution projects. *Friends of the Cheat* (FOC) completed their Beaver Creek project, which addresses the largest load of dissolved aluminum and acidity in the Beaver Creek watershed (050200040604). The project is now discharging alkaline water, and only detection-limit concentrations of dissolved aluminum. NBC helped trouble shoot a slow permitting process, helped explain the need for additional resources to funders, participated in meetings with engineers and contractors, and offered advice to FOC.

Buckhannon River Watershed Association (BRWA) completed its Swamp Run #2 project (050200010306), which addresses the largest untreated source of acidity and iron to Swamp Run. NBC facilitated communication between engineers, project managers, BRWA, and the contractor, conducted stream and source monitoring, and helped with permit applications, construction oversite, and invoicing.

Save the Tygart Watershed Association (STTWA) made progress on two nonpoint source projects. For the Barlow project (050200010501), STTWA worked out a plan with partners. The NBC wrote and circulated this plan for discussion, which eventually became the workplan. The NBC also discovered locations where surface water entered the ground, recharging the polluted mine water. STTWA's Roaring Creek project (050200010406) partnered with the landowner to develop plans, secured funding, and moved through the Army Corps and WVDEP's stormwater permits.

GWF/WVWRI experiment on methods to refine AMD treatment.

Guardians of the West Fork (GWF) partnered with the *WV Water Research Institute* (WVWRI) to propose additional §319 projects to restore Lambert Run (050200020602), which currently violates water quality standards (WQS) for total iron. GWF and WVWRI proposed projects on two sources. NBC has revised the WBP and worked with WVWRI on a quality assurance project plan (QAPP) to support project data collection.

Friends of Blackwater (FOB) partnered with WVDEP to treat mine drainage in the North Fork of the Blackwater River (050200040203). NBC assisted with procuring a design engineer and identified some of the sources that must be treated. FOB also started a project on Beaver Creek of the Blackwater River (050200040202). NBC helped with data collection, site selection, and review for eligibility by WVDEP.

Friends of Deckers Creek (FODC) continued projects on Sandy Run and Dillan Creek (050200030201) as well as Hartman Run (050200030202). NBC assisted with engineer procurement, source identification, conceptual design, and grant management.

The NBC also:

- Reviewed QAPPs.
- Drafted Standard Operating Procedure (SOPs) for reviewing QAPPs.
- Compiled data from some of the projects and uploaded it to WQX-Web.
- Provided mapping for §319 reports.
- Submitted a success story through the GRTS tool.
- Trained teachers about the skills used in the Envirothon Aquatic Science test.

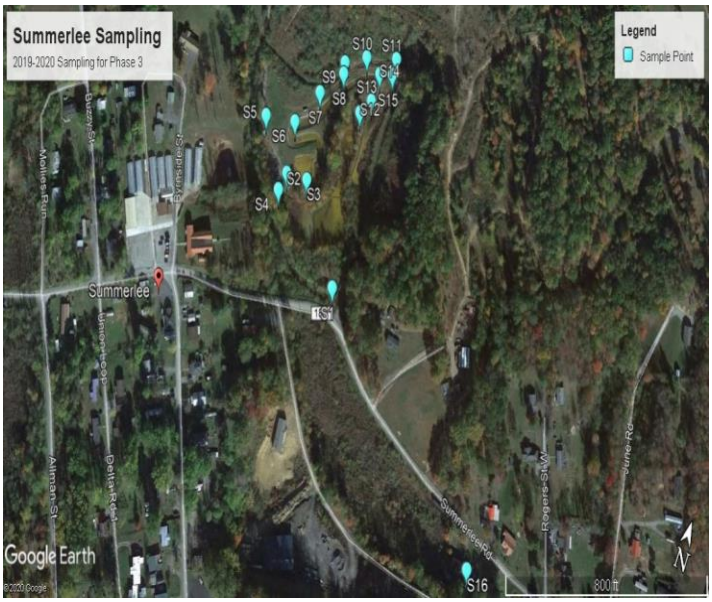
Jennifer Liddle - Southern BC

<u>New organizations/re-establishing</u>

The Southern (SBC) is helping to revive the *New River Clean Water Alliance* (NRCWA). The only in-person 2020 meeting involved a variety of stakeholders from within the Lower New watershed including watershed groups, National Park Service, regional councils, Beckley Sanitary Board, WVCA, multiple WVDEP sections, local outfitters and concerned citizens. This group is focusing on bacteria and is compiling data to prioritize project areas. To support the efforts, the SBC gathered additional agency partners, assisted with their water

quality sampling, coordinated discussions on wastewater treatment options and participated in a video promoting NRCWA. Several virtual meetings have occurred and will continue.
Friends of the Tug Fork (FOTF), a new watershed group, has begun the process of applying for their nonprofit status. They also received their first *WV Stream Partners* grant and the SBC will be meet with FOTF virtually to help identify possible 2021 projects.

Nonpoint Source Projects



Piney Creek Watershed Association (PCWA) has multiple §319 projects including: Crescent Elementary, Woodrow Wilson Restoration, Convention Center Phase II and the New River Drive. They are also supported by WIB's *Watershed Pilot Program* (WPP) and have started AGO grant to develop a subwatershed plan for Little Whitestick Creek. Virtual meetings are frequent as the technical advisory board and the monitoring committee keep projects moving forward.

Working closely with Plateau Action Network (PAN), WVDEP's Office of Abandoned Minelands (AML) and Special Reclamation, the SBC has completed 12 months of monitoring for the next phase of Summerlee. The SBC is the point person for the efforts and facilitates communication between PAN, AML, and Special Reclamation. The data collected will be used to determine the best treatment option moving forward. WVDEP-AML will design, install, and take the lead on managing the current site, and all future projects. Due to Covid the sampling period was extended, as several months were missed. In spring/summer 2021 benthic sampling will be conducted below the project and at five other sites in Wolf Creek watershed.

Outreach

2020 in-person outreach events were canceled after March 13th. We hope that most will be re-scheduled and resume in the fall of 2021. Even though events were cancelled, planning continued and the transition to virtual events was successful. The SBC worked with the Project WET coordinator and the National Park Service to provide an online Water festival curriculum and assisted with a virtual STEM camp. Working with WIB's Basin Coordinators, WV River's Coalition, and others the inaugural virtual *WV Watershed Symposium* occurred in November 2020.

Helping watershed groups during the past year has been a challenge in the coalfields. Several groups have not been meeting since Covid shutdown, they do not have adequate internet or availability to attend virtual meetings. One exception is the *Greenbrier River Watershed Association* (GRWA), who continued their monthly meetings as well as select projects. The SBC facilitated board meetings and reorganization for the Mountain Resource and Conservation who offer grants to nonprofits in the coalfields. Another success is Friends of the Second Creek (FOSC) who has been providing quality watershed education to 4H and schools in Monroe County.

Re-used barrels are ready for distribution to participants of the Hampshire County virtual rain barrel webinars in summer 2020.

Alana Hartman - Potomac BC

WIB's Potomac BC (PBC) facilitated online meetings of the Tuscarora Creek Project Team and hosted online board meetings for the *Friends of The Cacapon River* (FOCR). She was a project liaison for a spring tree planting event in Romney, which was carried out and maintained by the town's public works crew. She co-hosted two virtual rain barrel workshops for Hampshire County residents and helped to distribute the barrels to participants afterward, using physically-distanced procedures. The workshops featured local speakers explaining their efforts to include green infrastructure in plans for the towns.

The PBC spoke to the CB Citizens Advisory Committee in February about West Virginia's participation in the Chesapeake Bay Program, and she presented a virtual poster at the *National Nonpoint Source Conference* on green infrastructure and technical support for communities. She also hosted a *WV stormwater webinar* featuring the former Stormwater Specialist, Sebastian Donner, who shared insights on WVDEP's stormwater guidance manual. The PBC visited several properties, providing technical assistance to managers and landowners on best practices, and available funding for reducing erosion and stormwater pollution. This included private and commercial land along the Cacapon River and Tuscarora Creek, and streets, parking lots and parks in Ranson, Martinsburg and Wardensville. The PBC continued to facilitate meetings of the CB Tributary Team and submits BMP data from multiple sources to the CB Program.

Tomi Bergstrom - Western BC

Group photo of student presenters, judges, and organizers of the Wild & Wonderful Water Science Fair.

The Western BC (WBC) worked with WVWRI to create a project committee to monitor the water quality changes of liming on Cane Fork. She worked with *Coal River Group* (CRG) to submit their next §319 project for the Browns Creek remediation effort. This project is now in phase II and multiple septic systems have been rehabilitated. Their outreach efforts and successful projects have resulted in a long waiting list of interested landowners within and beyond the project area. The WBC worked with *Morris Creek Watershed Association* (MCWA) lavender field project, analyzing BEHI data to determine how the fields are reducing erosion along streambanks. The *Fourpole Creek Watershed Association* (FCWA) is close to submitting their WBP for review. The WBC has worked with the group to provide feedback, create maps, analyze data, and form a project committee.

Before the pandemic, the WBC hosted the *Wild & Wonderful Water Science Fair* inspiring over 300 students to investigate water science - 65 presented at and attended the event. The WBC adapted outreach events to a virtual world. She formed a committee who created and recorded seven water lessons, then she edited and posted the lessons in Schoology for teacher access. More than 30 teachers used the information in their classroom, reaching an estimated 750 students. Stormwater education and rain barrels workshops were hosted virtually - 80 attendees participated. The WBC is partnered with the City of Charleston to sponsor a FestivALL event as a single-use plastic awareness event, highlighting plastic and stormwater pollution. The WBC also hosted a webinar on wetlands and presented at the *WV Science Teachers Conference* on wetland education. Before her assistant moved to a new position, she completed six rain barrel installations at West Virginia schools, through the *Rain Barrels in School Program*; hosted a webinar on water conservation and created online challenges for World Water Day as well as *World River Day*.

Summer interns were trained on how to collect water quality data along Browns Creek as new septic systems were being installed.

Timothy Craddock - Nonpoint Source Program Coordinator

In addition to his regular grant/program management duties the NPS Coordinator plays a role in watershed outreach, primarily as an advisory and subject matter expert. He frequently provided §319 program and project assistance, helped to organize and presented at multiple nonpoint source and volunteer monitoring webinars. The NPS Coordinator updates and monitors *WIB's calendar of events* which posted 1,200 entries/events on WVDEP websites as well as several agencies and partner sites. We estimate the calendar was viewed more than 1,600 times last year and is getting more and more attention. The NPS Coordinator was a member of the *National Nonpoint Source* virtual conference planning committee and will serve as a moderator for a session on AMD at the National Monitoring Conference in April 2021.

Multiple staffing challenges occurred in 2020. We lost two stormwater specialist positions – their focus was primarily the Chesapeake Bay drainage but there was technical assistance provided in other §319 project areas. We also lost the *WV Save Our Streams* Coordinator; however, that position was filled in February 2021 and we expect good things for the program's future.

WV Watershed Symposium

West Virginia Watershed Network (WVWN) holds an annual Watershed Celebration Day to provide watershed organizations an opportunity to learn, celebrate, and network with their peers. This year, the WVWN moved Watershed Celebration Day online and hosted a *Virtual Watershed Symposium*. The symposium was held Nov 5-6, through video conferencing. Staying true to

its Watershed Celebration Day roots, we kicked off by honoring four outstanding groups and two individuals for their contributions towards watershed restoration. The symposium also provided presentations and resources for watershed groups to hone their skills and be more effective in their efforts to preserve and protect their watersheds.

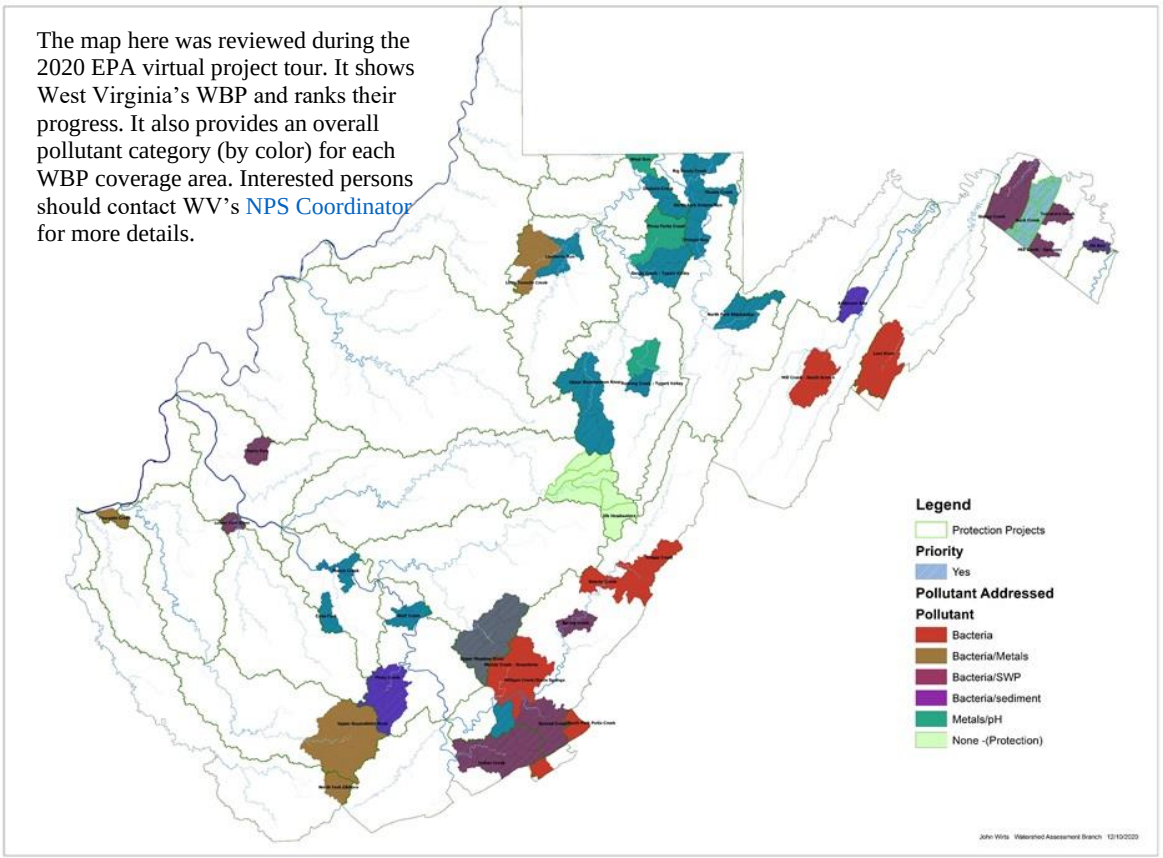
1. Keynote Speaker: Celebrating the Great River with a Plan for the Ohio River Basin – Dr. Harry Stone, *Ohio River Basin Alliance*
2. Water advocacy 101, & Legislative update – Angie Rosser
3. Benthic Macroinvertebrate identification refresher – Timothy Craddock
4. Marketing your watershed: Danny Forinash - Charles Ryan Associates
5. Educational opportunities: Morris Creek projects, WVDEP Youth Environmental Program, WV Rivers/Trout Unlimited Mobile Monitoring Application

Event details available at: *https://wvrivers.org/resources/watershed/wcd2020/*

Watershed plan highlights

No new watershed based plans (WBPs) were developed in 2020; however, there are several revisions occurring and we anticipate at least two-three new WBPs in 2021-2022. Several with recent activity are highlighted in the next section.

Figure 4. West Virginia watershed based plans map.



There are 42 USEPA approved WBPs and two watershed protection plans (WPPs) in the state. Roughly 20% of those are inactive. WIB anticipates two more plans in late 2021 or early 2022.

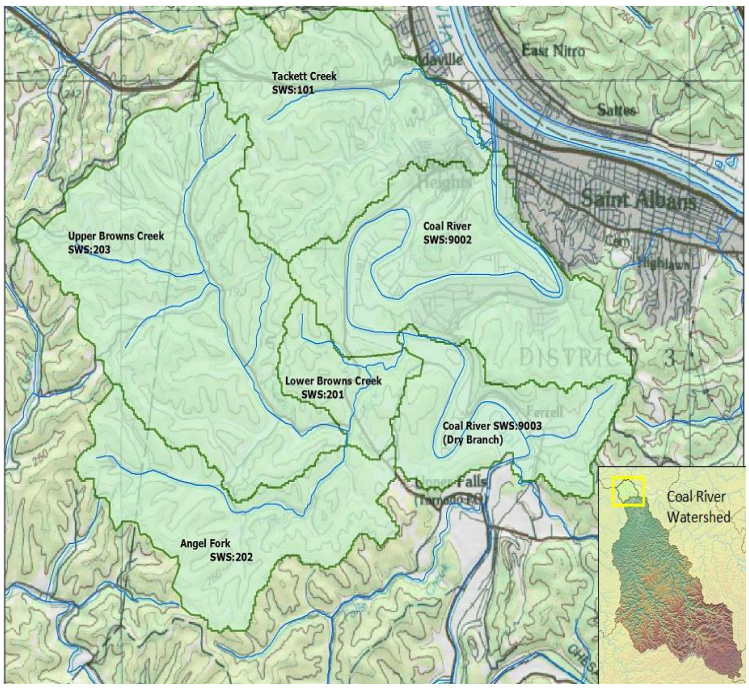
Lower Coal River watershed plan

Watershed information
HUC12: 050500090608
Sponsor(s): Coal River Group, WV Conservation Agency, local landowners, other State and Federal partners

Contact(s): Justin Hunt, Project Manager and Bill Currey, CRG Chairman

Introduction

Figure 5. Lower Coal River WBP map.



The Browns Creek-Coal River watershed is defined by the U.S. Geological Survey (USGS) 12-digit HUC (050500090608) and is included in the Coal River TMDL. The Browns Creek-Coal River watershed is referred to in this plan as the *Lower Coal River watershed*. The area is part of the larger Coal River watershed, 8-digit HUC (05050009), an 891 square mile watershed draining the Big Coal, Little Coal, and main stem Coal Rivers.

The watershed forms in the highlands of Boone and Raleigh counties and flows north to the Coal's confluence with the Kanawha River. The Lower Coal River area addressed in this plan makes up the northern-most reach of the Coal River watershed and includes the mouth of the Coal River at St. Albans, WV. The Lower Coal River area drains 14,371 acres (22.5 square miles) in Kanawha and Putnam counties. The watershed consists of the Coal River, from below Upper Falls in Tornado, WV, to the confluence with the Kanawha River in St. Albans, WV. Major tributaries within the area consist of Browns Creek, Angel Fork of Browns Creek, and Tackett Creek.

One of many successful septic leach field installations.

Highlights

The goal of the Browns Creek septic remediation projects is to repair and replace failing septic systems. CRG now has two §319 projects since 2016. Twenty-failing septic systems have been replaced thus far. All replacements were traditional absorption field septic systems. Concrete and plastic tanks were used depending on *Kanawha County Health Department* (KCHD) recommendations. The replacements were successful due to CRG's marketing and recruiting process. At the start of the project the CRG hosted homeowners, contractors, and consultants at the CRG building to educate them about the §319 projects. Outreach continued throughout with signage, social media, and direct mailing methods. The other aspect of the grant was the septic pumping portion. The original goal of the pumping effort was 30 systems. However, CRG

discovered that more homeowners need the complete replacement or repair rather than simple maintenance. A total of five homeowners had their functioning septic tanks pumped.

CRG volunteers sample Browns Creek during low flow.

Results

The goal of the first project was to remove 1.07E+12 cfu loads from Browns Creek and Angel Fork. With twenty-one septic tanks replaced and five septic tanks pumped out; fecal coliform counts are progressively decreasing in the Browns Creek and Angel Fork tributaries, which is supported by water quality monitoring data. Note: More details are provided in the project write-up found later in this report. CRG uses WVDEP's conversion model – originally developed by Alvan Gale and later refined by the current NPS Coordinator. The spreadsheet model estimates 2.63E+13 cfu loads have been reduced thus far. This estimate will be further quantified by CRG's monthly monitoring regiment.

The CRG outreach strategy has recruited thirty-five residents with the NPS-1619 and NPS-1724 §319 projects, plus a long waiting list.

Funding and partners

Table 4. Browns Creek funding Phase I-II.

§319 projects	Funding		Fiscal years
	§319	Match	
Browns Creek Septic Phase I	$94,000	$62,667	2016
Browns Creek Septic Phase II	$186,000	$124,000	2020
Totals	**$382,000**	**$186,667**	
Funds spent thus far	$152,710	$102,200	

Example of signage posted throughout Browns Creek watershed. A Real Estate type metal frame held the signs. The frames were donated.

The WBP and projects are supported by the local community. Successful implementation efforts are due largely to CRG, with assistance from KCHD and WVCA. WVCA has been a key financial partner and has been a willing fiscal agent throughout the life of the projects. KCHD sanitarians inspect and approve each project and do follow-up visits when necessary. The WPP has supported CRG staff for five-years and has allowed them to dedicate project managers to this effort. WVDEP's WBC and NPS Coordinator have provided §319 technical and administrative support throughout. *WPP funding* has supported CRG staff from the inception of this effort. This funding source will be available for at least one more state fiscal year.

Back Creek watershed plan

Watershed information

HUC12: 020700040404, 020700040405, 020700040406, 020700040407, 020700040408, 020700040409

Sponsor(s): WV Conservation Agency, local landowners, Blue Heron Environmental Network, other State and Federal partners

Watershed description

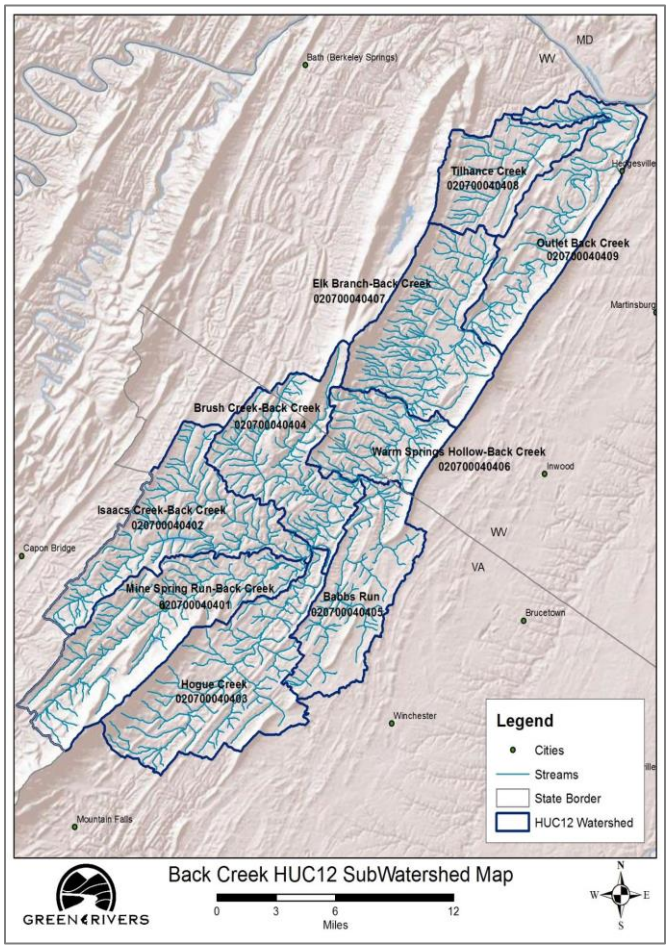


Figure 6. Back Creek WBP map

The Back Creek watershed is part of the Potomac Direct Drains and Chesapeake Bay watersheds. It extends from Frederick County, VA, to Berkeley and Morgan Counties, WV, and drains 274 square miles. The watershed is comprised of distinctive, high-quality cold and warm water streams and unique shale bedrock outcrop topography. Back Creek is one of the few watersheds in the eastern panhandle of WV that does not have water quality impairments, but there are threats. The watershed contains large areas of undeveloped and forested land, and rare, threatened, and endangered species have been documented throughout the West Virginia portion of the watershed.

Goals

USEPA approved the watershed protection plan (WPP) developed for *Back Creek* in 2014. The WPP provides a framework for achieving the goals of protecting and restoring the watershed. The WPP recommended management measures include protecting forested areas, farmland, and wetlands from development, zoning and ordinance enforcement for low impact development, implementation of agricultural BMPs, and reducing erosion through natural stream design.

Partnerships

WVCA and WVDEP have partnered with a variety groups and local stakeholders throughout the implementation of the WPP, including the *Blue Heron Environmental Network* (BHEN), who has been monitoring water quality in Back Creek and working to protect the watershed many years prior to the WPP. Other partners include the *Berkeley County Farmland Protection Board* (BCFPB), the WV Division of Forestry (WVDF), the WV Division of Natural Resources (WVDNR), and the *Eastern Panhandle Conservation District* (EPCD). WVCA's AgE and USDA Farm Bill programs are also implemented throughout the watershed.

Project highlights

Under Phase I, three stream restoration sites were identified and assessed. Since then, one natural stream design has been implemented with two more in progress, one porous paver project has been installed, and a

forestry workshop was held for landowners who own large tracts of forested land in the watershed. The workshop promoted and demonstrated healthy forest management practices. Probably the most critical components have been the purchase of conservation easements on high-quality agricultural land, which protects the land in perpetuity from development, subdivision, or non-agricultural commercial activities, even if that land is sold. This is especially important for the watershed since most of it lies within Berkeley County, the fastest-growing county in the state. To date, easements have been purchased on five parcels consisting of 251 acres. These properties contain or border 8,360 feet of Back Creek or its tributaries, which contributed to the higher ranking during the selection process. This practice is key to preserving current forested and agricultural land, protecting riparian areas, and maintaining the water quality of Back Creek. This project is currently in Phase III.

Figure 7. Completed Back Creek projects 2012 – 2020.

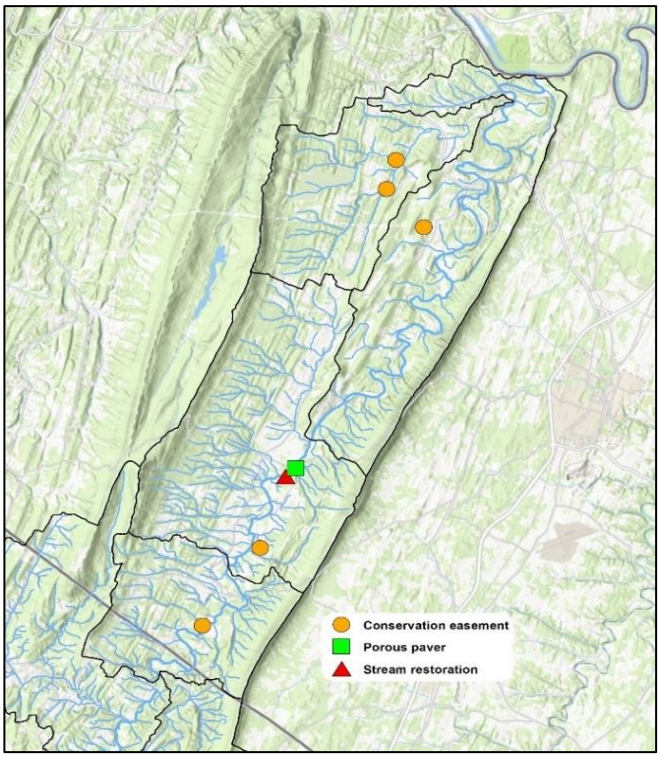


Table 5. Back Creek summaries.

Practices

Natural stream design	915 feet
Conservation easements	251 aces
Porous pavers	0.05 acres

Load reductions

Sediment (tons/year)	0.92
Nitrogen (lbs/year)	0.69
Phosphorus (lbs/year)	0.05
TSS (lbs/year)	31.1

Funding

Source	Award	Match
§319 Phase I	$30,000	$20,000
§319 Phase II	$209,450	$221,689
§319 Phase III	$303,450	$202,774
§319 AGO	$20,000	$14,000
CB-LIF	$56,100	$101,419
Total	$619,000	$559,882
Overall total	**$1,178,882**	

Back Creek stream restoration.

Porous paver installation at a public stream access on Back Creek.

Indian Creek watershed plan

Watershed information

HUC12: 050500020701, 050500020702, 050500020703, 050500020704, 050500020705

Sponsor(s): WV Conservation Agency, local landowners, Indian Creek Watershed Assoc., other State and Federal partners

Introduction

Indian Creek is a significant tributary to the New River. Its watershed begins in the mountains of Monroe County and enters the New River near Forest Hill in Summers county. The Indian Creek watershed is a rural watershed with the predominant land use being grazing-based agriculture with small communities and farms scattered throughout. The watershed is 122,788 acres with over 45% being pasture and cropland. Karst geology is a significant feature within the watershed and creates special challenges for restoration efforts. Karst is limestone geology typified by sink holes and underground streams which can allow pollutants to rapidly enter the groundwater and be transported to springs that enter surface streams.

The Indian Creek WBP was approved in 2017. It was developed for the purpose of implementing a *National Water Quality Initiative* (NWQI) area for the USDA Natural Resources Conservation Service (NRCS). As the project came together certain limitations were recognized, and §319 funding became vital to the project. WVCA and NRCS worked together to develop the program, utilizing NRCS funding for grazing and water system development, while §319 funds would fill in the gaps for areas not funded from the NRCS ranking process. §319 funds would also be used to address outreach and issues with failing septic systems.

Project highlights

To date, §319 grant awards and NRCS funding have assisted 56 landowners on 9,731 acres of karst land - 55 grazing and alternative livestock watering systems have been installed. Within these projects, approximately 17,432 feet of streams has livestock exclusion fencing, which has led to the development of about 160 acres of buffers. These practices aid in evenly distributing livestock waste throughout pasture grasslands where the nutrients can be utilized by vegetation and bacteria survivability is significantly reduced due to UV light exposure. Two failing septic systems have also been addressed, one periodic failure and one permanent failure. The overall modeled load reduction for practices implemented through §319 programs is 1.13E+13.

Livestock exclusion fencing

Most of the practices funded with §319 and NRCS have been implemented in the Burnside Branch. Additionally, NRCS has assisted cooperators with practice implementation on five farms within the Upper Indian Creek and four farms within the Lower Indian Creek. The photos demonstrate livestock exclusion fence. The left photo provides a buffer around a pond located on karst land while the fence in the right photo excludes a surface running stream.

Table 6. Indian Creek WBP progress January 2018 – September 2020

Activities	Burnside Branch			Upper Indian Creek			Lower Indian Creek			Middle Indian Creek			Rock Camp Creek		
	§319	USDA	State	§319	USDA	State	§319	USDA	State	§319	USDA	State	§319	USDA	State
Total cooperators with cost-share programs	11	39			5			1							
Total cooperators with technical assistance								3							
Total grazing systems installed	10	39			5			1							
Total alternative watering systems installed	10	39			5			1							
Total acres of buffers installed	160														
Total feet of stream protected	17,432														
Total acres of karst land protected		9,731													
Cooperators provided w/technical assistance			2									4			1
Cooperators assisted w/cost share programs			14			2						5			4
Grazing systems installed			5			1						2			3
Alternate water systems installed			5			1						1			1
State funds spent			$19,305			$745						$7,882			$5,496

Outreach

An outreach event was held on November 4, 2019 at WVU's *Willow Bend demonstration farm*. The purpose of this event was to promote projects and demonstrate installation of specific BMP's. Approximately 50 local farmers attended the event.

1

2

3

1) Attendees were presented info about cost share programs and water quality protection. 2) Staff demonstrate the proper installation of a recycled tire trough for watering livestock. 3) Staff demonstrate the proper installation of fencing.

Results

Table 7. Indian Creek monitoring summary.

2019-2020 monitoring summary	Monitoring sites					
	1	2	3	4	5	Average
> 200 cfu/100 mL exceedances	9	6	7	6	4	6.4
Percent exceedance	75.0%	50.0%	58.3%	50.0%	33.3%	53.3%

Consistent water quality monitoring for fecal coliform has been conducted since 2019. In the 12 months between September 2019 and September 2020, results exceeded the state water quality standard nine times in the upper watershed and four times in the lower portion of the watershed. During the 2019-2020 sampling period, there were several exceedances, all of which occurred during higher precipitation events. Water quality results thus far, indicate that BMPs associated with unrestricted access to surface water and karst

features are having a positive impact. The resource concern that needs addressed is more closely related to stormwater, soil quality and infiltration rates. Additional monitoring is needed for definitive conclusions.

Partners and funding

Partners in this effort include USDA-NRCS, WVDEP-WIB, both of whom provide funding support. *Greenbrier Valley Conservation District* approves landowner contracts and administers the funds. WVCA provides technical assistance to landowners, monitors water quality, and provides overall project management. Outreach is a partnership between WVCA, WVU Extension Service and *Indian Creek Watershed Association* (ICWA).

Photo: *WVCA staff conduct water monitoring along Indian Creek. At site 5 a Van Dorn horizontal sampling bottle is lowered from the bridge into the stream. Once retrieved, 100 ml is collected and taken to a commercial lab and analyzed for fecal coliform. On site, a YSI multi meter is used to analyze for pH, temperature, and dissolved oxygen.*

Table 8. Indian Creek WBP funding resources.

Total funds spent	
§319 grants	$167,588
USDA-NRCS funding	$1,441,052
State and local funding	$98,355
Total	$1,706,995

Watershed project highlights

The number of watershed projects completed in 2020 were limited. The prominent reason was the Covid-19 pandemic. We anticipated all projects from fiscal year 2016 to be completed and about a 50% completion rate in 2017. What we saw was a 76 and 33% completion rate, respectively. Those that did complete on-time were ahead of schedule and not impacted by the pandemic.

This report highlights three successful projects, two of which are associated with WBPs previously discussed. Our 2016-2020 project list and their status are provided in *Appendix 3*.

Back Creek protection

Organization(s):	WV Conservation Agency, Blue Heron Environmental Network	Contact:	Kristen Bison
Watershed information			
HUC8:	02070004	Stream code:	WVP-6
HUC12:	020700040404, 020700040406, 020700040407, 020700040408, 020700040409	GRTS:	FY16 #10

Project overview

This project is in the Back Creek watershed of the Potomac Direct Drains watershed in Berkeley County and Morgan County. Back Creek is one of the few watersheds in the eastern panhandle that does not have water quality impairments on the 303(d) list, which has made this watershed a priority area for conservation for the WVDEP-WIB, WVCA, EPCD, BHEN, WVDF, *Upper Potomac River Keeper* and the Chesapeake Bay Program.

This project was intended to promote conservation through the acquisition of 100 acres of conservation easements on priority agricultural parcels, reduce erosion by 0.92 tons/year of sediment through natural stream restoration of 915 feet, inventory and prioritize sediment producing dirt and gravel roads, assessing physical stream conditions using *The Easy Assessment Method* (TEAM) and gauge program effectiveness through water quality monitoring. Further nutrient and sediment reductions were a goal by providing targeted outreach and promoting USDA Farm Service Agency's *Conservation Reserve Enhancement Program* CREP. CREP is a federal cost-share program for riparian forest and vegetative buffer establishment, alternative watering, fencing, and stream crossings.

Problem description

Back Creek is one of only very few watersheds in the Eastern Panhandle that does not have water quality impairments. However, continued development from urban sprawl, timbering and agricultural practices are future threats. As a result, the Back Creek WPP was developed and approved by USEPA in 2014 to focus restoration efforts and enable financial and technical assistance to facilitate improvement strategies and restoration projects in the Back Creek watershed. Protection of forest, wetland, and farmland properties as well as natural stream design (NSD) were identified as priority management actions for the watershed.

Figure 8. Conservation easement postcard.

Project highlights

The original grant deadline was extended due to delays in one of the conservation easements purchases and the stream restoration project.

Conservation easements

A postcard was distributed to the entire Back Creek watershed to promote the conservation easement program. BCFPB received four applications and ranked the properties according to the ranking criteria detailed in the project work plan. Two properties were selected for conservation easement purchase: one property consisting of 60 acres with 2,600 feet of frontage on Back Creek and another property consisting of 95 acres. These 155 acres exceeded the original goal of 100 acres. The closing for the first easement was completed in April 2018, and the closing for the second easement was finalized in December 2018.

Stream restoration

The stream restoration project is located near Tuscarora Pike outside the community of Shanghai, WV. Most of the project was completed on the Butts property, which is used primarily for crop production; this property had been placed into conservation easement by the current landowner. The streambank on the opposite side belongs to Broomgrass HOA. The portion of Back Creek flowing through these properties has areas of lateral erosion, which contributed excess sediment to the creek.

Location of stream restoration project (looking at the Butts property, river left, from the Broomgrass HOA side, river right).

The stream restoration design, permitting, and project oversight were completed by WVCA staff. In 2016, flooding in the southern part of the state delayed the design and permitting stage of this project because watershed division staff were engaged in flood response activities. By August 2018, the design had been completed, a contractor selected, and most of the permits had been obtained. However, the WVDNR was unable to perform the required mussel survey in 2018. The survey was completed in June 2019 and the project was cleared. The contractors completed the work in 2019 and 2020.

Regrading of bank on river left.

Grass growing ~ 3 weeks post project.

The design included the installation of one j-hook, the installation of toe wood on the river right bank, and the regrading of the river left bank downstream of the j-hook. The disturbed areas were stabilized with coir fiber matting and grass seeding. Live stakes and trees will be planted during the dormant season this year to stabilize the banks and to restore the riparian buffer.

TEAM assessment

Using the TEAMS method, WVDEP summer interns completed inventories of eroded streambanks in the watershed, focusing on one subwatershed at a time. In addition to assessing streambanks, interns collected GPS coordinates and created maps of priority sites, primarily focusing on erosion and inadequate buffers. Priority areas include: One Spring Run (also known as Town Run), Elk Branch, Sawmill Run, Tub Run, Gough's Run and White's Run, a tributary of Tilhance Creek.

Obstacles

1. **Dirt and gravel roads assessment** - CB funds originally intended for the Dirt and Gravel Roads assessment did not take place. *Cacapon Institute* was still interested in holding a Dirt and Gravel Roads assessment, but the activity did not occur during this phase.
2. **Volunteer monitoring** - Due to the retirement of staff previously tasked with developing the volunteer monitoring QAPP, the QAPP was not developed for BHEN volunteer monitoring program. Additionally, BHEN is currently inactive, so alternatives for water quality monitoring and QAPP development will be explored during the Phase III project.

Results

Table 9. Load reduction estimates for Back Creek stream restoration.

Back Creek Phase II results		
Pollutant	Stream length	Load reduction
Sediment	915 linear ft	0.92 tons/year

155 acres of farmland were placed into conservation easement, which exceeds the original goal. One of the properties includes 2,600 feet of stream frontage along Back Creek. The protection of both properties will help mitigate some of the development pressure that threatens the excellent water quality of Back Creek. The completion of the stream restoration project along the Butts and Broomgrass properties will reduce an estimated 0.92 tons of sediment/year from entering Back Creek.

Beaver Creek at Auman Rd

Organization(s):	Friends of the Cheat	Contact:	Madison Ball
Watershed information			
HUC8:	05020004	Stream code:	WVMC-12-B-1
HUC12:	050200040603	GRTS:	FY16 #8

Introduction

Beaver Creek is a tributary within the Big Sandy Creek watershed, which hosts a viable fishery and is nationally renowned for river recreation. For these reasons, FOC and its partners have targeted restoration activities in the watershed since the late 1990s. FOC had already implemented two projects in the Beaver Creek watershed, including Big Bear and McCarty Highwall passive AMD treatment projects, and completed the Big Sandy Creek WBP in 2019.

Problem

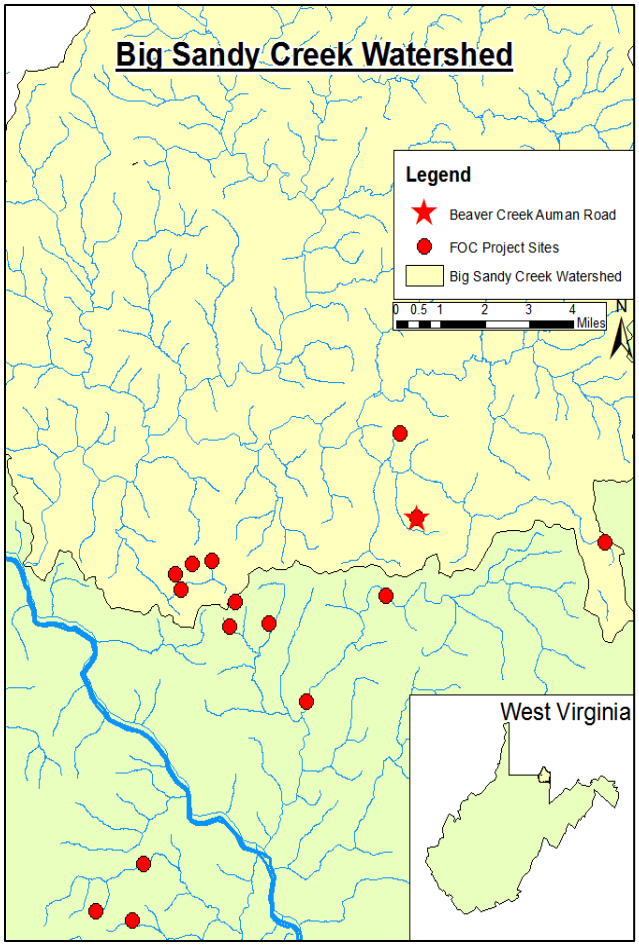
The seeps associated with the "Beaver Creek at Auman Road" projects contribute some of the highest acidity, aluminum, and iron loadings to the Beaver Creek watershed, and have been identified as priorities for treatment via FOC's Big Sandy Creek WBP and have been on FOC's radar for treatment since 2009. Because the previous landowner was not interested in treatment, FOC was unable to pursue treatment for many years until the property changed ownership.

The project, a major priority for FOC, had experienced many challenges throughout the project duration, including a lengthy permitting process (the USACE permitting process alone took approximately 1 year from submission to approval), landowner complexities, attempting to accomplish the work during COVID-19, and construction cost overages.

Project highlights

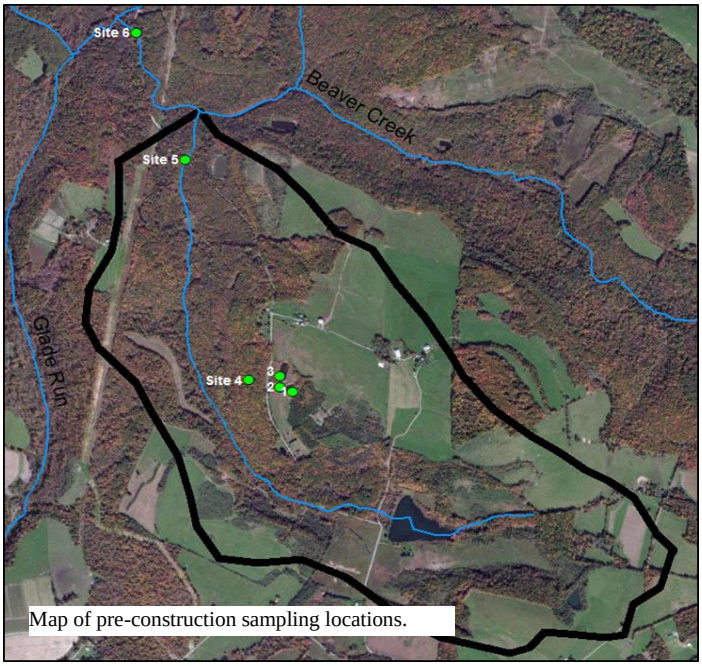
In October 2019 FOC announced a bid opportunity for the project for construction, at which time all bids were over-budget, with the lowest bid being $115,628 over-budget. During the previous reporting period, FOC consulted with Civil & Environmental Consultants (CEC), WVDEP, and various firms to determine why the bids were so high over the opinion of probable cost (OPC). It was determined that the OPC did not factor in some critical concerns, and no local quarries at that time were producing high calcium carbonate limestone. FOC sought and secured additional funding ($115,628) to cover this overage with the 319 program and split the project between Phase I and Phase II. CEC in conjunction with FOC held a second pre-bid meeting to procure a construction contractor for the project in February 2020. A contractor was awarded, and an agreement was signed in March. During the final project period, FOC constructed the upper and lower passive AMD treatment systems at Beaver Creek of Auman Road. Construction was completed in July, although the planting effort was postponed until October to increase the chances that the tubelings and potted plants would survive and would not dry out in the hot summer months. A budget amendment for NPS 1725 was also approved, which allowed FOC to move $8,800 to Personnel to provide construction oversight and post-construction monitoring, $2,250 for laboratory fees to continue post-construction monitoring in 2021, and $1,200 in operating costs.

Figure 9. Map of Big Sandy Creek watershed showing FOC project locations.



Pollutant reductions

Initial water quality results show dramatic improvements and a 100% reduction in acidity, and 80% or greater reduction in aluminum for AMD source that feeds the lower treatment system. Iron reductions of the lower treatment system are near 67%, and FOC anticipates the reduction will increase once wetland species establish in the wetland. Ultimately load reductions of 4091 lbs/year of acidity, and 494 lbs/year of aluminum have occurred at the upper treatment system; 32,543.1 lbs/year of acidity, 3,335 lbs/year of aluminum, and 518.20 lbs/year of iron reductions have occurred at the lower system.



Map of pre-construction sampling locations.

UNT/Beaver Creek RM 1.7 is recorded as having load reductions of 99,082.6 lbs/year of acidity and 2,069 lbs/year of aluminum. There has been an increase in iron (437.2 lbs/year). FOC is unsure of this source of iron but will continue to monitor UNT/Beaver Creek RM 1.7 to see if the increased iron is an anomaly or a trend. While water quality monitoring of the upper treatment system is showing that it is reducing acidity, aluminum, and iron loads by 80% or greater, there has not been a significant change to the pond on site. However, the seep that feeds the upper system has been dry for most of the sampling events, or near dry. FOC is interested in tracking water quality changes in the pond during high flow months in March and April of 2021. Water quality monitoring of the site continues, and the tree planting component of the construction plan took place in October 2020. FOC plans to monitor success of the planting in the future.

Table 10. Loadings in pounds per year for water quality parameters pre and post construction at monitoring locations for the Beaver Creek at Auman Road project. Samples were collected on 3/20/2020 and 8/20/2020. ND represents non-detectable concentrations.

Site	Acid loading lbs/year	Alkalinity loading lbs/year	Diss. Al loading lbs/year	Total Fe loading lbs/year
Auman upper seep	4,091	ND	494	ND
Auman upper limestone bed	-12.32	30.6	ND	ND
Load reduction	4091		494	
Auman lower seep	32,543.1	ND	3,335.1	521.2
Auman lower system wetland	-42.51	100.24	0.14	3.03
Load reduction	32,543.1		3,335	518.2
UNT/Beaver Ck RM 1.68 mouth	99,149.1	ND	2,069	ND
UNT/Beaver Ck RM 1.68 mouth	66.5	ND	ND	437.2
Load reduction	99,082.6		2,069	-437.2

Beaver Creek at Auman Road Lower System Post Construction

Beaver Creek at Auman Road Upper System Post Construction

Partners and funding

Most of the funding was secured through the USEPA's §319 Program, specifically NPS-1584 Phase I and later, NPS-1720 Phase II), as well as a Department of Interior – Office of Surface Mining (OSM) *Watershed Cooperative Agreement Program* (WCAP) grant. Match was provided by FOC, CEC, and volunteer match. FOC provided match in the form of additional funds for personnel as well as operating costs.

Table 11. Final Beaver Creek at Auman Rd project budget

	§319 NPS 1584	OSM WCAP	Non-Federal Match	FOC	Phase I Total	§319 NPS 1725	Phase I and II Total
Implementation							
Personnel and Benefits	**$ 22,950**	**$ 4,500**	**$ -**	**$ -**	**$ 27,450**	**$ 8,800**	**$ 36,250**
Equipment and Supplies	**$ 2,208**	**$ -**	**$ -**	**$ -**	**$ 2,208**	**$ -**	**$ -**
Subcontracts	**$ 111,958**	**$ 126,525**	**$ -**	**$ -**	**$ 238,483**	**$ 103,378**	**$ 341,861**
Engineering	$ 36,308	$ -	$ -	$ -	$ 36,308	$ -	$ -
Construction	$ 75,650	$ 126,525	$ -	$ -	$ 202,175	$ 103,378	$ 305,553
Travel	**$ 1,417**	**$ -**	**$ -**	**$ -**	**$ 1,417**	**$ -**	**$ 1,417**
Lab Fees	**$ 9,125**	**$ -**	**$ -**	**$ -**	**$ 9,125**	**$ 2,250**	**$ 11,375**
Non-Implementation	**$ 34,000**	**$ -**	**$ -**	**$ 14,000**	**$ 48,000**	**$ 1,200**	**$ 49,200**
FOC Operating Costs	$ 17,000	$ -	$ -	$ 14,000	$ 31,000	$ 1,200	$ 46,200
Non-point Source Monitoring and Planning Activities	$ 17,000	$ -	$ -	$ -	$ 17,000		$ 17,000
Total	**$ 181,658**	**$ 131,025**	**$ -**	**$ 14,000**	**$ 326,683**	**$ 115,628**	**$ 440,103**

Browns Creek Phase I

Organization(s):	Coal River Group, WV Conservation Agency	Contact(s):	Justin Hunt, Bill Curry
Watershed information			
HUC8:	05050009	Stream code:	WVKC-2
HUC12:	050500090608	GRTS:	FY16 #5

Project overview

The Browns Creek and Angel Fork -Coal River watershed is defined by the U.S. Geological Survey (USGS) as 12-digit HUC (050500090608) and is included in the Coal River TMDL. The Lower Coal River watershed makes up the northern-most reach of the Coal River watershed and includes the mouth of the Coal River at St. Albans, WV.

This HUC12 area drains 14,371 acres in Kanawha and Putnam counties. Unfortunately, there is no plan to extend public sewer to Browns Creek or Angel Fork like surrounding areas. CRG hosted educational outreach events to discuss the Browns Creek septic project and develop a relationship between contractors and homeowners with failing septic tanks. Sixteen tanks were successfully replaced, and four septic tanks were pumped between September 2015 and June 2020. The project concluded with a substantial waiting list. In 2019, CRG applied for an additional watershed project grant to continue its work reducing fecal coliform bacteria from the Lower Coal River watershed. This will be known as the Browns Creek Phase 2.

Problem

Fecal coliform bacteria pose a major issue throughout the entire Coal River watershed. According to the 2006 TMDL for the Coal River the area faces some of the most serious fecal coliform problems in the entire Coal River watershed. Failing onsite wastewater treatment systems pose the most significant nonpoint source of fecal coliform bacteria in the Lower Coal River watershed. Biological impairments are also prevalent in the watershed but are a secondary concern currently. In some cases, biological conditions will improve once the increased enrichments from failing septic's are reduced.

CRG staff and volunteers recruiting homeowners for septic tank replacements.

In April 2015, Kanawha Charleston Health Department (KCHD) conducted a comprehensive sanitary survey of Browns Creek area (consisting of the Upper Browns Creek and Angel Fork sub-watersheds). The survey verified the functionality of only 27% of onsite home sewage treatment systems and documented over 60% as failing or non-functioning at the time of the survey. Of the 378 homes in the area, 301 homes are on septic systems and 67 are served by home aerator units (HAUs). The survey also identified instances of straight pipes discharging sewage directly into Browns Creek.

Project highlights

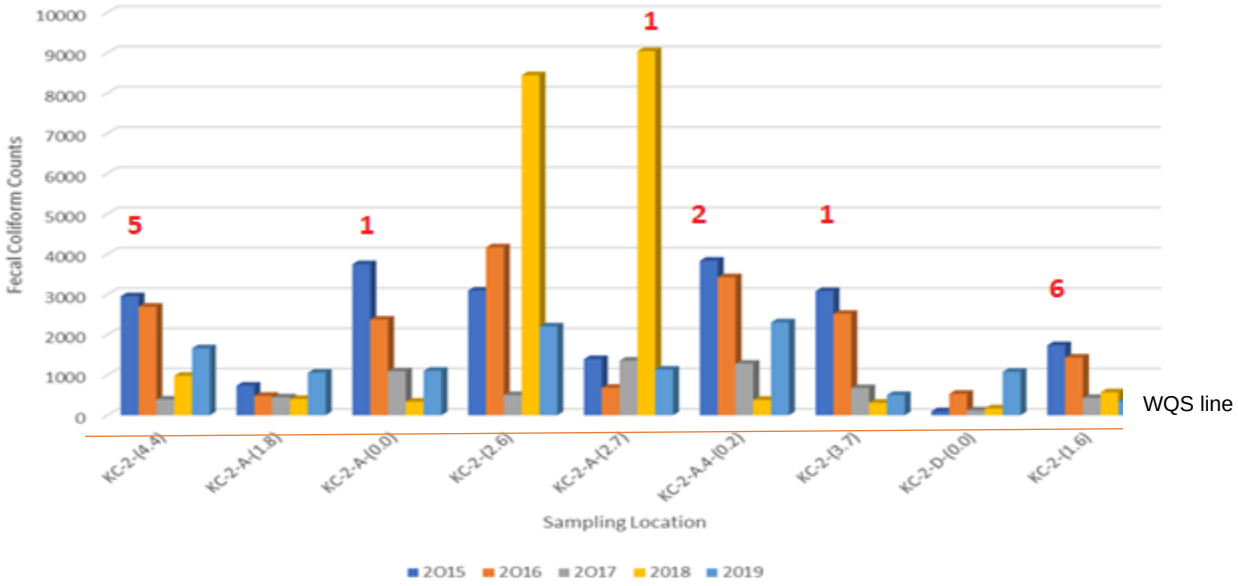
During the grant period, 16 homeowners replaced their failing septic systems, which exceeds the number of replacements sought in the original workplan. All homeowners replaced their failing systems with traditional absorption field septic systems. Concrete and plastic tanks were used depending on KCHD recommendations. The replacements were successful due to the recruiting of the homeowners. To start the grant period the CRG hosted homeowners, contractors, and consultants at the CRG building to educate and recruit homeowners for the program. Outreach continued throughout the grant period with signage, social media, and direct mailing

methods. The other aspect of the grant was the septic pump-out portion. A goal of 30 pumping's where also part of the effort, but CRG discovered that most homeowners need the complete replacement rather than simple maintenance. A total of four homeowners had a functioning septic tank and had their septic tank pumped.

Figure 10. Septic work in the Browns Creek watershed.

Results

Figure 11. Fecal coliform monitoring in Browns Creek.



Monitoring has been conducted since before the project started. Results are shown in *Figure 10*.

In the graph you will notice some locations with gradually reduced fecal counts. A red number above each sampling location shown indicates the number of septic tanks that have been replaced immediately up-stream of the location. Thus far, water quality data indicates the higher number of septic tanks replaced upstream the lower fecal counts are downstream. Overal, the water quality data indicates improvement in some locations but other areas need attention.

With sixteen septic tanks replaced and four septic tanks pumped out; fecal coliform counts are progressively decreasing in the Browns Creek and Angel Fork tributaries. The CRG outreach strategy has recruited more than 25 residents for NPS-1619, and now have a waiting list for NPS-1710.

The estimated load reduction progress thus far is 2.63E+13.

Partners and funding

Browns Creek Phase 1 remediation project started in 2016 through a §319 watershed project grant provided by WVDEP's Nonpoint Source Program. KCHD is a valuable partner. They evaluated all home septic systems for participating homeowners. They made recommendations on the best sytems each site needed and inspected the site following installation. The fiscal agent for the project was WVCA. WVCA conducts the payments directly to the contractors for each project. This was an enormous benefit for the CRG, which alleviated the pressure of needing the funds upfront for each project and it reduced turn around time on reimbursements. WPP funding has supported CRG project management and monitorng staff, and of course willing landowners are critical to the project success.

CRG quickly learned that the focus of most funding needed to be on replacement/repair. Funds were moved from other categories to make sure implementation was the focus. This is critical to the overall success of the effort.

Table 12. Browns Creek NPS-1619 expenditures.

Items/tasks	Award	Match	Final expenditures
Education/outreach	$3,500.00	$2,333.00	$1,099
Tank replacements	$80,000.00	$53,334.00	$86,705.00
Tank pump-outs	$6,000	$4,000.00	$800
Water sampling	$4,500.00	$3,000.00	$5,396
Totals	**$94,000.00**	**$62,667.00**	**$94,000.00**

Success Stories

The stories in the next section are not the typical US EPA success story, but this was not the typical year. These include a story about Muddy Creek for US EPA's 50th anniversary, a story about the integration of source water protection plans and watershed based plans, and finally a testimonial from a Browns Creek resident.

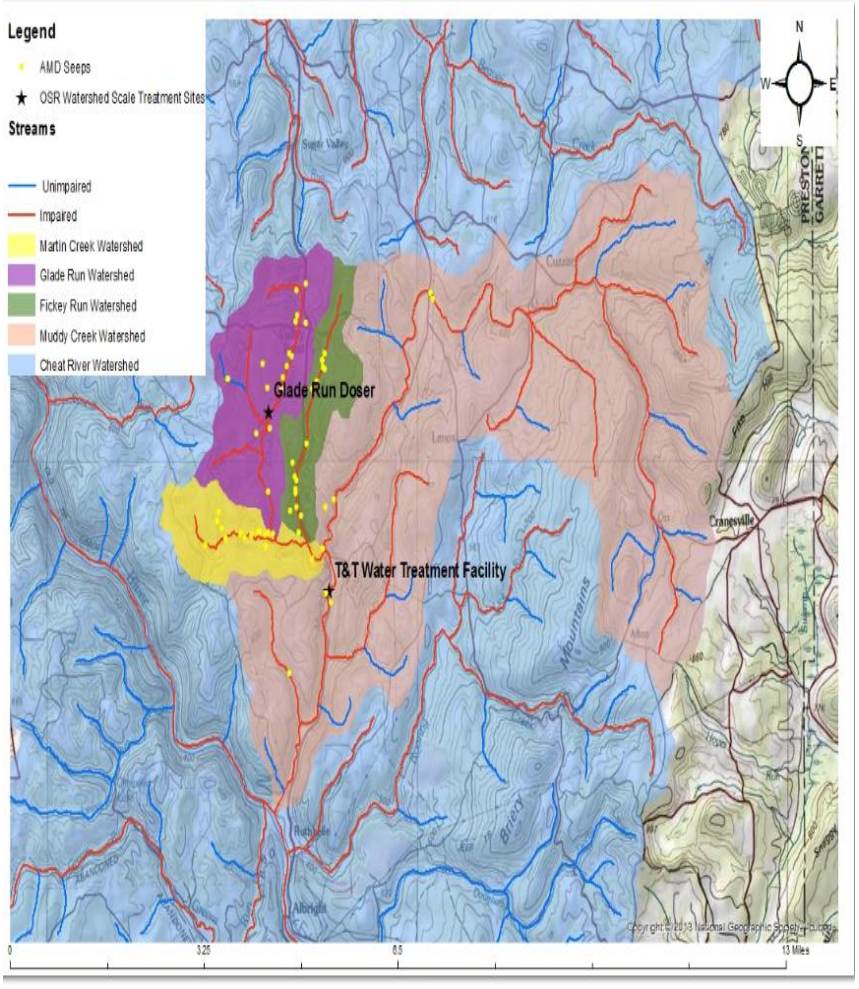
Muddy Creek – a story of partnership and restoration

Developed for *US EPA's 50th Anniversary*.

West Virginia is known as the "Almost Heaven" state – a desired destination for anyone wanting to experience its incredible beauty and stunning scenic views. The state is an attraction for fishermen, nature lovers, and world-class whitewater rafting enthusiasts. West Virginia's beautiful state parks, forests, rivers, lakes, and streams are the natural resources that help define its "Almost Heaven" name. So, when the integrity of Muddy Creek was in jeopardy, it received state-wide attention.

The Muddy Creek watershed, located in Preston County, WV encompasses nearly 21,500 acres and joins the Cheat River near Albright, West Virginia. Muddy Creek had been severely impacted by acid mine drainage (AMD) and was the largest source of pollution for the whole Cheat River. The following story demonstrates how coordinated efforts of partners restored Muddy Creek and benefited the Lower Cheat River.

Figure 12. Muddy Creek watershed



In 1994, the first of two incidents turned the waters orange for miles, destroying aquatic life and bringing attention to the problems of AMD. Torrents of polluted water from an underground mine blew out a hillside and poured into Muddy Creek and then the Cheat River, turning the river orange for 16 miles on the way to Cheat Lake. The devastation killed all aquatic life in its path. The results were not all negative because of the attention generated but more importantly, the disaster resulted in the formation of Friends of the Cheat (FOC), one of the most successful watershed groups in West Virginia.

Unfortunately, in 1995, another mine blowout added AMD, contributing to an already devastating situation.

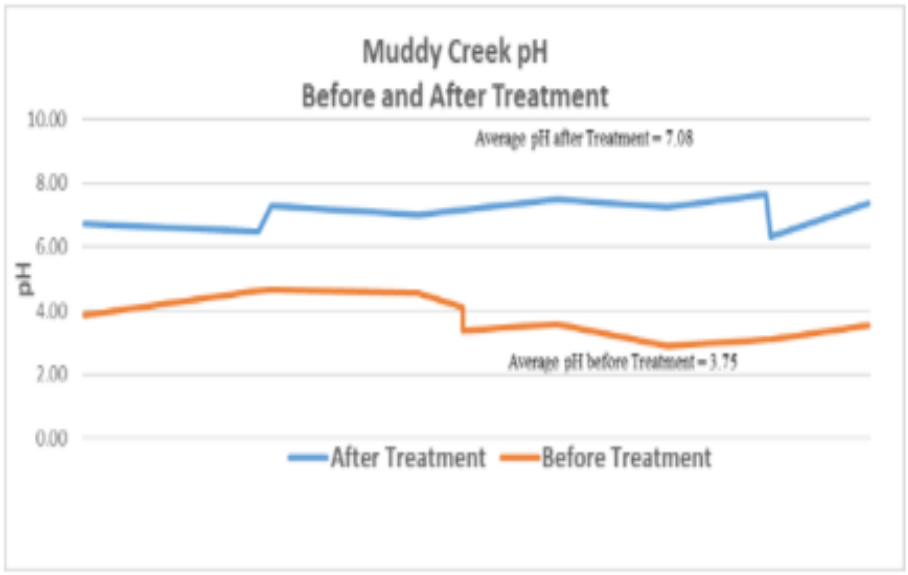
In the years since the blowouts, Multiple sections/offices within WVDEP, FOC, Southwestern Energy, OSM and many other members of the *River of Promise* (ROP) have worked tirelessly to restore Muddy Creek as well as other dozens of other AMD impacted streams within the Cheat River watershed.

Aerial photo 1994 Mine Blowout - Photo Credit Randy Robinson

The ROP team along with the US EPA determined that the best way to treat the pollution problem was to look at the entire watershed holistically rather than treat individual pollution sources. Thus, US EPA Region III worked with WVDEP to develop a first-of-its-kind permit in West Virginia to neutralize acidity, reduce metals and improve water quality.

This innovative permitting strategy allowed for contaminated water flowing from several streams to be treated via an in-stream dosing or conveyed through the AMD water collection system to the treatment facility by which a yellow-orange sludge separates during the decontamination process and is safely disposed. The water is decontaminated through a process using lime slurry, polymers, and clarifiers to raise the pH and remove the metal substances. It is then returned to the watershed through a single outlet where clean fresh water returns to the stream in a continuous flow that dilutes and gradually restores the creek and river to a life-supportive pH balance – a range of 6.5 to 7.5.

Figure 13. Muddy Creek water quality summary



Since treatment began, Muddy Creek (and Cheat River's) water quality has improved, according to results gathered in recent monitoring surveys. Muddy Creek now holds a net alkaline measurement indicative of a healthier watershed. Inspectors have spotted brown trout in Muddy Creek for the first time in several decades.

This project is an ongoing study requiring more surveys and data to be collected to fully assess the biological recovery of Muddy Creek. The success of this project is largely due to the result of a decision among regulators, scientists, and the local conservation group to treat the pollution problem as an entire watershed. To learn even more about Muddy Creek visit FOC's *Muddy Creek StoryMap*.

Integrating Source Water Protection and Watershed Based Plans: A Pilot Project Success Story

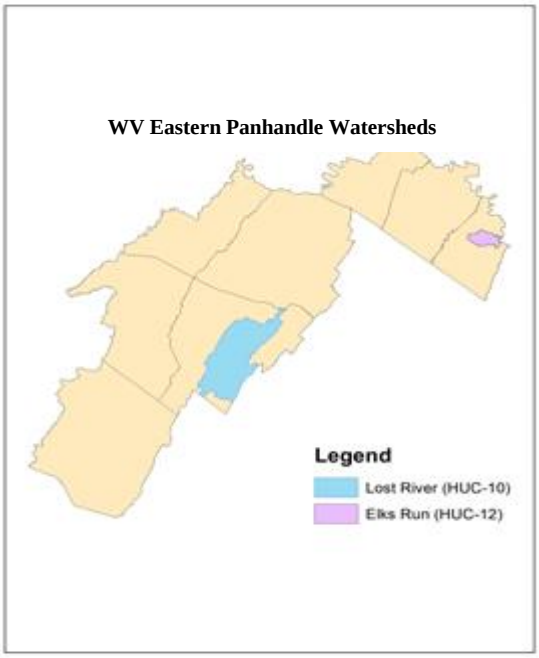
Protecting Drinking Water and Improving Watershed Health

This pilot project successfully sought to develop an effective model for efficient co-implementation of priority practices identified in Source Water Protection Plans (SWPPs) and Watershed Based Plans (WBPs) in two watersheds. This project serves as an example of how community organizations, state agencies, and watershed groups can partner with water utilities to protect drinking water and improve water quality.

Problem

In 2014 the Elk River chemical contamination was an alarming reminder of the vulnerability of our water sources. In response, the WV Legislature passed SB 373, which requires most water utilities across the state to have SWPPs. As nonpoint sources pose a predominant threat to drinking water supplies, many of the source water protection strategies are attempting to manage nonpoint sources of pollution. Now that SWPPs are in place across the state, in many cases there is a direct link between SWPP strategies and WBP strategies. Overlap of these two plans, where applicable, offers a unique opportunity to address nonpoint source pollution and source water protection together. This pilot project aligns those plans, and in doing so, helps to strengthen the community connections between water utilities, their customers, and citizens of their source water protection area.

Figure 14. SWWP-WBP project basins



Project highlights

Community engagement and collaboration

In the Elks Run watershed, a dedicated group of partners drove the project's success, including sustained engagement from Harpers Ferry Water Works, *Elks Run Watershed Association* (ERWA) WV Department of Health and Human Resources (WVDHHR) Bureau of Public Health, WVDEP, the regional *Planning and Development Council*, *Harpers Ferry Merchants Association*, and WVCA. WV Rivers found that cross promotion and collaboration on events yielded additional relationships to enhance project work.

Development of the overlap matrix

One of the key processes developed through these pilot projects, was the overlap matrix. The overlap matrix is a table created from the practices and management strategies articulated in a watershed's WBP and the SWPP of the water utility serving that watershed. The overlap matrix is a powerful tool to provide a roadmap for co-implementation of overlapping strategies. Strategies marked with **D** have direct overlap between both plans. Strategies with a **I** are not expressly stated in both plans, but the strategies do meet the intent of both plans. The matrix is provided in *Figure 15*.

Community projects

A variety of community projects were completed that supported the co-implementation and provided the public with a better understanding of watershed management planning, and how WBPs and SWPPs are related.

Figure 15. Elks Run overlay matrix.

Pollutant	Landuse	WBP Practices	SWPP PSSC's: Railroads	Agriculture	Septics & Sewer	Commercial & Ind.	Subdivisions	Climate Change	Edu. & Outreach: ICPRB Partnership	BMP Lists	Clean up Events	Early Education	Display Info.
Fecal Coliform	Residential/Urban	Filters				I	I						
		Vegetated Open Channels				I	I						
		Bioretention				I	I						
		Permeable Pavement & Pavers				I	I						
		Infiltration Trenches & Basins				I	I						
		Urban Wet Ponds				I	I	I					
		Urban Wetlands				I	I						
		Impervious Surface Reduction				I	D						
		Pet Waste Runoff Campaign				I	I						
		Rehabilitation of Drainage				I	I						
	Pasture	Grass Buffer*		D									
		Riparian Forest Buffer*		D				I					
		Livestock fencing		D									
		Alternative Water Sources		D									
		Armored Stream Crossing		I									
		Wetland Restoration*		I				I					
		Wetland Creation*		I				I					
	Cropland*	Nutrient Management Plan		D									
		Manure Composting		D									
		Increased Soil Testing		D									
		Manure Storage Structure		I									
		Manure Transport		I									
		Others, described above	N/A	N/A	N/A	N/A	N/A	N/A					
	Onsite Sewer Systems	Septic ID & Inspection			D								
		Septic Pumping			I								
		Septic Repair			I								
		Septic Replacement			I								
		Sewer Line Extension			D								
Sediment	Residential/Urban	Described above	N/A	N/A	N/A	N/A	N/A	N/A					
	Pasture	Described above	N/A	N/A	N/A	N/A	N/A	N/A					
	Cropland	Conservation Till		I									
		Cereal Cover Crops		D									
		Commodity Cover Crops		D									
		Others, described above	N/A	N/A	N/A	N/A	N/A	N/A					
	Barren Areas	Silt Fencing											
	Streambanks	Elevation Control Structures		I									
Ches. Bay	Onsite Sewer Systems	De-nitrifying Septic Systems			I								
Forest Cover	Forests	Afforestation		D		I	I	I					
		Land Conservation		D			D	I					
Education - "first step in achieving clean water is to educate residents"		Workshops							I				
		Pet Waste Runoff Campaign								I			I
		Watershed Walks							I				
		Subdivision Stormwater Audit								I			
		Water Bill Inserts											I
		Youth Education										D	D
		Demo Rain Gardens											

Community project examples

Community movie night: Free outdoor movie screenings were held in the summer of 2018 in collaboration with Jefferson County Parks and Recreation. Showings included a source water protection PSA and information on local watershed organizations.

Water Bill inserts: Multiple water bill inserts by Harpers Ferry Water Works educated customers on what they can do to reduce nonpoint source pollution. A total of 800 water customers were reached through three mailings.

Watershed education: Support the development of a watershed education experience partnership between *Potomac Valley Audubon Society* (PVAS) and Morgan Academy. WV Rivers also partnered with PVAS to create a watershed education series for kids learning at home due to the Covid-19 pandemic: In total, 200 students participated in these educational activities.

Water Faire: The Water Faire event was debuted and hosted by the Harpers Ferry Merchants Association for two consecutive years.

Septic pumping: A septic pumping project in collaboration with the EPCD provided free septic pumping to 22 households in the Elks Run watershed. This project included source water protection educational outreach to 474 homes in the Elk Run watershed to advertise the opportunity. At the close of the septic project, multiple homeowners indicated interest in joining ERWA.

Lesson 3: Run-off and Erosion

Results

There are three high-level outcomes of this project:

1. Creation of an integrated SWPP/WBP for two pilot project watersheds, plus the Tuscarora Creek watershed.
2. Inclusion of the outcome matrix in a WBP revision/update; and
3. Sharing our methods with the larger NPS community.

A key result of the pilot project is the creation of a blueprint for collaboration and community engagement in the overlap of SWPP and WBP management strategies to protect drinking water and improve watershed health. An integrated plan is the culmination of stakeholder efforts in coordinating the co-implementation of the WBP and SWPP for the Elks Run watershed. It contains the overlap matrix identified in stakeholder discussions, a list of the priority practices already completed, and a list of proposed projects (currently underway). The matrix documents were the main drivers for community conversations in the Elks Run watershed, the Lost River watershed, and Tuscarora Creek. The Elks Run overlay matrix was the most successful for future project planning. Stakeholder interest was more challenging in Lost River, but the effort did result in a matrix. An overlay matrix was also developed by the Tuscarora Creek project team will be incorporated into the next WBP revision. WV Rivers presented at the *National Nonpoint Source Conference* on this pilot project in November 2020.

Funding and partners

Table 13. WV Rivers funding and key partners

§319 funds	Budgeted	Actual
	$100,000	$100,000
Match	$ 66,968	$66,968
Total	$ 66,968	$66,968
Matching fund sources WV DHHR, Land Trust Alliance Land and Water Initiative, Potomac Riverkeeper SEP Award, private foundations, and individual donations.		

Key partners

Alliance for the Chesapeake Bay, Cacapon Institute, Cacapon and Lost Rivers Land Trust, EPCD, ERWA, Friends of the Cacapon River, Hardy County Government, Hardy County Public Service District, Harpers Ferry Merchant Association, Harpers Ferry Town Council, Harpers Ferry Water Board, Harpers Ferry Water Commission, Harpers Ferry Water Works, Morgan Academy Middle School, National Park Service, Potomac Valley Audubon Society, Region 9 Planning and Development, Ten Fold Fair Trade, The Downstream Project, True Treats Candies, Tuscarora Creek Project Team, WV Bureau of Public Health, WVCA, WVDEP-WIB, WV Rural Water Association

Browns Creek testimonial

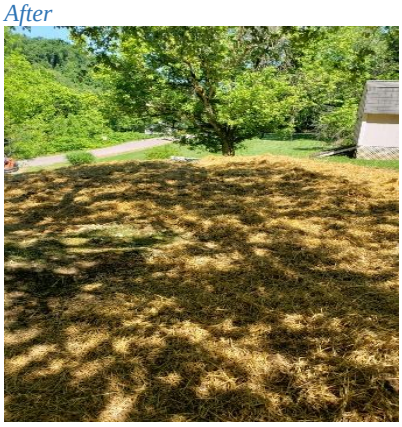
"First I'd like to take the opportunity to say thank you for the work you have begun, helping to clean up the rivers and creeks. I was very happy to hear that my project was approved and I was accepted into the program. The process was explained to me by Justin and I immediately began searching for three qualified installers to complete my job. I had it down to three options and two of them had bid near the full allotted amount supplied by the grant and the 3rd was almost $2000 less. I liked the idea that I could get my system replaced and leave some extra money available for the next guy. Then I had my system installed and as luck would have it the low bidder did not do a proper installation of my tank, the chambers, my downspout drain that he dug out and "replaced" my lawn looked like a horribly plowed field, I contacted the installer several times (as did Justin) and basically was told that he wasn't coming back out unless he was paid (again) he also said in response to being notified that the top of the tank was partially collapsed and that the downspout drain had failed that it "wasn't his fault that the ground settled". So fast forward a few months and I had "gray water" coming back up in my yard (which was the reason I was approved for the replacement in the beginning). Soon I was notified by Justin that my project was going to be looked at for a possible repair. After it was looked at Justin called and said that it was in fact going to be repaired . It has since been replaced with an aeration system that was installed by McVay's Innovative Septic Systems which appears to have corrected the issues that were left by the previous installer. I feel that this program is a very worthwhile attempt to clean up the creeks and rivers in areas that aren't serviced by modern sewer systems. I wish to convey my sincerity in saying that I truly appreciate the CRG's Justin Hunt and everyone that played a part in this project and I intend to assist in informing others in this area about the benefits of this program." - *Kenny R. Romine*

Figure 16. Photo-log of septic installation troubles.

Before



After



Appendix 1. §319 projects and AgE BMPs

Basin	BMP	Amount	Unit	Date
Little Sandy Creek	AMD treatment system	1	Syst	Sep-20
Little Sandy Creek	Anoxic limestone drain	1,406	Sqft	Nov-20
Little Sandy Creek	Catch basin	435	Sqft	Nov-20
Little Sandy Creek	Constructed wetland	2,363	Sqft	Nov-20
Little Sandy Creek	Limestone leachbed	2,194	Sqft	Nov-20
Little Sandy Creek	Limestone leachbed	3,544	Sqft	Nov-20
Little Sandy Creek	AMD treatment system	1	Syst	Nov-20
Browns Creek-Coal River	Onsite wastewater system	5	IU	Nov-20
Browns Creek-Coal River	Onsite wastewater system	1	IU	Apr-20
Upper Indian Creek	Onsite wastewater system	1	IU	Sep-20
Burnside Branch	Fence	2,594	Ft	Sep-20
Burnside Branch	Fence	10,653	Ft	Sep-20
Hughes Creek-Kanawha River	Natural stream restoration	400	Ft	Jul-20
Lower Second Creek	Fence	2,187	ft	Sep-20
Lower Second Creek	Fence	33,889	ft	Sep-20
Mill Creek-Meadow River	Streambank protection	120	ft	Sep-20
Tenmile Creek	AMD treatment system	1	IU	Sep-20
Tenmile Creek	Limestone channel	550	Sqft	Sep-21
Tenmile Creek	Catch basin	4,000	Sqft	Sep-20
Statewide (WVCA)	Outreach	19,943	IU	Sep-20
Elks Run (WV Rivers)	Outreach	1,772	IU	Sep-20
Statewide (WVDEP)	Outreach	1,322	IU	Sep-20
Tilhance Creek	Conservation easements	62	Ac	Sep-20
Warm Springs Hollow	Conservation easements	34	Ac	Sep-20
Elks Run	Onsite wastewater pumpout	22	IU	Sep-20
Statewide	Nutrient management	4,298	Ac	Nov-20
Elks Run	Outreach	1,952	IU	Jun-20
Tuscarora Creek	Outreach	164	IU	Jun-20
WVDEP Statewide	Outreach	4,037	IU	Dec-20
WVCA Statewide	Outreach	19,923	IU	Dec-20
WIB calendar	Outreach	2,710	IU	Dec-20

BMP totals	Amount	Unit	Legend
AMD treatment systems	3	Syst	Syst - systems
Anoxic limestone drain	1,406	Sqft	Sqft - square feet
Limestone leachbed	6,330	Sqft	Ft - feet
Limestone channel	550	Sqft	Ac - acres
Catch basin	4,435	Sqft	IU - individual units
Constructed wetland	2,363	Sqft	
Fence	49,323	Ft	
Nutrient management	4,298	Ac	
Natural channel restoration	400	Ft	
Streambank protection	120	Ft	
Onsite wastewater	29	IU	
Conservation easements	96	Ac	
Outreach	26,076	IU	

Note: WIB calendar is not included in above total.

Appendix 2. §319 projects and AgE load reductions

Basin	Pollutant	Reduction	Unit	Date
Little Sandy Creek	Acidity	75,152	Lbs/yr	Nov-20
Little Sandy Creek	Acidity	32,543	Lbs/yr	Nov-20
Tenmile Creek	Acidity	19,191	Lbs/yr	Dec-20
Little Sandy Creek	Metals (Al)	8,846	Lbs/yr	Nov-20
Little Sandy Creek	Metals (Al)	3,385	Lbs/yr	Nov-20
Tenmile Creek	Metals (Al)	2,026	Lbs/yr	Dec-20
Little Sandy Creek	Metals (Fe)	143	Lbs/yr	Nov-20
Little Sandy Creek	Metals (Fe)	521	Lbs/yr	Nov-20
Burnside Branch	Nitrogen	1,826	Lbs/yr	Sep-20
Burnside Branch	Nitrogen	1,325	Lbs/yr	Sep-20
Lower Second Creek	Nitrogen	1,775	Lbs/yr	Sep-20
Browns Creek-Coal River	Pathogens (coliform)	8.20E+10	CFU	Nov-20
Browns Creek-Coal River	Pathogens (coliform)	2.30E+13	CFU	Apr-20
Burnside Branch	Pathogens (coliform)	9.6E+11	CFU	Sep-20
Burnside Branch	Pathogens (coliform)	6.9E+11	CFU	Sep-20
Upper Indian Creek	Pathogens (coliform)	1.64E+10	CFU	Sep-20
Lower Second Creek	Pathogens (coliform)	9.3E+11	CFU	Sep-20
Mill Creek-Meadow River	Pathogens (coliform)	1.74E+09	CFU	Sep-20
Elks Run	Pathogens (coliform)	9.12E+10	CFU	Jun-20
Burnside Branch	Phosphorus	415	Lbs/yr	Sep-20
Burnside Branch	Phosphorus	301	Lbs/yr	Sep-20
Lower Second Creek	Phosphorus	403	Lbs/yr	Sep-20
Hughes Creek-Kanawha River	Sedimentation	30,000	Lbs/yr	Jul-20
Mill Creek-Meadow River	Sedimentation	76,000	Lbs/yr	Sep-20
AgE (statewide)	Nitrogen	287,225	Lbs/yr	Nov-20
AgE (statewide)	Phosphorus	274,911	Lbs/yr	Nov-20

Pollutant	LR	AgE	Totals	Unit	Legend
Acidity	94,343		94,343	Lbs/yr	Lbs/yr (pounds/year)
Metals (total)	14,921		14,921	Lbs/yr	CFU (colony forming units)
Nitrogen	4,926	287,225	292,151	Lbs/yr	AgE (Ag Enhancement Program)
Phosphorus	1,119	274,911	276,030	Lbs/yr	
Pathogens (coliform)	2.58E+13		2.58E+13	CFU	
Sedimentation	106,000		106,000	Lbs/yr	

Appendix 3. Project status

Note: The shaded projects have been completed.

Organizations	2016	Available	Requested	Spent	PPS	PPE
	Nonpoint Program	**$643,448**				
WV Dept. of Env. Protection	WVDEP Statewide NPS Program		$295,082	$295,082		
WV Conservation Agency	WVCA Statewide NPS Program		$129,314	$129,314	Aug-16	Dec-20
US Env. Protection Agency	EPA Watershed Plan Tracking		$10,000	$10,000		
Friends of the Cheat	NF Greens Run WBP - FY 15 carryover		$25,516	$25,463	Aug-16	Sep-19
Friends of the Cheat	Muddy Creek WBP - FY 15 carryover		$60,484	$60,484	Aug-16	Sep-20
Friends of Blackwater	Friends of Blackwater monitoring		$12,986	$12,406	Sep-16	Jun-18
Friends of Deckers Creek	Clean Creek Program		$12,000	$9,086	Sep-16	Jun-18
Friends of the Cheat	State of the watershed		$15,000	$14,275	Sep-16	Jun-18
Goodnews Mountaineer Garage	Mtneer Garage rain garden		$3,000	$2,906	Sep-16	Dec-17
WV Rivers Coalition	WVRC volunteer monitoring		$18,000	$18,000	Sep-15	Sep-17
Friends of Deckers Creek	FODC Kanes Creek Study		$13,350	$7,087	Aug-17	Sep-19
WV Rivers Coalition	Capacity Building for WSAs		$4,450	$4,450	Aug-17	Sep-19
WV Rivers Coalition	WVRC-TU monitoring program		$8,900	$8,900	Aug-17	Sep-18
WV Conservation Agency	Howards Creek Improvements		$13,350	$11,388	Aug-17	Sep-18
Canaan Valley Institute	CVI ALIVE education		$4,461	$4,461	Aug-17	Sep-19
City of Charleston	City of Charleston Rain Barrel Kits		$3,950	$3,950	Apr-18	Jul-18
WV Conservation Agency	Sleepy Creek septic mini grant		$21,000	$21,000	Oct-18	Sep-20
	Watershed Projects	**$1,099,895**				
Coal River Group	Browns Creek Phase I		$8,381	$8,381	(see below)	
Friends of the Cheat	Beaver Creek AMD		$181,658	$181,566	Aug-16	Jun-20
Friends of Deckers Creek	Sandy Run Renovation		$236,600	$116,291	Aug-16	Jun-20
Piney Creek Watershed Assoc	Beckley Little League - PCWA		$54,291	$54,291	Aug-16	Jun-19
WV Conservation Agency	Second Creek WSA		$127,600	$127,600	Aug-16	Sep-18
WV Conservation Agency	Back Creek		$209,450	$209,450	Aug-16	Sep-19
WV Water Research Institute	Swamp Run #2		$183,954	$99,704	Aug-16	Jun-21
WV Conservation Agency	Browns Creek - thru WVCA		$94,000	$94,000	May-17	Dec-19
	Totals	**$1,743,343**	**$1,746,777**	**$1,529,535**		
			Balance:	$213,808	**Exp**	**Sep-21**

Organizations	2017	Available	Requested	Spent	PPS	PPE
	Nonpoint Program	**$713,531**				
WV Dept. of Env. Protection	WVDEP Statewide NPS Program		$327,780	$327,780		
WV Conservation Agency	WVCA Statewide NPS Program		$73,653	$31,736	Oct-16	Sep-20
US Env. Protection Agency	EPA Watershed Plan Tracking		$10,000	$10,000		
WV Rivers Coalition	WBP/SWPP integration		$100,000	$100,000	Mar-17	Sep-20
Friends of Blackwater	Beaver Creek WBP		$10,078	$10,078	Oct-17	Sep-19

WV Rivers Coalition	Building capacity for WSAs		$5,000	$5,000	Aug-18	Dec-19
WV Rivers Coalition	WVRC/TU water quality monitoring		$10,000	$10,000	Aug-18	Sep-20
Friends of Blackwater	Targeted Analysis of Beaver Creek		$9,000	6,805	Aug-18	Sep-20
Guardians of the West Fork	Modification of AMD Site 7		$5,808		Aug-18	Dec-19
WV Water Research Institute	Fisheries in treated AMD trib		$12,000	$12,000	Aug-18	Dec-20
Piney Creek Watershed Assoc	Piney Creek monitoring/education		$4,000	$4,000	Aug-18	Sep-20
Morris Creek Watershed Assoc	Morris Creek Lavender Patch		$5,000	$4,026	Aug-18	Jun-21
Friends of Deckers Creek	Evaluating coliform		$12,000	$4,718	Aug-18	Mar-21
Friends of the Cheat	State of the watershed 2018		$9,000	$9,000	Aug-18	Sep-20
	Watershed Projects	**$1,145,279**				
Plateau Action Network	Summerlee AMD Monitoring		$23,200	$9,511	Mar-17	Jun-21
Piney Creek Watershed Assoc	New River Drive Soil Erosion		$32,500		Mar-17	Jun-21
Morris Creek Watershed Assoc	Morris Creek Stream Restoration		$72,000	$71,486	Mar-17	Jun-21
Friends of the Cheat	Muddy Creek Dream Mountain		$326,800	$146,278	Sep-17	Jun-21
Friends of Deckers Creek	Hartman Run AMD		$23,617	$23,617	Sep-17	Jun-21
Friends of Blackwater	WALD treatment - Phase I		$149,594	$116,529	Sep-17	Jun-21
WV Water Research Institute	Cane Fork Treatment - Phase I		$149,993	$64,956	Sep-17	Jul-21
WV Conservation Agency	Spring Creek - Phase I		$180,000		Sep-17	Jul-21
Friends of the Cheat	Beaver Creek AMD addition		$115,628	$99,822	Aug-16	Jun-21
WV Water Research Institute	Swamp Run #2		$29,736		Aug-16	Sep-20
	Totals	**$1,858,810**	**$1,934,849**	**$983,242**		

				Balance:	$875,568	**Exp**	**Sep-21**
Organizations	2018	Available	Requested	Spent	PPS	PPE
	Nonpoint Program	**$513,417**				
WV Dept. of Env. Protection	WVDEP Statewide NPS Program		$288,949	$288,949		
WV Conservation Agency	WVCA Statewide NPS Program		$95,750		Oct-17	Jun-22
US Env. Protection Agency	Watershed Plan Tracking EPA in-kind		$10,000	$10,000		
Friends of Deckers Creek	Long term O&M for AMD treatment		$12,000		Aug-19	Sep-21
WV Rivers Coalition	Building Capacity for watershed groups		$5,000	$1,053	Aug-19	Sep-21
Experienced Learning	App watershed & stream monitors		$15,000	$15,000	Aug-19	Sep-20
Friends of Blackwater	Sand Run Investigation		$7,500	$3,258	Aug-19	Sep-21
Piney Creek Watershed Assoc	Piney Ck WSA data loggers		$8,034	$7,955	Aug-19	Sep-21
WV Rivers Coalition	WVRC/TU WQ monitoring		$10,000	$10,000	Aug-19	Sep-21
WV Rivers Coalition	Source water		$17,000	$17,000	Feb-18	Sep-19
Friends of the Cheat	Capacity Expansion		$12,000	$9,762	Aug-19	Mar-21
Friends of Deckers Creek	Using GIS to improve services		$10,000		Aug-19	Sep-21
Save the Tygart	Beaver Creek load refinement		$2,700		Oct-20	Sep-21
Friends of Blackwater	Outreach/State of the watershed		$4,000		Oct-20	Sep-21
Experienced Learning	App watershed & stream monitors		$15,000		Oct-20	Sep-21
	Watershed Projects	**$1,347,125**				
Friends of Blackwater	WALD Passive Treatment II		$134,000		Sep-18	Dec-21

Friends of the Cheat	Beaver Creek McElroy Seep		$130,000	$59,889	Sep-18	Sep-21
Friends of Deckers Creek	Dillan Creek Remediation I		$207,000	$10,924	Sep-18	Jun-22
WV Water Research Institute	Barlow Portal I		$212,716	$17,991	Sep-18	Sep-21
Piney Creek Watershed Assoc	Woodrow Wilson Stream Restoration		$60,000	$0	Sep-18	Jun-22
WV Conservation Agency	Upper Indian Creek		$100,000	$99,502	Mar-18	Sep-21
WV Conservation Agency	Second Creek IV		$100,000		Sep-18	Sep-21
WV Conservation Agency	Back Creek Protection		$216,515	$12,790	Sep-18	Sep-21
Coal River Group	Browns Creek Phase II		$186,000	$58,090	Nov-19	Jun-22
	Totals	**$1,860,542**	**$1,902,877**	**$594,349**		
			Balance:	$1,266,193	**Exp**	**Sep-22**

Organizations	2019	Available	Requested	Spent	PPS	PPE
	Nonpoint Program	$624,232				
WV Dept. of Env. Protection	WVDEP Statewide NPS Program		$340,692	$340,692		
WV Conservation Agency	WVCA Statewide NPS Program		$65,000		Jun-19	Jun-23
US Env. Protection Agency	EPA Watershed Plan Tracking		$10,000	$10,000		
WV Rivers Coalition	Integrating SW and WBP II		$80,000	$6,637	Sep-19	Mar-21
Friends of the Cheat	Monitoring and maintenance		$14,500		Oct-20	Sep-22
Friends of Deckers Creek	Stream data loggers		$9,800	$8,803	Oct-20	Sep-22
Trout Unlimited	Increasing riparian delivery		$14,000		Oct-20	Sep-22
WV Rivers Coalition	WV Watershed Network		$10,000		Oct-20	Sep-22
WV Rivers Coalition	WVRC-TU monitoring program		$10,000		Oct-20	Sep-22
Piney Creek Watershed Assoc	Piney Creek SWS planning		$6,000		Oct-20	Sep-22
	Watershed Projects	$1,190,064				
Friends of the Cheat	Sovern Tom Clark AMD		$152,000	$21,068	Jun-19	Sep-22
Friends of Deckers Creek	Marilla Park Restoration		$118,121	$6,513	Jun-19	Jun-22
Friends of Deckers Creek	Slabcamp Run AMD Phase I		$207,778	$7,065	Jun-19	Dec-22
WV Water Research Institute	Roaring Creek N. Portal		$262,195	$11,105	Jun-19	Dec-22
Piney Creek Watershed Assoc	Crescent Elementary SW		$90,000		Jun-19	Jun-22
WV Conservation Agency	Burnside Branch Indian Ck		$121,770	$56,513	Jun-19	Feb-23
WV Conservation Agency	Mill Creek Meadow River		$111,200		Jun-19	Dec-22
WV Conservation Agency	Second Creek Karst III		$127,000	$7,654	Jun-19	Dec-23
	Totals	**$1,814,296**	**$1,814,296**	**$476,050**		
			Balance:	$1,338,246	**Exp**	**Sep-23**

Organizations	2020	Available	Requested	Spent	PPS	PPE
	Nonpoint Program	$626,612				
WV Dept. of Env. Protection	WVDEP Statewide NPS Program		$468,612	$361,707		
WV Conservation Agency	WVCA Statewide NPS Program		$68,000		Jun-19	Jun-23
WV Dept. of Env. Protection	GI in southern WV		$80,000		TBD	
Save the Tygart	Beaver Creek WBP development		$10,000		Jul-20	Sep-23
	Watershed Projects	$1,259,388				
Friends of Blackwater	Beaver Creek Seep 100-02		$182,211	$1,266	Jul-20	Sep-23

Friends of the Cheat	Sovern Tom Clark Passive Treatment		$212,000	$2,771	Jul-20	Sep-23
Friends of Deckers Creek	Dillan Creek Phase II		$191,500		Jul-20	Sep-23
WV Water Research Institute	Lambert Site 7 Passive Treatment		$65,252		Jul-20	Sep-23
WV Conservation Agency	Sleepy Creek VI		$92,130		Jul-20	Sep-23
Piney Creek Watershed Assoc	Little League Convention Center II		$97,132		Jul-20	Sep-23
WV Conservation Agency	Anthony Creek Ag BMPs		$150,000		Jul-20	Sep-23
WV Conservation Agency	Pipestem Creek Ag BMPs		$117,663		Jul-20	Sep-23
WV Conservation Agency	Cherry Fork Ag BMPs		$151,500		Jul-20	Sep-23
	Totals	**$1,886,000**	**$1,886,000**	**$365,744**		

Balance: $1,520,256 **Exp** **Sep-24**

Exp Grant expiration
PPS Performance period (Start)
PPE Performance period (End)

Appendix 4. §319 and AgE project HUC list

Elks Run	020700041107
Tuscarora Creek	020700040907
Laurel Fork-North Fork South Branch	020700010101
Red Lick Run-North Fork South Branch	020700010103
Mill Creek-North Fork South Branch	020700010106
Jordan Run-North Fork South Branch	020700010107
East Dry Run-South Branch Potomac	020700010303
Mill Run-South Branch Potomac	020700010308
Johnson Run-Mill Creek	020700010402
Rough Run-South Fork South Branch Potomac	020700010505
Middle Fork Sleepy Creek	020700040202
Outlet Back Creek	020700040409
Hoke Run-Opequon Creek	020700040909
Rattlesnake Run-Potomac River	020700041106
Middle Blackwater River	050200040202

Beaver Creek-Little Sandy Creek	050200040603
Browns Creek-Coal River	050500090608
Burnside Branch	050500020701
Hughes Creek-Kanawha River	050500060306
Lower Second Creek	050500030703
Mill Creek-Meadow River	050500050605
Tenmile Creek-Buckhannon River	050200010304
Upper Indian Creek	050500020703
Left Fork-Sandy Creek	050200010502
Little Laurel Run-Tygart Valley River	050200010701
Teter Creek	050200010704
Hackers Creek-Tygart Valley River	050200010705
Wickwire Run-Tygart Valley River	050200010707
Headwaters Elk Creek	050200020202
Horseshoe Run	050200040501

Appendix 5. Partners active in 2020

FY16 projects
WVU Water Reseach Institute
Buckhannon River Watershed Association
City of Charleston
Coal River Group
Friends of Blackwater
Friends of Deckers Creek
Friends of the Cheat
Local landowners
US Environmental Protection Agency
WV Conservation Agency
WV Rivers Coalition
WVDEP Watershed Improvement Branch

FY18 projects
US Environmental Protection Agency
Berkeley County Farmland Protection Board
Blue Heron Environmental Network
Coal River Group
Experienced Learning
Friends of Blackwater
Friends of Deckers Creek
Friends of the Cheat
Kanawha County Health Department
Local landowners
Save the Tygart Watershed Association
USDA Natural Resource Conservation Service
WV Conservation Agency
WV Rivers Coalition
WVDEP Watershed Improvement Branch

FY20 projects
US Environmental Protection Agency
Greenbrier River Watershed Association
Guardians of the West Fork
Guardians of the West Fork
New River Conservancy
Piney Creek Watershed Association
Save the Tygart Watershed Association
Sleepy Creek Watershed Association
WV Conservation Agency
WVDEP Watershed Improvement Branch
WVU Water Reseach Institute

FY17 projects
Cabin Creek Watershed Assoication
Canaan Valley Institute
Elks Run Watershed Group
Friends of Blackwater
Friends of Deckers Creek
Friends of the Cheat
Guardians of the West Fork
Local landowners
Morris Creek Watershed Assocation
Piney Creek Watershed Association
US Environmental Protection Agency
WV Conservation Agency
WV Rivers Coalition
WVDEP Abandoned Minelands Program
WVDEP Watershe Assessment Branch
WVDEP Watershed Improvement Branch
WVU Water Reseach Institute

FY19 projects
US Environmental Protection Agency
Friends of Deckers Creek
Friends of the Cheat
Local landowners
Piney Creek Watershed Association
Save the Tygart Watershed Association
Trout Unlimited
WV Conservation Agency
WV Rivers Coalition
WVDEP Watershed Improvement Branch
WVU Water Reseach Institute

FY21 projects
US Environmental Protection Agency
WVU Water Reseach Institute
WVDEP Watershed Improvement Branch
WV Conservation Agency
Local landowners
Guardians of the West Fork
Friends of the Cheat
Friends of Deckers Creek
Friends of Blackwater
Elks Run Watershed Group
Canaan Valley Institute

Note: The list above represents the majority of partners for projects that had some level of actity during the past year. In many instances many more organizations and individuals were involved. Diverse partners are critical for project success.

Appendix 6. 2021 grant award

Organizations	Nonpoint Funds	§319	Match	Total	
WV Dept. of Env. Protection	WVDEP NPS Program	$375,240	$174,068	$549,308	
US Env. Protection Agency	EPA Watershed Tracking	$10,000		$10,000	
WV Conservation Agency	WVCA NPS Program	$116,900	$77,933	$194,833	
	Total Nonpoint	**$502,140**	**$252,001**	**$754,141**	27%
	Watershed Project Funds				
WV Conservation Agency	Back Creek Phase IV	$156,000	$162,824	$318,824	
WV Conservation Agency	Elks Run Phase III	$96,800	$64,780	$161,580	
WV Conservation Agency	Indian Creek III	$150,000	$100,000	$250,000	
WV Conservation Agency	Mudlick Run	$110,000	$73,335	$183,335	
Canaan Valley Institute	Tuscarora Creek III	$95,477	$63,660	$159,137	
Friends of Blackwater	Beaver Creek passive treatment	$132,252	$111,700	$243,952	
Friends of the Cheat	Sovern Tom Clark III	$192,500	$131,500	$324,000	
Friends of Deckers Creek	Slabcamp OLC-650	$270,031	$177,000	$447,031	
WV Water Research Institute	Lambert Site 2	$150,000	$100,000	$250,000	
	Total Watershed	**$1,353,060**	**$984,799**	**$2,337,859**	73%
	Total §319 request	**$1,855,200**	**$1,236,800**	**$3,092,000**	