



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

**West Virginia §319 Program
2021 Annual Report
March 2022**



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.

<https://go.wv.gov/nonpoint>

Acronym List

Acid mine drainage	AMD	Natural Resource Conservation Service	NRCS
Additional grant opportunities	AGOs	New River Clean Water Alliance	NRCWA
Agricultural Enhancement Program	AgEP	Piney Creek Watershed Assoc.	PCWA
Army Corp of Engineers	ACOE	Quality assurance project plan	QAPP
Basin Coordinators	BCs	Raleigh County Board of Eduction	BOE
Beckley Area Foundation	BAF	Resource Conservation and Development	RC&D
Beckley Sanitary Board	BSB	Save the Tygart Watershed Assoc.	STTWA
Best Management Practices	BMPs	Science, technology, engineering and math	STEM
Buckhannon River Watershed Association	BRWA	Sleepy Creek Watershed Association	SCWA
Cacapon Institute	CI	Total Maximum Daily Load	TMDL
Chesapeake Bay	CB	Trout Unlimited	TU
Coalfields Development Corporation	CFDC	US Department of Agriculture	USDA
County Health Department	CHD	US Environmental Protection Agency	EPA
Downstream Strategies	DS	US Fish and Wildlife Service	USFWS
Eastern Panhandle Conservation District	EPCD	US Geological Survey	USGS
Federal Fiscal Year	FFY	US Office of Surface Mining	OSM
Fourpole Creek Watershed Association	FCWA	Warm Springs Run Watershed Association	WSRWA
Friends of Blackwater	FOB	Watershed based plans	WBPs
Friends of Deckers Creek	FODC	Watershed Cooperative Agreement Program	WCAP
Friends of the Cheat	FOC	Watershed Improvement Plan	WIP
Friends of Tug Fork	FOTF	Watershed protection plans	WPPs
Grants Reporting and Tracking System	GRTS	West Virginia University	WVU
Green infrastructure	GI	Wonders of Wetlands	WOW
Greenbrier River Watershed Association	GRWA	WV Conservation Agency	WVCA
Greenbrier Valley Conservation District	GVCD	WV Division of Forestry	WVDF
Guardians of the West Fork	GWF	WV Division of Natural Resoruces	WVDNR
Hydrologic Unit Code	HUC	WV Masters Naturalist	WVMN
Indian Creek Watershed Assoc.	ICWA	WV Rivers Coalition	WVRC
Morris Creek Watershed Assoc.	MCWA	WV Science Teachers Association	WVSTA
National Aeronautics and Space Administration	NASA	WV Water Research Institute	WVWRI
National Institute of Safety and Health	NIOSH	WV Watershed Network	WVWN
National Water Quality Initiative	NWQI		
West Virginia Department of Environmental Protection (WVDEP) Sections			
In Lieu Free Program	ILF	Save Our Streams	SOS
Nonpoint Source Program	NPS	Southern Basin Coordinator	SBC
Northern Basin Coordinator	NBC	Watershed Assessment Branch	WAB
NPS Management Plan	NPSMP	Watershed Improvement Branch	WIB
Office of Abandoned Minelands	OAML	Watershed Pilot Program	WPP
Office of Special Reclamation	OSR	Western Basin Coordinator	WBC
Potomac Basin Coordinator	PBC		



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 2022

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

It is the policy of the WVDEP to provide its facilities, services, and programs to all persons without regard to sex, race, color, age, religion, national origin, or handicap. Proper licenses/registration and compliance with official rules and regulations are the only sources of restrictions for facility use or program participation. WVDEP is an equal opportunity employer.



West Virginia's NPS Program is funded by a Clean Water Act §319 Grant administered by EPA.

Report prepared by
Timothy Craddock, NPS Program Coordinator

Acknowledgements: WVDEP-[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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This report summarizes activities that occurred primarily in calendar year 2021. It is important to note that projects and programs are multi-year efforts so those highlighted in this report were completed in 2021 but in some a portion of the implementation occurred in earlier years.

Introduction

In 2021 West Virginia’s NPS Program provided technical and financial support to more than 90 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 *AGOs*. *Table 1* provides a summary.

Table 1. §319 Program status.

Federal Fiscal year	2017	2018	2019	2020	2021
§319 allocations	\$1,858,810	\$1,860,524	\$1,814,296	\$1,806,000	\$1,845,326
§319 funds spent	\$1,710,295	\$1,003,589	\$570,706	\$410,511	\$283,149
Percent	92%	54%	31%	23%	15%
§319 projects	33	23	17	13	11
Nonpoint	4	2	3	4	2
Nonpoint (AGOs)	18	12	6	0	0
Watershed	10	9	9	9	9
Completed projects	18	8	2	1	0
Percent	55%	35%	12%	8%	0%
Grant expiration	Sep-22	Sep-22	Sep-23	Sep-24	Sep-25

Note: Completed projects include cancelled. COVID Extension

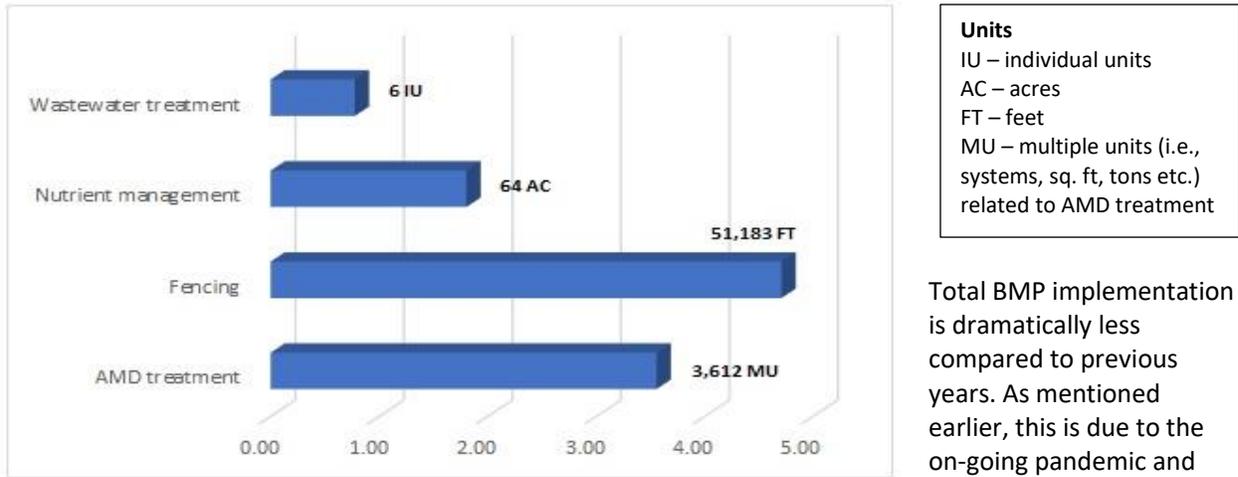
Like the previous year, percent completion has slowed. This is directly attributed to the challenges brought on by the continued Covid-19 pandemic. A one-year extension was granted by EPA for FFY 2017. *Appendix 3* provides additional details on project status.

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 2021 BMP implementation occurred in 17 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*. WVCA continued agricultural contributions through their statewide AgEP. Although not funded with §319, AgEP provides match and often is a vehicle for additional BMPs in priority watersheds.

Figure 1. §319 and AgE BMP implementation.



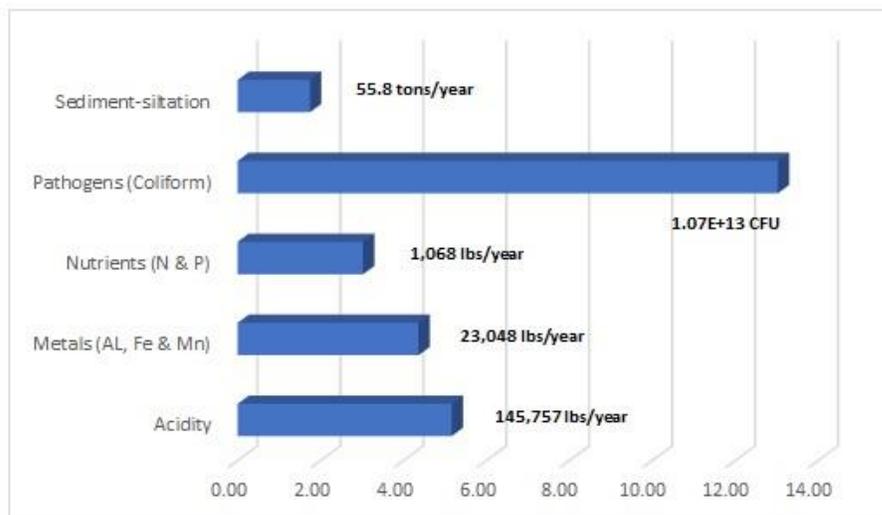
Total BMP implementation is dramatically less compared to previous years. As mentioned earlier, this is due to the on-going pandemic and the problems associated

with availability of materials as well as the increased cost. It is also important to note that project implementation varies from year to year regardless of the effects of the pandemic.

Pollutant load reductions

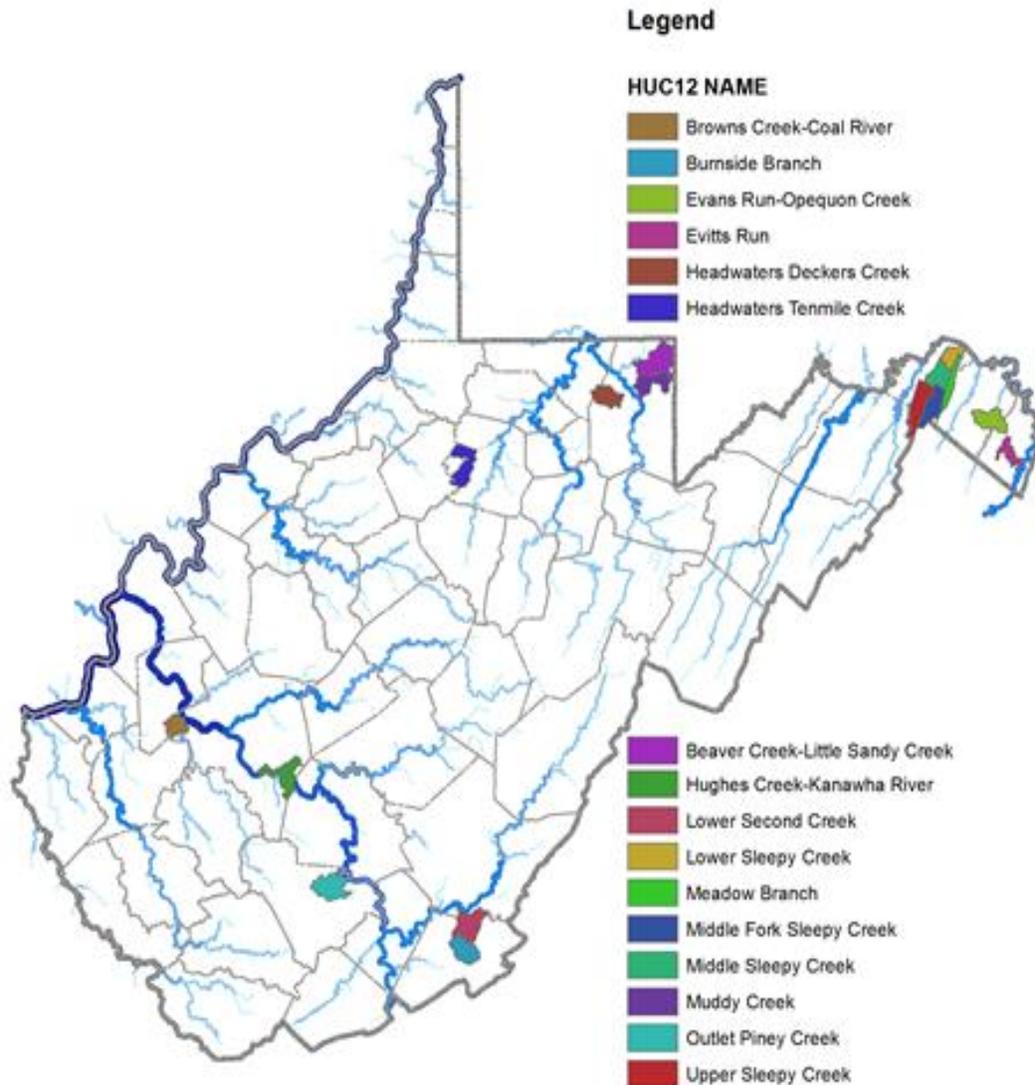
In West Virginia bacteria and pollutants associated with acid mine drainage (AMD) are the two largest contributors of nonpoint sources accounting for approximately 70 percent of the impairments. Most of the bacteria loads come from agriculture and failing septic systems, whereas AMD pollutants (acidity and metals) are associated with abandoned mining. In addition to the West Virginia priorities, EPA’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 previous management plan goals. Progress on the current *WVNP SMP*, which was revised in 2019 is provided later in this report.

Figure 2. §319 and AgEP load reduction estimates.



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 AgEP contributions to nutrient and sediment reductions continue to occur.

Figure 3. BMP/load reduction HUC basins.



Chesapeake Bay Program

Nitrogen and phosphorus reductions are needed for restoration of the CB watershed. West Virginia’s CB Tributary Team continued to implement wastewater and nonpoint source strategies from the [Phase III WIP](#), to meet West Virginia’s portion of the CB TMDL by 2025. 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. Modeled progress during the 2021 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. Stream restoration projects implemented by partners like, TU, WVCA, DS, and others, has been a successful strategy for many years and achieves additional co-benefits such as improved habitat for native brook trout.

Table 2. Progress towards reducing CB pollutants.

Pollutant	Category	2013 Progress (Baseline)	Progress 2020	Progress 2021	WV WIP3
Nitrogen	Agriculture	3.31	3.40	3.38	not specified
	Urban Runoff	1.20	1.20	1.20	
	Natural+Deposition	2.60	2.57	2.57	
	Septic	0.34	0.35	0.35	
	Wastewater+CSO	0.70	0.43	0.42	
	All Sources	8.15	7.96	7.92	7.79
Phosphorus	Agriculture	0.14	0.14	0.13	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	0.44	0.44	0.40

WV's progress toward reducing CB pollutants; units: million lbs/yr. All results are from the CAST 2019 model, available at: <http://cast.chesapeakebay.net>.

WIB and partner highlights



This section highlights the activities of WIB staff and the WVCA. Their contributions are critical to the success of our programs but without participation from a diverse group of partners and individuals' projects cannot move forward and will not be successful. [Appendix 4](#) captures a list of most active partners in 2021.

WV Conservation Agency

While continuing to work through the global pandemic, the WVCA's AgEP has successfully implemented agricultural BMPs throughout West Virginia, further reducing nutrient loads. The WVCA's outreach programs continued to exceed expectations. WVCA outreach and the Soil Tunnel Trailer, focused on soil and water health. These activities and more reached of over 1,500 students during school visits, and approximately 16,000 visitors at local fairs and festivals.

Contact [Jennifer Skaggs](#) for more details.

WIB Basin Coordinators

WVDEP-WIB BCs contribute to the WIB mission by providing technical support and expert knowledge in a wide variety 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 WBPs.
- Facilitating project teams to implement water quality improvement projects.

Martin Christ - Northern BC



The NBC supported several watershed groups with their projects to decrease nonpoint source pollution projects. FOC completed a second and final Beaver Creek AMD project, which addresses the last substantial load of dissolved aluminum and acidity in the Beaver Creek watershed (050200040604). They are now planning studies of the fish and invertebrate communities in the Beaver Creek watershed. FOC also completed the Dream Mountain project on Muddy Creek (050200040703), which will treat the last acid mine drainage source to Muddy Creek upstream from the WVDEP Treatment Plant (the goal of which is to maintain good water quality downstream). Following many years of experience and interaction with the Nonpoint Source program, the organization flew forward with this project with little advice from NBC or WIB.

(Left): At the Muddy Creek Dream Mountain project, AMD flows down a coarsely riprapped channel into a very large limestone bed. In this picture, the team reviews operation of the SmartDrain system which flushes the water in the leachbed.

After BRWA and the WVVRI completed the Swamp Run #2 project (050200010306), NBC worked with the partners to monitor the entire Swamp Run watershed. Partners will be focused on the Swamp Run #1 and #2 projects as flows through them increase following the dry growing season and the dry autumn. NBC has assisted with monitoring and encouraged the partners to think about water quality in the entire watershed, not just in the projects.

STTWA made progress on the Roaring Creek project (050200010406), STTWA and WVVRI partnered with the landowner to develop plans, secure funding, and acquire ACOE, and construction stormwater permits. The NBC has worked with the other partners to prepare a bid package to procure contractors.

GWF partnered with WVVRI to propose additional §319 work to restore Lambert Run (050200020602), which violates standards for total iron. GWF and WVVRI have proposed nonpoint source projects on two sources. NBC has prepared a QAPP that is keyed to the WBP and can be completed once that plan is approved.

FOB is working with WVDEP to design an acid mine drainage treatment plant for all the damaging AMD sources in the North Fork of the Blackwater River (HUC12 050200040203). In past years, NBC assisted with procuring a design engineer and identified some of the sources that must be treated. In the last year, NBC assisted with water quality monitoring. FOB also started a project on Beaver Creek of the Blackwater River (050200040202). NBC continues to help with data collection, site selection, and watershed planning.

FODC completed a project on Sandy Run and continues its work on Dillan Creek and Slabcamp Run (050200030201). NBC advises and assists as needed.

NBC also

- Reviewed QAPPs
- Drafted standard operating procedure for reviewing QAPPS
- Provided mapping for §319 reports
- Submitted a success story through the GRTS tool.

Jennifer Liddle - Southern BC



Partners and contractors attend a site visit and evaluation of the Woodrow Wilson stream and wetland restoration project.

The SBC continues to provide support to watershed associations and partners by offering technical support for projects and facilitating and attending virtual meetings. For PCWA, she sits on the monthly Technical Advisory Committee and the monitoring committee, attends monthly board meetings, and helped facilitate §319 projects constructed in 2021 that include, Woodrow Wilson Restoration and New River Drive. She helped with permitting, meetings, and relocation of fish from the Woodrow Wilson Pond. The SBC completed all water quality monitoring at Summerlee, for the OAML's next phase of treatment. She served on the rain barrel and outreach committee for the GRWA, attended board meetings and helped conduct a virtual rain barrel workshop.

The SBC assisted the WBC in teaching a virtual STEM camp, Fayette County Adventure Camp and created a virtual water festival curriculum. She taught at Camp Waldo in Hinton, and at Grandview Water Festival.

The SBC took the lead in creating a request for proposal through state purchasing to implement a GI pilot project for a select community in the Lower New River watershed. She facilitated the selection committee and is the point of contact for this project. The purpose is to educate more communities and partners in southern West Virginia about stormwater BMPs. She has worked closely with many federal and state agencies and has brought new partners to projects. She helped the NRCWA in their efforts to compile data from WVDEP, WVCA, PCWA and NPS and created a method to share with the public. She is part of the CORE group that meets biweekly, participating in the Natural Resource and Infrastructure committees.

The SBC is helping coordinate efforts across state lines with Kentucky to support the FOTF in water monitoring and establishing the watershed association. She is helping the Mountain RC&D with their grant and project management after the loss of a valuable board member. The SBC is also a member of the WVWN and helps to plan events and create newsletters to watershed partners.

Alana Hartman - Potomac BC

WIB's PBC facilitated online meetings regarding two subwatersheds of Opequon Creek. For Specks Run, she drafted a snapshot-style report, which will be refined and distributed to watershed residents in 2022. For Tuscarora Creek, her summer intern, Cora Alderman, created a story map with stream assessment data so that stakeholders could readily identify problem areas and project opportunities. Under the PBC's supervision, Cora also evaluated recently constructed stormwater BMPs, a task that had been accomplished through a position that is vacant. The PBC hosted a West Virginia CB science update virtual meeting with speakers from USGS and the CB Program, facilitated an in-person meeting for stakeholders of Town Run, and helped the Town of Romney and Wardensville Garden Market with tree planting projects through CommuniTree. She co-hosted two virtual rain barrel workshops for Mineral County residents and helped to distribute the barrels to participants afterward. The PBC provided technical assistance to landowners on BMPs and available funding for reducing erosion and stormwater pollution. This included private and public land along the South Branch Potomac River and Specks Run; and streets, parking lots and parks in Romney, Paw Paw, Bunker Hill and Wardensville. The PBC continued to facilitate meetings of West Virginia's CB Tributary Team and submits BMP data from multiple sources to the CB Program. A new committee of the CB Tributary Team focused on diversity, equity, inclusion, and Justice is helping to inform our grantmaking and project selection, by building partnerships with new groups in our communities.

The PBC (left) and City of Martinsburg staff assessed portions of Tuscarora Creek in 2021.



Tom Bergstrom - Western BC

WIB's WBC provided technical assistance to the CFDC as they applied for \$319 AGO funds to support a hybrid rain catchment system. The grant was awarded, and engineers are designing a staged system to collect roof rain into a 10,000 gallon internal storage tank for greywater use, with an overflow into a bioswale and rain garden. In addition to supporting this nonprofit, the WBC offered technical support to the four watershed groups below.

MCWA

MCWA completed their road stabilization and stream restoration project in 2021. The project resulted in four stream structures installed to reduce stream bank erosion. The group worked with several volunteer groups to aggressively establish native plants and grass to reduce iron laden soils from entering Morris Creek after construction. The WBC completed the final site

CCWA

Even with constant support and project meetings hosted by the WBC, CCWA and the WVWRI was unable to work with the land holding company to secure the AMD project sites on Cane Fork. Due to this and other issues, involving theft of monitoring equipment, the project was terminated. The WBC worked with WVWRI, WVDEP-OAML, and WVDEP-OSR, and WAB to establish a limestone dump

inspection and worked with MCWA to present on their project at the annual EPA Tour, which was virtual due to COVID-19.

FCWA

FCWA has worked closely with the WBC to build partnerships and seek advice from the NPS coordinator to collect baseline monitoring data on Fourpole Creek. The Fourpole Creek WBP has been drafted and once the final data has been summarized, it will be submitted for review to the NPS Coordinator in 2022.

schedule. The land holding group does support to continued lime-dumping efforts.

CRG

The WBC has worked with WVDEP-WAB, the NPS Coordinator, and CRG to continue monitoring of the nine sample sites within the project area. CRG completed over four septic system replacements and is expecting to complete six more in 2022. CRG's program is gaining support from the community and can easily recruit landowners for this project.

Outreach and partnerships

With COVID-19 ongoing through 2021, the WBC conducted several virtual educational events, including a four-week long STEM camp completely focused on water topics such as watersheds, green infrastructure and management, water monitoring, and climate change. The WBC also communicated the importance of watershed organizations and WIB programs for clean water with Try This WV virtual public meetings. To reach a broader audience, she partnered with WVDEP's Wetland Scientist and NBC to host a three day series on WOW through the WVU Osher Lifelong Learning Institute. She also hosted a virtual gathering for the Western Basin.

BC joint projects

The basin coordinators served on the WVWN and applied for a grant to support capacity building of volunteer programs within watershed organizations. The four BCs also worked with WVDEP colleagues to apply for and receive an EPA's Wetland Program Development Grant.



The WBC also organized, hosted, supported, and presented at several in person events, including five different water festivals, a weeklong Water Wonders Camp with Adventure Scientists, Camp Waldo, the WV Science Teachers Conference, and the Adventure Pocahontas Program reaching hundreds of students with hands-on water education. The WBC partnered with the City of Charleston's Stormwater Program to host three in person stormwater education workshops, which communicate how to reduce nonpoint source pollution, how to install a rain barrel, and a tour of the WVDEP Headquarters rain garden. As a result of this, brochures were updated, and

schools were lined up to receive a rain barrel and stormwater education in their schools. She created and distributed a “how to winterize your rain barrel” graphic as well. The WBC organized and supported WVDEP colleagues, volunteers from the WVMNP and area schools to replant the rain garden with low native flora, remove invasive plant species, and establish a permeable border to reduce erosion. She also supported communication between WVDEP’s ILF Program and the public by creating an infographic showing how dam removal and streambank stabilization supports aquatic life and clean water.

As a final highlight to the 2021 year, the WBC was contacted by Judge Copenhaver to recommend a procedure for six watershed groups to receive over \$600,000 *cy press* funds to support clean water and watershed improvement programs. She worked with her supervisors, Judge Copenhaver and WVDEP’s legal team to establish a work plan and budget to initiate projects and agreed to manage the program with her supervisor. The NPS Coordinator will also offer assistance and guidance on work plan development.

WV Save Our Streams



Benthic collection and identification during an early spring workshop along the Cacapon River.

During 2021, the SOS Coordinator led monitoring workshops for a variety of audiences and participated in numerous outreach events. The SOS Coordinator drafted the WV Envirothon competition’s aquatics test along with the \$319 Supervisor and the NBC. The SOS Program hosted seven certification training workshops resulting in 65 individuals trained in monitoring protocols. Additionally, the SOS Coordinator participated in outreach and education events at NASA Globe Educator workshop, Junior Conservation Camp, Camp Waldo, Adventure Pocahontas, WVMN Conference, and the WVSTA Conference. The SOS Coordinator participated in water monitoring outings with watershed groups to facilitate ongoing monitoring efforts and to initiate new monitoring projects, which closely watch new disturbances. Two efforts of note include, STTWA monitoring of the proposed NIOSH underground lab, and she partnered

with WVRC and WSRWA on a study design that will provide the monitoring template to examine possible impacts from a major highway planned for construction in 2023 and beyond.

New for 2021, the SOS Coordinator leads a Vernal Pool Monitoring Working Group, consisting of members from WVDEP, WVDNR, and WIB. The goal is to develop a volunteer vernal pool monitoring protocol that is aligned with the SOS stream protocols as well as the best practices from other states’ and organizations’ existing volunteer vernal pool monitoring programs. The protocol development will continue in 2022. This project is funded in part by an EPA Wetlands Program Development grant. Additionally, the SOS Coordinator is developing a curriculum for upper middle and high school students in collaboration with partners in the school system. Overall, West Virginia’s SOS Program continues to fulfil its mission to empower community volunteers to preserve and restore our state’s waters.

Thoughts from our Assistant Director

As we approach the spring of 2022, we look back on our accomplishments during a year in which we were slowly adapting to the new normal of Covid. Supply chain issues and material cost increases had an impact on our work. While load reductions and project construction were less than previous years, we continued to provide a significant amount of outreach, both virtual and in person, and support to our §319 partners including partner agencies, watershed associations, nonprofit organizations, and West Virginia University.

During our annual program review in December 2021, we heard from WVCA, PCWA, MCWA and FOC about their outstanding work in fostering partnerships and working cooperatively with landowners both public and private to construct projects with meaningful benefits to water quality. Those projects spanned agriculture, dam removal, stream restoration and acid mine drainage treatment. These partnerships and projects are incredibly inspiring, and we look forward to the coming year and the opportunities before us. – *Teresa Koon*

West Virginia uses a variety of outreach and education tools that are effective in encouraging public interest in nonpoint source issues. Most of the project related outreach is done locally. Signage is important on site, but print and social media is used to generate interest about watershed projects and local activities. Still the most effective tool is face-to-face communication. The people aspect is critical!

Unfortunately, over the past several years the Covid pandemic has dramatically impacted the personal connections. We are hopeful that the pandemic is beginning to turn the corner and we can once again safely interact with the public. But we have learned to use the many virtual forms of communication, and these will continue to be an important tool within our arsenal...

A very popular and effective tool is WIB's online calendar. In 2019 it received more than 1,600 visitors, and that number has steadily increased by 10-20 percent each year. In 2021 West Virginia's §319-Program posted 754 events, workshops, newsletters, articles, webinars, and much more.

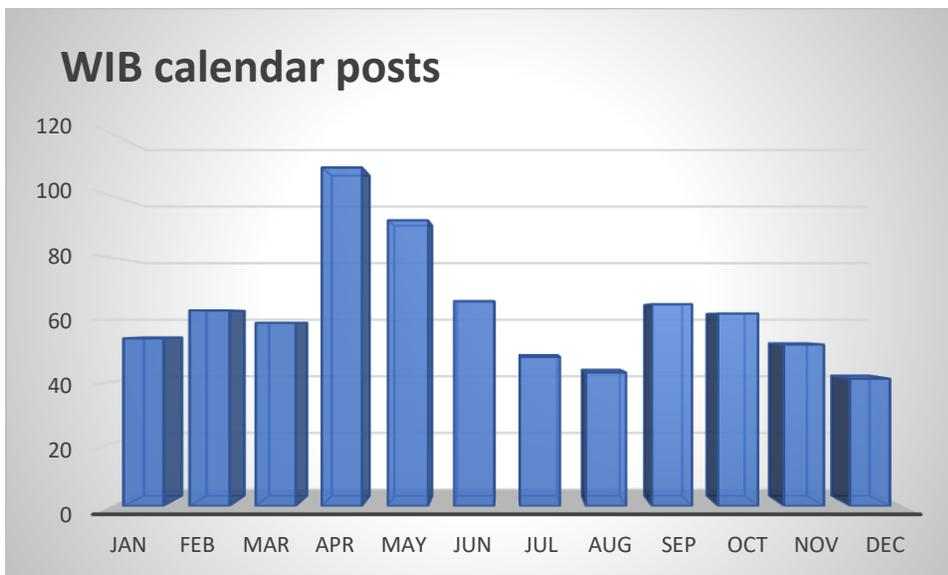


Figure 4. WIB calendar post by month. - <http://localendar.com/public/wib>

Management plan updates

The most recent version of West Virginia’s NPSMP was approved in the fall of FFY 2019. We are now a little less than halfway through the objectives and load reduction goals that were established. This section summarizes some important progress thus far.

Summaries of WVNPSMP long-term narrative objectives	Progress/updates		
	Ahead	On track	Behind
<p>Watershed management</p> <ul style="list-style-type: none"> Conduct restoration activities and BMP implementation in priority watersheds with the goal of achieving load reductions that will meet their designated uses by 2025. Table 3 provides load reduction projections for the major categories of NPS pollutants. Support and encourage the protection of healthy watersheds and work with local stakeholders to educate their communities on their importance. This includes waters identified as high quality and outstanding national resources, as well as those that remain high quality but may be threatened by NPS pollutants. 			
<p>Agriculture</p> <ul style="list-style-type: none"> Targeting statewide opportunities and priority watersheds, promote the conservation of cropland, pastureland and other land within the agriculture community through technical assistance, BMP implementation, conservation planning, nutrient management, monitoring and education. Manage pesticides to protect surface and groundwater. 			
<p>Urban stormwater/developed lands</p> <ul style="list-style-type: none"> Improve and protect West Virginia’s soil and water resources by reducing the amount of erosion from earthwork sites through education and technical assistance. Provide education and technical assistance on stormwater BMPs. 			
<p>Resource extraction</p> <ul style="list-style-type: none"> If funding allows, the NPS Program will coordinate to the extent possible with WVDEP’s OAMLR, OSR, OO&G and WVDOF on future project opportunities in watersheds impaired by resource extraction activities. 			
<p>Chesapeake Bay Program</p> <ul style="list-style-type: none"> WV is a headwater state for the Chesapeake Bay watershed and the NPS Program will support the goals of the CB Agreement by serving on committees, participating in regular meetings and calls and providing input to the future development of the Bay TMDL and models. The NPS Program will also work on specific objectives that support the general goals of the CB Program. 			

WVNPSMP is available [Here](#).

Table 3. WVNPSMP load reduction goals

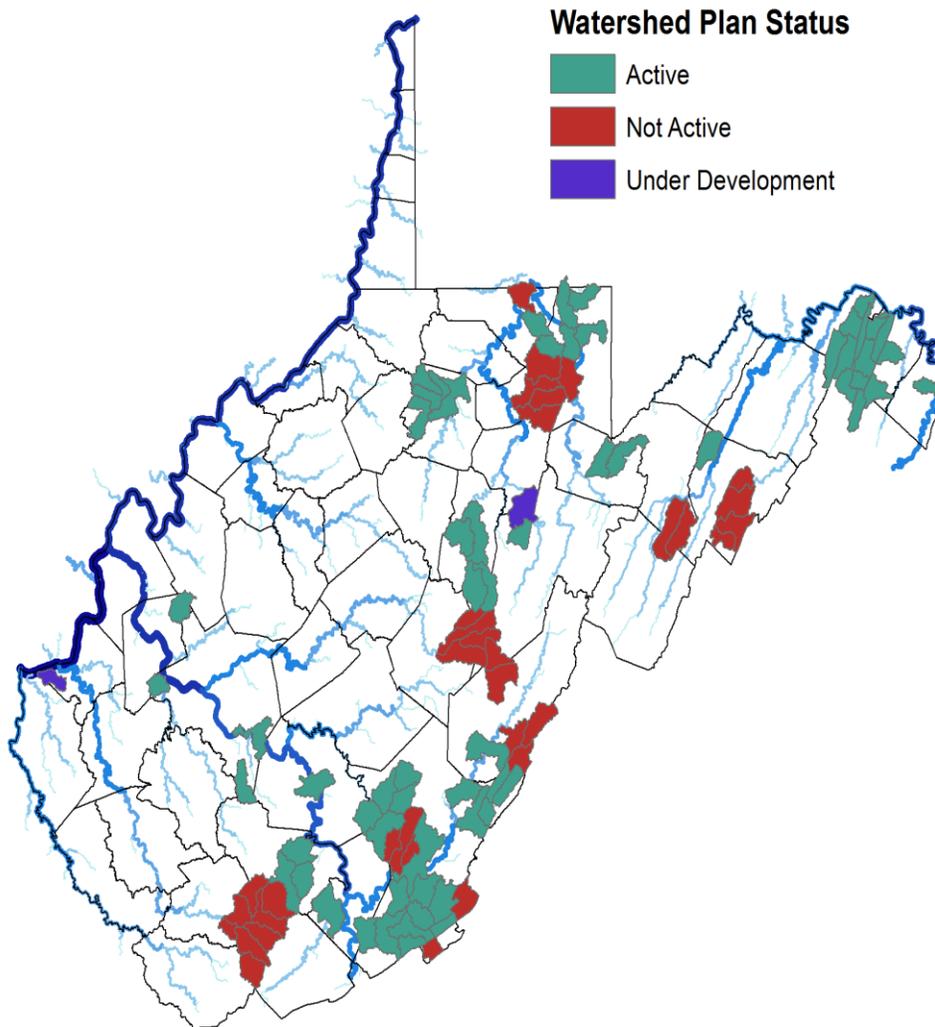
Goals	350	180,000	400,000	300,000	20,000	2.00E+15
Year	Acidity	Total Metals	Nitrogen	Phosphorus	Sediment	Pathogens
2019	WV NPS Management Plan approved in the fall of 2019					
2020	47	14,921	292,151	276,030	53	2.58E+13
2021	73	23,048	620	448	56	1.07E+13
Totals	120	37,969	292,771	276,478	109	3.65E+13

Note: There are load reductions that occurred in 2019 following the approval of the WVNPSMP. These have not yet been accounted for.

Watershed plan highlights

No new WBPs were developed in 2021; however, there are several revisions occurring and we anticipate two WBPs in 2022-23. Two active WBPs are highlighted in this section.

Figure 5. West Virginia watershed based plans map.

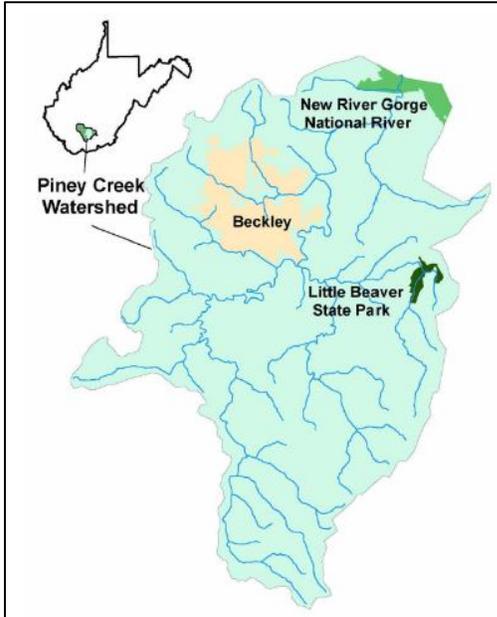


There are 42 EPA approved WBPs and two WPPs in the state. Roughly 20% of those are inactive.

[Appendix 5](#) provides a list of all West Virginia WBPs.

HUCs: 050500040101; 050500040102; 050500040103
Organizations: PCWA; Beckley BSB
Contacts: Jim Fedders, PCWA; Jennifer Liddle, WVDEP; Jeremiah Johnson, BSB

Piney Creek watershed plan



Watershed description

Piney Creek is in the northwestern portion of the New River watershed in Raleigh County, West Virginia. It drains approximately 136 square miles. The Piney Creek watershed consists of three HUC12 drainages: Outlet Piney Creek; Headwaters Piney Creek; and Beaver Creek. The towns of Beckley, Crab Orchard, Sophia, Mabscott, and portions of Coal City are within the watershed boundary as well as Little Beaver State Park and a portion of the New River Gorge National River. The watershed is mostly forested (68.4 percent of the watershed) with significant urban/residential (15.2 percent) and grassland (12.7 percent) areas.

Goals

The EPA approved the WBP in 2012. The WBP provides a framework for achieving the goals of protecting and restoring the watershed. The plan recognized fecal coliform, iron, and sediment as the most widespread impairments. Recommended management measures included: public outreach and education; GI design projects such as rain gardens; septic system repair; public sewer line extensions; limited AMD remediation; and constructed wetlands.

Partnerships/funding

PCWA and WVDEP have partnered with a variety of groups throughout the implementation of the WPP, including: the City of Beckley, BSB, Raleigh County BOE, WVU Tech; NRCWA; BAF; USDA-NRCS, WVCA; SCD; YMCA of Southern West Virginia; Raleigh County SWA; Mountain RC&D; local private landowners; and community groups. Funding dedicated to the WBP thus far is provided in Table 4.

Project highlights

Since the WBP approval, six \$319 watershed projects have been completed or are in progress. The first was a barren area above the YMCA soccer fields in Beckley was contributing sediment to Piney Creek. The area was graded and revegetated. Before (1-2) and after photos (3) are shown below.



1



2



3

HUCs: 050500040101; 050500040102; 050500040103
 Organizations: PCWA; Beckley BSB
 Contacts: Jim Fedders, PCWA; Jennifer Liddle, WVDEP; Jeremiah Johnson, BSB



Another barren area along New River Drive in Beckley was contributing sediment to Little Whitestick Creek. This site was graded and revegetated in 2021. A rain garden was established to detain stormwater runoff from the front parking lots of the Raleigh County Convention Center. Some work was completed with assistance from a local boy scout troop. (Photos: 1-1A)



An aging pond that contributed high levels of fecal bacteria to Cranberry Creek was converted to a wetland with assistance and cooperation from the local school board. (Photos: 2-2A)



Other activities include establishment of a monthly stream monitoring program at 21 locations in the watershed in conjunction with WVU Tech and the BSB. PCWA also coordinates local volunteer groups for stream and highway litter removal. PCWA conducts educational events with school and scout groups and coordinates an annual Earth Day celebration. PCWA has also undertaken locally funded projects to renovate wetlands at the Shady Spring Public Library and are working with the BAF to install a rain garden adjacent to their new parking lot.

Load reductions

Thus far the focus of most of the projects have been to target sediment and iron loads, which is the major focus of the WBP. Nutrients are targeted to a limited extent, and future reductions will continue to focus on metals, sediment, and fecal coliform. Metals have been reduced by 46 lbs/yr, Sediment by 2.6 tons/yr and nutrients by 3.7 lbs/yr. Only a small percentage (< 10%) of the overall loads have been reduced thus far. Note: Reductions for 50% of the active projects have not yet been determined.



Table 4. Piney Creek WBP funding

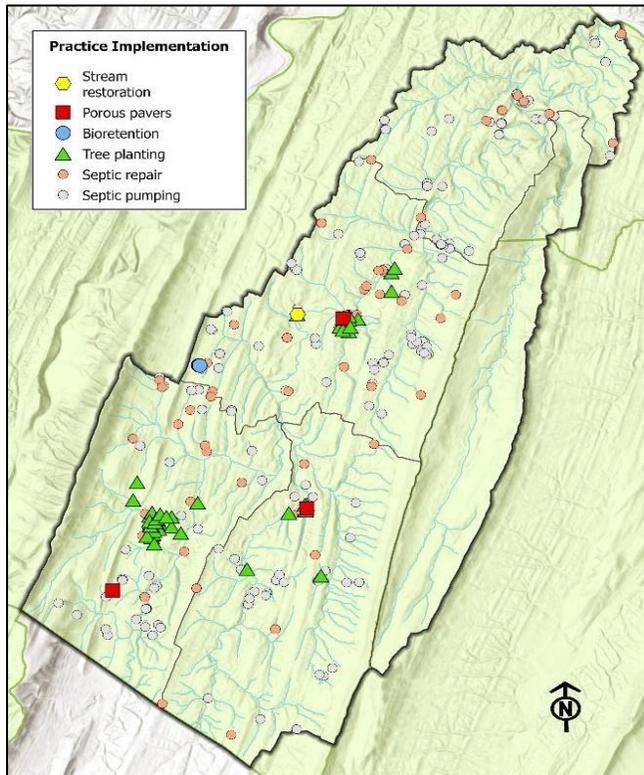
319 Projects	\$319 funds	Match	Projects/other	State funds	Match
YMCA barren lands	\$20,145	\$13,800	WPP (years 1-2)	\$60,000	NA
Piney Green-infrastructure	\$54,291	\$36,195	WPP (years 3-4)	\$52,500	NA
New River Drive	\$32,500	\$20,240	WPP (years 5-7)	\$67,500	NA
Woodrow Wilson	\$60,000	\$40,000	AGO monitoring	\$7,000	\$10,000
Crescent Elementary	\$90,000	\$59,000	AGO data loggers	\$8,034	\$5,500
Convention Center	\$97,132	\$64,750	AGO SWS planning	\$6,000	\$4,000
Column totals	\$354,068	\$233,985		\$201,034	\$19,500
Overall Totals (all funds)	\$555,102	\$253,485	<u>Note</u> : AGO projects are 319 funds.		

HUC12s: 020700040201; 020700040202; 020700040203; 020700040204; 020700040205

Organizations: SCWA; WVCA

Contacts: Kristen Bisom, WVCA; Alana Hartman, WVDEP; Chuck Marsh, SCWA

Sleepy Creek watershed plan



Watershed description

Sleepy Creek originates in Frederick County, VA, and flows 42 miles northward through Morgan County, WV, until it reaches the Potomac River. Approximately 87% of the total watershed area of 145 square miles is contained in WV. Over 77% of WV's portion of the watershed is forested with the remainder consisting mostly of agricultural and residential land cover. The watershed contains many important species that rely on aquatic habitat, such as the imperiled wood turtle and the federally endangered plant, [Harperella](#).

Goals

The mainstem of Sleepy Creek and one of its tributaries, Indian Run, were listed as impaired for fecal coliform bacteria in the 2007 TMDL developed for the streams. The EPA approved a WBP for Sleepy Creek in 2008, which prescribes actions to be taken within the watershed to reduce fecal coliform bacteria loads originating from failing home septic systems and runoff from

agricultural, urban, and residential areas. Since the Sleepy Creek watershed falls within the CB watershed, CB funds have also been utilized to target sediment, phosphorus, and nitrogen pollution.

Partnerships/funding

The WVCA and WVDEP have partnered with various entities to implement the WBP. The local volunteer group SCWA has been key to connecting with local landowners and identifying project opportunities. CI analyzed fecal coliform bacteria levels throughout the watershed since 2010. The WVDF, Morgan CHD, and EPCD have helped significantly with project implementation. Funding for practices has come from five §319 watershed projects (one ongoing), three CB grants (one ongoing), and match in the form of state and local funds as well as in-kind contributions.



Riparian buffer planting along the banks of Sleepy Creek (2019).

HUC12s: 020700040201; 020700040202; 020700040203; 020700040204; 020700040205
 Organizations: SCWA; WVCA
 Contacts: Kristen Bisom, WVCA; Alana Hartman, WVDEP; Chuck Marsh, SCWA

The total amount spent or allocated from current grants on WBP implementation is \$1,817,372 (Table 5). Additionally, WVCA’s AgEP and USDA Farm Bill programs are applied throughout the watershed.

Project highlights



Since 2008, project implementation has included repairing failing septic systems, septic system pumping, riparian and urban tree plantings, porous pavers, bioretention, and a stream restoration . Additionally, education and outreach efforts such as a pet waste campaign and a fecal coliform monitoring website have been completed. Project implementation was so successful in Indian Run that it was delisted in 2012 due to reductions in fecal coliform bacteria loads. Significant reductions in sediment, nitrogen, and phosphorus have also been achieved in the watershed. The Sleepy Creek WBP is currently undergoing revisions to extend the project implementation timeline, which will include additional septic pumping and repairs, tree plantings, and stormwater BMPs.

Table 5. Sleepy Creek project funding 2008 – 2021

Grant awards	Federal funds	Match	Total
319 Phase I	\$292,550	\$192,091	\$484,641
319 Phase II	\$70,200	\$43,000	\$113,200
319 Phase III	\$74,600	\$52,948	\$127,548
Chesapeake Bay Phase IV	\$93,130	\$95080	\$188,210
319 Phase V	\$21,000	\$17,000	\$38,000
Chesapeake Bay stream restoration	\$478,135	\$51,008	\$529,143
319 Phase VI	\$92,130	\$64,500	\$156,630
Chesapeake Bay Phase VII	\$90,000	\$90,000	\$180,000
Total	\$1,211,745	\$605,627	\$1,817,372

Table 6. Sleepy Creek BMPs 2008-2021

BMPs	#	Units
Septic system repair	68	IU
Septic system pumping	209	IU
Riparian buffers	12.7	AC
Streambank stabilization	612	FT
Urban tree planting	16.4	AC
Porous pavers	0.2	AC
Bioretention	7.4	AC

Table 7. Pollutant reductions 2008-2021

Pollutant	Reduction	Units
Pathogens (Coliform)	1.68E+15	CFU
Sediment	1,389	Tons/yr
Nitrogen	10,873	Lbs/yr
Phosphorus	16,057	Lbs/yr
WBP (pathogen) goal	5.31E+15	CFU
WBP reduction achieved for (pathogens)	36.7	Percent

Watershed projects and success stories

The number of watershed projects completed in 2021 were limited. The prominent reason was the continuing Covid-19 pandemic, which generates many supply chain issues, shortages of materials and personnel, and significant cost increase in some instances. The completion rate for FFY17 is only 45% ([Table 1](#)), which is lower than anticipated at this point in the cycle. However, the majority of the FFY17 watershed projects are on track to be completed on/before that close of the FFY.

This report highlights two watershed projects; one is an example of agricultural work, and the other is acid mine drainage (AMD) remediation. The continued successes of the Muddy Creek restoration is our 2021 success story.

Below are photos from a few more projects active in 2021. Additional details can be found on USEPA's new [GRITS public portal](#), which is an excellent way to learn more about the \$319 projects in West Virginia and beyond, and by contacting the Program Coordinator. Our 2017-2021 project list and their status are provided in [Appendix 3](#).

Watershed project photos



Stream structures being placed during the early phase of the Morris Creek restoration. Shortly after installation a heavy rain event occurred but the structures remained stable.



For many years MCWA has been able to involve a wide variety of partners and volunteers in their projects and other activities. Unfortunately, when WVU Tech moved from Montgomery, student/teacher participation became much more difficult, and the pandemic hampered efforts even more. However, many dedicated volunteers continued to give their time and effort, some coming from great distances to learn and provide a helping hand.



Piney Creek wetland/stream restoration progression...



Removing/relocating fish



Dredging/dam removal/channel work



Wetland meanders



Successful planting and regeneration

A plethora of agency partners, students/teachers, residents, and more were involved in the many phases of this project. It was truly amazing how this unique project motivated so many. This is not the end of this effort. There is still more to do, and it is a likely candidate for a future success story.

The projects and photos shown here were a few of those highlighted from projects presented during the 2021 virtual tour. The project presentations are available upon request.

Organization: FOC

Contact: Madison Ball and Martin Christ

Watershed Information

TMDL Subwatershed: 275 - HUC 12: 50200040703 – Muddy Creek

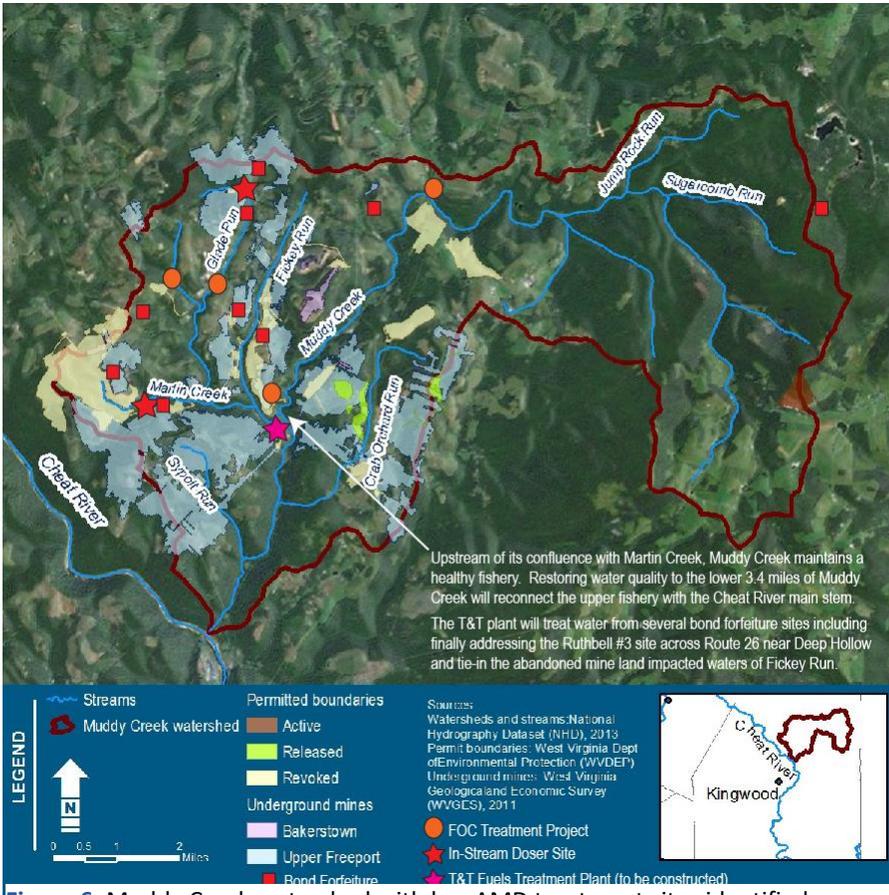


Figure 6. Muddy Creek watershed with key AMD treatment sites identified.

Introduction

The Muddy Creek Watershed is a direct tributary to the Lower Cheat River, which is a part of the Monongahela River System. Muddy Creek has historically been considered the most significant source of AMD to the Cheat River system.

FOC has worked collaboratively with federal, state, and local agencies to restore Muddy Creek from the damaging effects of AMD since 1994. WVDEP’s OSR is currently undertaking a new approach (Figure 5) to restore the lower 3.4 miles of Muddy Creek to improve biological connectivity between upper Muddy Creek (a trout stream) and the Cheat River. This approach has had success, and routine data collected at the mouth of Muddy Creek shows that it is no longer the primary contributor to AMD-related impairments and is considered pH-circumneutral.

However, Muddy Creek mainstem is still occasionally outside of the parameters for healthy water quality standards related to iron and aluminum. Additional treatment

measures are needed on abandoned mine land sites to continue to improve water quality of the Muddy Creek headwaters as well as to the mainstem.

Thus, FOC began a large improvement project to rebuild the “Dream Mountain” Passive Treatment System on Muddy Creek just upstream of Martin Creek. This primary site is the last major source of AMD that drains directly to Muddy Creek. Originally constructed in 2009, the steel slag bed was often dry and did not currently produce enough alkalinity to compensate for the AMD even when it is discharging water.

Project highlights

In September 2019 FOC procured BioMost, Inc. to design passive treatment system improvements at Dream Mountain. The design consisted of converting the existing steel slag bed into a 4,750 ton auto flushing vertical flow pond filled with high quality (90% CaCO3) limestone, converting the mixing basin to settling pond, and improving the existing connections between treatment components. FOC then procured a construction contractor (Blue Gold Development, LLC) in December of 2020. Project construction went smoothly, and the project reached substantial completion on April 27th, 2021.

Results

Water quality results after over a month post construction show improvements and a 66% reduction in acidity), a 59% reduction in total aluminum, and a 91% reduction in total iron from the system-in to the system-out for the AMD source that feeds the Dream Mountain passive treatment system. However, as expected the recent water quality shows effluent leaving the site (system-out) does not meet water quality standards for pH, aluminum, and iron (Table 8). FOC anticipates improved water quality from the system effluent and improved load reductions (target 80% or greater) after the construction of a Phase II at the project site, which will consist of converting one or both of the manufactured wetland cells into more efficient treatment components, such as a second limestone leach bed or Jennings Pond.

Table 8. Muddy Creek Dream Mountain treatment results.

Site name	Date	pH	Flow	Alk	Acid	Al (total)	Fe (total)	Mn (total)	Totals
DM-SO System out	11-Jun-21	3.54	55.2 cfs	ND	184.5 mg/L	19.5 mg/L	3.96 mg/L	1.84 mg/L	209.8
DM-combo System in	11-Jun-21	2.9	66.1 cfs	ND	455.4 mg/L	39.4 mg/L	34.9 mg/L	2.13 mg/L	531.8

The table above shows recent water quality parameters for monitoring locations for the Muddy Creek Dream Mountain project. ND represents non-detectable, and the total represents a sum of all pollutants except for pH. Note: there is an 86 percent difference between system-in and system-out.

Partners and funding

Most of the funding was secured through the USEPA’s §319 NPS Program, specifically NPS1633 (\$326,800) as well as a Department of Interior OSM-WCAP grant (\$100,000). Match was provided by WVDEP-OAML, FOC, BioMost, and volunteer match (\$122,374).



4,750 ton Auto Flushing Vertical Flow Pond filled with 90%+ CaCO₃ content limestone.



Newly dredged settling pond with greater storage capacity.

Indian Creek project summary

HUCs: (050500020701) Burnside Branch

Lead agency/contacts: WVCA (Matt Morgan, John Nelson, Mike McMunigal)

Project location - introduction

Indian Creek in Monroe County of West Virginia is a large tributary of the New River (Figures 6-7). This stream is heavily impacted by cattle and other livestock feeding on karst geology and near karst windows and open sink holes. Agriculture in this area consists primarily of beef cattle and sheep operations with limited dairy production. The goal of this project is to evenly distribute grazing throughout the karst area, spreading nutrients and bacteria laden waste in a manner that will reduce concentrated runoff and infiltration; and

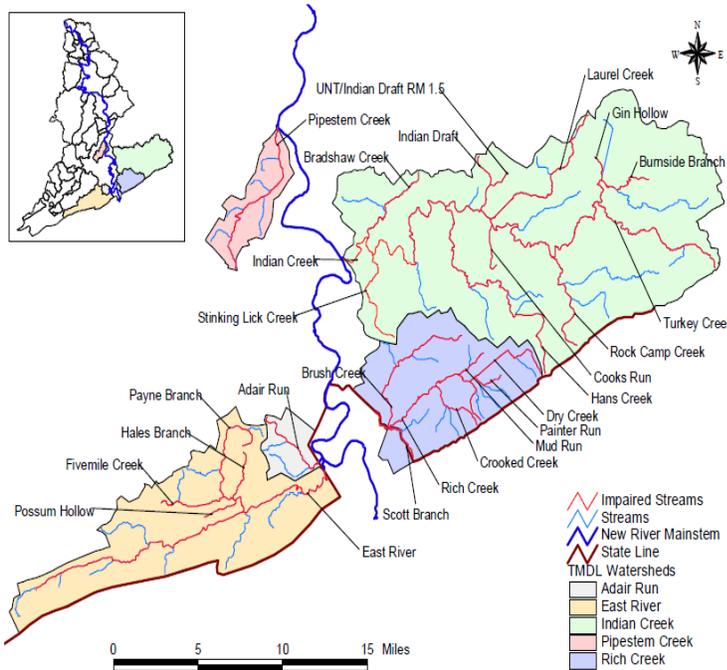


Figure 7: Lower New River TMDL map

rehabilitate failing septic systems contributing to the bacteria load (Indian Creek WBP, 2017). BMPs included prescribed grazing, nutrient management, livestock water development, pasture division fencing and failing septic system rehabilitation. Alternative water development and division fencing were utilized to implement the prescribed grazing plans.

Problem

Indian Creek was placed on the 303(d) list in 2006 due to fecal coliform bacteria contamination due to undetermined sources and is included in the 2008 TMDL for streams in the New River watershed (TMDL, 2008). The Indian Creek watershed consists of five HUC12 watersheds (Burnside Branch, Upper Indian Creek, Rock Camp Creek, Middle Indian Creek, and Lower Indian Creek – Figure 7). Projects

associated with this grant focused efforts only within the Burnside Branch HUC12 watershed. Future project proposals (Indian Creek II – NPS 1706 and Indian Creek III – NPS 1781) will continue to focus efforts on Burnside Branch but will also begin to expand to adjacent Indian Creek HUC12 watersheds. The goal will be to continue working in a stepwise fashion, downstream throughout the entire watershed to the confluence of Indian Creek and the New River.

Results

Project results included the development of four grazing plans to facilitate rotational grazing and exclude livestock from streams, sinkholes and ponds, assisting USDA-NRCS staff with project implementation under the NWQI program, conducting a field day in November 2019 at the WVU Willow Bend Demonstration Farm, highlighting projects during the November 2019 EPA tour, providing technical assistance to cooperators, monitoring water quality within the project area, coordinating septic system project planning efforts with the MCHD, and the installation of 33,513 feet of pasture division and exclusion fence. Septic system project participation was low during this grant period due to challenges with outreach efforts; however, participation

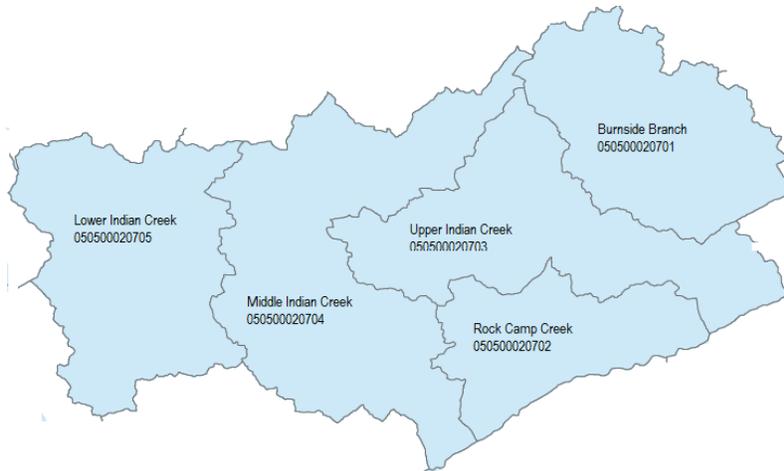


Figure 8: Indian Creek HUC12 watersheds

has increased significantly within the last few months and several septic system replacement and pumping projects have been completed utilizing funding from subsequent grant awards (Indian Creek II – NPS 1706), and more are under contract or in process, and will be completed soon. Due to the low septic program participation and a few fencing projects having not been completed yet, estimated load reductions during this grant period are slightly below expected load reduction goals (Table 9).

Partners and funding

The following were vital partners supporting this \$319 project – WVCA, USDA-NRCS, WVDEP, Monroe CHD, USFWS, the GVCD, and of course local landowners. In addition, the ICRW provided limited monitoring and outreach support and NWQI funding has provided major benefits for all the Indian Creek projects.

Table 9. Project load reductions

Load reduction goal	1.04E+13 CFU
Load reductions achieved	4.69E+12 CFU
Difference	5.71E+12 CFU
Percent difference	75.7

Table 10. Project funding summary

\$319 funds awarded	\$100,000
\$319 funds spent	\$100,000
NRCS-NWQI	(See below)
Match spent	\$73,799
Total spent	\$173,799

NWQI support for all Indian Creek HUCs:

FFY18 (\$479,000), FFY19 (\$411,000), FFY20 (\$280,000), FFY21 (\$35,000)



Stream exclusion fencing with a riparian buffer.



Field day presentation/lunch and fencing demonstration





NONPOINT SOURCE SUCCESS STORY

West Virginia

Muddy Creek Watershed Restoration Projects and Partnership Improve Water Quality of Cheat River

Waterbodies Improved

The lower 3.4 miles of Muddy Creek, a tributary to the Cheat River, has been impaired by acid mine drainage (AMD). The acidity, due to dissolved metals in AMD, severely impacts fish, other stream organisms and the river ecosystem. Muddy Creek failed to meet water quality standards for pH, iron and aluminum, and the Cheat River failed to meet standards for pH and iron. Partners, led by Friends of the Cheat (FOC), a citizens' group, have eliminated most of the pollution loads with passive treatment projects. A new AMD treatment facility provided even more treatment. Fish communities downstream in Muddy Creek now include pollution-sensitive species, such as brown trout. Walleye, which once inhabited the river and were stocked in a lake downstream, are now migrating upstream. Boaters on the Cheat report an improvement in the river and a more satisfying boating experience. ([Visit the story map](#))

Problem

Muddy Creek is a tributary to the Cheat River near the town of Albright in northern West Virginia (Figure 1). The Cheat River drains a rugged, 1,400-square mile watershed in West Virginia and Pennsylvania. It is a destination for whitewater boaters worldwide and has hosted commercial guided trips since 1968.

AMD pollution in Muddy Creek comes from coal mines, where pyrite, a mineral in the coal, oxidizes to form dissolved iron and sulfuric acid, which dissolves additional metals from rock and soil (Figure 2). In 1994, water in a mine void in the T&T Mine Complex “blew out” through a hillside. The AMD polluted not only Muddy Creek but the entire Cheat River, its receiving stream. The blow-out called attention to the need to neutralize hundreds of other long-term AMD sources in the Muddy Creek and Cheat River watersheds.

FOC used U.S. Environmental Protection Agency (EPA) Clean Water Act section 319 funds administered by the West Virginia Department of Environmental Protection (WVDEP) to begin building passive treatment projects for other AMD sources in the watershed.

In the meantime, WVDEP was treating AMD from mines that had gone bankrupt and forfeited their permits. The treated water was good enough to support fish and other aquatic life, but it would flow into

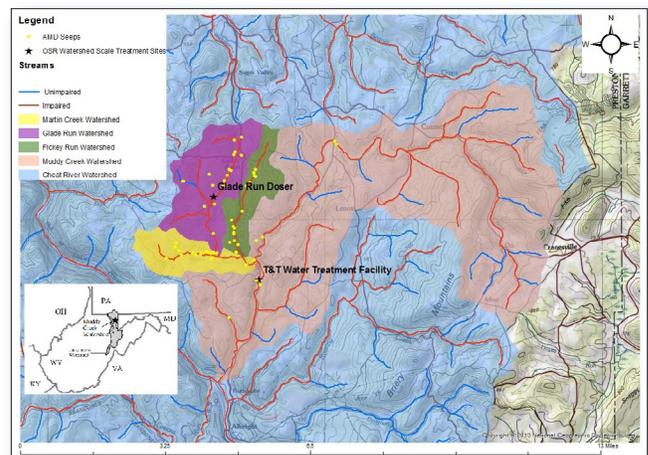


Figure 1. Muddy Creek is in the lower Cheat River watershed in northern West Virginia.

streams that were polluted to a pH level near 3.0 (i.e., acidic) by mines that had been abandoned before the law required stringent permits.

Story Highlights

FOC, formed after the 1994 AMD blow-out, organized efforts for the restoration of Muddy Creek and the Cheat River. FOC secured section 319 funding and installed four passive treatment projects on small-to-moderate AMD sources. They also hold a popular annual river festival and maintain access roads for



Figure 2. Iron-laden, acidic water from Fickey Run, center, discharged into Martin Creek, a tributary of Muddy Creek, before the restoration project.



Figure 3. Greg Short displays a walleye.

boaters. FOC also organized a partnership, called “River of Promise,” with state and federal agencies as well as local citizens and whitewater recreation advocates worldwide. The partnership coordinates resources and advocates for restoration projects. WVDEP, which has been part of River of Promise from the beginning, used its greater resources to finish the

work of improving Muddy Creek and the Cheat River. Under a 2017 water quality variance, EPA approved an innovative permitting strategy that allows for contaminated water flowing from several streams to be treated by an in-stream water doser or conveyed through the AMD water collection system that ties into a new treatment facility. The water is decontaminated using lime slurry, polymers and clarifiers to raise pH and remove the metal substances. Clean water is then returned to the watershed in a continuous flow that dilutes and gradually restores the creek.

Results

Before treatment, in 2015, results from an electro-shock fish survey near the mouth of Muddy Creek showed no fish. In 2019, after treatment had begun, a survey detected 143 fish of nine different species. Median pH values increased from 4.3 to 7.3 following treatment. Since June 2018, Muddy Creek has been net alkaline. Median aluminum and iron concentrations decreased from 10 and 9 milligrams per liter (mg/L), respectively, to 1 mg/L. The median discharge of acidity into the Cheat River decreased from 11,800 pounds per day (lbs/day) to -1,100 lbs/day calcium carbonate equivalent.

Sensitive game fish species, notably walleye, have been caught in the Cheat River closer to the mouth of Muddy Creek (Figure 3). Whitewater boaters downstream from Muddy Creek perceive the improvement as a decrease in turbidity. FOC continues to monitor Muddy Creek through regular water quality and benthic macroinvertebrate sampling, focused on assessing and quantifying watershed improvements from AMD treatment projects in the Muddy Creek watershed.

Partners and Funding

From 2005 through the present, a significant amount of funding has been dedicated to Muddy Creek restoration activities. FOC secured \$837,000 through the WVDEP’s and EPA’s nonpoint source programs. FOC also spent \$407,000 from EPA through a Targeted Watershed Initiative grant. These funds were matched by \$497,000 from the U.S. Office of Surface Mining Reclamation and Enforcement and \$478,000 in state matching funds. Most recently, WVDEP spent \$9 million on AMD treatment plants.



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

EPA 841-F-21-001P
September 2021

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Appendix 1. §319 projects and AgE BMPs

HUC12	HUC Name	BMP	#	Unit	Date
020700040908	Evans Run-Opequon Creek	Nutrient Management	38	AC	Aug-21
020700070302	Evitts Run	Nutrient Management	26	AC	Jul-21
050500020701	Burnside Branch	Fencing	3,301	FT	Nov-21
050500020701	Burnside Branch	Fencing	4,231	FT	Nov-21
050500020701	Burnside Branch	Fencing	9,762	FT	Mar-21
050500020701	Burnside Branch	Septic System (New/Existing)	3	IU	Nov-21
050500020701	Burnside Branch	Septic System (Pumpout)	2	IU	Nov-21
050500030703	Lower Second Creek	Fencing	33,889	FT	Nov-21
050500090608	Browns Creek-Coal River	Septic System (New/Existing)	1	IU	Mar-21
050200040703	Roaring Creek-Cheat River	AMD Treatment System	1	IU	Sep-21
050200040703	Roaring Creek-Cheat River	Limestone Leach Bed/Pond	3,500	TONS	Sep-21
050200040603	Beaver Creek-Little Sandy Creek	Tree/Shrub Establishment	1	AC	Mar-21
050200040603	Beaver Creek-Little Sandy Creek	Wetland Enhancement	0.3	AC	Mar-21
050200020502	Headwaters Tenmile Creek	Limestone Open Channel	110	FT	Sep-21

Appendix 2. §319 projects and AgE load reductions

HUC12	HUC name	Pollutant	Reduction	Unit	Date
020700040908	Evans Run-Opequon Creek	Nitrogen	300	LBS/YR	Aug-21
020700040908	Evans Run-Opequon Creek	Phosphorus	288	LBS/YR	Aug-21
020700070302	Evitts Run	Nitrogen	320	LBS/YR	Jul-21
020700070302	Evitts Run	Phosphorus	160	LBS/YR	Jul-21
020700040201	Upper Sleepy Creek	Pathogens (Coliform)	4.15E+09	CFU	Nov-21
020700040201	Upper Sleepy Creek	Pathogens (Coliform)	3.28E+10	CFU	Nov-21
020700040202	Middle Fork Sleepy Creek	Pathogens (Coliform)	4.15E+09	CFU	Nov-21
020700040203	Middle Sleepy Creek	Pathogens (Coliform)	4.93E+10	CFU	Nov-21
020700040204	Meadow Branch	Pathogens (Coliform)	4.15E+09	CFU	Nov-21
020700040205	Lower Sleepy Creek	Pathogens (Coliform)	8.29E+09	CFU	Nov-21
050500020701	Burnside Branch	Pathogens (Coliform)	1.37E+12	CFU	Mar-21
050500020701	Burnside Branch	Pathogens (Coliform)	1.89E+07	CFU	Nov-21
050500020701	Burnside Branch	Pathogens (Coliform)	5.67E+07	CFU	Nov-21
050500020701	Burnside Branch	Pathogens (Coliform)	4.62E+11	CFU	Nov-21
050500020701	Burnside Branch	Pathogens (Coliform)	5.92E+11	CFU	Nov-21
050500020701	Burnside Branch	Pathogens (Coliform)	4.69E+12	CFU	Nov-21
050500030703	Lower Second Creek	Pathogens (Coliform)	3.55E+11	CFU	Nov-21
050500030703	Lower Second Creek	Pathogens (Coliform)	5.92E+11	CFU	Nov-21
050500040103	Outlet Piney Creek	Pathogens (Coliform)	1.84E+12	CFU	Nov-21
050500090608	Browns Creek-Coal River	Pathogens (Coliform)	3.94E+11	CFU	Sep-21
050500090608	Browns Creek-Coal River	Pathogens (Coliform)	3.28E+11	CFU	Mar-21
050500060306	Hughes Creek-Kanawha River	Sedimentation-Siltation	55.8	TONS/YR	Mar-21
050200040703	Roaring Creek-Cheat River	Metals (Al)	6,692	LBS/YR	Sep-21
050200040703	Roaring Creek-Cheat River	Metals (Fe)	9,146	LBS/YR	Sep-21
050200040703	Roaring Creek-Cheat River	Acidity	44,614	LBS/YR	Sep-21
050200040603	Beaver Creek-Little Sandy Creek	Metals (Al)	1,403	LBS/YR	Mar-21
050200040603	Beaver Creek-Little Sandy Creek	Acidity	71,537	LBS/YR	Mar-21
050200020502	Headwaters Tenmile Creek	Metals (Mg)	87	LBS/YR	Nov-21

050200020502	Headwaters Tenmile Creek	Metals (Fe)	1,907	LBS/YR	Nov-21
050200020502	Headwaters Tenmile Creek	Metals (Al)	14	LBS/YR	Nov-21
050200020502	Headwaters Tenmile Creek	Acidity	7,207	LBS/YR	Nov-21
050200030201	Headwaters Deckers Creek	Metals (Al)	1,277	LBS/YR	Jul-21
050200030201	Headwaters Deckers Creek	Metals (Fe)	2,522	LBS/YR	Jul-21
050200030201	Headwaters Deckers Creek	Acidity	22,399	LBS/YR	Jul-21

Appendix 3. Project status

FFY 2017	Org	NPS#	Available	Requested	Spent	PC
Nonpoint Program Funds			\$713,531			
WVDEP Statewide NPS Program	WVDEP			\$327,780	\$327,780	100%
WVCA Statewide NPS Program	WVCA	1605		\$73,653	\$59,586	81%
Watershed Plan Tracking EPA in-kind	EPA			\$10,000	\$10,000	100%
WBP/SWPP integration	WVRC	1610		\$100,000	\$100,000	100%
Beaver Creek WBP	FOB	1647		\$10,078	\$10,078	100%
Building capacity for WSAs	WVRC	1668		\$5,000	\$5,000	100%
WVRC/TU water quality monitoring	WVRC	1669		\$10,000	\$10,000	100%
Targeted Analysis of Beaver Creek	FOB	1670		\$9,000	\$6,805	76%
Modification of AMD treatment Site 7	GWF	1671		\$5,808		0%
Fisheries in treated AMD trib	WVU	1672		\$12,000	\$12,000	100%
Piney Creek monitoring and education	PCWA	1673		\$4,000	\$4,000	100%
Morris Creek Lavender Patch	MCWA	1674		\$5,000	\$4,110	82%
Evaluating coliform	FODC	1675		\$12,000	\$12,000	100%
Planting and streambank stabilization	FOB	1777		\$9,000		0%
Sonde deployment and WQ	FOC	1770		\$15,000	\$5,355	36%
Kanes Creek repair/remediation	FODC	1769		\$10,800		0%
Expanded stream monitoring	PCWA	1771		\$3,000		0%
Expanded watershed monitoring	STTWA	1772		\$5,905		0%
Swamp Run upgrade	BRWA	1773		\$5,100		0%
Roof runoff management program	WVCA	1774		\$5,000		0%
West Edge rain garden design	CDC	1775		\$15,000		0%
GI training and certification	WVCA	1776		\$15,000		0%
Statewide and Warm Springs monitoring	WVRC	1778		\$15,000	\$1,292	9%
State of the watershed 2018	FOC	1676		\$9,000	\$9,000	100%
Watershed Project Funds			\$1,145,279			
Summerlee AMD Monitoring	PAN	1611		\$23,200	\$21,164	91%
New River Drive Soil Erosion	PCWA	1612		\$33,000	\$29,562	90%
Morris Creek Rd and Stream Restoration	MCWA	1613		\$72,000	\$71,632	99%
Muddy Creek Dream Mountain Improvements	FOC	1633		\$326,800	\$325,563	100%
Hartman Run AMD	FODC	1641		\$23,617	\$23,617	100%
WALD treatment - Phase I	FOB	1632		\$149,594	\$149,594	100%
Cane Fork Treatment - Phase I	WVU	1642		\$68,443	\$68,443	100%
Spring Creek - Phase I	WVCA	1643		\$180,000		0%
FY16 Beaver Creek AMD Addition	FOC	1725		\$115,628	\$105,467	91%
Swamp Run #2	WVU	1589		\$25,889	\$29,736	100%
			\$1,858,810	\$1,710,295	\$1,401,785	
FFY 2018	Org	NPS#	Available	Requested	Spent	
Nonpoint Program Funds			\$513,417			
WVDEP Statewide NPS Program	WVDEP			\$288,949	\$288,949	100%
WVCA Statewide NPS Program	WVCA	1646		\$95,750	\$39,477	41%
Watershed Plan Tracking EPA in-kind	EPA			\$10,000	\$10,000	100%

Long term O&M for AMD treatment	FODC	1714		\$12,000		0%
Building Capacity for Watershed Groups	WVRC	1715		\$5,000	\$5,000	100%
App WS & Stream Monitors	EL	1716		\$15,000	\$15,000	100%
Sand Run Investigation	FOB	1717		\$7,500	\$3,258	43%
Piney Ck WSA data loggers	PCWA	1718		\$8,034	\$8,034	100%
WVRC/TU Water Quality Monitoring	WVRC	1719		\$10,000	\$10,000	100%
Source water	WVRC	1604		\$17,000	\$17,000	100%
Capacity Expansion	FOC	1720		\$12,000	\$11,772	98%
Using GIS to improve services	FODC	1721		\$10,000	\$10,000	100%
Beaver Creek load refinement	STTWA	1758		\$2,727		0%
Outreach/State of the watershed	FOB	1759		\$4,000		0%
App WS & Stream Monitors	EL	1757		\$15,000		0%
Watershed Project Funds				\$1,347,125		
WALD Passive Treatment II	FOB	1680		\$134,000	\$72,648	54%
Beaver Creek McElroy Seep	FOC	1681		\$130,000	\$125,435	96%
Dillan Creek Remediation I	FODC	1682		\$207,000	\$63,170	31%
Barlow Portal I	WVU	1684		\$212,716	\$36,345	17%
Woodrow Wilson Stream Restoration	PCWA	1685		\$75,000	\$59,510	79%
Upper Indian Creek	WVCA	1650		\$100,000	\$100,000	100%
Second Creek IV	WVCA	1686		\$100,000	\$17,514	18%
Back Creek Protection	WVCA	1687		\$216,515	\$12,790	6%
Browns Creek Phase II	CRG	1724		\$186,000	\$97,688	53%
				\$1,860,542	\$1,874,191	\$1,003,589
FFY 2019	Org	NPS#	Available	Requested	Spent	
Nonpoint Program Funds				\$624,232		
WVDEP Statewide NPS Program	WVDEP			\$404,932	\$340,692	84%
WVCA Statewide NPS Program	WVCA	1709		\$65,000		0%
Watershed Plan Tracking EPA in-kind	EPA			\$10,000	\$10,000	100%
WVRC Integrating SW and WBP II	WVRC	1723		\$80,000	\$23,625	30%
Monitoring and maintenance	FOC	1751		\$14,500	\$9,129	63%
Stream data loggers	FODC	1752		\$9,800	\$8,803	90%
Increasing riparian delivery	TU	1753		\$14,000		0%
WV Watershed Network	WVRC	1755		\$10,000		0%
WVRC-TU monitoring program	WVRC	1754		\$10,000	\$3,664	37%
Piney Creek sub-watershed planning	PCWA	1756		\$6,000	\$6,000	100%
Watershed Project Funds				\$1,064,405		
Muddy Creek Dream Mountain II	FOC	1789		\$127,691		0%
Sovern 62	FOC	1792		\$173,940		0%
Sovern Tom Clark AMD	FOC	1701		\$26,341	\$26,341	100%
Marilla Park Restoration	FODC	1702		\$118,121	\$6,513	6%
Slabcamp Run AMD Phase I	FODC	1703		\$207,778	\$7,065	3%
Roaring Creek N. Portal	WVU	1704		\$262,195	\$19,969	8%
Crescent Elementary SW	PCWA	1705		\$90,000		0%
Burnside Branch Indian Creek	WVCA	1706		\$121,770	\$101,250	83%
Mill Creek Meadow River	WVCA	1707		\$111,200	\$0	0%
Second Creek Karst III	WVCA	1708		\$127,000	\$7,655	6%
				\$1,688,637	\$1,990,268	\$570,706
FFY 2020	Org	NPS#	Available	Requested	Spent	
Nonpoint Program Funds				\$526,900		
WVDEP Statewide NPS Program	WVDEP			\$362,900	\$362,998	100%
WVCA Statewide NPS Program	WVCA	1729		\$68,000		0%
Rain garden	WVDEP			\$6,000	\$454	8%
GI in southern WV	WVDEP			\$80,000		0%

Beaver Creek WBP Development	STTWA	1730		\$10,000		0%
Watershed Project Funds			\$1,232,121			
Beaver Creek Seep 100-02	FOB	1731		\$182,211	\$1,266	1%
Sovern Tom Clark Passive Treatment	FOC	1732		\$10,793	\$10,793	100%
Sovern 62 Improvements	FOC	1732		\$173,940		0%
Dillan Creek Phase II	FODC	1733		\$191,500		0%
Lambert Site 7 Passive Treatment	WVU	1734		\$65,252		0%
Sleepy Creek VI	WVCA	1735		\$92,130	\$35,000	38%
Little League Convention Center II	PCWA	1736		\$97,132		0%
Anthony Creek Ag BMPs	WVCA	1737		\$150,000		0%
Pipestem Creek Ag BMPs	WVCA	1738		\$117,663		0%
Cherry Fork Ag BMPs	WVCA	1739		\$151,500		0%
			\$1,759,021	\$1,759,021	\$410,511	
FFY 2021		Org	NPS#	Available	Requested	Spent
Nonpoint Program Funds			\$502,266			
WVDEP Statewide NPS Program	WVDEP			\$375,366	\$283,149	75%
WVCA Statewide NPS Program	WVCA	1788		\$116,900		0%
EPA Watershed Tracker support	EPA			\$10,000		0%
Watershed Project Funds			\$1,353,060			
Tuscarora Creek Phase III	CVI	1783		\$95,477		0%
Beaver Creek AMD	FOB	1784		\$132,252		0%
Sovern Tom Clark Phase III	FOC	1785		\$192,500		0%
Slabcamp OLD-650 Phase III	FODC	1786		\$270,031		0%
Back Creek Phase IV	WVCA	1779		\$156,000		0%
Elks Run Phase III	WVCA	1780		\$96,800		0%
Indian Creek III	WVCA	1781		\$150,000		0%
Mudlick Run of Anderson Run I	WVCA	1782		\$110,000		0%
Lambert Run Site 2	WVU	1787		\$150,000		0%
			\$1,855,326	\$1,855,326	\$283,149	

PC (Percent complete based on expenditures)

Complete	
Cancelled	

Appendix 4. Partners active in 2021

FFY17 partners

Buckhannon River Watershed Association (BRWA)
Cabin Creek Watershed Association (CCWA)
Canaan Valley Institute (CVI)
Coalfields Development Corporation (CDC)
Elks Run Watershed Association (ERWA)
Friends of Blackwater (FOB)
Friends of Deckers Creek (FODC)
Friends of the Cheat (FOC)
Guardians of the West Fork (GWF)
Local landowners
Morris Creek Watershed Association (MCWA)
Piney Creek Watershed Association (PCWA)
Save the Tygart Watershed Association (STTWA)
US Environmental Protection Agency (EPA)
WV Conservation Agency (WVCA)

FFY18 partners

Coal River Group (GRG)
Experienced Learning (EL)
Friends of Blackwater (FOB)
Friends of Deckers Creek (FODC)
Friends of the Cheat (FOC)
Local landowners
Piney Creek Watershed Association (PCWA)
Save the Tygart Watershed Association (STTWA)
Trout Unlimited (TU)
US Environmental Protection Agency (EPA)
WV Conservation Agency (WVCA)
WV Rivers Coalition (WVRC)
WV Water Research Institute (WVWRI)
WVDEP Abandoned Minelands Program
WVDEP Watershed Improvement Branch

WV Rivers Coalition (WVRC)
 WV Water Research Institute (WVWRI)
FFY17 partners continued
 WVDEP Abandoned Minelands Program
 WVDEP Watershed Assessment Branch
 WVDEP Watershed Improvement Branch

FFY19 partners
 Friends of Deckers Creek (FODC)
 Friends of the Cheat (FOC)
 Local landowners
 Piney Creek Watershed Association (PCWA)
 Save the Tygart Watershed Association (STTWA)
 Trout Unlimited (TU)
 US Environmental Protection Agency (EPA)
 WV Conservation Agency (WVCA)
 WV Rivers Coalition (WVRC)
 WV Water Research Institute (WVWRI)
 WVDEP Watershed Improvement Branch

This list represents most of the funded partners that had sum level of activity during the past year. In many instances there are many more local volunteers, NGOs, individuals and more that dedicate their time to the success of these projects. Others are mentioned throughout this report. Diverse partnerships are the key to success!

FFY20 partners
 Friends of Blackwater (FOB)
 Friends of Deckers Creek (FODC)
 Friends of the Cheat (FOC)
 Guardians of the West Fork (GWF)
 Local landowners
 New River Clean Water Alliance (NRCWA)
 Piney Creek Watershed Association (PCWA)
 Save the Tygart Watershed Association (STTWA)
 Sleepy Creek Watershed Association (SCWA)
 US Environmental Protection Agency (EPA)
 WV Conservation Agency (WVCA)
 WV Water Research Institute (WVWRI)
 WVDEP Watershed Improvement Branch

FFY21 partners
 Canaan Valley Institute (CVI)
 Elks Run Watershed Association (ERWA)
 Friends of Blackwater (FOB)
 Friends of Deckers Creek (FODC)
 Friends of the Cheat (FOC)
 Guardians of the West Fork (GWF)
 Local landowners
 US Environmental Protection Agency (EPA)
 WV Conservation Agency (WVCA)
 WV Water Research Institute (WVWRI)
 WVDEP Watershed Improvement Branch

Appendix 5. West Virginia watershed based plans

§319_WBPs	HUC12	HUC12_name	Year	Pollutant
Lambert Run	050200020602	Limestone Run - West Fork River	2004	Metals/pH
Three Forks Creek	050200010601 050200010602	Headwaters Three Fork Creek Outlet Three Fork Creek	2005	Metals/pH
Upper Buckhannon River	050200010301 050200010302 050200010303 050200010304	Left Fork Buckhannon River Right Fork Buckhannon River French Creek Tenmile Creek - Buckhannon River	2006	Metals/pH
Lost River	020700030502 020700030504 020700030501 020700030503	Upper Cove Run - Lost River Kimsey Run - Lost River Cullers Run-Lost River Baker Run	2006	Bacteria
Upper Guyandotte River	050701010101 050701010102 050701010103 050701010301 050701010302 050701010303	Tommy Creek Slab Fork Devils Fork - Guyandotte River Barkers Creek Pinnacle Creek Cabin Creek - Guyandotte River	2006	Bacteria/Metals
North Fork Elkhorn	050702010202	Headwaters Elkhorn Creek	2007	Bacteria/Metals
Mill Creek - South Branch	020700010401	South Mill Creek	2007	Bacteria

	020700010402	Johnson Run-Mill Creek		
Sleepy Creek	020700040201 020700040202 020700040203 020700040204 020700040205	Upper Sleepy Creek Middle Fork Sleepy Creek Middle Sleepy Creek Meadow Branch Lower Sleepy Creek	2008	Bacteria
Mill Creek - Opequon	020700040905	Mill Creek	2008	Bacteria
Second Creek	050500030701 050500030702 050500030703	Upper Second Creek Middle Second Creek Lower Second Creek	2008	Bacteria
West Run	050200030309	West Run - Monongahela River	2008	Metals/pH
Wolf Creek	050500030904 050500040304	Wolf Creek Wolf Creek-New River	2009	Metals/pH
Muddy Creek - Greenbrier	050500030802 050500030803 050500030804	Kitchen Creek Mill Creek Muddy Creek	2009	Bacteria
Roaring Creek - Tygart Valley	050200010406	Roaring Creek	2012	Metals/pH
Piney Creek	050500040101 050500040102 050500040103	Beaver Creek Headwaters Piney Creek Outlet Piney Creek	2012	Bacteria/Sediment
Sandy Creek - Tygart Valley	050200010501 050200010502	Little Sandy Creek Left Fork-Sandy Creek	2012	Metals/pH
South Fork Potts Creek	020802010301 020802010401	Sweet Springs Creek - Cove Creek South Fork Potts Creek	2012	Bacteria
Elk Headwaters	050500070101 050500070102 050500070103 050500070104 050500070105 050500070106	Old Field Fork Dry Fork - Elk River Abb Run - Elk River Sugar Creek Back Fork Elk River Bergoo Creek - Elk River	2012	None
Tuscarora Creek	020700040907	Tuscarora Creek	2013	Bacteria
Elk Run	020700041107	Elk Run	2013	Bacteria/Sediment
Knapp Creek	050500030201 050500030202 050500030203	Douthat Creek Headwaters Knapp Creek Outlet Knapp Creek	2013	Bacteria
Morris Creek	050500060306	Hughes Creek - Kanawha River	2013	Metals/pH
Back Creek	020700040404 020700040405 020700040406 020700040407 020700040408 020700040409	Brush Creek - Back Creek Babbs Run Warm Springs Hollow - Back Creek Elk Branch - Back Creek Tilhance Creek Outlet Back Creek	2014	None
Milligan Creek/Davis Springs	050500030903	Milligan Creek - Greenbrier River	2014	Bacteria
Upper Meadow River	050500050601 050500050602 050500050603 050500050604 050500050605	Little Clear Creek Otter Creek-Meadow River Big Clear Creek Sewell Creek Mill Creek - Meadow River	2014	Bacteria/Metals
Lower Coal River	050500090608	Browns Creek - Coal River	2014	Bacteria
Deckers Creek	050200030201 050200030202	Headwaters Deckers Creek Outlet Deckers Creek	2015	Metals/pH
Little Tenmile Creek	050200020502 050200020503 050200020504	Headwaters Tenmile Creek Little Tenmile Creek Outlet Tenmile Creek	2015	Bacteria/Metals
Spring Creek	050500030408	Spring Creek	2015	Bacteria
North Fork Blackwater	050200040203	Lower Blackwater River	2016	Metals/pH

Indian Creek	050500020701 050500020702 050500020703 050500020704 050500020705	Burnside Branch Rock Camp Creek Upper Indian Creek Middle Indian Creek Lower Indian Creek	2017	Bacteria
Cane Fork	050500060201	Headwaters Cabin Creek	2017	Metals/pH
Beaver Creek	050500030406	Beaver Creek	2017	Bacteria
Pipestem Creek	050500020909	Little Bluestone River	2018	Bacteria
Cherry Fork	050500080401	Headwaters Eighteenmile Creek	2018	Bacteria
Anderson Run	020700010602	Anderson Run	2019	Bacteria/Sediment
Beaver Creek	050200040202	Middle Blackwater River	2019	Metals/pH
Big Sandy Creek	050200040604	Beaver Creek - Little Sandy Creek	2019	Metals/pH
	050200040604	Middle Big Sandy Creek		
	050200040605	Lower Big Sandy Creek		
Muddy Creek	050200040703	Muddy Creek	2019	Metals/pH
North Fork Greens Run	050200040705	Greens Run - Cheat River	2019	Metals/pH
Anthony Creek	050500030502	North Fork Anthony Creek	2019	Bacteria
	050500030503	Upper Anthony Creek		
	050500030504	Middle Anthony Creek		
	050500030505	Lower Anthony Creek		
Pringle Run	050200040702	Pringle Run - Cheat River	2019	Metals/pH
Fourpole Creek	050901011006	Fourpole Creek	-	Bacteria/Metals
Beaver Creek	050200010407	Mill Creek-Tygart Valley River	-	Metals/pH

	Active
	Not active
	Under development

Appendix 6. 2022 grant submission

<u>Organizations</u>	<u>Nonpoint Funds</u>	<u>\$319</u>	<u>Match</u>	<u>Total</u>
WVDEP	WVDEP Nonpoint Program	\$518,456	\$414,466	\$932,922
WVDEP/NRCWA	Southern WV GI Phase 2	\$85,693	\$15,600	\$101,293
WVCA	WVCA Nonpoint Program	\$156,200	\$104,133	\$260,333
WVRC	WBP-SWPP integration	\$100,000	\$66,667	\$166,667
USEPA	EPA Watershed Tracker (in-kind)	\$10,000		\$10,000
	Total Nonpoint	\$870,349	\$600,866	\$1,471,215
	<u>Watershed Project Funds</u>			
FOC	Dinkenburg Improvements	\$173,400	\$116,000	\$289,400
WVWRI/GWF	Lambert Site 7 Phase 2	\$148,920	\$100,000	\$248,920
WVWRI/STTWA	North Portals Phase 2	\$197,982	\$130,000	\$327,982
WVWRI/BRWA	Swamp Run Phase 2	\$149,999	\$100,000	\$249,999
FODC	Beulah Chapel upgrade	\$262,100	\$175,400	\$437,500
PCWA	Piney Creek wastewater treatment	\$52,250	\$34,833	\$87,083
	Total Watershed	\$984,651	\$656,233	\$1,640,884
	Total Grant request	\$1,855,000	\$1,257,099	\$3,112,099