

The 2020 stories are not the typical US EPA success story, but this was not the typical year. These include a story about Muddy Creek for USEPA'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.

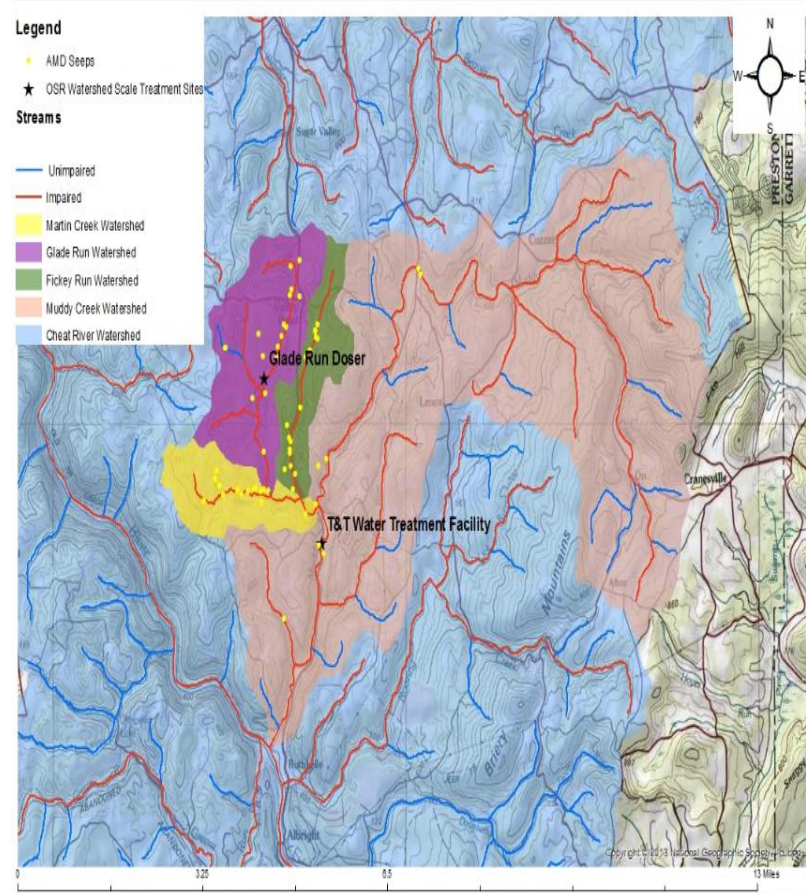
Muddy Creek – a story of partnership and restoration

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.



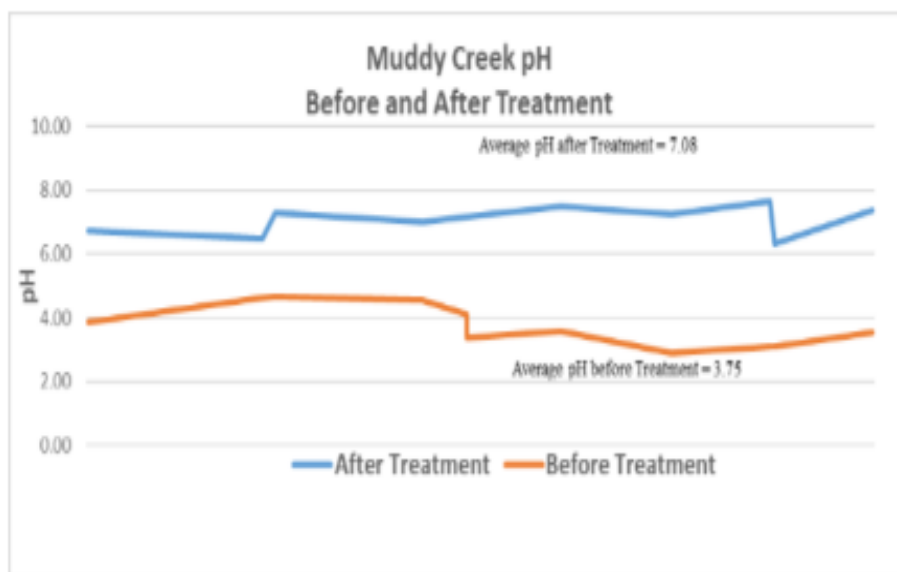
Aerial photo 1994 Mine Blowout - Photo Credit Randy Robinson

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.

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 an **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 14. SWWP-WBP project basins

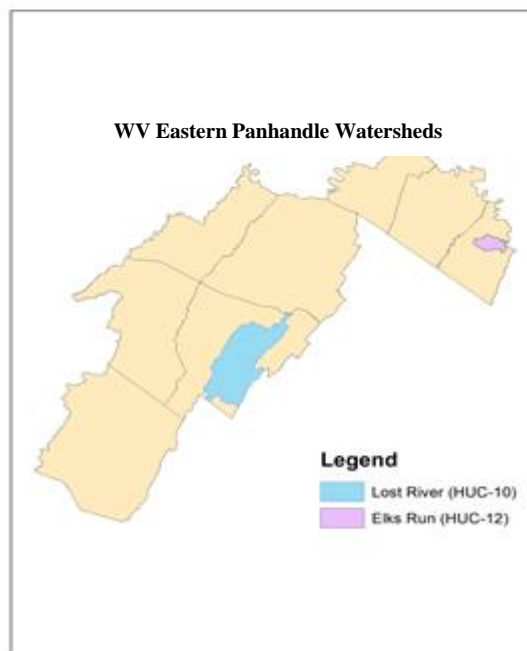


Figure 15. Elks Run overlay matrix.

Pollutant	Landuse	WBP Practices	SWPP PSSC's					Edu. & Outreach						
			Roadways	Agriculture	Septics & Sewer	Commercial & Ind.	Subdivisions	Climate Change	ICPWP Partnership	WMP 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						
	Cropland*	Wetland Creation*		I				I						
		Nutrient Management Plan		D										
		Manure Composting		D										
		Increased Soil Testing		D										
Onsite Sewer Systems	Manure Storage Structure		I											
	Manure Transport		I											
	Others, described above	N/A	N/A	N/A	N/A	N/A	N/A	N/A						
	Septic ID & Inspection			D										
	Septic Pumping			I										
Sediment	Residential/Urban	Septic Repair			I									
		Septic Replacement			I									
	Pasture	Sewer Line Extension			D									
		Described above	N/A	N/A	N/A	N/A	N/A	N/A	N/A					
	Cropland	Described above	N/A	N/A	N/A	N/A	N/A	N/A	N/A					
		Conservation Till		I										
		Cereal Cover Crops		D										
		Commodity Cover Crops		D										
Barren Areas	Others, described above	N/A	N/A	N/A	N/A	N/A	N/A	N/A						
	Silt Fencing													
Streambanks	Elevation Control Structures		I											
	Ches. Bay Onsite Sewer Systems			I										
Forest Cover	Forests	De-nitrifying Septic Systems			I									
		Afforestation		D		I	I	I						
Education - "first step in achieving clean water is to educate residents"		Land Conservation		D			D	I						
		Workshops							I					
		Pet Waste Runoff Campaign								I				
		Watershed Walks								I				
		Subdivision Stormwater Audit									I			
		Water Bill Inserts										I		
		Youth Education											D	D
Demo Rain Gardens														

Community project examples

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.

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.

Supported 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.

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

A **septic system 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 Elks Run watershed to advertise the opportunity. At the close of the septic project, multiple homeowners indicated interest in joining ERWA.

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	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
	\$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.			

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

