



TEAM
KENTUCKY[®]

ENERGY AND
ENVIRONMENT CABINET

2023

ANNUAL REPORT

December 2023
Kentucky Nonpoint Source Program



KENTUCKY DIVISION OF WATER WATERSHED MANAGEMENT BRANCH NONPOINT SOURCE AND BASIN TEAM

The Kentucky Division of Water's Nonpoint Source and Basin Team implements the state's Clean Water Act Section 319 Nonpoint Source Program, including the 319(h) grant, river basin coordination, and volunteer monitoring initiatives.

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ENERGY AND
ENVIRONMENT CABINET

NONPOINT SOURCE MANAGEMENT IN KENTUCKY



The Kentucky Nonpoint Source Management Program's mission is to protect surface and groundwater from nonpoint source pollution (NPS), abate pollution threats, and restore degraded waters to meet water quality standards and support beneficial uses. Given its diffuse nature, NPS management requires partnering with a wide variety of organizations; alongside federal, state, local, and private partners, the NPS team promotes complementary regulatory and non-regulatory pollution control initiatives at both statewide and watershed scales.

The NPS Management Program administers and implements the Kentucky Division of Water's 319(h) federal grant program. The Environmental Protection Agency (EPA) awards the Kentucky Division of Water (DOW) with grant funds each year for the purpose of addressing problems associated with NPS pollution. A 40 percent non-federal match is required on all projects that receive funding. During the ranking period, priority is given to projects involving watershed-based plan development and implementation in impaired waters, as well as protection of Special Use Water with identified threats.

In the Federal Fiscal Year (FFY) 2023, DOW received \$2.8 Million from Clean Water Act (CWA) Section 319(h) funding to execute the program. This year, communities and organizations shared \$1.4 million in federal funding to implement projects that control NPS pollution within watershed planning areas. The Division of Water awarded those funds to implement best management practices in 15 watershed planning areas, help develop 5 watershed plans, coordinate statewide Agriculture Water Quality Authority Efforts, and provide technical assistance and training to agricultural producers on water quality issues.

This report features accomplishments aligned with the NPS program's goals that occurred during FFY 2023 (October 1, 2022- September 30, 2023)





NONPOINT SOURCE PROJECTS

Division of Water staff provide technical assistance to watershed groups and other partners as they develop watershed plans and implement NPS pollution abatement strategies identified through the watershed planning process. During FFY 2023, DOW staff reviewed four draft watershed plans: Upper Paint Lick Creek, McDougal & Castleman, Lower Pitman, West Hickman, and Mill Creek. The West Hickman watershed plan was officially accepted by the EPA during FFY 2023.

Watershed plan reviews are coordinated by the Nonpoint Source staff and ensures that all necessary DOW branches can comment or offer constructive feedback on watershed plans prior to acceptance. Currently, 30 watershed plans have been accepted for full implementation with CWA Section 319(h) funding and an additional nine watershed plans are under development.

Twelve watershed plans are being implemented through one or more CWA Section 319(h) funded contracts during FFY 2023. Watershed coordinators are integral to the success of implementation projects by supervising on-the-ground best management practice implementation to reduce nonpoint sources from urban stormwater to agricultural runoff. Watershed coordinators also conduct watershed-focused environmental education and outreach to the public, local officials, and school-aged children.

SUCCESS STORY: RED BIRD RIVER

Watershed Planning & Septic Outreach Leads to Red Bird River Delisting

The Kentucky Division of Water (DOW) added an approximate 15-mile segment of Red Bird River (miles 0.0–15.35) to the 2016 Clean Water Act (CWA) section 303(d) list/Integrated Report as impaired (partial support) for primary contact recreation (PCR) due to *Escherichia coli* bacteria. In 2021, the U.S. Environmental Protection Agency (EPA) approved DOW's statewide bacteria total maximum daily load (TMDL), which includes Red Bird River. After years of outreach and septic system improvements, water quality collected in 2018 indicated the segment fully supports its Primary Contact Recreation (PCR) designated use. As a result, DOW proposes to delist the *E. coli* impairment for this Red Bird River segment in the 2022 Integrated Report to Congress.

Water Quality Challenge

Red Bird River (KY-2483) drains into the South Fork of the Kentucky River in southeast Kentucky (Figure 1). The river is approximately 34 miles long and drains a 195.5-square-mile watershed dominated by forestland in Clay, Leslie, and Bell counties. Water chemistry sampling of Red Bird River in 2013 indicated that concentrations of *E. coli* did not support the PCR designated use, which resulted in a 15-mile segment being listed as impaired on the 2016 CWA section 303(d) list/Integrated Report. A bacteria TMDL was subsequently developed and approved in 2021. Other Red Bird River watershed streams listed in this bacteria TMDL include Upper Jacks Creek (mi. 0–2.3), Big Creek (mi. 0–4.25), Elk Creek (mi. 0–5.75), and Lawson Creek (mi. 0–2.85).



Project Highlights

Watershed planning efforts began in June 2010 when the U.S. Forest Service and local community partners met to find ways to improve water quality and tourism in the Red Bird River watershed. In 2015, the CWA section 319(h) program awarded \$231,237 to the Daniel Boone National Forest to develop and implement the Red Bird River watershed plan. In 2016, the Red Bird River Watershed Team finalized the plan, which outlines watershed needs for septic system improvements, erosion mitigation, and trash cleanup. To reduce bacteria loading in the watershed, this project funded two septic system workshops, 24 septic cleanouts, and 11 new septic system installations through partners such as Eastern Kentucky PRIDE, the Red Bird Mission, the

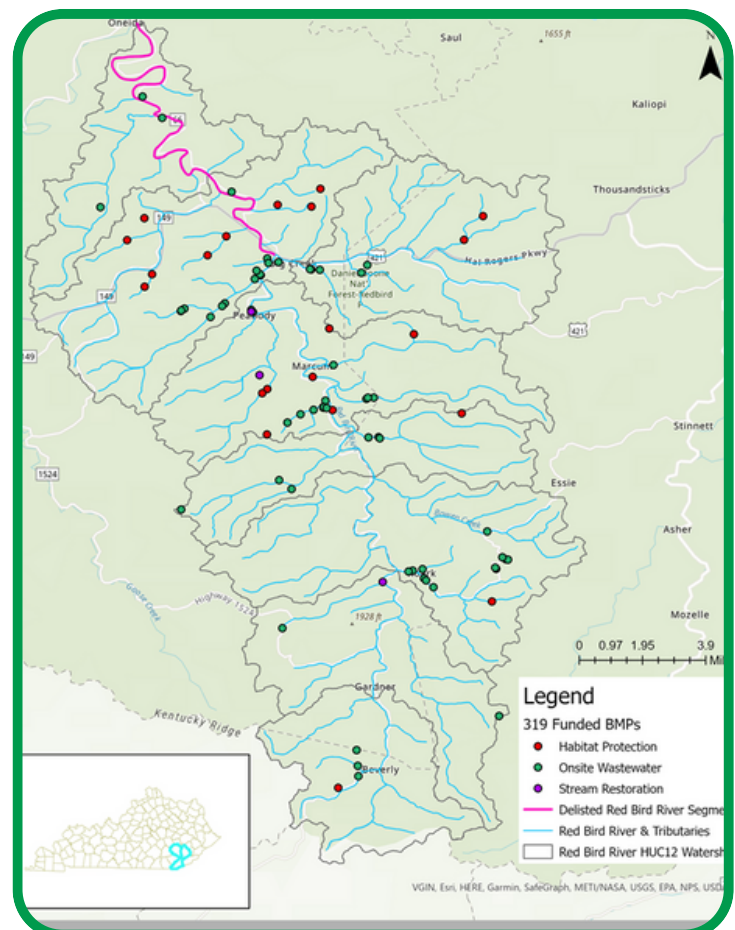


Figure 1. Red Bird River watershed in southeastern Kentucky

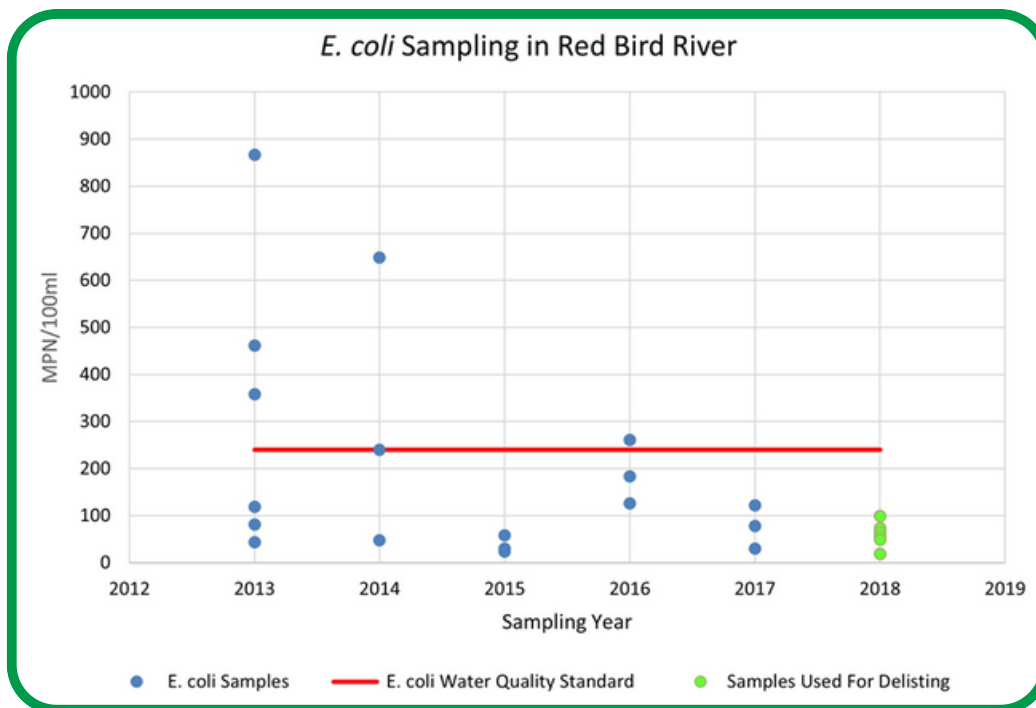


Figure 2. Bacteria sampling in the Red Bird River watershed

University of Kentucky, and the Cumberland Valley Resource Conservation and Development Council. Outside funding to the Red Bird Mission helped multiply the impact of this effort with the installation of an additional 19 new septic systems and completing two septic repairs. Volunteer participation in on streamside trash cleanups, erosion control projects, and septic system workshops demonstrated the high level of community engagement during this project. For over three years, volunteers conducted trash cleanups along 16.6 miles of stream in the Red River watershed (Figure 3), 100 community members attended an informational meeting on septic improvements, and 73 people attended septic workshops. Grant funding also helped mitigate erosion along 69.2 miles of hiking trails in the Daniel Boone National Forest.

Project Partners

Substantial local engagement led to finalization of the Red Bird River Watershed Plan and focused engagement on septic system improvements. The U.S. Forest Service and Red Bird Mission played pivotal roles in galvanizing community support, while also leveraging over \$154,000 in matching funds. The Division awarded another CWA 319(h) grant for \$178,255 in 2019 to continue septic system improvements, erosion mitigation, and stream restoration efforts. Matching funds nearing \$119,000 are slated to multiply this investment, with an enduring impact on the health of this watershed.

Results

Following substantial watershed planning, septic investment, and watershed cleanup, new data demonstrates the Red Bird River segment from miles 0.0 to 15.35 now supports the PCR designated use. In 2018, DOW monitoring results showed that all five samples during the PCR season (May–September) were under the 240 most probable number (MPN)/100 milliliters (mL) water quality threshold for delisting (see Table 1). As a result, Red Bird River (miles 0.0–15.35) now meets its primary contact recreation designated use, and *E. coli* is proposed for delisting as part of the 2022 Integrated Report to Congress.



Figure 3. Red Bird River cleanup, November 2017

FEATURED PROJECTS: DIX RIVER & HINKSTON CREEK



Dix River: Clarks Run and Hanging Fork

The Clarks Run Watershed covers approximately 28.5 square miles and is a tributary to the Dix River. It is mainly characterized by agriculture, with pasture/hay being the dominant land use. In comparison, the Hanging Fork Watershed covers around 96.4 square miles and is also a tributary to the Dix River. It is also predominantly agricultural, with cattle farms being the primary land use. Both watersheds have experienced water quality issues due to farming practices and failing septic systems. Riparian zones in both watersheds are underdeveloped or absent, which further contributes to these problems.

Both Clarks Run and Hanging Fork have high levels of bacteria pollution, primarily due to septic system failure, which has led to unsafe swimming conditions and high concentrations of *E. coli* in the streams. The Watershed Based Plans for these watersheds recommend implementing failing septic system repair or replacement programs, connecting homes with failing septic systems to sewer lines, and restricting cattle access to waterways. The implementation of these recommendations received support through grant funding and the formation of the Lincoln County Sanitation District. Additionally, inadequate riparian zones have been identified as a major water quality concern in these watersheds, and initiatives have been undertaken to promote riparian buffer restoration.

Historic Projects

CWA Section 319(h) grant funds were awarded to four different projects between federal fiscal years 2010-2014. During 2010, efforts were made in the Dix River Watershed to evaluate water quality and address pollution from failing septic systems by providing public sanitary sewer service to homes and establishing a park to restore riparian zones. In 2011, an Agricultural Oversight Committee was formed to implement best management practices in the Clarks Run and Hanging Fork Watersheds. By the end of 2012, progress had been made towards repairing septic systems and educating the community on water quality. The 2014 project focused on public education, riparian zone restoration, and collaboration with community partners to achieve successful outcomes such as tree planting and an Earth Day Festival. Challenges included technical difficulties and delays, but lessons were learned for future projects. Overall, strong partnerships were crucial to the success of these projects.

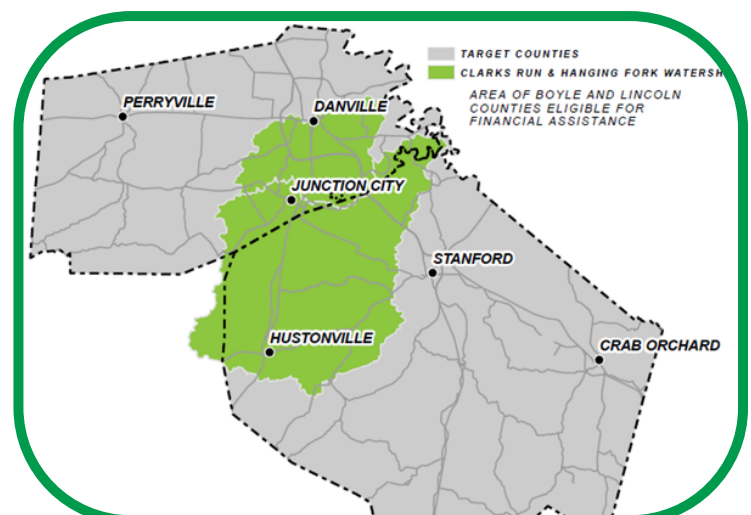


Figure 4 Project area map for 319(h) projects 16-07, 19-05, and 20-08.

Hinkston Creek

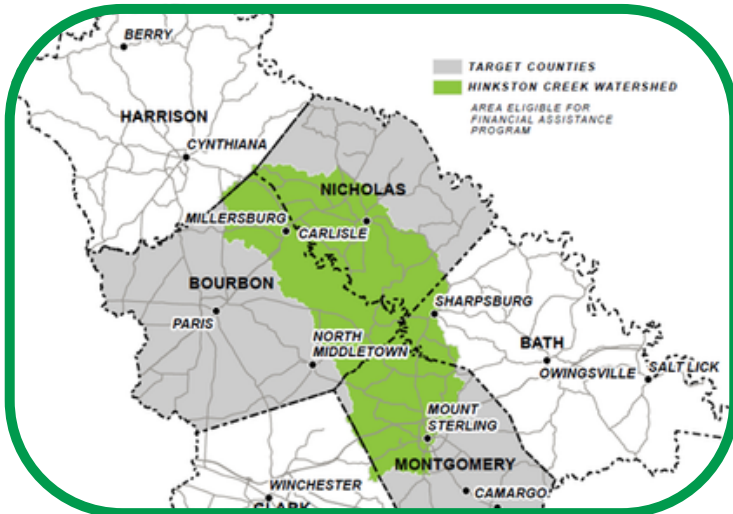


Figure 5 Project map for 319(h) projects 16-07, 19-05, 20-08, and 23-10

In the Hinkston Creek watershed, NPS pollutants such as urban runoff, agriculture, and failing septic systems are of concern. The presence of fecal coliform and *E. coli* loading is attributed to failing septic systems and riparian buffer deficiency is a significant issue. Recommendations for reducing pathogen levels in the watershed include repairing or replacing failing septic systems, riparian buffer restoration, and retrofitting urban and rural runoff. Implementation efforts have included septic system education, pumpout and repair cost-share programs, and on-farm best management practices to address agricultural pollution.

Historic Projects

Clean Water Act 319(h) grant funds were awarded to three different projects, focused mainly on agricultural NPS sources, from federal fiscal years 2011-2013. The 2011 project aimed to implement best management practices (BMPs) in the Hinkston Creek Watershed Plan, provide cost share support to farms in Montgomery, Bourbon, and Nicholas counties, and resulted in significant expansion of farm conservation practices. In 2012, work continued by targeting agricultural resource concerns and promoting BMPs among landowners. In 2013, Nicholas County focused on improving water quality through various measures such as livestock exclusion fencing and streambank stabilization, where landowners were prioritized based on their impact. The work accomplished by these early projects has made important strides in addressing agricultural nonpoint sources and improving water quality in the targeted areas.

Watershed Implementation Project: Clarks Run, Hanging Fork, and Hinkston Creek (16-07)

This CWA 319(h) funded watershed implementation project focused on reaching and educating individuals in the five-county project area about NPS pollution and water quality. Bluegrass Greensource conducted various outreach and educational activities including workshops, presentations, meetings, and participation in community festivals and events which reached over 15,600 individuals. The project successfully implemented the Septic System Repair and Maintenance Program with 57 pumpouts and 38 septic system repairs and replacements. It also conducted Saving your Streambank workshops and established six streamside buffers, which established a total of 1,645 linear feet of riparian buffer. The project actively engaged local partners and stakeholders and implemented a comprehensive advertising campaign through newspapers, radio, online platforms, and flyers. It conducted homeowner septic workshops, distributed educational publications, and trained septic installers and pumpers. Overall, the project made significant progress towards improving water quality and promoting awareness and understanding among community members



Figure 6 Volunteers working on a riparian buffer planting.

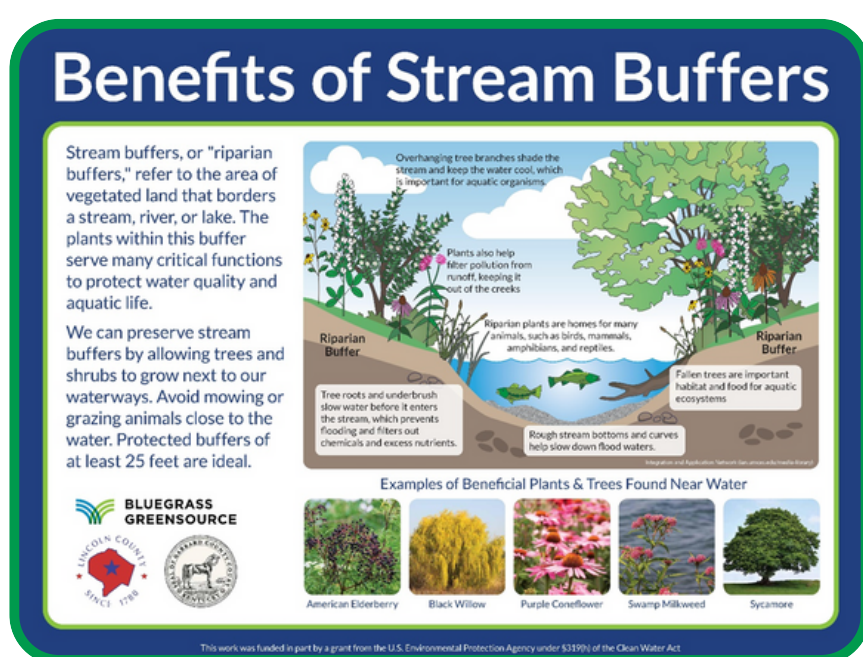


Figure 7. Educational signage developed and installed for 319(h) project 20-08.

Clarks Run, Hanging Fork, and Hinkston Creek Watershed Improvement Program (19-05)

This project built upon the goals and activities of the FFY 2016 project by providing financial assistance for water quality improvements, focusing on septic system function and riparian zones. Septic Care workshops were hosted in collaboration with local Health Departments in five counties, leading to 33 pumpouts and 39 septic system repairs/replacements. Riparian buffer workshops resulted in four approved projects with three completed in 2021. Educational opportunities, stakeholder meetings, presentations, and community events reached approximately 4,567 people directly and an estimated 25,000 through marketing campaigns. Partnerships with local organizations and individuals played a crucial role in the success of the program.

Dix River and Hinkston Creek Watershed Improvement Program (20-08)

This ongoing project is designed to improve water quality in the Clarks Run, Hanging Fork, and Hinkston Creek Watersheds and is built upon the success of the FFY 2016 and FFY 2019 projects. The Watershed Coordinator oversees education and implementation activities related to the Watershed Based Plans (WBP) for each watershed. The Coordinator also maintains Watershed Stakeholder Groups in the focus areas (i.e., Dix River and Hinkston Creek) to provide guidance on all aspects of the WBP implementation. General outreach and education efforts are conducted through various mediums, including newspaper articles, radio Public Service Announcements, booths, and displays at local events, classroom activities, online toolkits, social media, and flyers.

Septic care educational workshops are scheduled, materials are prepared and utilized in coordination with project partners and a Septic System Repair and Maintenance Program is being implemented. Watershed festivals and outreach events are coordinated and water quality mini grants are offered to residents of the watersheds. State and federal cost-share for on-farm BMPs is promoted. Student water quality education is provided. The project aims to increase awareness, involvement, and implementation of water quality improvement strategies in the focus watersheds.

Hinkston Creek Watershed Improvement Plan (23-10)

This project is specifically focused on improving water quality in Hinkston Creek. While it shares similar goals and activities with previous projects, its scope is narrowed down to this particular watershed. The project includes educational workshops on septic care and a Septic System Repair and Maintenance Program. The Watershed Coordinator will oversee implementation of the project which involves collaboration with local partners, county health departments, and other stakeholders. The aim is to address the specific water quality needs of Hinkston Creek, which include addressing bacterial contamination in the watershed, and implementing measures to protect and improve its ecosystem. This project is slated to begin in early 2024.

FEATURED PROJECTS: MAYSVILLE



Maysville Gets Serious About Restoring Limestone Creek

Forming a true partnership, the Mason County Public Library, City of Maysville, Buffalo Trace Area Development District, and DOW have collaborated towards the goals of flood mitigation, watershed management planning, creating public greenspace, and restoring Limestone Creek. Representatives from the Mason County Public Library and City of Maysville initiated the project when they contacted the Division for help with flood mitigation. Limestone Creek runs behind the library and water rises to the back of the library (see Figure 8 for library location) during heavy rain events. Adjacent to the library, Limestone Creek was dredged into two large basins 25 years ago, which are now filled with sediment (Figure 8). Initially the Library and City wanted to re-dredge these basins but expressed they were open to other options, including nature-based solutions.

The Section met with representatives from both the Library and the City of Maysville to discuss the problems associated with creek dredging and offered alternative nature-based solutions for flood mitigation. Since then, the City has dedicated substantial time and resources to a sediment tracing study, alternative non-dredging options for flood mitigation, watershed planning, creating public green space, and future restoration of Limestone Creek. With water outreach and education, Maysville has shifted their focus from Limestone Creek as simply a method for flood water removal to establishing community investment in public greenspace, outdoor recreation, and a centerpiece for the community, in addition to the flood mitigation the area originally needed (Figure 9).

The Mason County Public Library is taking the first step toward Limestone Creek restoration by partnering and funding a sediment tracing study

with the University of Louisville. Because of the accumulation of sediment in Limestone Creek, which discharges directly into the Ohio River (Figure 10), determining its origin is important for any future projects. The year-long University of Louisville study will address these questions using stable isotopes analysis and other techniques for sediment tracing. Additionally, the library plans to turn this partnership into a “Science in Action” public relations campaign to highlight Limestone Creek, its environmental issues, and the steps being taken to restore it.



Figure 8: Ariel image of the Mason County Public Library (blue star), relative to Limestone Creek, and the areas of sediment build-up (yellow circles) that were formerly dredged basins.

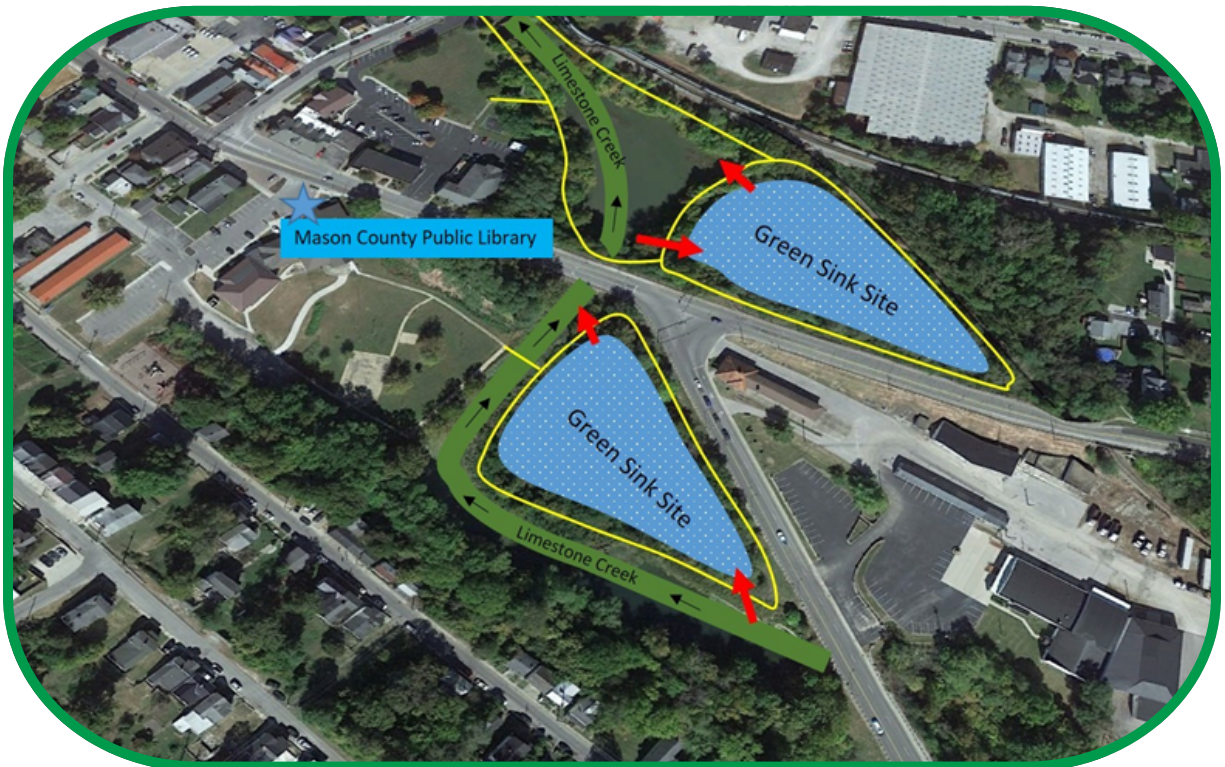


Figure 9: The current flood mitigation/public green space/creek restoration design for Limestone Creek, supported by the City of Maysville, Mason County Public Library, and Buffalo Trace Area Development District.

The City of Maysville and Buffalo Trace Area Development District (BTADD) have partnered to develop a CWA Section 319(h)-funded Watershed Management Plan for Limestone Creek and build green sinks for flood mitigation (Figure 9) using a FEMA-Hazard Mitigation Assistance Program grant. Green sinks are off-channel infiltration basins that capture flood water and store it temporarily until it filters through the permeable basin bottom to the groundwater below, leaving behind NPS pollution. Applications for those programs are in progress. The City has allocated grant-matching funds for the next 3 years for these projects.

In addition to the current Limestone Creek projects, the City of Maysville, Mason County Public Library, and Buffalo Trace Area Development District are planning for a full stream Limestone Creek restoration and develop the area into a public greenspace complete with hiking trails, nonpoint source outreach signage, overlooks, and bridges (Figure 9).

“We’ve had our backs to the creek for too long, and now it’s time to turn around and face it”

MAYOR DEBRA COTTERILL OF MAYSVILLE, KY



Figure 10 Levee-wall culvert that connects Limestone Creek to the Ohio River. Large pump station is also visible just to the right of the levee culvert.

PROJECTS STARTED

State Project Number	Project Title	Contract Executed
22-03	Project WET in Kentucky	10/1/2022
22-04	McDougal and Castleman Creek WSP	11/1/2022
22-06	Lincoln County Homeowner Assistance Program Phase II	10/1/2022
22-07	Chestut Creek Ag and Homeowners Assistance Program	10/1/2022
22-08	Beargrass Creek Watershed Coordinator	12/1/2022
22-09	Sulphur Creek Watershed Plan Implementation	11/1/2022
22-10	South Fork Little River Watershed Plan Implementation	3/1/2023
22-11	Currys Fork Basin Retrofit Demonstration	11/1/2022

PROJECTS FINISHED

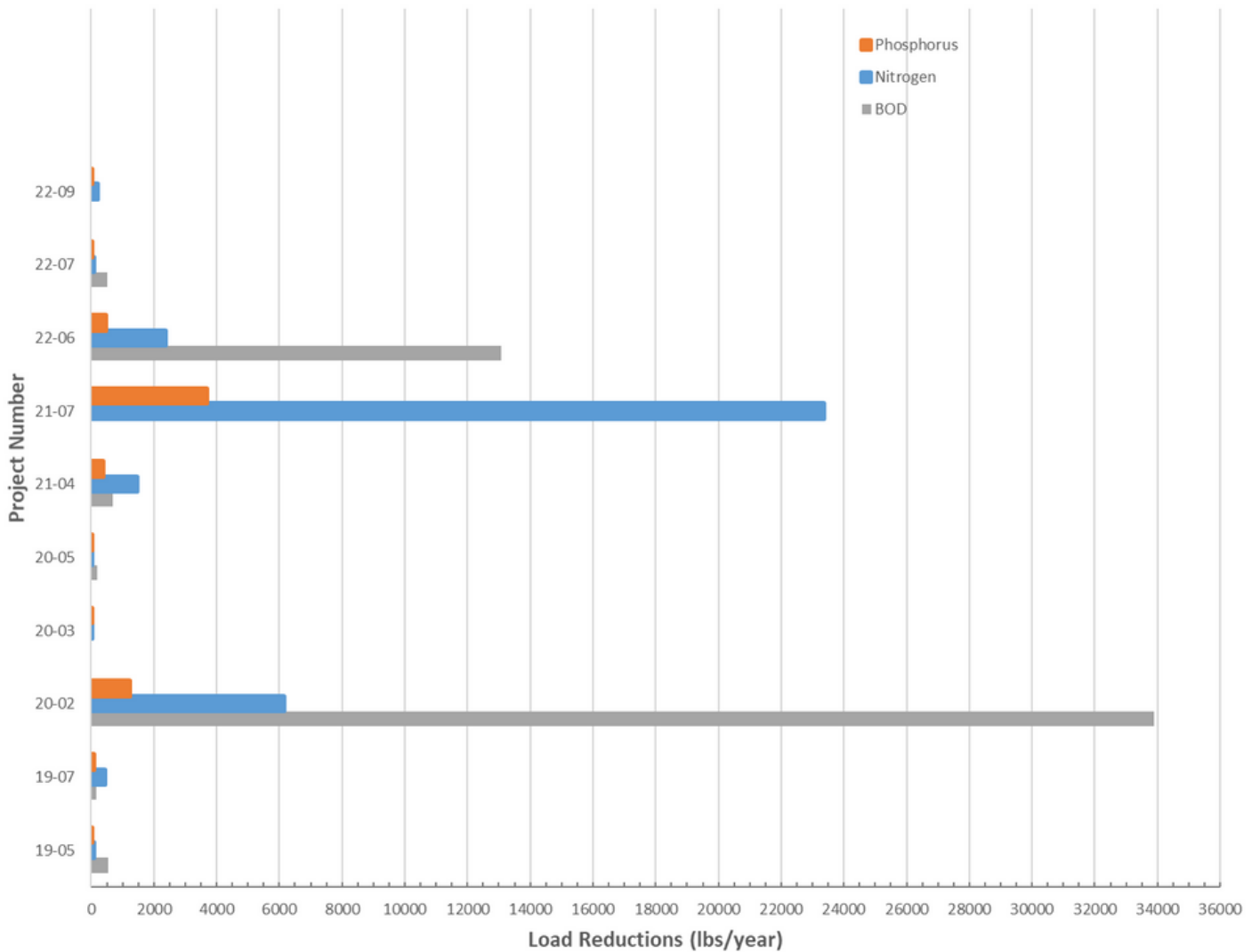
State Project Number	Project Title	Date Completed
19-02	Currys Fork BMP Implementation	9/30/2023
19-03	Kentucky Assessments and TMDL Tracking System	9/18/2023
19-05	Dix River & Hinkston Creek Watershed Improvement Program	9/15/2023
19-06	Bacon Creek Homeowner Septic Program	9/30/2023
19-07	Banklick Creek Watershed Plan Implementation	9/15/2023
19-09	Red Bird River Watershed Plan Implementation	9/15/2023
19-12	CVG Airport Southwest Detention Basin Retrofit	9/18/2023
19-13	DOC Nutrient Management Planning	5/12/2023
22-08	Beargrass Creek Watershed Coordinator	12/1/2022
22-09	Sulphur Creek Watershed Plan Implementation	11/1/2022
22-10	South Fork Little River Watershed Plan Implementation	3/1/2023
22-11	Currys Fork Basin Retrofit Demonstration	11/1/2022

LOAD REDUCTIONS

State Project Number	Project Title	Load Reductions				
		Nitrogen (lbs/year)	Phosphorus (lbs/year)	BOD Reduction (lbs/year)	Sediment (tons/year)	E.Coli (CFU/year)
19-05	Clarks Run, Hanging Fork, & Hinkston Creek Watershed Improvement Program	100.9	20.2	553.5	0.1	1.82E+10
19-07	Banklick Watershed Plan Continued Implementation	429.9	81.2	150.8	10.8	2.52E+11
20-02	Georgetown/Scott County South Sewer Extension HAP	6159.2	1231.8	33875.4	0.0	2.00E+11
20-03	Improving Water Quality Across Currys Fork Watershed	4.4	1.6	8.0	2.2	2.38E+11
20-05	Agriculture/Watershed Coordinator for Chestnut Creek	36.6	7.3	201.0	0.0	1.80E+09
21-04	Upper Bacon Creek Agriculture BMP Implementation	1470.3	386.6	689.0	107.7	4.62E+11
21-07	Lower Howards Creek Implementation Project on Vaught Road	23369.2	3689.0	0.0	659.5	1.95E+13
22-06	Lincoln County Homeowner Assistance Program Phase 2	2375.9	475.2	13067.7	0.0	7.43E+10
22-07	Agriculture/Watershed Coordinator for Chestnut Creek, HAP	91.4	18.3	502.6	0.0	5.09E+09
22-09	Sulphur Creek Watershed Ag BMP Implementation Plan: Phase IV	212.7	9.8	0.0	0.0	7.86E+10

LOAD REDUCTIONS

FFY 2023 Load Reductions for Nitrogen, Phosphorus, and BOD





BASIN COORDINATION

The Kentucky Division of Water Basin Coordinators serve as catalysts in the watershed management process by acting as facilitators for agency activities and as points of contact for local organizations interested in addressing water quality and pursuing watershed planning. Basin Coordinators enhance communication with stakeholders by invigorating regional basin teams and stakeholder groups (local, state, and federal agencies, universities, non-governmental organizations, industry, and community groups) that work actively in the basin. These groups meet regularly to discuss current projects, needs, and strategies related to basin-wide ecosystem health. Basin Coordinators help facilitate discussions, gather feedback for DOW, and communicate with members via regular newsletter releases. In addition to the basin teams, Basin Coordinators help involve the public in setting management priorities, developing watershed plans, providing grant assistance, supplying water-focused education and outreach, and exploring innovative ways to improve water quality at the community level.

Currently, the Kentucky Division of Water directly employs five Basin Coordinators (Big Sandy, Little Sandy, and Tygarts Rivers Basin, Green and Tradewater Rivers Basin, Licking River Basin, Upper Cumberland River Basin, and the Salt River Basin) and two through outside contractors (Four Rivers and Kentucky River Basins), covering all seven of the state's watershed management units.

UPDATES: BIG SANDY RIVER BASIN

Tug Fork Tributaries: Blackberry Creek, Miller Creek, Pond Creek, Sycamore Creek, Lower Big Creek, Upper Big Creek, Coldwater Fork, Drag Creek, Jennie Creek

The Tug Fork and Big Sandy Rivers form most of the border between Kentucky and West Virginia. In October of 2016, a Facebook group called “Friends of the Tug Fork” (Figure 11) was formed to share fishing photos and recreational information from the Tug Fork River. Today, that group is now a 501(c)3 not-for-profit-organization with over 19,500 followers and has pursued greater efforts to improve the water quality of their river. Among their efforts are establishing a blue water/flat water trail along the Tug Fork, establishing volunteer water monitoring partnerships with both the Save Our Streams Program (West Virginia) and the Watershed Watch in Kentucky Program, and conducting tire cleanups in cooperation with both states. To date, the efforts by Friends of the Tug Fork have removed over 13,340 tires from the river, eliminating 4,566 in 2023 alone. The group worked with the West Virginia Department of Environmental Protection (DEP) on several tire disposal events to reduce the number of tires entering the river, engage and educate the public on proper tire removal, and arrange a trailer for tire disposal. The success of these tire removal efforts also inspired others to act, and in August the nearby city of Pikeville, KY held its first tire cleanup on the Levisa Fork (Figure 12). With some guidance from the Tug Fork group a coalition of city workers, community members, and over 60 students from the University of Pikeville recovered nearly 400 tires from the Levisa.

In October of 2023 the Friends of the Tug Fork received CWA Section 319(h) grant funds from the West Virginia DEP to conduct a water quality assessment and develop a watershed plan. Bids are now being gathered by the group and data.



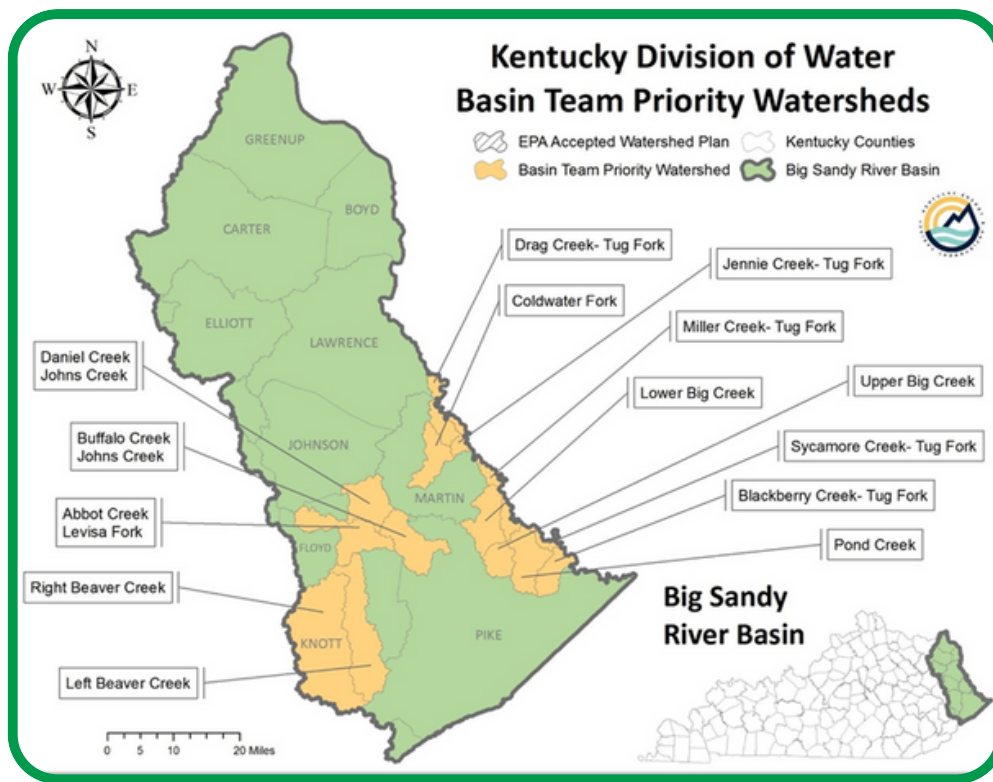
collection is scheduled to begin in early 2024. Once completed, the Tug Fork River Watershed Plan will be used to design and implement water quality projects in both West Virginia and Kentucky as part of a multi-state, multi-EPA Region restoration effort.

Beaver Creek Watersheds: Upper Left Fork, Upper Right Fork, Middle Right Fork, Lower Left Fork, Lower Right Fork

The Beaver Creek watersheds have an existing TMDL and assessment data available. The Big Sandy River Basin Coordinator is attempting to gather local capacity and inspire interest to best use the available data. Development of an *E. coli* focused plan began in the summer of 2022.



Figure 11 Logo for the Tug Fork Watershed Group



Watershed Planning Areas

Recognizing the importance of clean water to community and economic health, several communities in the Big Sandy Basin are interested in watershed planning. These locations would like to improve the ecological health of local waterways while improving recreational opportunities and current storm water infrastructure. The Big Sandy River Basin Coordinator is working with these communities to prepare for watershed planning efforts:

- Prestonsburg, Floyd County Watersheds (Buffalo Creek Johns Creek, Abbot Creek Levisa Fork, Daniel Creek Johns Creek)
- Olive Hill, Carter County Watersheds (Trough Camp Creek-Tygarts Creek)
- Louisa, Lawrence County Watersheds (Morgans Creek-Blaine Creek & Griffiths Creek Levisa Fork)
- Sandy Hook, Elliot County Watersheds (Newcombe Creek & Headwaters Little Sandy River)



Figure 12 The Pikeville Community work together to remove tires on Levisa Fork

UPDATES: KENTUCKY RIVER BASIN



Cane Run of North Elkhorn

For years, sewage from two large mobile home communities in Scott County has discharged to failing wastewater treatment package plants, which resulted in high biological oxygen demand (BOD) values and excessive levels of *E. coli*, ammonia/nitrogen, and phosphorus in nearby Cane Run.

Due to an expansion of the Georgetown Municipal Water and Sewer Service (GMWSS) area, a project connecting the two mobile home communities to a new sanitary sewer line began in 2021. Clean Water Act (CWA) Section 319(h) funds were awarded to the city of Georgetown to run a Homeowner Assistance Program. The program provided financial assistance to mobile home park residents for the costs associated with tapping into the new municipal sewer extension.

One of the mobile home communities with 500 lots is expected to be fully connected to the GMWSS line (Figure 13) at the end of calendar 2023. This is a significant step towards eliminating pollution from the failing wastewater treatment package plants and will considerably reduce the BOD values and excessive levels of *E. coli* and nutrients found within Cane Run. A community stakeholder group called Kentucky Watershed Watch is monitoring the pre- and post-project water quality at multiple stream sites around the location to document anticipated improvements.

Wolf Run

Implementation activities in the Wolf Run Watershed of Fayette County continue to move forward. The municipal separate storm sewer system (MS4) monitoring program has been completed, and an update of the 2013 data from Wolf Run Watershed Management Plan and the Best Management Practices (BMP) table is planned for 2023. The Regency Road detention basin will be retrofitted (BMP #48 identified in the watershed plan) by

removing concrete channels, installing wetland micropools, and planting trees at the basin on Regency Road between Derby Drive and Lowry Lane, and a new detention basin (BMP #49 identified in the watershed plan) will be added in the Southland area of Wolf Run.

Additionally, The Friends of Wolf Run has received successive Stormwater Incentive Grants from the Lexington-Fayette Urban County Government which enabled implementation of multiple riparian buffer education and enhancement activities. This included the recent use of grazing goats to remove invasive species, such as bush honeysuckle and wintercreeper, which also reduced the need for herbicide treatments in the watershed. The interest in the goats also helped engage the community around the project site. A video of the project can be viewed [here](#).

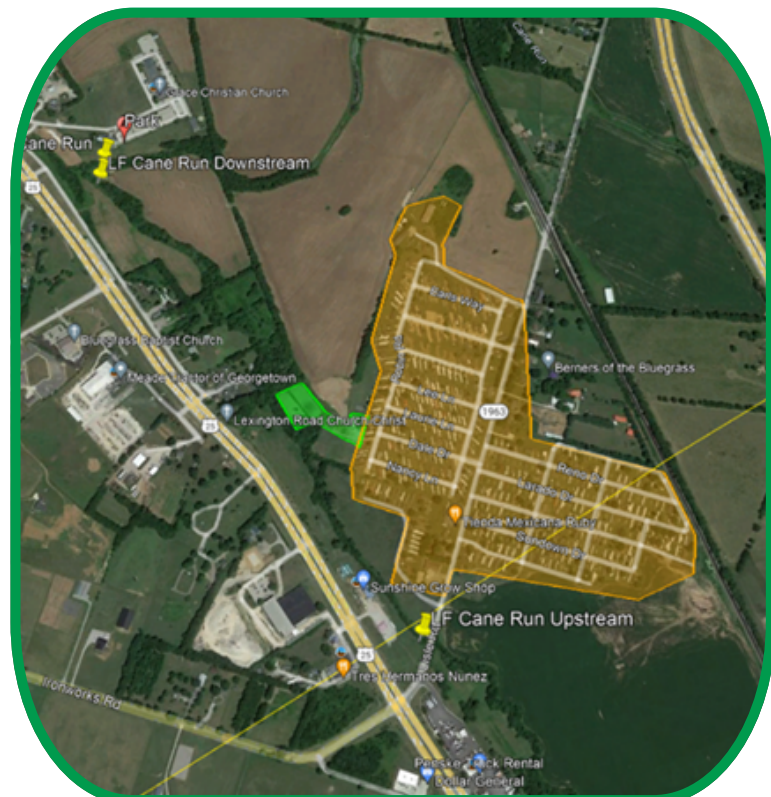


Figure 13 A map of the 500-lot mobile home park to be connected to the Georgetown Municipal Water and Sewer Service by the end of the calendar year.

West Hickman Creek

Since 2016, 19 septic systems have been installed and twenty-nine septic pump outs have been performed in the Redbird River watershed using CWA Section 319(h) funding and Kentucky River Authority grants which led to the state delisting for *E. coli* impairment from the mouth of Red Bird River to Big Creek. In addition, USFS organized riparian plantings and trash cleanups in the Red Bird River (Figure 14).

To continue bolstering these successes, Kentucky Waterways Alliance received a Septic and Education Project CWA Section 319(h) grant for FY 2023. These funds will continue supporting a watershed coordinator who will work to install thirteen additional septic systems in the watershed and host septic education opportunities in the community.

Red Bird River

The Hickman Creek Conservancy (HCC) and celebrated the EPA approval of the West Hickman Creek Watershed Management Plan in FY 2023. The first planned projects are removal of a non-functioning low-head dam in the lower portion of the watershed and, in partnership with the Bluegrass Chapter of Trout Unlimited, designing an outdoor classroom along West Hickman Creek in Veterans Park. During the development of the watershed plan, Palmer Engineering created an interactive map of potential BMPs for the watershed: [Map of West Hickman Creek's Areas of Concern and Proposed Projects](#). This map will help guide future community water quality improvement efforts within the West Hickman Creek watershed.

Glenn's Creek

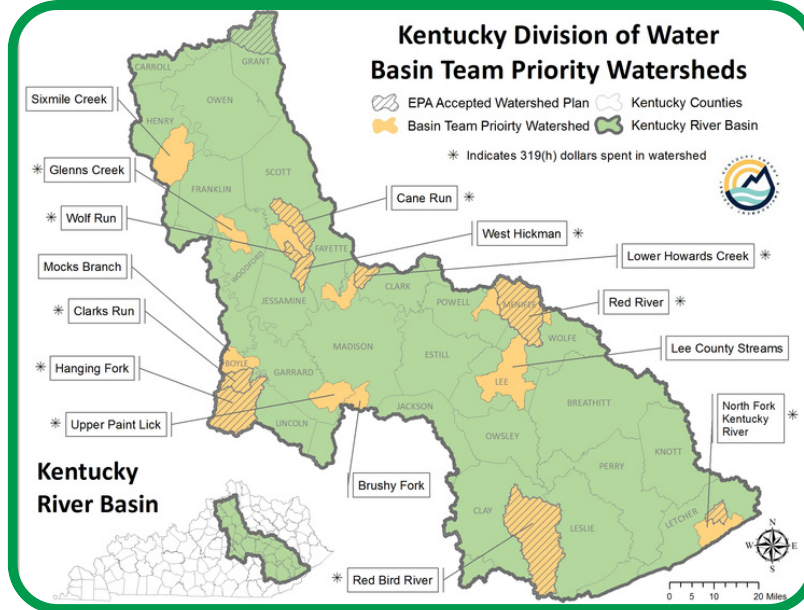
In FY 2021, the Kentucky Water Research Institute (KWRI) received a CWA Section 319(h) grant to complete a watershed plan using 2021-2022 monitoring data. ArcGIS Online software is being used to develop an interactive, electronic Glenss Creek Watershed plan. The main benefits of this electronic plan include real-time community engagement with the data and the ability to continually update the plan with new information. This framework has the potential for use as a template for other watershed planning efforts across Kentucky. Initial watershed characterization components are posted as a [Story Map](#) and as an [Interactive Water Quality and Erosion Site Report Map](#). KWRI also formed a Glenss Creek Watershed leadership committee and is conducting stakeholder meetings to better understand local water quality goals. Plans to engage the several bourbon distilleries located in the watershed to improve and protect water quality are also being developed.

Upper Paint Lick Creek

The Upper Paint Lick Creek Watershed Management Plan is in review with the Kentucky Division of Water and there are plans in place for several green infrastructure projects to kick off implementation!



Figure 14 Community members at the Beverly Trash Cleanup, April 2022.



Lower Howards Creek

In FY 2023, the City of Winchester installed a stormwater bioretention basin along an upstream tributary of Lower Howards Creek, funded by a FFY 2021 CWA Section 319(h) grant. The project is designed to reduce the 100-year, 24-hour storm event maximum water elevation by approximately six inches and promote pollutant removal from stormwater through infiltration and pollutant uptake with native vegetation (Figure 15). Additionally, the basin will provide educational opportunities for schools and visitors to its sports complex on the impact of high velocity stream flows on siltation, hydromodification, and in-stream habitat. Planting native vegetation inside the bioretention basin is planned for FFY 2024.

Other improvements to the Lower Howards Creek watershed include the elimination of thirteen sanitary sewer overflows (SSO) in the Lower Howards Creek (LHC) watershed by Winchester Municipal Utilities so there are no reoccurring SSOs in the LHC watershed.

Bluegrass Greensource also utilized a separate grant from the Kentucky River Authority to conduct a Junior Watershed Festival at Legacy Grove Park in Winchester, with hands-on educational activities for local children and their families. During the festival students learned about trees and riparian buffers for better stream health and how pollution impacts water, people, and animals, and parents received information about stormwater and the watersheds in their county

South Elkhorn Creek

In March 2023, Neighbors United for South Elkhorn Creek (NUSEC) hosted “A Wet and Wild Watershed!” event during Water Week, an annual occasion held by the City of Lexington that encourages residents to celebrate the importance of water and learn about their role in protecting it. In August, Friends of Dogwood Park hosted an educational event called “Marsh Madness” that focused on the water and ecosystems found in the park.

Several projects to remove invasive species have also taken place in this watershed. NUSEC hosted an invasive species removal day during which area residents removed invasive species from around native plants to encourage a healthy riparian area. Friends of Dogwood Park received a Lexington Fayette Urban County Government (LFUCG) Stormwater Quality Projects Incentive Grant to direct stormwater away from Clemmons West Spring, and to stabilize the area around the spring by removing invasive species and replacing them with native vegetation. In addition to the LFUCG grant, Friends of Dogwood Park received a Kentucky River Authority Grant to coordinate professional invasive tree, shrubs, and winter creeper removal along Brannon Run and the tributary of Clemmons West Spring. Restoration work continues in South Elkhorn Creek with LFUCG funding a stream restoration project slated to begin in spring of 2024.



Figure 15. The completed stormwater bioretention basin along an upstream tributary of Lower Howards Creek.

Dix River

Implementation activities continued through CWA Section 319(h) grant funding to Bluegrass Greensource and the efforts of the Clarks Run Environmental and Educational Corporation (CREEC) in 2023. As part of these efforts educational signage regarding watersheds, stormwater runoff, eutrophication of lakes, and stream buffers for Logan-Hubble Park in Lincoln County has been designed and sent for printing. Bluegrass Greensource, through a contract with the City of Danville, has hosted several watershed focused educational events for preK-12 students and adult residents of Boyle County. In summer and early fall of 2023, CREEC worked with Danville High School Admiral Leadership Academy students to develop a riparian buffer project along Town Creek, a tributary of Clarks Run. The students removed invasive species in the riparian area and planted native perennials and shrubs in the fall of 2023. Completed implementation projects include two septic repairs in the Hanging Fork watershed and two riparian buffers installed in the Clarks Run watershed.

In the Hanging Fork watershed, the Lincoln County Sanitation District started a sewer expansion project that will transition 363 septic systems to sanitary sewer connections. This project will help fulfill one of the primary recommendations of the Hanging Fork Watershed Management Plan: adding municipal sewer service to an area formerly served by failing onsite septic systems. A second round of homeowner assistance to offset sewer connection costs is funded by an FFY 2022 CWA Section 319(h) grant to the Lincoln County Sanitation District. To date, Lincoln County Sanitation District has assisted 156 applicants and connected 104 homes to the sanitary sewer system.

North Fork Kentucky River

Since the devastating floods of July 2022, the City of Whitesburg and the general Letcher County community have re-engaged in local environmental efforts with renewed focus on the Whitesburg Tributaries Watershed Management Plan. On November 13-14, 2023, Cowan Community Action Group, Inc. hosted a community workgroup meeting with an “Imagining Community-Led Sustainable Stream Restoration” theme and attended by 20+ local community members and stakeholders. During this event the community decided to apply for FFY 24 CWA Section 319(h) funding to support a local watershed coordinator to lead implementation of the Whitesburg Tributaries Watershed Management Plan.



Figure 16. Photo from the Marsh Madness Event in the Kentucky River Basin

UPDATES: LICKING RIVER BASIN



Northern Licking River Basin

There is significant momentum in the northern parts of the Licking River Basin. Gunpowder Creek, Dry Creek, and Banklick Creek all have active, EPA-approved, watershed plans, Banklick Creek has a contracted watershed coordinator, and all three had/have active implementation projects in 2023. All watershed groups are highly interested in implementing nature-based solutions to reduce erosive stormwater flows and protect water quality.

Gunpowder Creek

Gunpowder Creek contains the state's only TMDL Alternative Plan and was recently delisted from the state's list of impaired waterways. The Boone County Conservation District is using conservation funds from KDFWR FILO program and mitigation credits for stream and wetland mitigation projects on-going in Middle Creek, Gunpowder Creek, Woolper Creek, and Big Bone Creek. Also the Boone County Conservation District just purchased 97 acres of land adjacent to Gunpowder Creek Nature Park that will protect .9 miles of the Gunpowder Creek and adjacent forest. The property will be used to establish a center for conservation and education in Northern Kentucky.

Dry Creek

SD1 has a basin monitoring program that included data collection within the Dry Creek watershed as well as other locations throughout our service area. SD1 has a monitoring program that rotates through each of our established basin areas (East, Central, North and West). 2023 was the North Basin, so monitoring for the sites in this basin included water quality, biological/habitat and channel stability surveys. The other basins (Central, East and West) only had limited water quality monitoring but will include the more in-depth monitoring for their basin year (West – 2024, East – 2025, Central – 2026).

Banklick Creek

Banklick Watershed Council (BWC) is an active, local nonprofit that implements the watershed's management plan and is led by their watershed coordinator. The BWC had a busy FFY 2023 year and their projects included continued development of a TMDL-alternative for Banklick Creek (in conjunction with Northern Kentucky's Sanitation District, SD1), 8 Detention Basin Retrofits completed, 1 new septic tank replaced, 250 native/pollinator plants in at Brushy Fork, 600 bare-root saplings given away in Independence, and 3 Litter cleanup events (2 with Parks at Doe Run Lake, and 1 with Ft. Wright for Earth Day). Other ongoing BWC projects include 2 septic grant applications anticipated, updated Watershed Assessment Tool (WAT!) modeling, and working with SD1, multiple sewer extension projects under design. The sewer extension project will make sewers connections available to approximately 125 homes and eliminate a package plant to a 30-home subdivision. The Kenton County Conservation District has been monitoring the post-installation of the bottom-land hardwood forest, which was part of the FEMA-Banklick buyouts from the Meldahl Hydroelectric Project and are working on a plan for invasive-plant removal and restoration on donated property near Elsmere Elementary School. Finally, the EPA Office of Research and Development has been conducting a comparison study of bacteria sources in three of Banklick Creek's subwatersheds.



Figure 17 This Bankfull Wetland was created for erosion mitigation on Gunpowder Creek

Central-West Licking River Basin

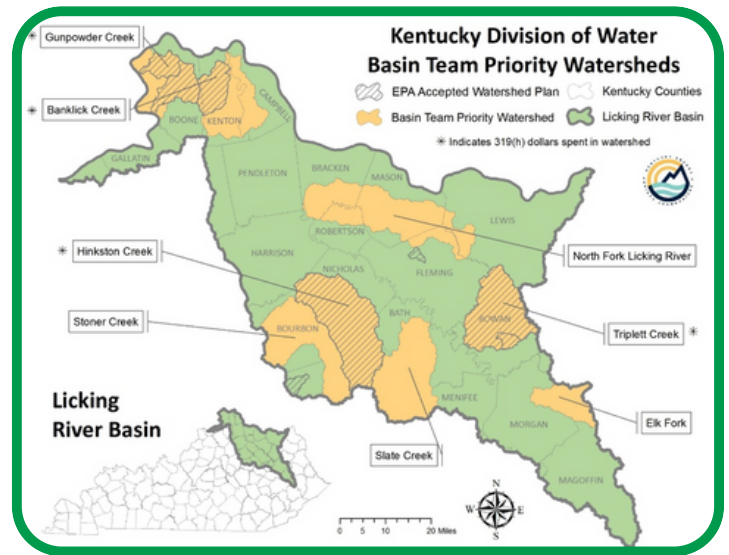
Within the central-west region of the basin, there are varying levels of stakeholder interest. Many watersheds had some level of activity during the year. Of the three priority watersheds in this region, one has an EPA-approved watershed plan (Hinkston Creek).

Hinkston Creek

In Hinkston Creek, Bluegrass Greensource completed 2 septic repairs and have ongoing work on 3 more septic repairs. In conjunction with UK Cooperative Extension, NRCS, Conservation Districts, and Kentucky Cattlemen's Association, Bluegrass Greensource sponsored a farmer-led conservation program (Farmer-to-Farmer) for disadvantaged farmers to help increase conservation practice and BMP implementation. The UK Cooperative Extension led a farmer watershed leadership training (using the Tap Your Potential curriculum) in Jan & Feb 2023. The workshop was funded by EPA Farmer to Farmer Cooperative Agreement No. 83575401-2 and a 319(h) grant from the U.S. EPA through DOW to the University of KY. The City of Mt. Sterling is working with Gateway Area Development District to build 2-4 large Green Sinks, off-channel retention basins, to mitigate flooding and non-point source pollution from stormwater runoff before it hits Hinkston Creek. The Bourbon County Conservation District has also been involved in the watershed with their Fall Farm Field Day to promote conservation, local pasture seeding cost-share program, promoting Soil Stewardship Week in the local schools, assisting landowners in the development of Agriculture Water Quality Plans, providing technical assistance to address conservation related issues, and a tree seedling giveaway with the goal of increasing hardwood tree density. Finally, Licking River Watershed Watch has been conducting regular sampling of Hinkston Creek.

Salt Creek and Beaver Creek

In both Salt Lick (Salt Creek) and Frenchburg (Beaver Creek), our Nonpoint Source and Basin Team is working with these communities and the Gateway Area Development District to construct Green Sinks for flood and nonpoint source pollution mitigation.



Stoner Creek

In Stoner Creek, the community group Friends of Stoner Creek have taken the lead. This year they have done water quality testing with DOW and Watershed Watch of Kentucky, removed tires (1200 to date), and worked with Bluegrass Greensource to deliver an environmental education program. In addition, the Bourbon County Natural Resources Conservation Service (BCNRCS) office has been active in and around Stoner Creek. BCNRCS used state cost share for pond fencing, two tanks and pipeline, heavy use area gateway, and two heavy use area feed pads. They also used local cost share for pasture renovation (1211 acres pasture/hayland) and cover crop (600 acres) programs. Finally, the BCNRCS gave away 6000 tree seedlings to landowners which they planted on their farms.

Slate Creek

Kentucky Division of Water, NRCS, City of Mt Sterling, and Mt Sterling Water and Sewer utility are all working together to reduce nonpoint source pollution runoff into the Greenbrier Reservoir, which is the drinking water source for the city of Mt Sterling and surrounding area. Additionally in Slate Creek, the local health department is concerned about failing septic systems in the watershed and subsequently, there is interest in an SRF project to address septic issues. Local partners voiced interest in educational awareness efforts around the Outstanding Water Resource in Slate Creek area. Slate Creek was also identified as a Mississippi River Basin Initiative watershed for NRCS--planning began FFY 2022.

Central-East Licking River Basin

Within the central-east region of the basin, there are varying levels of stakeholder interest. Most priority watersheds had some level of activity during the year. Of the two priority watersheds in this region, one has an EPA-approved watershed plan (Triplett Creek).

Licking River and North Fork Licking River

In the main stem of the Licking River, there have been regular trash and tire cleanups occurring and some 200 tires were removed in FFY 2023. In the North Fork of the Licking, Licking River Watershed Watch has been keeping up with regular water sampling, including water chemistry and *E. coli* levels.

Limestone Creek

There is new-found momentum in Limestone Creek and the City of Maysville is partnering with the Buffalo Trace Area Development District, the Mason County Public Library, and Kentucky Division of Water to invest, monetarily and temporally, into this creek to become an area of public greenspace and outdoor recreation. They are currently working on grant applications for a watershed management plan and nature-based solutions for flood mitigation. The Mason County Public Library is funding, and partnering, with the University of Louisville to do a sediment tracing study in Limestone Creek and there are future plans to do a complete restoration and public-greenspace build-out of Limestone Creek. Licking River Watershed Watch has also just started sampling Limestone Creek for water chemistry and Ecoli.

Triplett Creek

Two high-level resource documents have been produced by U.S. Army Corps of Engineers for Triplett Creek, including an Initial Watershed Assessment (2019) and a Planning Assistance to States Study Flood Risk Reduction on Triplett Creek (2018). There is significant local interest from the City of Morehead's Floodplain Coordinator and Morehead

Plant Utility Board regarding stormwater management and flash flooding impacting water treatment plants, wells, and the community. The Licking River Basin Coordinator has been in conversation with program staff to strategize 319(h)/MS4 synergies. Morehead State University has conducted regular sampling and in-house analysis for Triplett Creek, as part of a MSU research grant and partnership with Kentucky Division of Water. Finally, City of Morehead is working with Gateway Area Development District to build 2-4 large Green Sinks (off-channel retention basins) to mitigate flooding and non-point source pollution from stormwater runoff before it hits Triplett Creek (Figure 18).

Headwaters Licking River Basin

Elk Fork Creek

Historically, there have been no 319(h) dollars awarded to the headwaters of the Licking River and there is no current activity in Elk Fork Creek. Recently, a local water district approached the Licking River Basin Coordinator with interest in engaging in more watershed-focused conservation efforts, particularly surrounding septic and straight pipe issues. The local health department has expressed interest as well. The goal for next year is to spend more time in the Licking Basin headwaters and help foster more community involvement in this area.

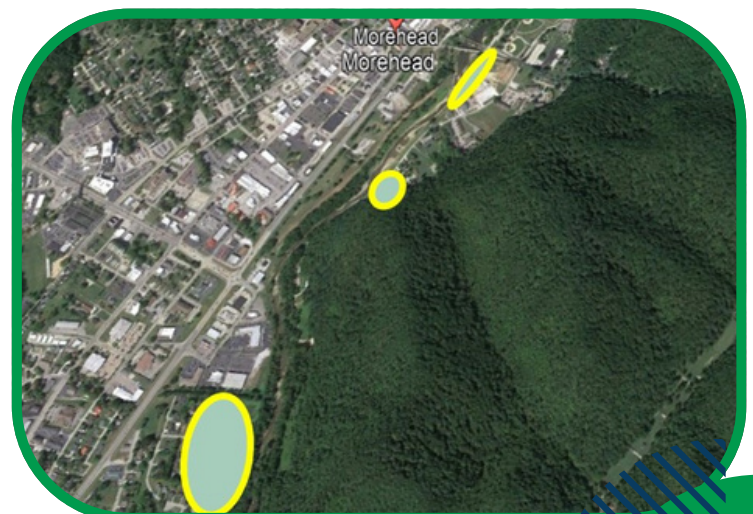


Figure 18 Future Green Sinks in Morehead, Kentucky

UPDATES: UPPER CUMBERLAND RIVER BASIN



Brushy Creek

In 2019, the Pulaski County Conservation District (PCCD) received additional CWA Section 319(h) funding to continue reducing agricultural runoff in the Brushy Creek Watershed (Project 19-10). An exciting part of the project was the purchase of new technology: a drone with a normalized difference vegetation index sensor to analyze plant health. This technology gives farmers a bird's eye view of crops to visualize areas of poor plant health. The drone is able to identify whether areas of declining health are due to insect infestations, lack of nutrition, or other types of crop damage. Once a determination is made, a farmer is able to take a targeted approach to chemical applications, which reduces the potential for NPS pollution on the property. Similar to the tour that demonstrated this process to the community, the 2019 project began with another farm tour, this time hosted virtually at the Somerset Drive-In, in partnership with the Pulaski County Cattlemen's Association, Natural Resources Conservation Service (NRCS), the Kentucky Beef Network, and the University of Kentucky Cooperative Extension Service. The project continued through 2023 with a focus on highlighting and installing agricultural best management practices.

Roundstone Creek Watershed

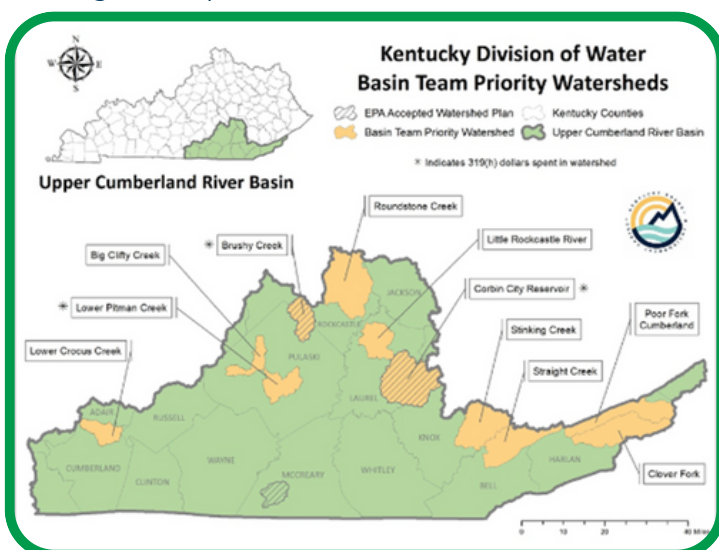
Located in the Roundstone Creek Watershed, Lake Linville is the primary drinking water source for Rockcastle County, Kentucky. While the water is considered safe for consumption, residents report frequent algal blooms, sediment plumes, and taste and odor issues. An analysis of the area suggests these issues may be the results of runoff from surrounding agricultural, forestry, and urban land use. In 2019, the NRCS and DOW began laying the groundwork to improve water quality in the watershed. NRCS approved two subwatersheds of Roundstone Creek for focused conservation projects, and the Division conducted an intensive water quality survey for the Renfro Creek watershed and a bacteria study in Roundstone.

Buck Creek

The Pulaski County Conservation District was awarded a CWA Section 319(h) grant to address sediment and water quality in the Buck Creek watershed. The watershed is home to 77 fish species and 30 species of mussels, nine of which are considered rare. The Buck Creek watershed is the pilot project for DOW Healthy Watershed Program.

Lower Pitman

The City of Somerset was awarded a CWA Section 319(h) grant to address water quality concerns in the Lower Pitman Creek watershed. The watershed is a heavily karst area, so the Division's Groundwater Section conducted a study to identify the location and flow patterns of sinkholes, springs, and the groundwater under the city. The Division's Water Quality Branch also conducted a surface water intensive study to assess watershed conditions. The city hired a watershed coordinator and a watershed plan is in initial draft stages.



UPDATES: SALT RIVER BASIN



Curry's Fork

The Currys Fork Watershed is located in Oldham County, Kentucky, and is a tributary of Floyds Fork. The watershed is approximately 29 square miles and is composed of four smaller subwatersheds. The EPA approved the Currys Fork watershed plan in 2012. As a part of its 2019 and 2020 CWA Section 319(h) grants, the Oldham County Fiscal Court organized field days and workshops for the community, including litter pick-up at Centerfield Elementary School, fall tree planting, live stakes planting, invasive species management along waterways workshop, spring live stakes giveaway, rain barrel cost-share, and a lakes/ponds field day. The Watershed Coordinator offered one-on-one consultations with landowners for live stake plantings. In addition, two landowners participated in the Kentucky State Cost-Share Program to establish riparian buffers along the stream bank on Curry's Fork.

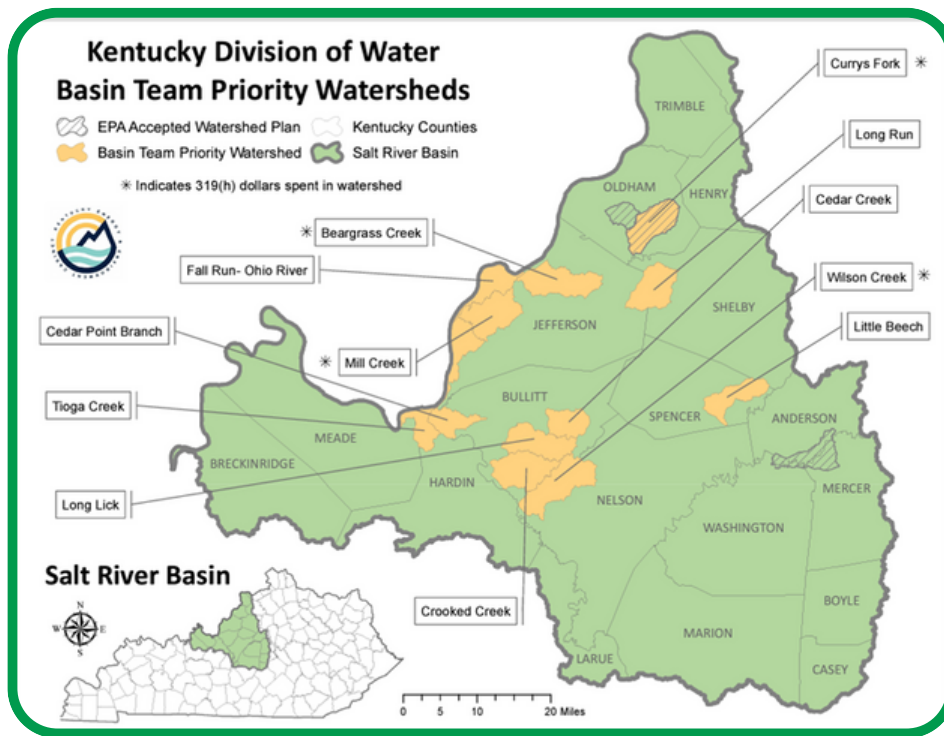
The live stakes planting event took place on a site adjacent to a high-priority stretch of South Fork at Centerfield Elementary School. Additionally, a live stakes tree farm was created at Wilborn Park (L&N Lake, Figure 19). There are currently funds and plans for another riparian buffer planting for the upcoming year.

The "Invasive Species Management Along Waterways" event was held along L&N Lake at the live stakes tree farm site, in collaboration with the Oldham County Extension, Kentucky Forestry, and contractors ICF. ICF staff assisted with training and completed the invasive species removal. Twelve community members and five park staff attended the training.

Curry's Fork was also awarded a FFY22 CWA Section 319(h) grant for a BMP demonstration, education, and outreach project that began in November 2022. Primary goals of this project are to mitigate stream flows that contribute to erosion and instability with a demonstration project integrating the Curry's Fork critical discharge ($Q_{critical}$) flow rate into new basin designs and retrofits with education, training, and examples, and a nature-based solutions education and incentive program. The third goal of this project is expanding community engagement through targeted litter reduction along waterways, improved lake and pond management, and inclusion-based outreach and training to support under-resourced communities.



Figure 19 Live Stakes at L&N Farm



Beargrass Creek

The Middle Fork Beargrass Creek is located in central Jefferson County, Kentucky, and is approximately 61 linear miles of stream. In 2022, the EPA approved the watershed management plan for the Middle Fork Beargrass Creek. Since then, the Louisville Jefferson County Metropolitan Sewer District hired a watershed coordinator to focus on implementation of BMPs, and education and outreach, including stream clean ups, educational programming for school aged children, and tree planting programs. Additionally, University of Louisville Sustainability students have performed research and organized stream clean ups as part of the Community-engaged Educational Ecosystem Model Program funded by the National Science Foundation (Figure 20).

Mill Creek

The Mill Creek watershed is a 34-square-mile basin located in southwest Louisville, Jefferson County, Kentucky, and is divided into the Upper Mill Creek and Lower Mill Creek sections. The Louisville/Jefferson County Metropolitan Sewer District (MSD) launched a new watershed-planning project in 2022, recruited partners for monthly meetings and input, and collaborated with the University of Louisville to research environmental justice issues in this watershed. A community survey and outreach events are planned for next year.

Sulphur Creek

The Sulphur Creek watershed is located in parts of Anderson, Mercer, and Washington counties. The basin is approximately 23-square miles and is a tributary to Chaplin River that drains directly into the Salt River. The EPA approved the Sulphur Creek Watershed plan in 2015. In FFY23, the Mercer County Conservation District implemented best management practices from the approved watershed plan including the installation of 1,250 linear feet of fencing on 64 acres that directly impact Sulphur Creek to facilitate rotational grazing of beef cattle.



Figure 20 Students from U of L clean up Beargrass Creek

UPDATES: GREEN RIVER BASIN



Upper Nolin River

The LaRue County Fiscal Court worked with Palmer Engineering in FFY 2023 to create a watershed plan for McDougal and Castleman Creeks. The watershed plan is nearly complete, with BMPs such as rotational grazing, heavy use areas, septic system repair, education and outreach, and riparian buffer development included. The LaRue County Fiscal Court and Palmer Engineering have also held public meetings and a stream walk with other local partners and stakeholders to promote upcoming projects and their benefits. The final watershed plan is expected to be completed by summer 2024.

Middle Nolin River

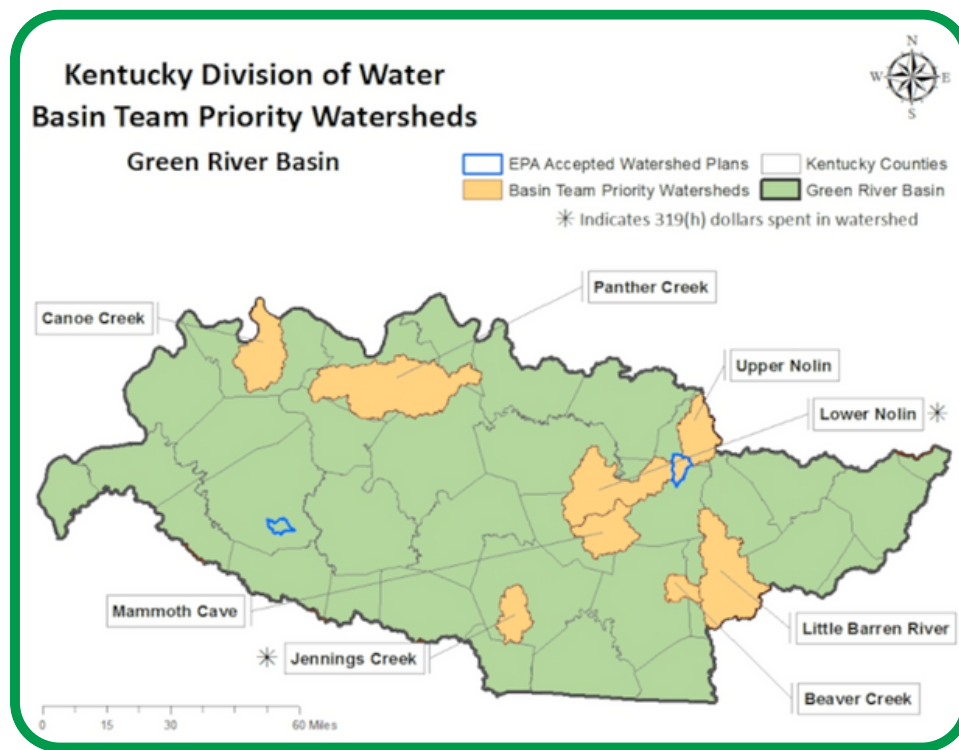
The City of Elizabethtown expressed interest in potential watershed planning projects for Freeman and Valley Creek Lake, and Freeman, Shaw, and Valley Creeks. These waterbodies are located within two HUC-12 subwatersheds, Upper and Lower Valley Creek. The Basin Coordinator plans to work further with the City regarding potential use of nature-based solutions, erosion stabilization projects, invasive species removal, and water quality improvements in the future, as well educational materials and outreach events that will address NPS pollution runoff.

Lower Nolin River

The LaRue County Conservation District and the Bacon Creek Watershed Coordinator have continued implementing BMPs with funds awarded from the FFY 2022 CWA Section 319(h) grant program. Best management practices completed this year include rotational grazing, gutter installation, cattle exclusion fencing, and solar-powered water well pumps. Septic repairs and replacements were completed in early 2023. More BMPs are planned for implementation in FFY 2024 through a 75-25 cost share program, and include winter feeding pads, heavy use areas, fence-line feeders, and alternate water sources. The LaRue County Conservation District and the Bacon Creek Watershed Coordinator hosted a farm field day in late September of 2023 that educated local farmers regarding agriculture BMPs that have worked on agricultural lands in the area (Figure 21). The project is expected to close in late December 2023.



Figure 21: Solar inverter used to power well pumps on a farm in the Bacon Creek Watershed.



Canoe Creek

Canoe Creek was added to the priority watershed list in FFY 2022 due to local concerns, failing septic systems, and future expansion in the area. The Green River National Wildlife Refuge is also situated within the watershed, further highlighting the need for watershed protection. It was previously selected as a National Water Quality Initiative (NWQI) Project for FFY 2023 and was identified as a prime candidate for state cost-share programs by the Kentucky Division of Conservation. Local partners are working to submit a Letter of Intent to apply for FFY 2024 with a goal of recruiting additional local partners to create a watershed plan next year aimed at mitigating issues faced by underserved communities, such as excess sedimentation, flooding, and water quality concerns.

Jennings Creek

Western Kentucky University (WKU) received CWA Section 319(h) funds in FFY 2022 to develop a watershed plan based on water quality data previously collected by WKU students. Additional work (Project #21-08) in FFY 2023 included compilation and analysis of historic data, weekly sampling for water quality data, and public meetings to discuss the watershed plan and issues surrounding Jennings Creek. The plan is expected to be completed in early 2024.



Figure 22 Green River by Colin Duncan

UPDATES: FOUR RIVERS BASIN



Bee Creek and Clayton Creek

In 2023 The Friends of Clarks River National Wildlife Refuge was received a 319(h) grant (Project 23-05) to write a watershed based plan for Bee Creek and Clayton Creek in Calloway County. In 2018, Four Rivers Watershed Watch conducted a study in the Clayton Creek watershed in Calloway County with a pathogen (*E. coli*) focus. Similar monitoring of Bee Creek was initiated in 2019, jointly supported by the City of Murray and Four Rivers Watershed Watch. The resulting plans will focus on identifying pathogen-reducing best management practices.

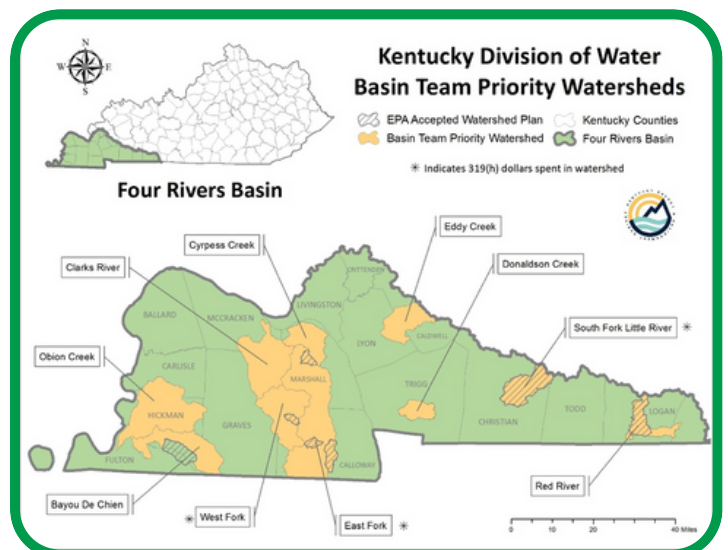
South Fork Little River

The Little River Water Quality Consortium received a 2018 319(h) grant (Project # 18-08) to hire a South Fork Little River Watershed Coordinator to oversee BMP implementation. The watershed coordinator is working with local landowners to implement best management practices that improve water quality. In 2022 approximately 60 home septic systems were pumped out and seven homes had new septic systems installed. In 2023 four home septic systems were pumped out and work is in progress on replacing a new septic system. Agricultural Best Management Practices are currently being discussed and designed with potential landowners to improve water quality in agricultural area of South Fork Little River.

Chestnut Creek

Through Several 319(h) Projects (17-14, 18-10, 22-05, 22-07, 23-05, 23-09) the Friends group continues to employ a Watershed Coordinator to work with the Division of Water, NRCS, U.S. Fish and Wildlife Service Partners Program, and other local partners to recruit landowners in Marshall County and the Chestnut Creek Watershed in implementing pathogen, nutrient, and sediment related best management practices, all of which are reinforced by continuous public education. Additionally, working with Marshall County Fiscal Court on Project # 18-10, the Watershed Coordinator helped facilitate residential connections to a newly installed sanitary sewer line. Twenty-four homes have been connected to Sanitation District 2. The connections to the sewer lines include the decommissioning of each of their septic tanks.

These projects also included agricultural best management practices. These practices included 9,000 feet of alternative water sources, 48 feed bunks systems, exclusion stream fencing, stream grade stabilization and two stream bank crossings.



TEAM KENTUCKY[®]

ENERGY AND
ENVIRONMENT CABINET



EDUCATION & OUTREACH

The Division of Water provides nonpoint source pollution education and outreach activities across the Commonwealth in addition to what is offered by 319(h) sub-grantees. The Basin Coordinators in the Nonpoint Source and Basin Team Section strive to reach a diverse audience, providing outreach and educational resources to create a more informed population and improve Kentucky's water quality.

During 2023 the Nonpoint Source & Basin Team Section continued to use an ArcGIS-based tool to track education and outreach events in order to accurately track the activities of the team and outside Basin Coordinators. The section has also taken over the management of the Volunteer Lake Monitoring Program, previously shared with Watershed Watch in Kentucky, and offers water education equipment rental for the public. Additionally, the section hosts several webpages and utilizes Facebook and Instagram accounts to share nonpoint source pollution (NPS) related information and events.

ACTIVITIES BY ACTION ITEM

Action Items	Accomplishments
Action Item 1.1: Continue effective messaging for the Division of Water	In 2022, the 'I Love KY Water' Facebook page was renamed to 'KY Wild Waters'. The page currently has 21,347 followers. A quarterly newsletter was distributed via MailChimp to 1,106 recipients.
Action Item 1.2: Partner w/organizations on environmental education and outreach opportunities	Partnered with the following organizations: - Kentucky Conservation Districts - Kentucky Water Resources Research Institute - Jeffer's Bend Environmental Center - Kentucky Association for Environmental Education - Kentucky Department of Conservation - Kentucky Waterways Alliance - Kentucky Association of Mitigation Managers - Friends of Tug Fork - Jackson Purchase Foundation - University of Pikeville - University of Louisville - Watershed Watch in Kentucky - The Nature Conservancy - Ohio River Basin Alliance - Louisville MSD - River City Paddle Sports - Murray State University - Banklick Watershed Council - Lewis County Highschool ROTC - Viking Canoe Club - Kentucky Department of Fish and Wildlife - Floyd County Early Education
Action Item 1.3: Develop content for social media, basin newsletters, and other print and non-print outlets	Social Media: The Basin Coordination team distributes a quarterly newsletter Each Basin Coordinator provides content for the Facebook page Participated in the following Social Media Campaigns to promote various aspects of water,; Lake Safety, Harmful Algal Blooms, Water Week in Kentucky, and Earth Day Produced Land, Air, and Water webzine article
Action Item 1.4: Coordinate and conduct public events and/or exhibits	- Kentucky State Fair - Bluegrass Greensource Riverfest - ORSANCO 75th Anniversary Water Event - Salt River Watershed Watch Fundraiser - Summer Spark Event & Community Fun Day - Marsh Madness at Dogwood Park - Whitesburg Community Restoration - Floyd County Public Library Early Education Event

ACTIVITIES BY TYPE

Type	Description	Community Reached
Presentations	Conducted presentations at various conferences and meetings throughout the State to educate the public about: - Green Sinks - General Water Quality - Stormwater Retrofit 303d - Kentucky Impaired Waters - Importance of Riparian Buffers - State of Kentucky Waterways - Clean Water and You (Clean Water Act) - Careers in Clean Water - Watershed Planning - PFAS and Public Health - Incorporating Wetlands into Planning - Partnerships in the Tug Fork River	Conducted 25 formal presentations reaching ~330 community members of all ages
K-12 Enviromental Education	- Reiland Elementary School - Caldwell Elementary School - Fancy Farm Elementary School - Wingo Elementary School - Northside Baptist Church School - New Covenant School - Symsonia Elementary School - Graves County Central Elementary School - Marsh Madness - Lee County Middle & High School - Danville High School Leadership Academy - Boyle County Earth Day Festival - Hogsett School Field Day - Wolfe County Field Day - Streamside Field Day - Spencer County Agriculture Day - Bardstown Field Day - Greenup County Field Day - Nicholas County Field Days - Boone County Family Nature Day - Jefferson County Environmental Outreach Event - Bluegrass River Festival - Meadow View Elementary School Visit - New Castle Elementary School Visit - Stinking Creek Cleanup - Murray Family Day - Lewis County High School Stream Clean-up - Maxwell STEM Night - Outdoor Adventure Day - Electrofishing @ Banklick - Summer Spark Event - Envirothon - Earth Day 2023 Cumberland Middle School - Outdoor Eco Day Russell County - Elkhorn Middle School Educational Event	Conducted environmental education Programs reaching ~5,300 students

ACTIVITIES BY TYPE

Type	Description	Community Reached
Workshops (hosted)	19 Watershed Watch Workshops throughout Kentucky	~208 community members and partners were taught by DOW
Workshops (attended)	Green River SRP Workshop Kentucky Tree Farmer of the Year Field Day Streamback Guidance Workshop Local Work Group Meeting for Shelbyville Work Unit ARRI Partner Meeting Developing Future Farmer Watershed Leaders Kentucky Association of Mitigation Managers Training MS4 Audit and Inspection Training Green Sinks Engineering Training Stream Safety Training MS4 101 Project WET, Project WILD, and Project Learning Tree Bootcamp Bluegrass Greensource Sustainability Summit Kentucky Stormwater Association Annual Conference Brownfield Bootcamp KAAE Annual Conference EEC Governor's Conference Watershed Watch Annual Conferences Freshwater Mussel Conservation Ohio River Basin Association Summit Kentucky Water Research Institute Annual Symposium Ohio River Basin Inspection Tour NKU's Wetland Delineation Microcredentials	
Watershed plan development areas	The NPS Team have worked in the following areas related to current or future watershed plan development: Beaver Creek Bee Creek Canoe Creek Clayton Creek Dry Branch Glenns Creek Hardy Creek Jennings Creek Lake Linville Laurel Lake Lower Pitman Creek McDougal & Castleman Creeks Mill Creek Upper Buck Creek Upper Paint Lick Creek Wilson Creek	

ACTIVITIES BY TYPE

Type	Description	Community Reached
Community Meetings Attended	Hinkston Creek Watershed NKU Center for Environmental Restoration FILO Hardy Creek Watershed Planning Meeting Trimble County Watershed Planning Meeting Garrard County Sanitation District Banklick Watershed Council LFUCG SSAC Meeting Hazard Disaster Recovery Subcommittee Meeting CREEC Meeting Clarks Run Watershed Meeting Danville Water Signage Wilmore Watershed Sampling Whitesburg Community Restoration Discussion Meeting Bowling Green Stormwater Meeting Henderson County Watershed Planning Meeting Friends of the Tug Fork River Smile Faith Community Meeting Levisa Fork Tire Round-up Committee Meeting Johnson County and Paintsville Floodplain Management Plan Limestone Creek Watershed Plan Meeting Hellbender Protection Slate Creek Watershed Planning Ohio River Conservation Corridor Launch Kentucky Emergency Management Grant Administration Elizabethtown impaired waterways and Green Infrastructure McDougal and Castleman Creek Watershed Advisory Council Meeting Elizabethtown work unit local working group Wetland Development Building Wetlands with Ducks Unlimited Green Sinks Meeting with Rowan County Bluegrass Greensource Area Development District Mason County Library Flood Mitigation Mt. Sterling Green Sinks Discussion NPS Strategic Planning Ohio River Work Group Curry's Fork Watershed Meeting UK CES Grant Application Discussion Buck Creek Watershed Lead in Drinking Water Herrington Lake Sampling Project Ohio River Restoration Plan Warren County Watershed Meeting Martin County Water Discussion Mills Creek Partners Meeting Beargrass Creek Alliance Rough River Lake Watershed Kentucky Waterways Alliance Ohio River Way Kentucky Native American Heritage Commission & Ripples Effects Ohio River Network Northern Kentucky Area Development District	Attended ~52 in-person and ~56 virtually community meetings throughout Kentucky

EDUCATION & OUTREACH: CLEAN WATER ACT CELEBRATION



Kentucky Division of Water Celebrates 50 years of the Clean Water Act

The year 2022 marked the 50th anniversary of the Clean Water Act (CWA) which established the goals of restoring and maintaining the chemical, physical and biological integrity of the nation's waters for the use and benefit of every American. Since its passage in 1972, the levels of water pollution in the United States have experienced a dramatic decrease.

To celebrate the work completed in the last 50 years and to showcase continued opportunities for this important work, the Division created an educational [website](#) to highlight resources, stories, and tips for conservation, including:

- The [Water Maps Portal](#) with a wide variety of water-specific web maps, applications and services.
- The [Story Map Gallery](#) includes Division Story Map and Map Tour applications that allow users to explore the waters of the Commonwealth.
- The [Integrated Report Hub](#) provides an opportunity to learn more about the 305(b) program, designated uses and assessment categories, and to review assessment results, impaired waters, and causes of impairments through the Commonwealth.
- Tips for Water Health & Conservation:
 - [Around your yard](#)
 - [In your community](#)
 - [In your garden](#)

Additionally, the Division created five videos to educate the public about water quality, monitoring, and inspections, and a [Clean Water Act 101 video](#) that provides a broad overview of the CWA and highlights how the Division helps keep drinkable, swimmable, and fishable in Kentucky.

Lastly, Governor Andy Beshear issued a Proclamation that designated October, 2022 as Clean Water Act Month in Kentucky (Figure 23).

There has been so much progress made by the Division of Water and the countless partner organizations across Kentucky to assess and manage the 90,000 miles of streams throughout the State. Of those streams, the Division has assessed 12,600 miles of streams and works to address known issues. The Division continues to focus on the importance of clean water, investment in clean water infrastructure and commitment to continued progress.



Figure 23 Governor's Proclamation for Clean Water Act Month

EDUCATION & OUTREACH: HIGHLIGHTS



Four Rivers Watershed Sustainability Festival and Summit

The Four Rivers Watershed Sustainability Festival and Summit grew from backyard conservation workshops, which were one-day events held by the Jackson Purchase RC & D Foundation (JPF), City of Murray, Calloway Conservation, and Calloway County Extension and 4-H, to a month of activities with multiple partners. The first festivals offered information tables on storm water runoff, NPS pollution, pollinator gardens, composting and recycling, previous concrete, planting and maintaining gardens, soil health, and fertilizer application, and the function and installation of rain barrels and rain gardens.

In 2018, the event moved to the Murray State University campus and the sponsors added a series of presentations to the usual information tables that addressed environmental projects in the area, including DOW CWA Section 319(h)-funded Damon Creek Watershed Implementation and Chestnut Creek Watershed Implementation. Speakers also presented information about the importance of the abundant water resources in Western Kentucky and the local partners and projects that work toward improving and protecting water quality.

In April 2019, the single day event became a month-long series of events to celebrate Earth Day and Water Quality and Sustainability. The Four Rivers Watershed Festival and Summit included a family day/festival of educational games, activities, and general information on clean water, conservation, and sustainability, an academic summit featuring state and local presenters who spoke about environmental issues and clean water, and several environmentally-themed movies, and a “Beast Feast” where wildlife students at Murray State cooked wild game and fish.

In 2022 and 2023, the Family Day event was filled with NPS demonstration models, tables with information about macroinvertebrates, water pollination, invasive species, beekeeping, and wildlife, and data from Watershed Watch in Kentucky. In 2022, the main attraction was Jason Lindsey, aka “Mr. Hooked on Science” who performed water-focused science experiments for the audience (Figure 24). In 2023 lessons on predators and prey, presented by Tennessee Fish & Wildlife and the MSU Wildlife Society, became the main attractions. (Figure 25)

The Four Rivers Watershed Festival and Summit has grown from five initial partners (JPF, City of Murray, Calloway Conservation, Calloway County Extension, and 4-H) to an array of sponsors, partners, and volunteers that organize, plan, and execute the event which include Jackson Purchase RC & D Foundation, City of Murray, , Calloway County Public Library, Calloway Conservation Office, UK Extension Offices, Four Rivers Watershed Watch, Friends of Clarks River National Wildlife Refuge, Friends of the Calloway County Public Library, Kentucky Division of Water, and from MSU, the Watershed Studies Institute, Hancock Biological Station, Arboretum, Department of Agriculture, Department of Humanities & Arts, Department of Biology, Bill Cherry Expo Center, Wildlife Fisheries Society, and Backcountry Hunters & Anglers.



Figure 24 Performance for the Family Day Event in 2022



Figure 25 Performance for the Family Day Event in 2023

Agricultural Day with 4-H Clubs

Becky Kaczur (The Graves County Conservation District Secretary - GCCD) and Rhonda Lamb (Four Rivers Basin Coordinator - FRBC) won the Kentucky Association of Extension 4-H Agents Specialty Award for Outstanding Achievement in Excellence in Natural Resources/Environmental Educational Programming. They also earned the Conservation District Outstanding Environmental Education Award from the Kentucky Association of Conservation Districts. They received these awards for their work with school children for Ag Day presentations within the Graves County School District which they delivered to 14 4-H clubs with approximately 270 children. This collaboration combined teaching children about watersheds with emphasis on the Mississippi River Watershed, demonstrating NPS pollution and what it means, discussing what children can do to help clean their watershed, and creating a “trash pickup kit” to complete their 4-H Community Service Project. Three clubs at one school went further by completing a trash pickup walk around school grounds.

The Four River Basin Coordinator provided “Enviroscapes” that demonstrate various water quality/pollution/watershed issues and solutions (Figure 26). For this collaboration, GCCD and FRBC chose the NPS Pollution Enviroscape that shows how pollutants enter watersheds through construction, neighborhoods, cleared ground, factories, roads, and farms. Ms. Kaczur and Ms. Lamb initially talked about what a watershed is and its importance to both local and regional life. They demonstrated how pollutants, like grease, feces, ag runoff, and factory effluent, impact water quality, and discussed what clean water means to both humans and the surrounding world.

Ms. Kaczur talked about children being the “solution, not the pollution” and their importance to the future of our world. She pointed out that while they are currently 9-11 years old, learning how to take care of their environment now will make all the difference for them as they age. She addressed why trash pickup walks matter, and then introduced simple rules to prevent safety issues, such as avoiding medical waste and sharp objects, making sure to have an adult present if walking on a road with possible traffic, and wearing bright colors for visibility. She finished with a description of the 4-H Community Service Project.

Each child received a pair of nitrile-lined gardening gloves, a trash bag, a flyer with the Community Service Project outline, and a reusable lunch bag or tote to put their materials in and reuse – emphasizing the “reusability” of both the gloves and the lunch/tote bag. If a child’s parent emails a photo of their child using the materials in a trash pickup walk to Ms. Kaczur, she will send the child a special die-cut vinyl sticker with an environmental theme.



Figure 26 Rhonda Lamb using Enviroscape

EDUCATION & OUTREACH:



KENTUCKY
project **WET**
WATER EDUCATION TODAY



The Kentucky Division of Water is the host institution for Project WET (Water Education Today) in Kentucky. The Project WET Foundation (PWF) is an international not-for-profit water resources education program that provides scientifically accurate and educationally sound water resource education materials, training courses, and networking services to citizens, organizations, governments, and corporations. The Kentucky Project WET Coordinator trains facilitators and educators across the Commonwealth, ensures that certified facilitators have all required forms to support their workshops, manages activity guide orders, develops and maintains a database of certified facilitators and educators in Kentucky, and provides an annual report to PWF detailing Project WET workshops. Kentucky Division of Water has formed a partnership with the Kentucky Association for Environmental Education (KAEE) to coordinate project trainings and further promote statewide water education.

In FFY 2023, KAEE continued using Project WET in collaboration with the Next Generation Science Standards (NGSS), a model that is now used by Project WET coordinators nationwide. Incorporating the Next Generation Science Standards is crucial to ensure the integration of environmental education into academic curricula and helps formal educators, guided by state required and -assessed standards, justify how Project WET activities correlate with NGSS. This is important for non-formal educators engaging with formal educators by addressing their NGSS-driven scholastic needs. KAEE also created a resource to help educators correlate Project WET to the Kentucky Academic Standards.

During FFY 2023, KAEE's Project WET program conducted 20 educator workshops and reached 269 educators, including (K-12) educators, university educators, pre-service educators, and non-formal educators.



Figure 27 Educators participate in a Project WET activity during a workshop

EDUCATION & OUTREACH: WEBSITE AND SOCIAL MEDIA



Webpages

Each Basin Coordinator maintains a basin-specific webpage under the [Community Outreach and Involvement](#) tab on the Energy and Environment Cabinet website. This user-friendly page informs the reader about watershed planning efforts in each basin by including current EPA approved watershed plans, watershed plans in development, watersheds that have been identified as a basin team priorities, success stories, upcoming local events, and additional resources that may be needed during the watershed planning process.

Additionally, the Nonpoint Source & Basin Team Section maintains the webpage which gives the user helpful information about the CWA Section 319(h) Grant Program and allows access to the Kentucky Water Health Guide, the Watershed Planning Guidebook for Kentucky Communities, the EPA Watershed Planning Module, and the 319 Grant Reporter. Users can also access the Integrated Report Hub Site, and the Water Health Portal which contains user-friendly interactive maps displaying water data that ranges from water quality impairments to harmful algal blooms, as well as tools to examine drought potential. The Division maintains an ArcGIS Storymap Gallery that allows users to explore specific projects, and watershed planning initiatives and programs.

Social Media

According to Google, an estimated 4.9 billion people worldwide use social media in order to stay relevant, it is essential to use social media as a source for outreach to Kentucky communities. To reach new demographics and travelers interested in Kentucky's rich heritage, the section manages social media platforms on both Facebook and Instagram (@kywildwaters). Both pages focus on informing readers of CWA Section 319(h) grant projects around Kentucky, sharing infographics on how to identify Harmful Cyanobacteria Blooms and what to do if one appears, how to get involved with Citizen Science, stream clean-ups, and articles pertaining to water quality. Each Coordinator is responsible for including content pertaining to their basin.



Figure 28 Volunteer Lake Monitoring Program Flyer

EDUCATION & OUTREACH: MATERIALS



Naturally Connected Blog and Land, Air, & Water Articles

The Energy and Environment Cabinet maintains several publications including a blog called Naturally Connected, and the webzine and video series called Land, Air, & Water. During water-related events, the NPS team worked with these publications to promote the CWA Section 319(h) Grant Program and a variety of other programs.

Examples of Land, Air, & Water articles published this fiscal year include:

- [New Tool Available for Kentucky's Watershed Professionals](#) (October 26, 2022)
- [Saving Money and Protecting Waterways While Managing Lawns and Gardens](#) (November 29, 2022)
- [Reducing Your Pollution Impact Over the Holidays](#) (December 21, 2022)
- [After 25 years of water sampling on Hinkston Creek, Larry George looks forward to new Challenges](#) (March 22, 2023)
- [There is Nothing Retro about the Latest Basin Retrofits](#) (May 11, 2023)

Examples of Land, Air, & Water videos published this fiscal year include:

- [Managing Stormwater with Basin Retrofits](#) (April 24, 2023) (picture below)



Figure 29: Images from the video shoot of *Managing Stormwater with Basin Retrofits*

Basin Coordinator Quarterly Newsletters

The Basin Coordinators distribute quarterly newsletters (Figure 30). These newsletters are statewide, thereby allowing a team approach to developing content. The information in these newsletters includes everything from introduction of new team members to Basin Team updates and highlights of basin successes to information on best management practices and watershed management-related funding updates. The statewide approach allows river basin stakeholders to learn about and engage with NPS efforts outside of their basin.



Figure 30: Example of the Basin Coordinator quarterly newsletter. Summer, 2023 edition, which introduces the newest Nonpoint Source Team members

EDUCATION & OUTREACH: VOLUNTEER LAKE MONITORING



Outreach Materials

The Division of Water created and published a total of 22 lake outreach materials throughout the summer and into the fall of 2023, including newsletters, social media posts, and handouts. Most of these handouts informed the public about harmful algal blooms (HABs) and Cyanotoxins, but topics such as safe water recreation, proper boat recreation, and aquatic life were also covered. Resources that promoted and explained the Volunteer Lake Monitoring Program (VLMP) were also created.

Social Media

Several social media posts were created and shared to Facebook and covered topics related to HABs, human and animal safety, and proper recreation.

Published Posts:

- V.L.M.P. Flyer, Facebook (July 7, 2023)
- How to Reduce Cyanobacterial Blooms (July 6, 2023)
- HABs in Your Area (July 3, 2023)
- What to do if Your Pet Ingested Cyanotoxins (July 3, 2023)
- Green Algae vs. Cyanobacteria (June 29, 2023)
- The Stick Test (June 29, 2023)
- What are HABs? (June 29, 2023)
- Swimming Recreation Safety Tips (June 28, 2023)
- Queen Anne's Lace vs. Poison Hemlock (June 28, 2023)
- Water Snake vs. Copperhead (June 26, 2023)
- Know What's Below (June 26, 2023)
- Water Snake vs. Water Moccasin (June 21, 2023)
- Lake Courtesy (June 21, 2023)
- How to Stay Safe on the Water (June 19, 2023)
- Water Recreation Safety Tips (May 31, 2023)

VLMP Newsletters

The VLMP summer monthly newsletters began in July of 2023, and are planned to be released monthly during the summer of every year. Each newsletter covered various topics relating to lake health and recreation safety.

Published Newsletters:

V.L.M.P. Newsletter, Volumes 1-4 (July-October 2023)

Other Outreach Materials

- Harmful Algal Bloom Rack Card (July 19, 2023)
- Snake Rack Card (July 19, 2023)
- Harmful Algal Bloom Trifold (June 15, 2023)



Figure 31: Example of VLMP newsletter, published August 2023

EDUCATION & OUTREACH: EQUIPMENT RENTAL



The Division of Water has a large supply of environmental educational equipment available for checkout, which allows teachers and other professionals to use various pieces of equipment for educational events in their regions. The equipment available includes items such as stormwater models, Envirosapes, display boards, and a stream table. In addition, a costume for “Ollie the Otter”, DOW’s Mascot, is available for events. A display box with 30 different macroinvertebrates to view, and a flip card booklet that describes the organism and its sensitivity to pollution, has also been added.

During 2023, DOW loaned Envirosapes for five events and the Ollie the Otter costume for five appearances. The macroinvertebrate display box was checked out for six events, and the stream table is on loan for a year-long exhibit at the Living Arts and Science Center in Lexington, KY.



Figure 33 Staff set up a stormwater model for Marsh Madness



Figure 34 Close up of one of the Envirosapes available for rent



Figure 35 NPS Staff wear DOW Mascot with Floyd County, KY Education Staff

EDUCATION & OUTREACH: WATERSHED WATCH



Watershed Watch in Kentucky (WWKY) continues to support water quality monitoring that informs, connects, and empowers volunteers and their communities to improve and protect Kentucky water resources. WWKY, established in 1997, trains, equips, and supports a dedicated group of volunteers across seven river basin units who actively monitor the Commonwealth's streams, rivers, and lakes.

Watershed Watch will be making more changes this year as it works towards becoming a truly volunteer-operated program. This will include volunteers analyzing their own bacteria samples and reporting their findings to a Survey 123 database. The organization maintained the previous method of sampling and training during this reporting period, which included sending *E. coli* grab samples to labs for analyses.

Watershed Watch currently has 960 active volunteers and 1096 active sampling sites across the state of Kentucky. There were 859 *E. coli* samples collected and analyzed during this reporting period and 41 nutrient samples, for a total of 984 samples collected and analyzed.



Figure 36 Staff at a Salt River Watershed Watch Fundraiser

In the winter of 2020, WWKY introduced potential volunteers to an online introductory training that is still being used as the initial step for individuals who want to become samplers for the program. This year 73 people completed the online training, of which 57 completed with an in-person, hands-on training that demonstrated the use of field chemistry equipment and grab sample collection. WWKY also offers an online volunteer recertification course; 37 people completed recertification and received new replacement chemicals for their dissolved oxygen and pH test kits.

WWKY also introduced the new in-person Habitat training which 40 volunteers received.

During this reporting period three volunteers completed a "Train the Trainer" workshop, resulting in the Licking River basin gaining two new trainers and the Kentucky River basin adding one new trainer.



Figure 38 Watershed Watch training for NPSBT

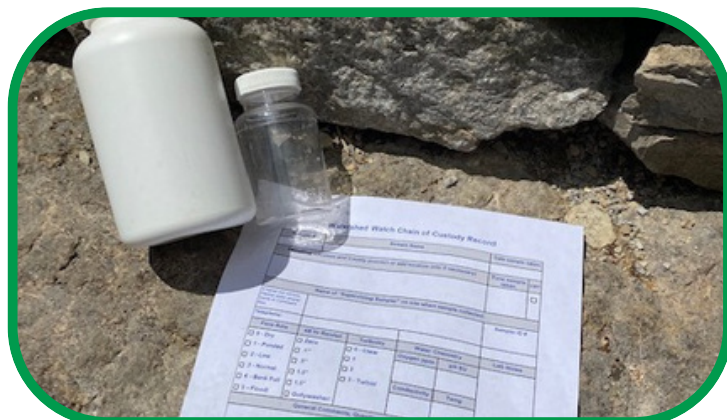


Figure 39 Supplies and Form for Watershed Watch



TOOLS FOR CLEANER WATER

319 Grant Program Updates

Bacteria Load Reduction Model

Mapping Tools

NPS TOOLS: 319 GRANT UPDATES



Grant Process Improvements

During FFY 2023, the Division evaluated the CWA Section 319(h) Grant Program and process to determine the effectiveness of the changes made in 2022 and adjust accordingly. The Team continues to use the timeline, letter of intent process, updated application, and developed resources that were established in 2022.

The Division established four major goals to improve the CWA Section 319(h) Grant Program: (1) streamline the application process for both partners and Division staff, (2) update the application and supporting documentation, (3) incorporate environmental justice into the application process, and (4) increase available resources to make the application process easier.

Goal One: Streamline

Streamline the application process for partners and Division staff. After the success of the FFY 2022 schedule the team has kept that schedule and has made adjustments to the Letter of Intent process.

- Early October: 319(h) Grant cycle begins
- Mid November: The Letter of Intent is due and is still strongly encouraged.
 - This year Basin Coordinators played a vital role in encouraging and reminding project partners to submit their letter.
 - Upon receiving the Letters of Intent, each are assigned their Basin Coordinator and Technical Advisor
 - Each partner that sends a Letter of Intent is invited to a Grant Webinar
- Early February: The final application must be submitted. Applications will be reviewed and ranked by a diverse group of professionals. and projects will be funded based on rank and review results, comments, and Division priorities.

Goal Two: Update

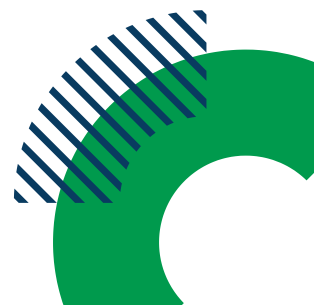
Update the application and supporting documentation. The Section reviewed and revised all 319(h) related documents. After difficulty with editing and finalizing applications, The Section returned to Word 2016 format instead of a pdf.

Goal Three: Revise

The Nonpoint Source & Basin Team Section and the CWA Section 319(h) Grant administrators revised the rank and review criteria to award points by individual criteria rather than by section. This will reduce reviewer subjectivity when ranking project proposals and more clearly communicate expectations to applicants and reviewers.

Goal Four: Maintain

Maintain and improve available resources to ease the application process. The Section updated resources developed in 2022 for the current grant cycle which are available on the [Section 319\(h\) Grant Program webpage](#) under "Section 319(h) Resources". The Team plans to host a 319 Grant Webinar which will explain the CWA Section 319(h) grant process to applicants, including an overview, section by section instructions, and the project selection process. The webinar will be open to the general public and partners that submitted a Letter of Intent will receive an invitation to attend.



NPS TOOLS: BACTERIA LOAD REDUCTION MODEL



Water pollution caused by fecal contamination is a significant issue as it can lead to the spread of illnesses caused by pathogens. The presence of coliform bacteria, specifically *Escherichia coli* (*E. coli*), is an indicator of fecal pollution and the potential presence of harmful pathogens. As *E. coli* is not typically found outside of the gut and feces of warm-blooded animals, it is considered the best indicator of fecal contamination and the possible presence of dangerous pathogens. A new Kentucky specific bacteria load reduction model has been developed that will help quantify the success of different programs aimed at improving water quality across the state.

Kentucky's physical setting, characterized by its karst development and unique physiographic regions, plays a significant role in bacteria transport and survival. Karst features, which make up a substantial portion of the state, can serve as underground pathways that connect surface water and groundwater systems. However, the challenges of managing NPS pollution in karst areas stem from the lack of documentation and the rapid movement of contaminants, like fecal coliforms, to surface waters and groundwater. Additionally, the state's diverse soil characteristics, influenced by variations in geology and topography, contribute to soil erosion and runoff, further facilitating the movement of bacteria to waterbodies and groundwater. The high population concentration in karst regions and regions with soils prone to runoff and erosion compounds the issue. Agricultural activities,

particularly livestock farming, and improperly managed onsite wastewater systems exacerbate NPS contamination in Kentucky because a significant portion of the population relies on septic systems or lack proper treatment systems. This combination suggests that bacterial contamination of waterbodies is likely widespread throughout the state.

In early 2023 DOW staff developed a Kentucky specific bacteria load reduction model based on the work of the South Carolina Department of Health and Environmental Control and research from the University of Kentucky. The working model was piloted with best management practices (BMPs) installed using 319(h) funds in FFY 2023. This model will help DOW assess the progress made in approved watershed plans, specifically the BMP implementation sections of these plans. There is also potential for other state programs, such as the Kentucky State Cost Share Program, to use this model to quantify *E. coli* load reductions for cost share funded BMPs. It also gives DOW the opportunity to compare this data to *E. coli* sampling data collected post-implementation which may help DOW gauge model accuracy.

The Division will apply the model to track and assess the effectiveness of various water quality improvement efforts through the 319(h) and TMDL programs. This model will provide valuable insights into the reduction of *E. coli* levels and inform decision-making to further protect and restore water quality in the state.



Figure 40 Unconfined cattle were previously allowed to access to a creek, allowing *E. coli* and other nonpoint source pollutants to enter the waterway

NPS TOOLS: MAPPING



Equity Analysis Tool

Kentucky's Equity Analysis Tool was created as part of the Environmental Protection Agency's (EPA) Phase II Equity Analysis Pilot with the states. The objectives were to 1) develop accessible methods of assessing where NPS pollution issues and program priorities exist in relation to communities with Environmental Justice concerns, and 2) provide an NPS-focused method for state programs to assess, track, and/or prioritize NPS program investments. The Kentucky Pilot utilized the Recovery Potential Screening Tool (RPST) framework to develop a state-specific version to identify NPS priorities while incorporating environmental justice concerns. A team of Kentucky Nonpoint Source and Basin Team (NPSBT) staff, EPA NPS staff, and Cadmus Group, a contracted consultant, worked together to develop the tool for Kentucky. The RPST typically consists of a variety of metrics within each ecological, stressor, and social categories that are assigned weights and combined, resulting in a prioritized list of HUC 12 watersheds. The new tool consists of two ecological, two stressor, and one social category with the metrics customized for different analyses around the state. Metrics for each category are listed to the right.

The Equity Analysis Tool will allow Division staff to better incorporate the needs of disadvantaged communities while prioritizing watersheds for work. This includes companion mapping that allows staff to see real-time updates as criteria are adjusted for different analyses (Figure 41). This differs from the Excel version of the RPST that requires re-setting for other analyses. Although the work was completed in FFY 2023, the Equity Analysis Tool will be used during the FFY 2025 grant rank and review process so staff can become familiar with it and set parameters for different analyses for different types of projects around the state.

Tool Criteria

Ecological - emphasis on protected areas

PHWA Watershed Index (standalone) or

Ecological – emphasis on headwaters

Custom: % N-Index, % Wetlands, % Woody Vegetation in Riparian Zone, Aquatic Condition Score, Presence of Critical Habitat for Aquatic Species, Headwater HUC12 Flag, % Draining to 1st, 2nd, or 3rd order streams, Unimpaired Waters

Stressor – NPS

Nitrogen Yield, Phosphorus Yield, Suspended Solid Yield, Impaired Waters %, Impairment Count, Impairment Cause Count, Nutrient Impaired Waters %, Sediment Impaired Waters %, Pathogen Impaired Waters %

Stressor – Pollutant Exposure

Risk Management Plan Site Count, Hazardous Waste Management Site Count, Toxic Release Inventory Site Count, Superfund Site Count, Impervious Surface Cover, Permitted Mines (state-specific indicator)

Social

% Low Income Population, % Less Than High School Educated Population, % Linguistically Isolated Population, % Vulnerable Age Group Population, Inverse NPS Pollution Control Project Count, Unassessed Waters %, Historically Redlined Communities

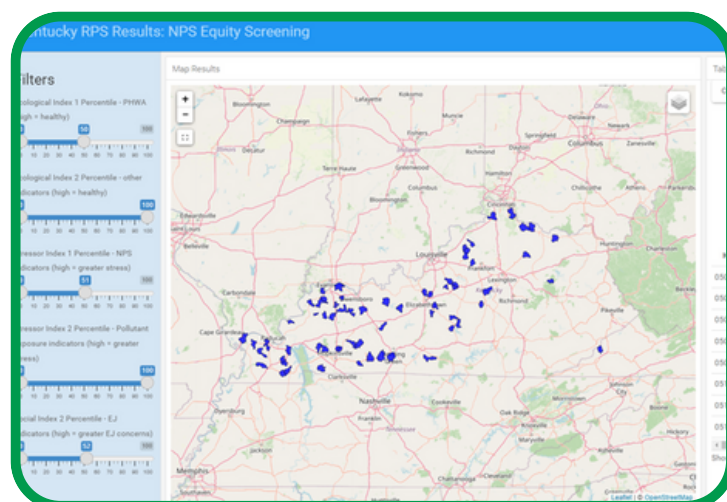


Figure 41 Equity Analysis Tool Companion Mapping Tool

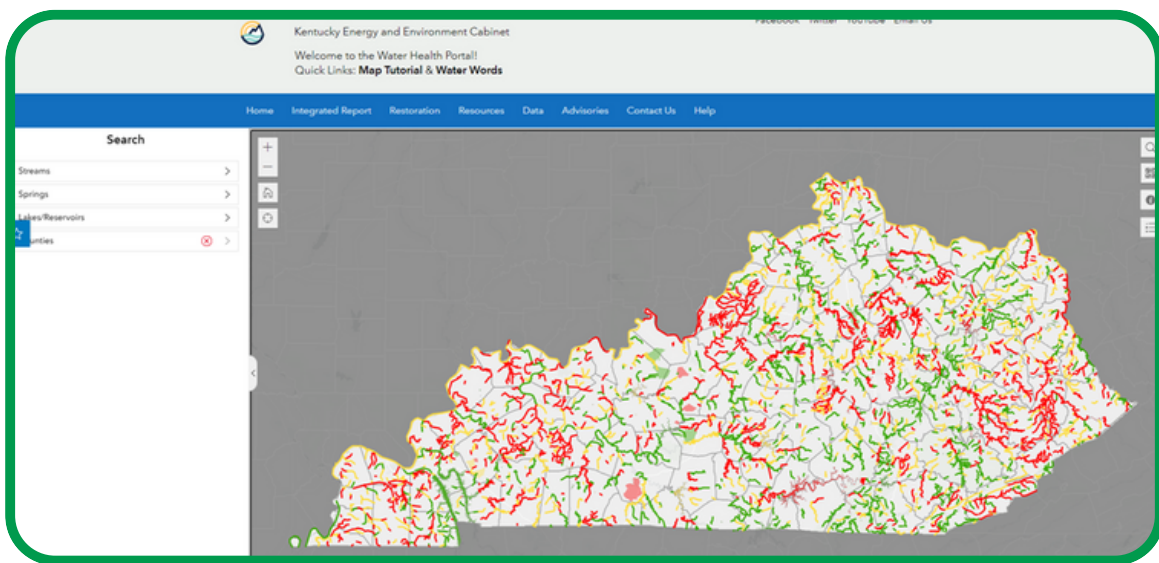


Figure 42 Water Health Portal landing page.

Water Health Portal 2.0

The [Water Health Portal](#) (WHP) is a one stop shop for all state water health information. This viewer provides the status of surface water uses for all assessed streams, springs, and lakes. From swimming, to fishing, to drinking water use, this viewer provides detailed information in an easily accessible format (Figure 42). In FFY 2023, the Water Health Portal was updated with data from the 2022 Integrated Report.

The WHP also identifies Kentucky Outstanding State Resources Waters (OSRW) and connects to studies and reports on various streams. Each assessed segment includes an Assessment Unit Summary which provides additional details on the assessed designated use, county, assessment date, and description.

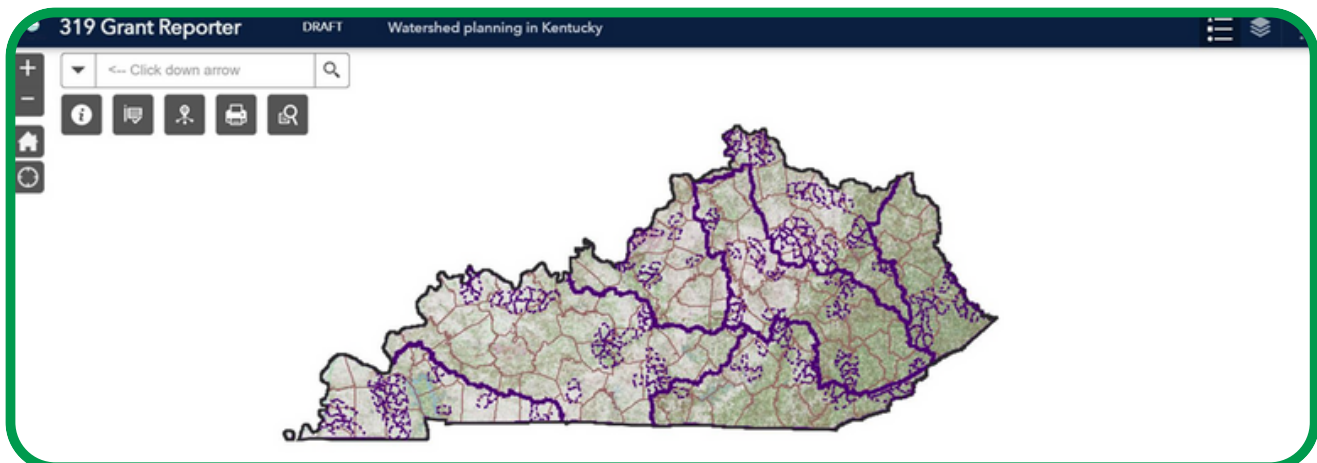
319 Grant Reporter

The online 319 Grant Reporter is an mapping and report-generating program that allows users to search for their watershed of interest and identify information necessary for CWA Section 319(h) NPS Funding applications. Users will be able to search for their watershed using stream name, county, Hydrologic Unit (HUC), or by scrolling to its location (Figure 43).

Once the correct watershed is selected, users will know in which major river basin it is located, whether it has been assessed to meet its designated uses, has a Total Maximum Daily Load Allocation (TMDL), is located in a Source Water Protection Zone (SWPP), or has any assigned special designations such as OSRW or a Priority Watershed. Users can download and print a copy of the report and attach it to the CWA Section 319(h) application or use it for any other purpose. In FFY 2023, the 319 Grant Reporter was updated with data and metrics from the 2022 Integrated Report.

For more information about the 319 Grant Program please check out the Kentucky Division of Water's [319\(h\) Grant Program Funding page](#).

Figure 43 319 Grant Reporter landing page

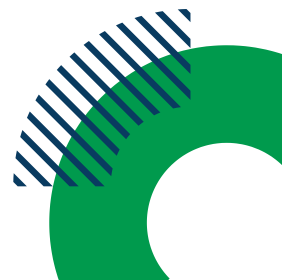


TEAM
KENTUCKY[®]

ENERGY AND
ENVIRONMENT CABINET



ENVIRONMENTAL JUSTICE EFFORTS



ENVIRONMENTAL JUSTICE EFFORTS



In July of 2021 the Biden Administration announced the “Justice 40 Initiative”, which requires that 40% of all Federal Benefits from certain programs be directed to disadvantaged communities that are marginalized, underserved, and overburdened by pollution. The Division has been working to ensure that it reaches communities most affected by NPS pollution, and that a minimum of 40% of its funds go to disadvantaged communities. Although much of the work in Kentucky already takes place in disadvantaged communities, the program has identified several barriers to groups new to watershed planning that can be improved, including lack of water/environmental literacy, lack of access to technical information and resources, and limited time and financial resources.

In order to identify and prioritize disadvantaged communities for NPS work within the state, Kentucky participated in the EPA Phase II Analysis for Incorporating Equity and Environmental Justice into Nonpoint Source Management, which included providing analytical assistance to states in using data layers that characterize disadvantaged communities, and helps decision-making in watershed projects, capacity building, outreach and education, and other NPS management activities. The Kentucky pilot utilized the Recovery Potential Screening Tool Framework to create a method that allows users to prioritize watersheds and address both disadvantaged communities and NPS concerns. Kentucky designed the tool, finalized in Summer 2023 for use in FFY 2025, to facilitate separate analyses for different parts of the geographically and demographically diverse state.

Additionally, the Division is working to limit the technical expertise and resources, financial barriers, and time required to pursue watershed planning and access to CWA Section 319(h) funding. This has primarily been done through the publication instruments such as the [319 Grant Reporter](#), that remove the need for technical expertise, separate mapping software, and decrease the time required to compile a grant application. The Division also has several other mapping and data resources available to the public, including the [Water Health Portal](#) and the [Watershed Explorer](#), that increase access to technical information.

For more information about mapping tools, see Chapter 5, Section 3.

The Division is simplifying and streamlining its watershed planning process by providing additional technical guidance and resources which reduces barriers to watershed planning. The Division is also examining the expansion of education and outreach efforts to improve water literacy across the state.



Figure 44 NPS Staff conducting water outreach to Bowling Green, KY students



FOCUSED INITIATIVES

Healthy Watershed Program

On Farm Water Management

Mapping Tools

Nature Based Solutions

MS4 Partnerships

Homeowners Assistance Programs

FOCUSED INITIATIVES: HEALTHY WATERSHEDS



The Division recognizes the importance of protecting healthy watersheds and is developing a method to do so. The Buck Creek Watershed is a pilot Healthy Watershed.

Protecting healthy watersheds in Kentucky offers a multitude of environmental and economic benefits. Watersheds feed into streams, rivers, and lakes, and play a crucial role in maintaining Kentucky's biodiversity by providing habitats for various aquatic and terrestrial species. A healthy watershed acts as a natural filter, capturing pollutants, sediments, and excess nutrients, so that water remains clean and safe for both human consumption and aquatic life. The natural vegetation along watersheds helps stabilize soil which reduces the risk of erosion and prevents sedimentation in waterways.

From an economic perspective, safeguarding watersheds in Kentucky has direct implications for industries such as agriculture, fisheries, and tourism. Clean water is essential for crop irrigation, livestock, and maintaining healthy fisheries, all of which contribute significantly to the state's economy. Furthermore, the scenic beauty of Kentucky waterways attracts tourists, which boosts local businesses and fosters recreational activities like fishing, boating, and hiking. Preserving the health of watersheds is not just an environmental necessity but also an economic imperative for the Bluegrass State.

Protecting land to maintain the health of a watershed, as opposed to stream restoration, offers a plethora of benefits. Prevention is often more effective and less costly than remediation. Once a watershed is degraded, the restoration process can be time-consuming, expensive, and may never fully replicate original conditions or the complex ecological processes that were present. Intact ecosystems have evolved over millennia, and their intricate web of relationships, from soil microbes to apex predators, can be challenging to recreate artificially.

Intact and protected watersheds provide continuous ecosystem services without interruption, including clean water, flood regulation, habitat for biodiversity, and carbon sequestration. When a watershed is degraded, these services can be disrupted and can result in immediate negative impacts on humans and the environment. For instance, degradation can lead to reduced water quality which requires more treatment for human consumption, and increased flood risks due to lost wetlands or forest cover. By proactively protecting land and its natural processes, the sustained health and functioning of a watershed is improved and prevents the cascading negative effects of degradation and subsequent restoration attempts.



Figure 45 Upper Cumberland by April Dudgeon

FOCUSED INITIATIVES: ON FARM WATER MANAGEMENT



The On-Farm Water Management Program is a collaboration between the Kentucky Division of Water and the Kentucky Office of Agricultural Policy. The program seeks to minimize water resource challenges for the agricultural community by helping producers capture, store, and use every drop of water that falls on their property. This grant program funds projects that implement water quantity BMPs. The Division provides technical expertise and performs site visits for interested farmers.

Implementing an on-farm water management program brings significant water quantity benefits. Effective water management practices, such as rainwater harvesting, controlled irrigation, and the use of cover crops, can enhance the efficiency of water use on the farm. By optimizing the distribution of water, farmers can reduce the waste that often occurs with unregulated watering, ensuring that crops receive the right amount needed for growth. Water conservation not only ensures a consistent supply during drier periods but also mitigates the stress on local water sources so that aquifers, streams, and rivers are not overdrawn.

Beyond water quantity benefits, an on-farm water management program also improves water quality. By implementing best management practices like contour plowing, crop rotation, and the strategic use of natural buffers and wetlands, farms can reduce fertilizer, pesticide, and sediment runoff into nearby water sources. These measures decrease the risk of nutrient pollution which can lead to harmful algal blooms and the degradation of aquatic ecosystems. Maintaining healthy soil structure and using organic farming methods minimizes the leaching of harmful chemicals into groundwater so that both surface and groundwater sources remain clean and safe for consumption and support the overall health of Kentucky aquatic habitats.

In FFY 2024 the Division conducted 5 site visits with farmers and helped farmers with their On Farm Water Management Program Applications.



Figure 46 & 47 Alternative Water Sources BMPs

FOCUSED INITIATIVES: NUTRIENT REDUCTION STRATEGY



In 2022 the Kentucky Division of Water (DOW) updated the Kentucky Nutrient Reduction Strategy (eec.ky.gov/nutrientreduction) and began outreach to stakeholders and partners. In the fall of 2022 and spring of 2023, DOW presented the updated strategy to partners that included the Kentucky Stormwater Association, Lexington-Fayette County Urban Government, the Kentucky Agriculture Water Quality Act Authority, the American Council of Engineering Companies of Kentucky, ORSANCO, and the Kentucky Water and Wastewater Operators Association. In June of 2023, DOW invited over 100 stakeholder and partner representatives to the Nutrient Reduction Strategy kick-off meeting and invited all participants to engage with nutrient-focused workgroups.

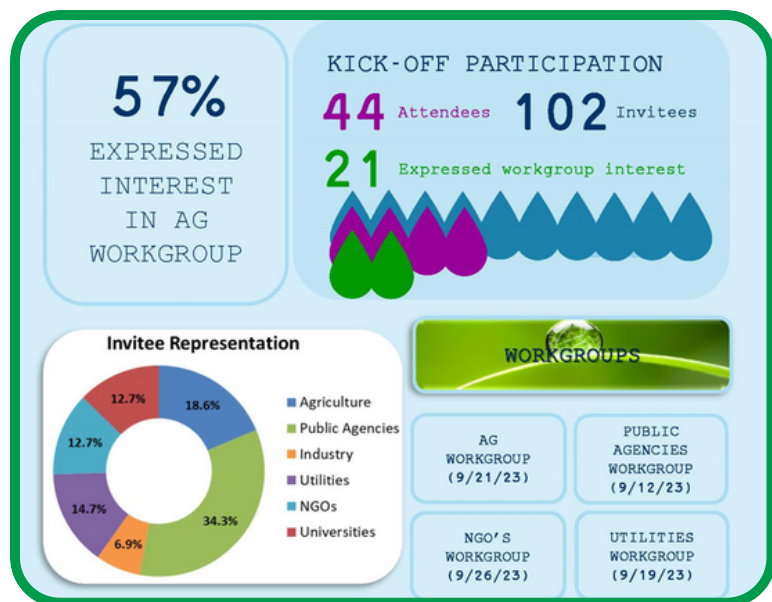


Figure 48 Nutrient Reduction Strategy Kick-Off Results



Figure 49 Ag Water Quality Plan Flyer

FOCUSED INITIATIVES: NATURE BASED SOLUTIONS



Bioretention is one of the most widely implemented nature based solution. Compared to gray infrastructure that relies on redirecting stormwater flow, nature-based solutions allow the landscape to naturally store, filter, and dissipate water, which reduces the flow and quantity of stormwater entering sewer systems and surface waters. The Division has taken Nature-Based Solutions a step further by implementing Green Sinks to help with flood mitigation.

One of the major issues the Commonwealth continuously faces is flooding, such as the Eastern Kentucky 100-year flood in July of 2022. Among the responsibilities of a Basin Coordinator is to listen and learn about local community needs by meeting with stakeholders and community members to identify the best solutions to water-related concerns.

One method that is gaining traction in the Licking River Basin and holds a lot of promise is Green Sinks, which are large, bottom-permeable bioretention basins, built to capture as much flood water as possible from local creeks and impermeable surfaces before they inundate neighborhoods and

communities. The captured water is temporarily held in a Green Sink basin, after which it filters down to groundwater, leaving behind filtered-out pollution and making them a useful mechanism for regulating both the quantity and quality of flood water. In addition, Green Sinks can be incorporated into public greenspaces, making them an attractive multi-use option for both local government officials and citizens.

Current Green Sinks projects across the Licking Basin include plans by the City of Morehead to build approximately ten to twelve Green Sinks along the length of Triplett Creek as a means of flood mitigation, and to connect all of the Green Sinks with a hiking and biking trail (Figure 50) to create a multi-purpose public green space. The City of Maysville plans to build Green Sinks in the city center to mitigate flooding from a local creek, while concurrently restoring the creek for recreational use and developing hiking trails. Both of these projects are great examples of the multipurpose benefits of nature-based solutions. [See Featured Projects in Chapter 2 for more details.](#)

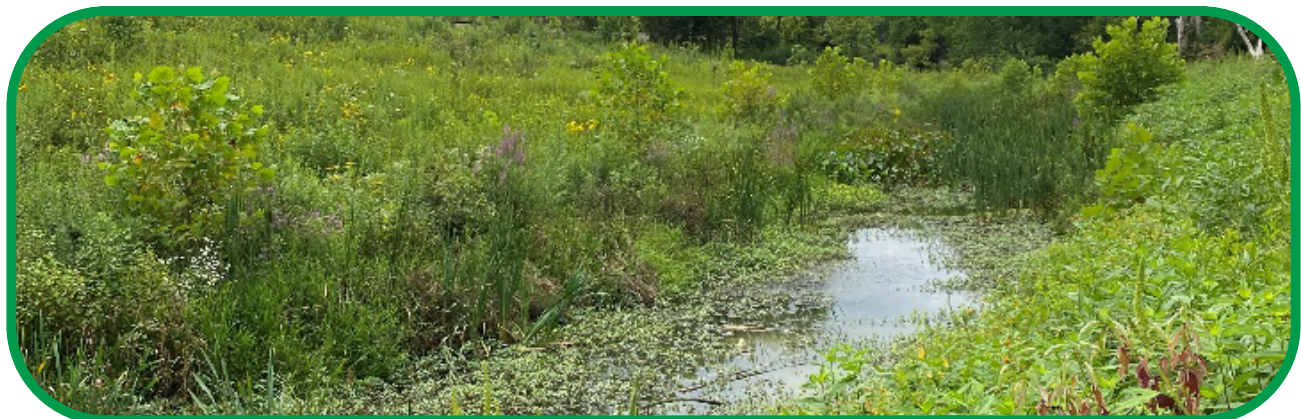


Figure 50 The Wolsing Woods Wetlands acts as a green sink for the Banklick Watershed

FOCUSED INITIATIVES: MS4 PROGRAM PARTNERSHIPS



Municipal stormwater runoff can be a major contributor of nonpoint source (NPS) pollution in Kentucky's waterways, therefore establishing an understanding of overlapping priorities and local partnerships with the Municipal Separate Storm Sewer Systems (MS4) programs is essential. In FFY 2023 the Division devoted one team member to investigate MS4 permit requirements, determine overlaps in priorities, and identify community needs and challenges, particularly in relation to NPS and nature based solutions (NBS). To do this they traveled with the Division's MS4 coordinator to attend Phase I and II inspections (Figure 51), interviewed Phase 1 and 2 MS4 communities that have implemented NBS, and networked at the annual Kentucky Storm Water conference, which is mostly attended by MS4 coordinators and affiliated public and private personnel.

Through these inspections and interviews, the team was able to identify some overlaps in priorities and an understanding of common barriers that exist to meeting MS4 requirements and implementing NBS.

Barriers to success identified have included; construction issues due to lack of technical expertise, incompatible NBS for the environmental conditions, and maintenance requirements due technical expertise and funding required. The Division is continuing to investigate these barriers and work with communities to identify solutions.

Many of the Phase II MS4 permittees also rely heavily on volunteer support and community groups to achieve some of their Minimum Control Measures (MCMs), but recently, many permittees have little-to-no community involvement in their MS4 programs. Basin Coordinators spend a significant amount of time networking within their basin and conducting water focused education and outreach programs. Basin Coordinators are poised well to help MS4 Coordinators network and engage with their communities. In turn, this will help the Basin Coordinator conduct necessary education and outreach and to strengthen partnerships within their MS4 communities.



Figure 51 NPS Team member partnering with MS4 State Coordinator for Phase II permittee construction site inspection

Additionally, many communities identified the stormwater education and outreach requirement to be a barrier to their success. The Division's Basin Coordinators can help with the design and implementation of educational and outreach materials for this purpose. Currently, a booklet of tabling activities for the MS4 coordinators is in development. This booklet will have instructions on how to build hands-on activities with stormwater/NPS messaging, that can be used to

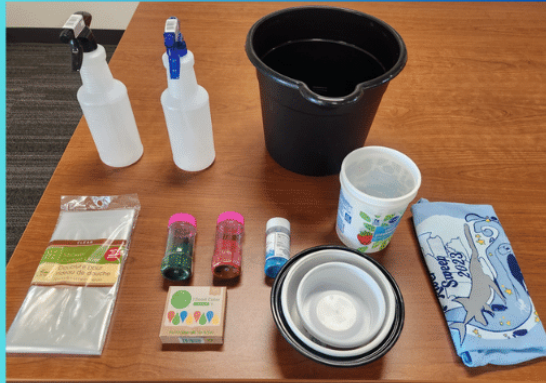
engage the public for 5-10 minute intervals as they visit a MS4 coordinator's table (Figure 52).

The Division is planning to continue this work and present the findings and resources at the next Kentucky Stormwater Association conference in FFY 2024. This will further bring awareness to the MS4 Communities of what the Basin Coordinators do and provide them the opportunity to engage with the Division in a new way.

Build a Watershed Activity

Supplies:

- Bucket or Large Container
- Shower Curtain
- Old towels or t-shirts
- Food Containers
- Sprinkles
- Food Coloring
- Spray Bottles



1. Have the kids stack the containers (at least 1' to 2' high). These will be the mountains and hills of your watershed!

ASK:

- Where do you think water comes from?
- Do you have a stream or lake near you?
- When it rains where does the water go?



Figure 52: Example of tabling activities being developed for MS4 coordinators.

FOCUSED INITIATIVES: HOMEOWNERS ASSISTANCE PROGRAMS



The Homeowner Assistance Program (HAP) is a reimbursement program designed to help homeowners connect to sewer lines for regional wastewater treatment facilities. The program aims to improve water quality by eliminating failing onsite wastewater systems, ease the financial burden for homeowners, and promoting sustainable practices. The program requires partnerships with local sanitation districts, health departments, state plumbing inspectors, licensed plumbers, and licensed septic installers. Homeowners are responsible for certain costs, but reimbursement percentages vary depending on income status. HAP covers activities such as installation of lateral lines and decommissioning of septic tanks but will not cover items such as tap-on fees or road repairs. Potential sources of matching funds for a HAP project include tap-on fee donations, homeowner contributions, staff hours, and financial contributions from local government agencies.

Lincoln County HAP: Phase I (16-08 & 16-09)

The Lincoln County Homeowner Assistance Program, funded by a 319(h) grant, connected homeowners to the local sanitary sewer system in order to improve water quality and protect the environment. Through public events and contractor training, the program successfully promoted and implemented the connection of 289 residences to the Lincoln County Sanitation District. While challenges such as underestimated construction costs and low contractor participation prevented more robust implementation, overall, the program was considered a success by the stakeholders and local officials.

Lincoln County HAP: Phase II (22-06)

This ongoing project focuses on addressing fecal coliform pollution in the Hanging Fork Watershed. The Hanging Fork Watershed Plan identified livestock and human waste as significant sources of pollution and found that conventional onsite wastewater systems were failing to properly treat household wastewater. The original watershed planning effort led to the formation of the Lincoln County Sanitation District and the implementation of a sewage collection system. Funding was secured to provide financial assistance to homeowners to connect their homes to the new system. The project is currently in Phase II, which will eliminate failing septic systems and continue addressing environmental and human health concerns. The Sanitation District and its partners are working to incentivize residential use of the new system. The ongoing HAP offers financial and technical assistance to residents who connect to the new system, with eligibility requirements based on income and proximity to the sewer. The project has resulted in 104 connections so far, with an additional 363 new sewer connections expected.



Figure 53 Project 16-08 Collapsed septic tank was decommissioned and residents were connected new lines



Figure 54 Workers in Scott County connect residents to new sanitary sewer

Boone Co HAP (18-09)

This project addressed groundwater contamination caused by failing septic systems in the Gunpowder Creek Watershed. Through the installation of a new sanitary sewer line and decommissioning existing septic tanks, 99 homes were connected to the new lines. The project faced various challenges, such as coordinating with multiple agencies, obtaining permits, and addressing residents' concerns about yard restoration. Although there were challenges during the restoration phase, ultimately the project was deemed successful and beneficial for all parties involved and the project is expected to improve water quality in Gunpowder Creek. Marshall Co HAP (18-10) and Ongoing Work This project was designed to reduce the amount of *E. coli* and human waste entering Chestnut Creek from failing septic systems. The successful implementation of the Homeowner Assistance Program resulted in the connection of 18 residences to Sanitation District #2 sewer lines and the decommissioning of 18 old septic systems. The program aimed to reduce the levels of *E. coli* and human waste entering Chestnut Creek from failing septic systems. The COVID-19 pandemic and other challenges were overcome, and partnerships between the Chestnut Creek Watershed Coordinator, the Marshall County Health Department, and Sanitation District #2 contributed to the success of the program. Ongoing 319(h) projects 20-05 and 22-07 have also incorporated the HAP and resulted in five additional connections to the sanitation district's sewer lines with more connections anticipated. The success of these projects demonstrates the potential for further implementation of HAPs and continued reduction of pollution caused by failing onsite wastewater systems.

Scott Co HAP (20-02 & 21-02)

The completion of the Homeowner Assistance Program for Sanitary Sewer Line Connections project in the Cane Run Watershed successfully connected over 500 residences to a newly constructed sanitary sewer collection system. This project, recommended in the Cane Run Watershed Plan, has eliminated the discharge of raw sewage in the area, improving water quality and environmental health. Educational materials were distributed to residents to promote the long-term success and maintenance of the new sewer lines. Overall, this project made a significant contribution to water quality improvement in the Cane Run Watershed and created a healthier and more sustainable environment.

Marshall Co HAP (18-10) and Ongoing Work

This project was designed to reduce the amount of *E. coli* and human waste entering Chestnut Creek from failing septic systems. The successful implementation of the Homeowner Assistance Program resulted in the connection of 18 residences to Sanitation District #2 sewer lines and the decommissioning of 18 old septic systems. The program aimed to reduce the levels of *E. coli* and human waste entering Chestnut Creek from failing septic systems. The COVID-19 pandemic and other challenges were overcome, and partnerships between the Chestnut Creek Watershed Coordinator, the Marshall County Health Department, and Sanitation District #2 contributed to the success of the program. Ongoing 319(h) projects 20-05 and 22-07 have also incorporated the HAP and resulted in five additional connections to the sanitation district's sewer lines with more connections anticipated. The success of these projects demonstrates the potential for further implementation of HAPs and continued reduction of pollution caused by failing onsite wastewater systems.

TEAM
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ENERGY AND
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WORKPLAN REPORTING

Long Term Goal 1: Restore Nonpoint Source Impaired Waters				Targeted Completion					Annual Reporting
Objective 1:	Prioritize watersheds for restoration potential.			2019	2020	2021	2022	2023	
	Action 1:	Utilize EPA Recovery Potential Screening Tool to select watersheds for implementation, within existing watershed planning areas.							
		Tracking measure:	Number and list of watersheds identified as recoverable within areas of watershed plans.		X		X	X	In 2020 DOW began the process of adding an Environmental Health index and Demographic index to further refine priority watershed selection (KY-RPST). Sulphur Creek was identified as recoverable in previous years and has an active Watershed Plan. The EPA RPST and KY RPST for pathogens were run for 1287 watersheds in KY and new areas were identified by comparing the results. 6 new watersheds were identified and DOW will be prioritizing those for watershed plans in the future.
		Tracking measure:	Number and list of recoverable watersheds receiving targeted implementation.			X	X	X	The NPS team has awarded funds for the Sulphur Creek Ag BMP Implementation Plan: Phase IV (22-09). In FFY 2023 6 new areas were identified: Swift Camp Creek, Middle North Fork Triplett Creek, East Fork Skegg Creek, Beaver Creek, Cane Creek, and War Fork. DOW will be prioritizing those for implementation in the future.
	Action 2:	Utilize EPA Recovery Potential Screening Tool to identify 303(d) listed impaired watersheds that have a high potential of showing measureable water quality improvement after targeted implementation							



		Tracking measure:	Number of watersheds identified as recoverable for pathogens.		X	X	X	X	Sulphur Creek was identified as being highly recoverable for pathogens, and the NPS team has awarded funds for the Sulphur Creek Ag BMP Implementation Plan: Phase IV (22-09). In FFY 2023 6 new areas were identified: Swift Camp Creek, Middle North Fork Triplett Creek, East Fork Skegg Creek, Beaver Creek, Cane Creek, and War Fork. DOW will be prioritizing those for watershed plans and implementation in the future. DOW is working to incorporate the 2022 IR data into the KY RPS to update and prioritize new recoverable watersheds.
		Tracking measure:	Number of recoverable watersheds receiving targeted implementation.					X	
Objective 2:	Monitor and assess Kentucky's waters			2019	2020	2021	2022	2023	
	Action 1:	Conduct monitoring and perform assessments of Kentucky's waters in conjunction with the watershed framework.							
		Tracking measure:	Number of stream miles assessed.	X	X	X	X	X	Kentucky's 2022 305(b) list has 2,954 assessment units, representing 13,139.4 river miles, 212,585 lake/reservoir acres, and 170,469 springshed acres.
		Tracking measure:	Number of stream miles impaired by NPS pollution.	X	X	X	X	X	Of the 2,954 assessment units on the 2022 305(b), 1,997 assessment units are impaired for at least one designated use. 1,903 rivers/streams are impaired totaling 9,110.7 river miles.
		Tracking measure:	Number of pollutant/waterbody combinations impaired by NPS pollution.	X	X	X	X	X	The 2022 303(d) has 2,925 pollutant-waterbody combinations in need of a TMDL.
	Action 2:	Conduct monitoring and perform assessments of targeted watersheds for the development of new watershed plans or to revise existing plans.							

		Tracking measure:	Number of stream miles with assessments completed in preparation for watershed plan development or improvement.	X	X	X	X	X	Assessment documents were completed for all watershed plan development baseline water quality data collection. Additional assessments and data is being sent to the DOW 303(d) and TMDL programs as it is completed.
		Tracking measure:	Number of streams with monitoring being conducted in preparation for watershed plan development or improvement.	X	X	X	X	X	During FFY 2023, DOW staff or contractors conducted water quality monitoring in four (4) watersheds in preparation for watershed plan development. • Mill Creek • Lower Pitman Creek • Jennings Creek • Upper Salt River
	Action 3:	Conduct monitoring and perform assessments of watersheds targeted through the Division of Water's Success Monitoring Program.							
		Tracking measure:	Number and list of streams prioritized through the Division's Success Monitoring program with completed assessments.	X	X	X	X	X	In 2023, 14 previously assessed and 1 previously unassessed* streams were prioritized for Success Monitoring based upon the abundance of BMP implementation in each of their watersheds. The data collected in 2023 in each of these 15 streams are intended for assessment in the 2026 IR cycle. The individual streams, including previously assessed river miles are listed below by watershed. • Sulphur Creek Watershed: Sulphur Creek (6.8-10.0); Cheese Lick (1.45-8.2); Cheese Lick UT 5.2 (0.0-1.55); Log Lick (0.0-4.2); Brush Creek (0.0-5.15) • Currys Fork Watershed: SF Currys Fork (0.0-5.3) • Brushy Creek Watershed: Brushy Creek (0.0-16.5); Clifty Creek (0.0-2.7); Bee Lick Creek (0.0-10.8); Bee Lick Creek UT 7.4* • Bacon Creek Watershed: Tampa Branch (0.0-2.15); Bacon Creek UT 28.9 (0.0-2.45); Bacon Creek UT 29.85 (0.0-3.25); Bacon Creek (27.1-34.1); Martis Branch (0.0-4.15)

		Tracking measure:	Number and list of streams that have a documented change in use support awaiting EPA approval.	X	X	X	X	X	Currently there are no streams awaiting EPA approval for a documented change in use support.
		Tracking measure:	Number and list of streams that have a documented delisting approved by EPA.	X	X	X	X	X	During the 2022 cycle, EPA approved the removal of 66 pollutant-waterbody combinations from the 303(d) list that have been attributed to the applicable water quality standard being attained based on new data (an additional 49 delistings are due to a clarification of listing cause or address prior listings where the original basis for listing was incorrect). • Baughman Fork • Beaver Creek • Benson Creek • Big Mine Fork • Big Sandy River • Big Willard Creek • Blaine Creek 8.2 to • Board Branch • Boltz Lake • Brushy Fork • Buffalo Creek • Cane Run UT • Caneyville Reservoir • Crooked Creek UT • Cumberland River • Cypress Creek • Eagle Creek • Eddy Creek • Elk Creek • Fern Creek • Flat Creek • Goose Creek • Green River Lake

									• Harris Branch • Hood Creek • Johns Creek • Lake Reba • Laurel River • Lees Creek • Lees Creek UT of UT • Levisa Fork • Lick Creek • Licking River • Little Sandy River • Livingston Creek • Lost Creek • Luzerne Lake • Marrowbone Creek • Martins Fork Cumberland River • Middle Creek Levisa Fork • Mill Creek Branch • North Fork Kentucky River • North Fork Nolin River • North Fork Whippoorwill Creek • Otter Creek • Paint Creek • Quicksand Creek • Red Bird River • Richland Creek • Salt River • Shawnee Creek • Shawnee Creek Slough • Shelby Creek • Sinking Creek • Slate Creek • South Fork Licking River
									• Stoner Creek • Taylor Fork Lake (aka Wilgreen Lake) • Taylorsville Lake • Triplett Creek • Troublesome Creek • Tygarts Creek • White Lick Creek
	Action 4:	Continue to implement a Division level watershed Success Monitoring Program.							
		Tracking measure:	Maintain and continue to update GIS layers for BMP implementation tracking tool.	X	X	X	X	X	Spreadsheets of on the ground BMP implementation data is compiled from internal and external state and federal agencies at least annually. GIS coverages were completed in 2019 and are updated with continuing implementation and used to evaluate potential for changes in watershed status.

		Tracking measure:	Number of watersheds identified as needing success monitoring.	X	X	X	X	X	In FFY 2023, monitoring was conducted in four (4) watersheds identified as needing baseline data for success monitoring and watershed planning: Sulphur Creek, Brushy Creek, Curry's Fork, and Bacon Creek.
		Tracking measure:	Conduct annual meeting to coordinate locations appropriate for success monitoring within the watershed framework.	X	X	X	X	X	DOW staff is actively conducting meetings with NRCS, KY Division of Conservation, and the Division of Abandoned Mine Lands to gather information about on the ground BMP implementation as well as coordinating locations for program effectiveness or success monitoring. Additionally, internal DOW meetings are regularly being held to develop success monitoring program annual monitoring targeted watersheds.
	Action 5:	Conduct post-BMP implementation Water Quality Monitoring for National Water Quality Initiative (NWQI) watersheds.							
		Tracking measure:	Evaluate NWQI watersheds annually to determine needs, and design success monitoring plan as appropriate.	X	X	X	X	X	NRCS instituted Focused Conservation Projects, that implement water focused agricultural best management practices in each of their 12 districts. DOW assisted NRCS with selection of project areas and has been providing technical support in the form of monitoring and data in the Roundstone Creek watershed in 2023. NRCS restarted NWQI planning in 2021, with implementation starting in 2022. DOW met with NRCS multiple times in FFY 2023 and provided detailed analysis and recommendations for selection of FFY 2023 Planning Year Watersheds.
		Tracking measure:	Implement NWQI success monitoring as needed.	X	X	X	X	X	DOW is coordinating with NRCS and anticipates monitoring of the Clarks Creek and Canoe Creek watersheds to begin in 2024, if enough Best Management Practices are implemented.

		Tracking measure:	Compile water quality data for trend analysis in NWQI watersheds as needed.	X	X	X	X	X	DOW provided extensive water quality data and supporting documentation to NRCS for the selection of 2023 NWQI planning year watersheds. DOW provided information on water quality conditions, watershed characteristics, environmental justice considerations, and partner resources.
		Tracking measure:	Number of NWQI BMPs per selected HUC 12.	X	X	X	X	X	With the continued emphasis by NRCS on Focused Conservation Projects, DOW has not received information about new BMPs implemented in NWQI watersheds.
Objective 3:	Implement the Nonpoint Source component of Approved TMDLs of restoration strategies in prioritized impaired watersheds.			2019	2020	2021	2022	2023	
	Action 1:	Coordinate with the Division's TMDL Program to implement the nonpoint source pollution component of approved TMDLs in areas with approved watershed plans.							
		Tracking measure:	Coordinate with the Division's TMDL Program to implement the nonpoint source pollution component of approved TMDLs in areas with approved watershed plans.	X	X	X	X	X	The Watershed Management Branch, including Nonpoint Source met quarterly with the Water Quality Branch, including the TMDL section. These quarterly meetings set goals for the year and created smaller working groups to accomplish those established goals. The NPS program continues to work closely with the TMDL program to identify TMDL Alt areas.
		Tracking measure:	Number of sub-grantee projects implementing BMPs in watersheds with approved TMDLs.	X	X	X	X	X	In FFY 2023, six (6) sub-grantees implemented BMPs in watersheds with TMDLs: • Bacon Creek • Chestnut Creek • Clarks Run and Hanging Fork • Currys Fork • Cane Run • Gunpowder Creek
	Action 2:	Coordinate with the Division's TMDL program to prioritize, develop, and/or implement TMDL Alternative Plans.							

		Tracking measure:	Number and list of watersheds prioritized for TMDL Alternative Plan development.	X	X	X	X	X	Two (2) watersheds are currently prioritized for Alternative Restoration Plan development. Sanitation District 1 in Northern Kentucky are still working with DOW to complete Alternative Restoration Plans for the Banklick Creek and Woolper Creek watersheds. Banklick and Woolper Creek watersheds both have an EPA accepted watershed plan. Two (2) additional watersheds are being considered for potential TMDL Alternative Plan development: McDougal & Castleman Creek, and North Fork Kentucky River (Whitesburg tributaries). McDougal & Castleman Creek has a watershed plan being developed and North Fork Kentucky River has an accepted watershed plan.
		Tracking measure:	Number and list of watersheds with approved TMDL Alternative Plans.	X	X	X	X	X	Currently the state of Kentucky has completed three (3) TMDL Alternative Plans: Sulphur Creek, Gunpowder Creek, and Threemile Creek.
Objective 4:	Implement restoration strategies for prioritized impaired watersheds that will result in measurable water quality improvements.			2019	2020	2021	2022	2023	
	Action 1:	Continue development and implementation of accepted watershed plans.							
		Tracking measure:	Number and list of watershed plans currently under development.	X	X	X	X	X	During FFY 2023, DOW worked with contractors toward development of nine (9) additional watershed plans: Bee Creek, Clayton Creek, Glenns Creek, Jennings Creek, Lake Linville, Lower Pitman Creek, McDougal & Castleman, Mill Creek, and Upper Paint Lick Creek.



		Tracking measure:	Number and list of watershed plans approved by EPA Region 4 for implementation.	X	X	X	X	X	During FFY 2023, the DOW had thirty (30) watershed plans accepted by the EPA. • Bacon Creek • Banklick Creek • Brushy Creek • Cane Run • Chestnut Creek • Clark's Run- Dix River • Corbin City Reservoir • Curry's Fork • Damon Creek • Darby Creek • Dry Creek • Gunpowder Creek • Hancock Creek • Hanging Fork- Dix River • Hinkston Creek • Lower Howards Creek • Middle Fork Beargrass Creek • North Fork Kentucky River • Pleasant Run • Red Bird River • Red River Gorge • Rock Creek • South Fork Little River • Stockton Creek • Sulphur Creek • Ten Mile (Eagle Creek) • Triplett Creek • West Hickman • Wolf Creek
		Tracking measure:	Number and list of watershed plans approved by EPA Region 4 for implementation actively being implemented.	X	X	X	X	X	During FFY 2023, the DOW had thirteen (13) watershed plans approved by EPA Region 4 for implementation actively being implemented. • Bacon Creek • Banklick Creek • Chestnut Creek • Clark's Run - Dix River • Hanging Fork - Dix River • Hinkston Creek • Currys Fork • Gunpowder Creek • Cane Run • Lower Howards • Sulphur Creek • South Fork Little River • Beargrass Creek
	Action 2:	Work to develop local capacity and implement actions necessary to address the pollution in prioritized watersheds.							

		Tracking measure:	Number of active watershed groups.	X	X	X	X	X	During FFY 2022, DOW documented thirty three (33) active watershed groups in the state each with multiple supporting organizations. The River Basin Coordination Program is actively working to support and coordinate with these existing watershed groups as well as increase the number of watershed groups working on water quality issues.
		Tracking measure:	Number of partner and/or stakeholder meetings attended.	X	X	X	X	X	NPS personnel attended approximately 108 partners meetings in FFY23
Objective 5:	Decrease input of pollutants from agricultural sources.			2019	2020	2021	2022	2023	
	Action 1:	Support projects that educate the agricultural community.							
		Tracking measure:	Number of sub-grantee projects with an agricultural BMP demonstration event or educational component.	X	X	X	X	X	Agricultural BMP demonstration events were held in two (2) watershed project areas: Bacon Creek Ag II (21-04) and Sulphur Creek Implementation III (22-09). Two (2) projects include an agricultural education component: Clarks Run (19-05) and UK CES Ag Water Quality (22-02).
		Tracking measure:	Provide financial and technical support to educate producers about the Agriculture Water Quality Act and nutrient management strategies.	X	X	X	X	X	Attended four (4) quarterly AWQA meetings during FFY23. DOW also had two (2) projects focused on nutrient management and support for agricultural producers and landowners; UK CES Ag Water Quality (22-02) and DOC Nutrient Management Planning (22-05).
	Action 2:	Provide financial and/or technical support for the implementation of BMPs that reduce nonpoint source pollution from agricultural sources.							
		Tracking measure:	Number of sub-grantee projects implementing BMPs to address agricultural sources of nonpoint source pollution.	X	X	X	X	X	During FFY 2023, the DOW had two (2) projects implement BMPs to address agricultural sources of NPS pollution. Bacon Creek Ag II (21-04); Sulphur Creek Implementation III (22-09).
	Action 3:	Coordinate with NRCS and KY Division of Conservation to implement BMPs.							

		Tracking measure:	Coordinate with KY DOC to fund BMPs in priority watersheds.	X	X	X	X	X	The Bacon Creek Ag II (21-04) and Sulphur Creek Implementation III (22-09) projects coordinate with KY DOC to fund BMPs in their respective river basins. DOW has connected with the DOC field representatives for their basins.
		Tracking measure:	Coordinate with NRCS to fund BMPs in priority watersheds.	X	X	X	X	X	The Bacon Creek Ag II (21-04) and Sulphur Creek Implementation III (22-09) projects coordinate with NRCS to fund BMPs in their respective river basins. DOW also coordinates with NRCS in the Lake Linville, Renfro Creek, and Roundstone Creek priority watersheds to fund BMPs.
	Action 4:	Coordinate with NRCS to identify and prioritize NWQI watersheds.							
		Tracking measure:	Number of NWQI watersheds identified.	X	X	X	X	X	In FFY 2023, DOW recommended five (5) watersheds for NWQI designation: Upper Bacon Creek, Hopkinsville, Upper Nolin, Long Run, and Bayou De Chien. In FFY23 NRCS selected Upper Nolin and Hinkston Creek.
	Action 5:	Participate in state wide meetings and conferences that have a focus on							
		Tracking measure:	Attend two (2) USDA NRCS State Technical meetings per year. Track number attended.	X	X	X	X	X	No NRCS State Technical Committee meetings were scheduled in FFY 2023.
		Tracking measure:	Participate in the four (4) quarterly Kentucky Agriculture Water Quality Authority Meetings per year.	X	X	X	X	X	DOW participated in all quarterly AWQA meetings during FFY 2023.
		Tracking measure:	Participate in the Kentucky Agriculture Science and Monitoring Committee meetings.	X	X	X	X	X	DOW participated in all scheduled KASMC meetings in FFY 2023.
		Tracking measure:	Number of staff attending agriculture related technical training.	X	X	X	X	X	NPS personnel attended agriculture related trainings/webinars including events such as: emerging on-farm research webinar, American Farmland Trust Outcomes Estimation Tools Training Webinar Series, Conservation Matters Webinar Series.

		Tracking measure:	Present information or a booth at one (1) agriculture related event each year.	X	X	X	X	X	NPS personnel presented information at the following agriculture related events in FFY 2023: Energy and Environment Cabinet Booth at the Kentucky State Fair, Spencer County Agriculture Day
Objective 6:	Decrease input of pollutants from developed lands.			2019	2020	2021	2022	2023	
	Action 1:	Provide financial and technical support for the implementation of green infrastructure (GI), low-impact-development (LID), and stormwater management BMPs.							
		Tracking measure:	Number of sub-grantee projects implement GI, LID, and/or stormwater management BMPs.	X	X	X	X	X	During FFY 2023, the DOW had seven (7) projects implement GI, LID, and/or stormwater management BMPs. Currys Fork (19-02); Dix River and Hinkston Creek (19-05); Banklick Creek (19-07); Gunpowder Creek (19-12); Currys Fork (20-03); Banklick Creek (20-06); Lower Howards Creek (21-07).
		Tracking measure:	Attend a minimum of one (1) stormwater management training event per year.	X	X	X	X	X	NPS staff attended the Kentucky Stormwater Association (KSA) Annual Conference in FFY 2023. This conference serves as a forum for information and technology transfer with regards to GI practices, general stormwater management strategies, and MS4 program implementation. NPS personnel also attended KSA quarterly meetings as they occurred and participated in various stormwater focused trainings and webinars.
	Action 2:	Coordinate with Kentucky Emergency Management to incorporate GI, LID, and/or stormwater management BMPs that address nonpoint source pollution into the State Hazard Mitigation Plan.							
		Tracking measure:	Participate in "Incorporating Green Infrastructure and Low Impact Development into State Hazard Mitigation Plan" grant project.	X	X	X	X	X	NPS personnel hosted "Incorporating Green Infrastructure and Low Impact Development into State Hazard Mitigation Plan" related trainings/webinars including events such as: in-person/virtual meeting with LFUCG to discuss Green Infrastructure uses in an urban setting and attended multiple GI webinars.

		Tracking measure:	Number of NPS BMPs included in the State Hazard Mitigation Plan.	X	X	X	X	X	The 2023 Kentucky Hazard Mitigation Plan was updated and Flood Risk Assessment included the <i>promotion and improvement of nature-based solutions to better mimic and support natural processes in the floodplain to help store excess flood water</i> in the mitigation strategy and associated mitigation action section.
		Tracking measure:	Provide updated GIS resources to KAMM program annually.	X	X	X	X	X	GIS layers are updated annually. NPS staff presented at the 2023 KAMM Annual Conference on using Nature-based Solutions for Flood Mitigation and Building partnership toward multi-state planning.
	Action 3:	Support Kentucky's MS4 program.							
		Tracking measure:	Number of Kentucky Stormwater Association meetings attended.	X	X	X	X	X	In FFY 2023 NPS staff attended two (2) virtual Kentucky Stormwater Association meetings, and the 2023 Annual Conference.
		Tracking measure:	Provide technical and/or educational support to MS4 communities.	X	X	X	X	X	In FFY 2023, DOW partnered with the MS4 program to develop NPS-related support materials. Partnership examples include: general education on MS4 practices, attending MS4 inspections, and planning for MS4 education and outreach materials. In addition, Planning efforts between DOW's NPS Program and the KSA Board are underway to develop a strategic plan for using 319(h) funding to increase the effectiveness of local stormwater programs on a statewide basis. NPS personnel normally seek ways to support MS4 communities in meeting their MCM 1 and 2 goals by providing environmental education material and support for field days and events.
		Tracking measure:	Provide technical and/or educational support for the DOW MS4 program.	X	X	X	X	X	NPS personnel and the DOW MS4 program are in regular communication to establish methods of supporting Kentucky's MS4 communities.

		Tracking measure:	Provide updated GIS resources to MS4 program annually.	X	X	X	X	X	GIS layers are updated annually and are available by request from DOW.
Objective 7:	Preserve the critical ecosystem functions which forestlands provide and reduce NPS pollution resulting from forestry related activities.			2019	2020	2021	2022	2023	
	Action 1:	Support watershed projects that focus on sustainable forestry management with water quality being the primary concern.							
		Tracking measure:	Number of sub-grantee projects that incorporate forest management BMPs to protect water quality.	X	X	X	X	X	During FFY 2023, the DOW had no projects implementing forest management BMPs.
	Action 2:	Work with partners to protect and enhance forestlands for the purposes of protecting or restoring water quality, water supply, and aquatic habitat.							
		Tracking measure:	Attend at least one (1) Forest Conservation Act BMP Board meeting per year.	X	X	X	X	X	The KFCA Board did not hold a meeting in FFY 2023.
		Tracking measure:	Provide technical and/or educational support for Forest Conservation Act BMP implementation.	X	X	X	X	X	The University of Kentucky Forestry Extension is distributing and training on the updated KY Forestry BMP Field Guide that was completed in FFY 2018. The DOW also provides support through maintenance of the Special Use Waters interactive map, which shows waters of special concern for logging operations.
		Tracking measure:	Number of active partnerships working on forestry related projects to reduce NPS pollution in Kentucky.	X	X	X	X	X	The NPS section is actively working with partners on forestry related issues including the University of Kentucky Department of Forestry and Natural Resources, the Office of State Nature Preserves, the US Office of Surface Mining Reclamation and Enforcement's Appalachian Regional Reforestation Initiative, and the Kentucky Woodland Owners Association.
Objective 8:	Protect and monitor Kentucky's groundwater.			2019	2020	2021	2022	2023	

	Action 1:	Provide technical and/or financial support for the assessment of groundwater impacts from nonpoint source pollution.							
		Tracking measure:	Number of springs sampled.	X	X	X	X	X	Thirty (30) springs were sampled in FFY 2023.
		Tracking measure:	Number of groundwater samples collected for <i>E. coli</i> .	X	X	X	X	X	Zero (0) groundwater samples were collected for <i>E. coli</i> in FFY 2023.
		Tracking measure:	Number of groundwater samples collected for pesticides.	X	X	X	X	X	152 groundwater samples for pesticides were collected in FFY 2023.
	Action 2:	Provide technical and/or financial support for groundwater protection plans (GPP).							
		Tracking measure:	Number of GPP field reviews conducted.	X	X	X	X	X	Two (2) GPP field reviews were conducted in FFY 2023.
		Tracking measure:	Number of GPPs approved.	X	X	X	X	X	Twenty-three (23) GPPs were approved in FFY 2023.
Objective 9:	Decrease nonpoint source pollution from onsite wastewater sources in Kentucky's water bodies.			2019	2020	2021	2022	2023	
	Action 1:	Provide financial, technical, and/or educational support to projects that decrease the negative impacts on water quality from sewage.							
		Tracking measure:	Number of sub-grantee projects that implement the onsite wastewater components of an accepted watershed plan.	X	X	X	X	X	During FFY 2023, DOW had six (6) projects implement onsite wastewater BMPs: Dix River & Hinkston (19-05); Cane Run HAP (20-02); Currys Fork (20-03); Chestnut Creek (20-05); Lincoln County HAP II (22-06); Chestnut Creek HAP (22-07).
		Tracking measure:	Number of sub-grantee projects with an educational component for onsite wastewater treatment.	X	X	X	X	X	During FFY 2023, DOW had seven (7) projects with an educational component for onsite wastewater treatment: Dix River & Hinkston (19-05); Cane Run HAP (20-02); Currys Fork (20-03); Chestnut Creek (20-05); Dix River & Hinkston Creek (20-08); Lincoln County HAP II (22-06); Chestnut Creek HAP (22-07).

	Action 2:	Coordinate with partners to decrease impacts from onsite wastewater.							
		Tracking measure:	Number of partner meetings attended.	X	X	X	X	X	NPS personnel attended seven (7) partner meetings to decrease impacts from onsite wastewater
Objective 10:	Protect and restore waters at risk from recreational impacts.			2019	2020	2021	2022	2023	
	Action 1:	Provide technical and/or financial support for Kentucky's Volunteer Lakes Monitoring Program (for the identification of harmful algal blooms (HABs).							
		Tracking measure:	Number of active volunteers.	X	X	X	X	X	There are currently forty three (43) active lake monitoring volunteers in FFY 2023
		Tracking measure:	Number of volunteers receiving trainings.	X	X	X	X	X	10 volunteers have received the lake monitoring training in FFY2023
		Tracking measure:	Number of sites sampled.	X	X	X	X	X	There were 349 sites monitored in FFY2023
	Action 2:	Provide technical and/or financial support for projects that implement BMPs in watersheds with recreation use impairments.							
		Tracking measure:	Number of sub-grantee projects implementing BMPs in watersheds with recreation use impairments.	X	X	X	X	X	During FFY 2023, DOW had twelve (12) projects implementing BMPs in recreation-impaired watersheds: Currys Fork (19-02 & 20-03); Dix River & Hinkston (19-05); Bacon Creek (21-04); Banklick (19-07 & 20-06); Chestnut Creek (20-05 & 22-07); Cane Run HAP (20-02); Lower Howards Creek (21-07); Lincoln County HAP II (22-06); Sulphur Creek (22-09)
	Action 3:	Provide technical and/or educational support for Harmful Algal Bloom issues.							



		Tracking measure:	Number of meetings and/or technical support provided .	X	X	X	X	X	NPS personnel are actively engaged in internal and external efforts to address Harmful Algal Blooms. Within the Division we coordinate with the Water Quality Branch to provide coordination with local volunteer monitors to address identification, reporting, and safety issues with HABs. NPS personnel continue to collaborate with the creators of the BloomWatch App to roll out the app to volunteer monitors in the Commonwealth through Watershed Watch in Kentucky's Lakes Monitoring Program. The NPS Section also hired a summer intern who designed and ran HAB focused outreach that was distributed via social media and newsletter for the Volunteer Lake Monitoring Program.
Objective 11:	Decrease nonpoint source pollution from resource extraction.			2019	2020	2021	2022	2023	
	Action 1:	Provide technical and/or financial support for reducing nonpoint source pollution due to resource extraction activities.							
		Tracking measure:	Coordinate with the KY Division of Abandoned Mine Lands to prioritize restoration of acid mine drainage sites on a statewide basis and within watershed planning areas.	X	X	X	X	X	DOW Staff are actively coordinating with the KY Division of Abandoned Mine Lands to target implementation of AMD sites on a statewide basis and within watershed planning areas.
		Tracking measure:	Number of sub-grantee projects implementing BMPs in areas with resource extraction activities.	X	X	X	X	X	In FFY 2023, there were no active projects implementing BMPs in resource extraction areas. DOW staff are working to build capacity for implementation in areas affected by resource extraction.
Objective 12:	Decrease the negative impacts of excessive sedimentation in Kentucky's Streams.			2019	2020	2021	2022	2023	
	Action 1:	Provide financial, technical, and/or educational support for projects that implement sediment control BMPs.							

		Tracking measure:	Develop and/or distribute guidance and/or educational materials for stream and riparian buffer maintenance.	X	X	X	X	X	DOW routinely distributes the Central Kentucky Backyard Stream Guide and has developed several fact sheets about the importance of riparian buffer zones. These resources are available upon request or online.
		Tracking measure:	Number of sub-grantee projects implementing riparian buffer BMPs or tree plantings.	X	X	X	X	X	During FFY 2023, DOW had three (3) projects implementing riparian buffer BMPs or tree plantings: Currys Fork (19-02 & 20-03)); Dix River and Hinkston (19-05).
		Tracking measure:	Number of projects monitoring for sediment impairments.	X	X	X	X	X	During FFY 2023, DOW had three (3) projects monitoring for sediment impairments: Lower Pitman (20-07), Jennings Creek (21-08), and Upper Salt River. DOW also facilitated one (1) sediment tracing project by coordinating a partnership between the Mason County Library and University of Louisville to determine the origins of the sediment build-up in Limestone Creek in Maysville, Kentucky. DOW has planned an Erosion Survey study using drone technology for the Upper Buck Creek Watershed Plan (23-04)
	Action 2:	Target additional sources of funding for stream restoration projects that will positively address sediment impaired streams.							



		Tracking measure:	Coordinate efforts with the USDA Natural Resources Conservation Service to help target conservation program funding toward priority watersheds and the implementation of accepted Watershed Plans.	X	X	X	X	X	DOW engages in direct programmatic coordination with NRCS by requesting that priority and impaired watersheds receive priority funding through NRCS programs. In 2022 DOW and NRCS evaluated the first few years of NRCS implementation in these prioritized watersheds. As a result of this collaboration, approximately 432,000 acres received enhanced cost sharing or technical assistance. More information is available here: https://storymaps.arcgis.com/collections/e129710c8a7a410c96df66b84a61ef69?item=5. DOW also coordinates on-the-ground implementation efforts with County Conservation Districts and local NRCS staff. The goal is that CWA Section 319(h) funding be used to augment the Farm Bill funding to agricultural producers by paying for companion practices or paying for nonstandard BMPs to address water quality problems on farming operations. This coordination is done by meeting with local NRCS, Conservation District, and Division of Conservation staff.
		Tracking measure:	Coordinate stream restoration efforts with the KY Department of Fish and Wildlife Resources and Northern KY University to help target Fees in Lieu of Mitigation (FILO) funding toward priority watersheds and the implementation of accepted Watershed Plans.	X	X	X	X	X	DOW consistently seeks opportunities for watershed projects to pursue Fees in Lieu of Mitigation funding. No projects used FILO funding in FFY 2023.
Objective 13:	Support education and outreach.			2019	2020	2021	2022	2023	
	Action 1:	Support education and outreach efforts across Kentucky.							
		Tracking measure:	Number of student and/or stakeholder contacts per year.	X	X	X	X	X	NPS personnel interacted with over 6,000 at outreach events throughout Kentucky

		Tracking measure:	Number of educational events participated in.	X	X	X	X	X	NPS personnel attended approximately thirty-six (36) educational events in FFY24
	Action 2:	Update nonpoint source website pages, and continue social media presence.							
		Tracking measure:	Number of followers for the I Love KY Water Facebook page.	X	X	X	X	X	The KY Wild Waters Facebook page (renamed in 2022 to reach a broader audience) is at 21,355 followers during this reporting period.
		Tracking measure:	Annually update information on DOW NPS website.	X	X	X	X	X	The DOW Nonpoint Source Program web pages are updated quarterly at a minimum. The NPS grant web pages are updated once per year.
	Action 3:	Develop and maintain nonpoint source pollution educational materials.							
		Tracking measure:	Number of educational materials developed or updated.	X	X	X	X	X	NPS created a multitude of education and outreach materials for audiences of all ages in FFY 2023. On our social media page, we included new content that informed our readers of Cyanobacteria, promoted the Volunteer Lake Monitoring Program, and the basin newsletter. Various educational material was created for K-5, such as Watershed Walk Bingo, Superhero coloring pages, and BMP farming coloring pages. A cost efficient watershed activity tutorial was created for our watershed/MS4 coordinators for tabling events.
	Action 4:	Support the Watershed Watch program in Kentucky.							
		Tracking measure:	Number of active volunteers.	X	X	X	X	X	There are currently 960 active watershed watch volunteers statewide.



		Tracking measure:	Number of volunteers receiving trainings.	X	X	X	X	X	Seventy-three (73) completed the online introductory training and fifty-seven (57) of them have completed the hands on training. Thrity-seven (37) volunteers have completed the recertification training. Also 3 volunteers have completed the train the trainer certification to become watershed watch trainers. Habitat training was also presented and Fourty (40) volunteers learned the new training method for habitat reporting.
		Tracking measure:	Number of sites sampled.	X	X	X	X	X	Watershed Watch volunteers collected 943 <i>E.coli</i> sampling. An additional forty-one (41) samples were collected for nutrients.
	Action 5:	Provide financial and technical support for Project WET implementation in Kentucky.							
		Tracking measure:	Number of Project WET educator/facilitator trainings.	X	X	X	X	X	DOW has formed a partnership with the Kentucky Association for Environmental Education (KAEE) to coordinate project trainings and further promote water education in Kentucky. In FFY 2022, the Project WET program conducted eighteen (20) educator workshops.
		Tracking measure:	Number of teachers trained.	X	X	X	X	X	In FFY 2022, the Project WET program trained one hundred forty-nine (149) nonformal educators and one hundred twenty (120) formal educators.



Long Term Goal 2: Protect waters currently meeting designated uses				Targeted Completion					Annual Reporting
Objective 1:	Promote the identification and protection of healthy watersheds throughout Kentucky.			2019	2020	2021	2022	2023	
	Action 1:	Provide technical and/or financial support for land conservation programs.							
		Tracking measure:	Coordinate annually between NPS and Wild Rivers program to prioritize land for conservation.	X	X	X	X	X	The Wild Rivers program has identified the Rockcastle River as a priority for conservation. Both the Wild Rivers program and the NPS section representatives are board members for the Rockcastle Conservation Initiative.
		Tracking measure:	Coordinate annually between NPS and Heritage Land Conservation program to prioritize land for conservation.	X	X	X	X	X	No new watersheds were identified as priorities for conservation with the Heritage Land Conservation Foundation in FFY 2023. Buck Creek is our most current recommendation.
	Action 2:	Provide technical and/or financial support for sub-grantee projects that implement the protection components of an approved watershed plan.							
		Tracking measure:	Number of sub-grantee projects implementing the protection component of an approved watershed plan.	X	X	X	X	X	In FFY 2023 two (2) sub-grantee implemented the protection component of a watershed plan: Banklick projects 19-07 & 20-06.

		Tracking measure:	Number of watershed planning areas with Special Use Waters.	X	X	X	X	X	To date, there have been four (4) watershed plans accepted for implementation with protection of a Special Use Water as their primary focus: Sulphur Creek, Red River, Red Bird River, and Brushy Creek. Other approved watershed plans that have Special Use Waters within their boundaries include: Rock Creek, Woolper Creek, Chestnut Creek, and Lower Howards Creek.
	Action 3:	Develop and implement a NPS Program strategy for better coordination with the Healthy Watersheds program.							
		Tracking measure:	Number and list of current priority Healthy Watersheds.			X	X	X	One hundred and eighty-eight (188) HUC12s in Kentucky scored in the top 25% of watershed health both within the state and their ecoregion. Among those Top 25% "healthiest" watersheds, forty-nine (49) have an elevated (>75th percentile) statewide vulnerability score.
		Tracking measure:	Number and list of new priority Healthy Watersheds.			X	X	X	Buck Creek has been identified as the first pilot healthy watershed partnership project.
Objective 2:	Prioritize Source Water and Wellhead Protection areas for protection from nonpoint sources of pollution.			2019	2020	2021	2022	2023	
	Action 1:	Coordinate with the Division's Source Water Protection Program to identify and reduce nonpoint source pollution in source water protection areas.							

		Tracking measure:	Number and list of Source Water Protection Areas with an approved watershed plan.	X	X	X	X	X	There are currently twenty-four (24) approved watershed planning areas that include a designated Source Water Protection area. • Bacon Creek • Banklick Creek • Cane Run • Chestnut Creek • Clarks Run • Corbin City Reservoir • Currys Fork • Darby Creek • Dry Creek • Gunpowder Creek • Hancock Creek • Hanging Fork • Hinkston Creek • Lower Howards Creek • North Fork: Whitesburg Tributaries • Red Bird River • Red River • Rock Creek AML • South Fork Little River • Stockton Creek • Ten Mile Creek • Triplett Creek • West Hickman Creek • Woolper Creek
		Tracking measure:	Number and list of Source Water Protection Areas with an approved watershed plan that is being actively implemented.	X	X	X	X	X	There are currently ten (10) active watershed plans that are actively implementing best management practices and education & outreach in Source Water Protection Areas. • Bacon Creek • Banklick Creek • Cane Run • Chestnut Creek • Clarks Run • Currys Fork • Gunpowder Creek • Hanging Fork • Hinkston Creek • Lower Howards Creek
		Tracking measure:	Number of Source Water Protection Plans developed and/or updated.	X	X	X	X	X	Zero (0) Source Water Protection Plans were updated or developed in FFY 2023.

	Action 2:	Provide technical assistance for projects protecting source water and promoting groundwater recharge							
		Tracking measure:	Staff attend at least one technical event per year on protection of drinking water sources.	X	X	X	X	X	DOW staff regularly attend Area Development District Water Management Council meetings, provide technical assistance for drafting and completing Source Water Protection Plan updates, in addition to attending and presenting at Source Water/Wellhead Protection planning public meetings.
	Action 3:	Coordinate with the Division's Wellhead Protection Program to identify and reduce nonpoint source pollution in wellhead protection areas.							
		Tracking measure:	Number and list of Wellhead Protection Areas with an approved watershed plan.	X	X	X	X	X	There are currently five (5) accepted watershed plans that contain DOW Wellhead Protection Areas. • Bacon Creek • Cane Run • Gunpowder Creek • Pleasant Run • Red River
		Tracking measure:	Number and list of Wellhead Protection Areas with an approved watershed plan that is being actively implemented.	X	X	X	X	X	There are three (3) active watershed plans that are currently being implemented that contain a DOW Wellhead Protection Area: Green River Valley (Bacon Creek), Georgetown Municipal (Cane Run), and Camp Turnabout (Gunpowder Creek).
		Tracking measure:	Number of Wellhead Protection Plans developed and/or updated.	X	X	X	X	X	There were fifteen (15) Wellhead Protection Plans developed and approved in FFY 2023.

Long Term Goal 3: Efficient and effective implementation of Kentucky's Nonpoint Source Program				Targeted Completion					Annual Reporting
Objective 1:	Develop NPS program components to increase program effectiveness and maintain current program staff.			2019	2020	2021	2022	2023	
	Action 1:	Develop tools for increased efficiency.							
		Tracking measure:	Complete development of a tracking spreadsheet for Watershed Based Plans.	X					The Watershed Plan tracking spreadsheet was developed during FFY 2014 and is updated annually. Watershed Plan summary documents are under development for all "Accepted" watershed plans. WSP summary documents are the next step to organize and share information regarding WSPs with stakeholders and work toward future implementation projects.
		Tracking measure:	Transfer electronic project management and storage for 319(h) projects to the Department's new ARM database.	X	X	X	x	x	During FFY 2016 all existing (active and historical) NPS sub-grantee project files were scanned into the Department's TEMPO (previously called ARM) database for permanent electronic storage purposes. During FFY 2023, significant revisions and updates were made to the NPS program workflow, and to TEMPO itself, to incorporate TEMPO into 319(h) project management. It is anticipated that the NPS program will use TEMPO for most 319(h) project mangament tasks starting in FFY 2024.

	Action 2:	Maintain staffing for effective NPS program coordination and on the ground implementation.							
		Tracking measure:	Number of DOW NPS technical staff.	X	X	X	X	X	During FFY 2023, DOW was able to fill vacant positions by hiring three (3) Basin Coordinators and one (1) Technical Advisor. The Section Supervisor position was also filled. All positions are currently filled.
		Tracking measure:	Number of Basin Coordinators.	X	X	X	X	X	DOW partners with and/or employees (7) seven Basin Coordinators to cover Kentucky's major River Basin Management Units.
		Tracking measure:	Number of Watershed Coordinators implementing watershed plans.	X	X	X	X	X	DOW maintains nine (9) Watershed Coordinators who implement accepted watershed plans. This includes Bacon Creek, Banklick Creek, Beargrass Creek, Chestnut Creek, Curry's Fork, Hinkston Creek, Red Bird River, South Fork Little River, and Sulphur Creek
	Action 3:	Provide professional development for watershed management to increase program effectiveness.							
		Tracking measure:	Number of training events hosted and/or attended.	X	X	X	X	X	In FFY 2023, the NPS team attended or hosted approximately forty one (41) training events

Objective 2:	Meet federal requirements.			2019	2020	2021	2022	2023	
	Action 1:	Reduce KY's NPS Program Un-liquidated Funding Obligation to less than 20%, and maintain that level throughout the Federal Fiscal Year.							
		Tracking measure:	Drawdown percentage in comparison to ULO goal of 20%.	X	X	X	X	X	EPA no longer tracks ULO percentages. DOW records indicate a 24% ULO as of November 2023. The open project years are on track to be fully spent by the grant deadlines. That being said, KY's NPS Program will continue to make additional adjustments in an effort to keep the ULO percentage as low as possible.
		Tracking measure:	Continue to manage KY's NPS sub-grantee projects with the goal of completing work in a 2.0 to 3.0 year contract timeframe.	X	X	X	X	X	Sub-grantee project contracts continue to operate on a two-year time frame as of FFY 2017.
	Action 2:	Complete EPA required Grants Reporting and Tracking (GRTS) information updates.							
		Tracking measure:	Enter new projects into GRTS within ninety (90) days after grant award.	X	X	X	X	X	All of the new projects selected for FFY 2023 funding are currently entered into GRTS.
		Tracking measure:	Complete bi-annual project status updates in March 30 and September 30 of each year.	X	X	X	X	X	Biannual project status updates were completed in FFY 2023 (March and September).

		Tracking measure:	Conduct bi-annual maintenance on EPA Mandated Elements.	X	X	X	X	X	Maintenance of the EPA Mandated Elements information was performed in GRTS to any/all applicable projects.
		Tracking measure:	Enter calculated project load reductions by February 28th of each year.	X	X	X	X	X	All load reductions generated during the FFY 2023 time period were calculated and entered into GRTS by the deadline.
	Action 3:	Submit Kentucky's Nonpoint Source Annual Report to EPA Region 4 by December 31st of each year.							
		Tracking measure:	Submission of Annual Report.	X	X	X	X	X	The FFY 2023 NPS Program Annual Report will be submitted to EPA Region 4.
	Action 4:	Submit at least one (1) Nonpoint Source Success Story to fulfill the requirements of WQ-10 by August 1st of each year.							
		Tracking measure:	Number of watersheds delisted and possible for WQ-10 development.	X	X	X	X	X	Fifty stream segments were approved for delisting at least one impairment parameter with the 2022 Integrated Report.
		Tracking measure:	Number of success stories submitted to EPA Region 4 this year.	X	X	X	X	X	One (1) Nonpoint Source Success Story was submitted to EPA meeting this requirement. The Red Bird River WQ-10 report was submitted in February and approved prior to the September 30, 2022 deadline.

		Tracking measure:	Number of Kentucky Success stories on EPA webpage.	X	X	X	X	X	EPA has posted thirteen (13) of Kentucky's Nonpoint Success Stories on their webpage. The 2023 NPS Success Story highlighting NPS driven collaboration in the Red Bird River watershed was accepted and posted to EPAs webpage in September 2023.
	Action 5:	Review and approve all Nonpoint Source Sub-grantee Quality Assurance Project Plans (QAPP) prior to monitoring activities.							
		Tracking measure:	Number of approved sub-grantee QAPPs.	X	X	X	X	X	Quality Assurance Project Plans are developed and approved for all Nonpoint Source Program water quality data collection efforts conducted by sub-grantees. QAPPs are approved by Quality Assurance staff prior to data collection. In FFY 2023 no projects required QAPP development or approval.
		Tracking measure:	Number of data packages reviewed.	X	X	X	X	X	DOW Quality Assurance Staff reviewed one (3) data packages for West Hickman, Glenn's Creek, and Jennings Creek from sub-contractors in FFY 2023.
Objective 3:	Provide technical assistance and support to the division regarding watershed impacts and the watershed perspective.			2019	2020	2021	2022	2023	
	Action 1:	Participate in DOW projects requiring technical experience from NPS staff.							
		Tracking measure:	Assist with finalizing and/or implementing the Kentucky Nutrient Reduction Strategy.	X	X	X	X	X	Staff from the Nonpoint Source Program helped refine the Kentucky Nutrient Reduction Strategy (NRS) Update, which was released November 2022.

		Tracking measure:	Provide water quality monitoring data for inclusion in the Integrated Report.	X	X	X	X	X	All water quality data collected through the NPS Program, whether collected as pre-watershed plan development baseline or post-watershed plan implementation success monitoring is submitted to the DOW Water Quality Branch to be used in the assessment of watersheds for the Integrated Report and TMDL development if applicable.
	Action 2:	Update the Watershed Framework.							
		Tracking measure:	Number of Basin Status Updates and/or Report Cards issued.	X	X	X	X	X	The Basin Status Report template was replaced with a combination of education and outreach materials. The Kentucky Water Health Portal and Kentucky Integrated Report Hub Site serve as the primary resources to communicate information previously contained within Basin Status Reports. During FFY 2023 NPS personnel also collaborated with Watershed Watch in Kentucky to develop and produce Basin Report Cards based on volunteer data collected during the 2022 field season.
		Tracking measure:	Annually update the Kentucky Water Health Portal.	X	X	X	X	X	The Kentucky Water Health Portal is updated with each new Integrated Report to Congress (IR) release. The Water Health Portal was most recently updated with the 2022 IR in the fall of 2022.
		Tracking measure:	Update priority watersheds as determined by the River Basin Coordinators and Basin Team members.	X	X	X	X	X	During FFY 2022, Basin Team Priority Areas were finalized, published, and integrated into the 319 and State Revolving Fund programs. No updates were made in FFY 2023.

General Program Management & Oversight	2023 Update
Provide Administrative, Financial, and Technical oversight for FFY 2023 NPS Program sub-grantee projects.	The KY Division of Water's Nonpoint Source Program provides Administrative, Financial, and Technical support for approximately 50 sub-grantee projects at any given point in time. This work is in addition to providing the same type assistance to watershed groups, Health Departments, and Conservation Districts for the development of future projects. Coordination with local, state, and federal government agencies is also done on a regular basis to create synergistic on-the-ground watershed plan implementation efforts.
Obligate all grant funding within one year of grant award date.	Obligation of grant funding for FFY 2023 is complete.
Submit 2019 Grant closeout package to EPA R4.	The 2019 Grant closeout package was submitted to EPA R4 by the deadline.
Maintain NPS Program Watershed Project GIS Coverage.	Kentucky's Nonpoint Source Program GIS Coverage was updated annually in November.
Maintain NPS Program webpages - Update Watershed Plans and Watershed Plan Maps.	Kentucky's Nonpoint Source Program web pages were updated annually in December (at minimum). The web links to accepted Watershed Plans, and the Watershed Plan Maps have been updated.
Attend EPA Region 4 Biennial NPS Conference.	Representatives of the KY Division of Water, Watershed Management Branch Manager, Nonpoint Source Program attended the EPA Region 4 Biennial NPS Conference virtually in 2020 due to Covid-19 restrictions. We anticipate attending the next Region 4 Biennial Conference when it is announced.
Attend EPA National Biennial NPS Conference.	Two representatives of the KY Division of Water, Watershed Management and Nonpoint Source Program attended the National Nonpoint Source Program Conference in Minneapolis in November, 2023.
National Water Quality Initiative	
Continue to support the Hinkston Creek Watershed Coordinator that will work toward increased implementation of the Hinkston Creek Watershed Plan.	The Hinkston Creek watershed has been withdrawn from the NRCS' NWQI priority list, but DOW is assisting NRCS with an MRBI watershed initiative in this watershed. Hinkston Creek watershed was selected as a 2023 planning year watershed for the MRBI initiative, with two subsequent implementation years planned. Kentucky NRCS is currently in the implementation phase for NWQI projects in Clarks River and Canoe Creek, and MRBI projects in Panther Creek and Slate Creek. DOW will provide monitoring support as needed starting in FFY 2025 for NWQI watersheds.
Work with KY NRCS on NWQI Pilot Project in "TBD" watershed.	DOW met with NRCS multiple times in FFY 2023 to coordinate NWQI and MRBI project initiatives. DOW provided multiple watershed recommendations for FFY 2023 planning year projects. Ultimately NRCS settled on an MRBI project in Hinkston Creek and an NWQI project in the Upper Nolin watershed.
NRCS Focused Conservation Projects	
Work with KY NRCS as needed to implement water focused best management practices throughout the Commonwealth through the new NRCS Focused Watershed Projects	Kentucky NRCS has moved on from Focused Watershed Projects to NWQI and MRBI project planning and implementation.

Watershed Success Monitoring Program	
Continue development of Success Monitoring Program by compiling watershed scale implementation data.	The Nonpoint Source Program continues to gather implementation data from several other state and federal programs. This data is now compiled in a GIS format to assist management decisions for the Division's Success Monitoring Program. To date, implementation information has been acquired from the NRCS, KY Division of Abandoned Mine Lands, DOW Nonpoint Source Program, State Revolving Fund, and the Division of Conservation Agriculture Water Quality State Cost Share Program. In FFY 2023, this data was incorporated into a public GIS layer to evaluate implementation on a watershed scale, and demonstrate local engagement.
Conduct baseline water quality monitoring prior to watershed plan development	Kentucky's watershed planning efforts are built on the foundation of good quality in-stream water quality data. Water quality data is analyzed and interpreted to identify the cause and source of pollution issues in every watershed plan. Additionally, pre-implementation water quality data sets a baseline for which post-implementation data can be compared to assess implementation effectiveness. During FFY 2023 Kentucky Division of Water Biologists monitored water quality parameters in Lower Pitman and Upper Salt River as part of a collection effort to develop watershed plans.
Conduct watershed success monitoring for watershed plan implementation projects.	The Kentucky Division of Water continues to develop its Success Program through enhanced communication between the Nonpoint Source Section and the Water Quality Branch in an effort to set joint priorities and determine standard operating procedures to trigger monitoring activities in areas with BMP implementation. In FFY 2023, success monitoring was completed for the Bacon Creek, Brushy Creek, sulphur Creek, and South Fork Curry's watersheds.
Grant Reporting and Tracking System	
Enter FFY 2022 Load Reductions into GRTS.	FFY 2023 Load Reductions for Nitrogen, Phosphorous, and Sediment were calculated for all projects that implemented on-the-ground Best Management Practices (BMP). Those load reductions were entered into the GRTS database by the March, 31 2023 deadline along with specific BMP description information.
Attend National GRTS Conference.	We anticipate attending the National GRTS Conference when it is announced.
Complete GRTS project status updates.	All NPS sub-grantee project biennial status updates and mandated elements updates were completed by March 30 and September 30 respectively.
Enter FFY 2023 Sub-grantee projects into GRTS.	Final FFY 2023 Nonpoint Source Program sub-grantee projects have been preliminarily entered into GRTS.



EPA Required Reporting

Submit Initial Annual Nonpoint Source Program Workplan to EPA R4.	An updated version of Kentucky's FFY 2023 Nonpoint Source Program Workplan was submitted to EPA Region 4 prior to the September 30, 2023 deadline
Submit Annual Report to EPA R4.	Kentucky's Nonpoint Source Program Annual Report was submitted to EPA region 4 by the December 31, 2023 deadline.
Submit WQ-10 Nonpoint Source Success Story to EPA R4.	Kentucky's WQ-10 Nonpoint Source Success Story for Red Bird River was submitted to EPA R4 in February 2023. The report was submitted through the GRTS database Nonpoint Source Success Story builder tool, revised based upon EPA Headquarters and Region 4 comments, and finalized by the September 30, 2023 deadline.
Submit Watershed Plans to EPA R4 for review and comment.	In June of 2023 the West Hickman Watershed Plan was submitted for EPA review and comment.

2019 KY NPS Management Plan Goals, Objectives, Strategies

The KY Division of Water will work to update the KY NPS Program 5-Year Management Plan.	In FFY 2019, the KY Division of Water revised and submitted the KY NPS Program 5-Year Management Plan. The plan was posted for public comment in May of 2019 and submitted to EPA region 4 on June 27, 2019. Over the course of this management plan cycle, DOW will continue to evaluate plan goals, objectives, and strategies to make improvements for the 2024 plan update. In FFY 2023 we received an extension due to the anticipated updated NPS National Guidelines. The plan is scheduled to be released in by December, 2024.
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