2021 Nonpoint Source Pollution Annual Report

KENTUCKY ENERGY & ENVIRONMENT CABINET

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Kentucky
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Introduction

Nonpoint Source Management in Kentucky

The Kentucky Nonpoint Source Management Program's mission is to protect surface and groundwater from nonpoint source pollution, abate pollution threats, and restore degraded waters in order to meet water quality standards and support beneficial uses. Given its diffuse nature, nonpoint source pollution (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 levels.

The Nonpoint Source 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 nonpoint source 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 Waters with identified threats.

In Federal Fiscal Year (FFY) 2021, DOW received $2.8 million from Clean Water Act Section 319(h) funding to execute the Nonpoint Source Management Program. This year, communities and organizations shared $1.4 million in federal funding to implement projects that control nonpoint source pollution within watershed planning areas. Division of Water awarded those funds to implement best management practices (BMPs) in 15 watershed planning areas, help develop three watershed plans, coordinate statewide Agriculture Water Quality Authority efforts, and provide technical assistance and training to agricultural producers on water quality issues (such as nutrient management).

This report features accomplishments aligned with the NPS program's goals that occurred during FFY 2021 (October 1, 2020 – September 30, 2021).

Chapter 1

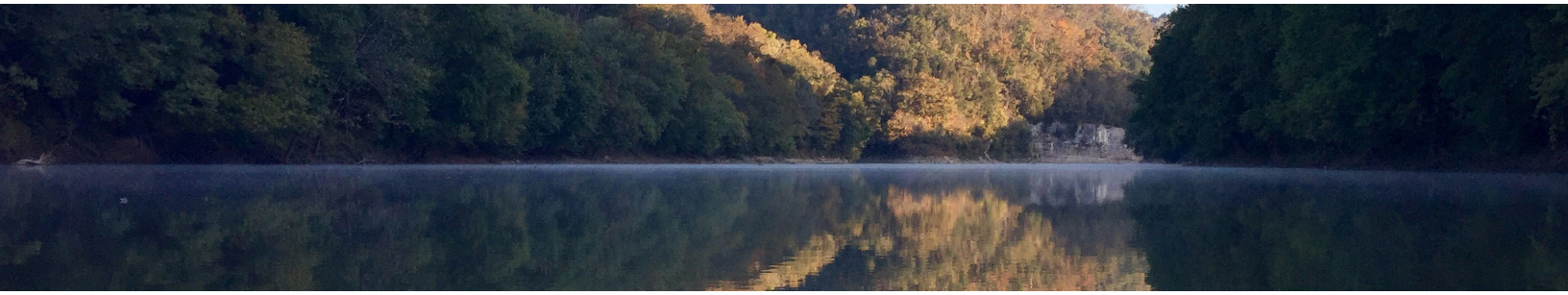
The Watershed Approach

Watershed Planning and Implementation

Division of Water staff provide technical assistance to watershed groups and other partners as they develop watershed plans and implement nonpoint source pollution abatement strategies identified through the watershed planning process. During FFY 2021, DOW staff reviewed two draft watershed plans, Upper Paint Lick Creek and Middle Fork Beargrass Creek.

Watershed plan reviews are coordinated by the Kentucky Interbranch Watershed Implementation Workgroup, which provides the opportunity for all DOW branches to comment or offer constructive feedback on watershed plans prior to acceptance. Currently, 29 watershed plans have been accepted for full or partial implementation with Clean Water Act Section 319(h) funding. At present, an additional nine watershed plans are under development.

Eleven watershed plans are currently being implemented through one or more Clean Water Act Section 319(h)-funded contracts during FFY 2021. Watershed coordinators are integral to the success of implementation projects, managing on-the-ground best management practices to reduce nonpoint sources ranging from urban stormwater to agricultural inputs. Watershed coordinators also work through many channels to conduct watershed-focused environmental education and outreach to the public, local officials, and school-aged children.



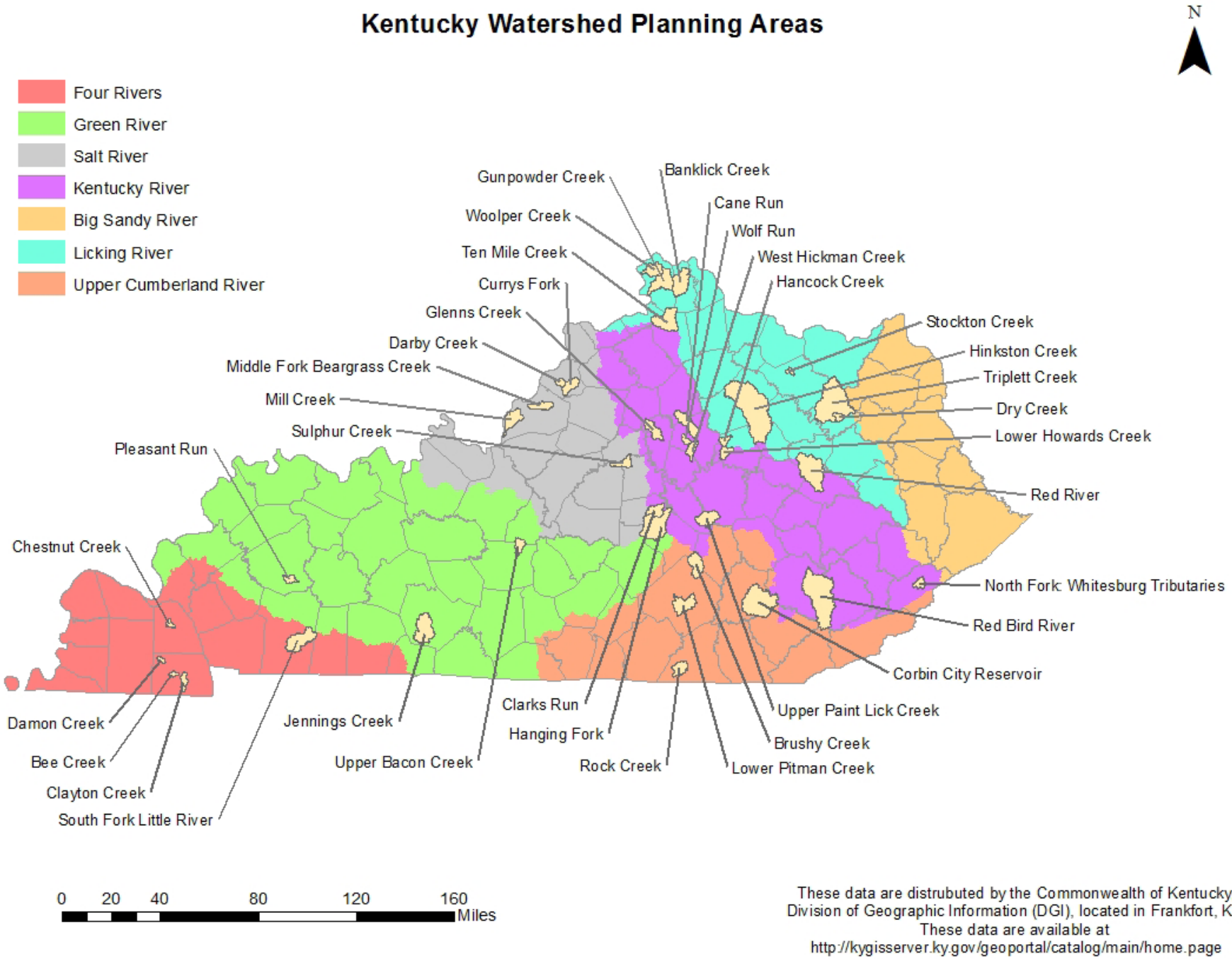


Figure 1. *Approved watershed planning areas and areas containing watershed plan development for Federal Fiscal Year 2021*

NPS Success Story

Watershed Planning and Wastewater Investment Leads to Clarks River Delisting

The Kentucky Division of Water added a 7.5-mile segment of Clarks River (miles 13.1–20.55) to the 2008 Clean Water Act (CWA) section 303(d) list/Integrated Report as impaired for primary contact recreation (PCR) due to Escherichia coli. In 2011, the U.S. Environmental Protection Agency approved DOW's bacteria total maximum daily load (TMDL) for parts of Clarks River, which called for large reductions in E. coli loadings from point and nonpoint sources of pollution. After years of watershed planning, wastewater improvements, and agricultural best management practice installations in the Clarks River watershed, E. coli data collected in 2015 indicated the segment fully supported its PCR designated use. As a result, DOW proposed delisting the E. coli impairment for this Clarks River segment in the 2018/2020 Integrated Report to Congress.

Problem

Clarks River drains into the Tennessee River in the Jackson Purchase region in western Kentucky (Figure 1). Clarks River is approximately 63 miles long and drains a 299-square-mile watershed dominated by agriculture (55%), forest (32%), and developed lands (8.58%) in Marshall, Calloway, McCracken, and Graves counties. The drainage area is made up of ten subwatersheds and includes the cities of Benton and Murray. Fecal coliform and E. coli sampling of Clarks River (miles 13.1–20.55) from 2004–2006 indicated this segment only partially supported the PCR designated use, resulting in its placement on the 2008 CWA section 303(d) list of impaired waters. Additional monitoring supported development of a 2011 TMDL for multiple bacteria impairments throughout the watershed.

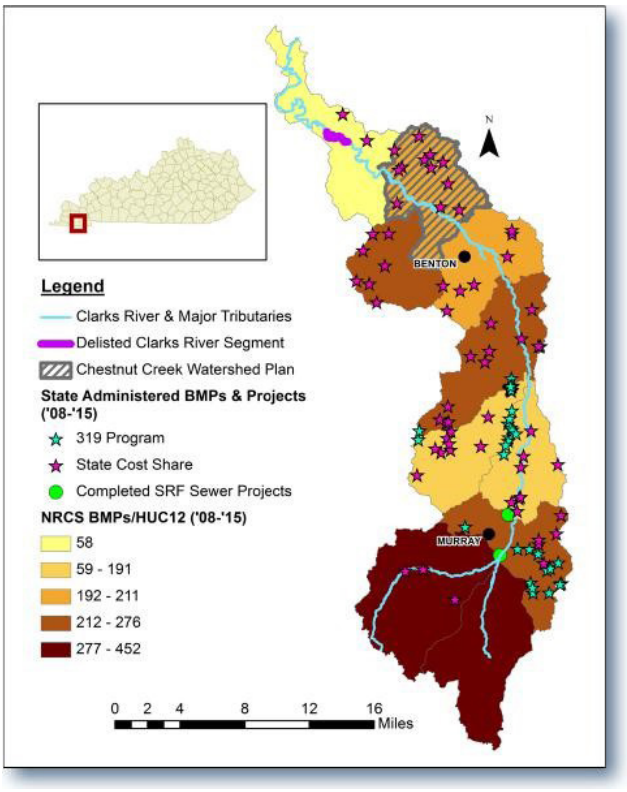


Figure 2. *Clarks River in Western Kentucky*

Story Highlights

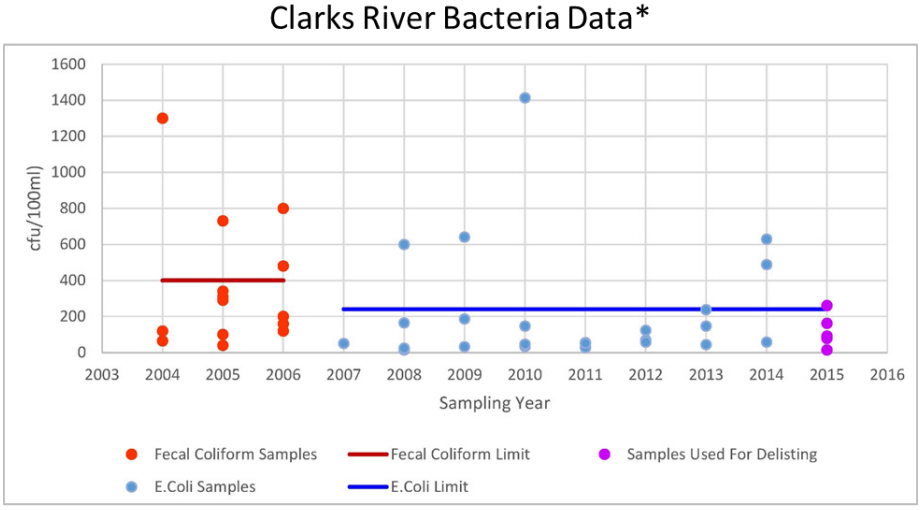
The CWA section 319(h) program funded a watershed-based plan for the Clarks River watershed. This plan identified agriculture, septic systems, stream-bank erosion, and permitted wastewater systems as primary pollution sources of concern. The Chestnut Creek subwatershed was identified as a priority water¬shed, resulting in an EPA-approved watershed plan directly upstream of the Clarks River segment (miles 13.1–20.55). Implementation funding for the Clarks River watershed plan supported repair of 40 septic systems and construction of a community waste lagoon to replace another cluster of 40 failing septic systems (see Figure 2). Additionally, the Kentucky Division of Conservation installed over 100 state cost-share-funded BMPs (Figure 3). In 2008–2015, the Natural Resources Conservation Service (NRCS) funded and installed 2,521 BMPs across nearly 40,000 acres in the Clarks River watershed, including riparian buffers, stream exclusion fencing, and cover crops.tons/year in 2012 alone (Figure 2).

In 2011, DOW developed a bacteria TMDL for 40 stream segments in the Clarks River watershed. The Clean Water State Revolving Fund (CWSRF) provided assistance to upgrade the wastewater systems of multiple point sources that had been identified by watershed plans and in the Clarks River TMDL as likely bacteria sources. CWSRF funds helped extend sanitary sewer service to approximately 100 residences in Draffenville, decommissioned three failing septic systems or package plants, and upgraded Murray's Bee Creek wastewater treatment plant.

Figure 3. *Examples of best management practices installed by project partners*

Results

Following substantial watershed planning and investment, new data demonstrates the Clarks River segment from miles 13.1 to 20.55 is now meeting water quality standards for E. coli. Limited sampling during separate PCR seasons from 2011 to 2014 suggested the stream segment could support its designated use, but more data were needed to recommend a delisting. In 2015, DOW conducted monthly sampling, with five of the six sample results remaining below the water quality criteria (Figure 4). Because fewer than 20 percent of sampling results exceeded the criteria, DOW proposed delisting E. coli as a cause of impairment for the Clarks River assessment unit (miles 13.1–20.55) in the 2018/2020 Integrated Report to Congress.



* For a waterbody to fully support PCR, no more than 20% of samples may exceed 240 colonies/100 milliliters (mL) in a 30-day period for E.coli bacteria or 400 colonies/100 mL in a 30-day period for fecal coliform bacteria.

Figure 4. *Bacteria data (2004–2015), including data that prompted the 2008 listing (red) and the data leading to the proposed delisting in 2018/2020 (purple)*

Partners and Funding

The Clarks River watershed received significant partner engagement, spearheaded by a 2009 Clarks River watershed plan and a 2016 Chestnut Creek watershed plan. In addition to EPA and DOW, key partners included the Jackson Purchase Foundation, the Marshall County Fiscal Court, the City of Murray, Kentucky NRCS, and the Kentucky Division of Conservation. Each partner played different roles, with the Jackson Purchase Foundation focused on implementing section 319(h)-funded septic system and residential wastewater initiatives, while the City of Murray and the Marshall County Fiscal Court leveraged nearly $67 million in CWSRF loans to improve wastewater infrastructure. Kentucky NRCS and Division of Conservation provided technical and financial assistance for agricultural BMPs.

The Division of Conservation collaborated on the Clarks River watershed plan implementation and invested over $701,000 in BMPs through the Kentucky Soil Erosion and Water Quality Cost Share Program. DOW's Nonpoint Source and Basin Team Section provided extensive planning and technical assistance for projects throughout the watershed. In particular, the Four Rivers Basin Coordinator, Maggie Morgan, conducted significant outreach and fostered community engagement that made this delisting possible. Nearly $1 million in CWA section 319(h) grants supported monitoring, implementation, and watershed planning activities, including the Clarks Fork Watershed-Based Plan ($108,300) and implementation ($436,970), a Four Rivers Basin Coordinator ($79,699), and the Chestnut Creek Watershed Plan ($125,000). Division of Water developed the 2011 Clarks River TMDL using two section 319(h) grants totaling over $243,000.

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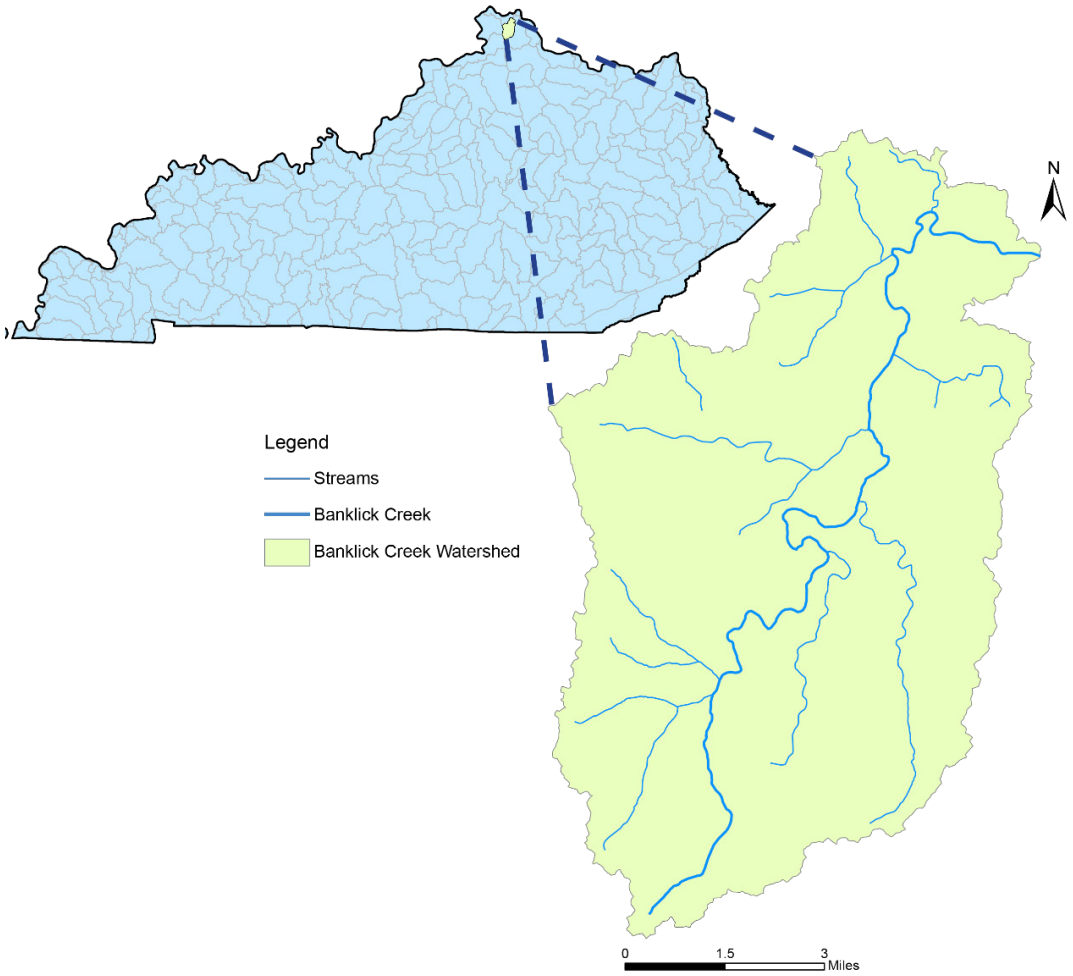
FFY 2021 Projects



Featured Project:

Banklick Creek Watershed

Figure 5. *Banklick Creek Watershed*

The Banklick Creek watershed (58 square miles) is located in the Licking River Basin in Northern Kentucky and spans both Kenton and Boone counties. The watershed has been identified as a priority watershed in Kentucky for several years due to historical issues with water quality violations and rapid population growth with subsequent changes in land use. Banklick Creek is currently listed on the 2016 303(d) list of impaired waters for both Primary Contact Recreation and Warm Water Aquatic Habitat. The stream begins in rural areas and flows through varied landscapes before discharging the Licking River in a highly urbanized area roughly five miles from where the Licking meets the Ohio River. Land uses in the watershed include commercial/industrial, high- and low-density residential, high- and low-density public, and agricultural. Changes in land use and population over the past several decades have posed challenges in addressing water quality, water quantity, and flooding. However, these changes have also created opportunities for working with key partners to improve the watershed during times of transition.

Banklick Watershed Plan Implementation

The Banklick Watershed Council (BWC) has received several Clean Water Act 319(h) grants (most recently Project # 19-07) to implement the Banklick Creek Watershed Plan. Through these grants, Banklick Watershed Council has continued to raise awareness of water quality issues within the watershed and has implemented a variety of projects and best management practices that have improved water quality. Key components of this project include:

Stormwater Management: BWC continues to complete stormwater management projects, including implementing detention basin retrofits in partnership with Sanitary District No. 1 of Northern Kentucky (SD1). Recent stormwater projects include a level spreader as an alternative to traditional riprap-reinforced stormwater headwall (Figure 6).

Pasture Management: There have not yet been any agricultural BMPs implemented; however, BWC has recently made connections within the agricultural community to garner interest in programs. They plan to work with landowners to address cattle access to creeks and pursue soil stabilization projects.

Septic Systems: Septic systems continue to pose issues in certain areas of the watershed. The Banklick Watershed Council collaborates with the Northern Kentucky (NKY) Health District to assist homeowners with septic problems. The NKY Health District refers homeowners with failing systems to BWC's septic repair and maintenance program. Since the start of the current 2019 project, BWC has assisted two homeowners with education and coordination to complete maintenance on their septic systems.

Figure 6. *Level spreader best management practice*

Figure 7. *Riparian Buffer, Bank Stabilization, and Stream Restoration Efforts in the Banklick Creek Watershed*

Riparian Buffer, Bank Stabilization, and Stream Restoration Efforts: Addressing streambank erosion and preservation efforts in the watershed are top priorities for BWC. Erosion continues to be an issue due to rapid development within the watershed. Recent efforts have included a hillside reforestation, stabilization of an eroded tributary, trail-crossing stabilization, creation of a tributary crossing, stabilization of eroded hiking trails and trail crossing, and invasive removals (Figure 7).

Watershed Advocacy, Outreach, and Education: The Banklick Creek Watershed Coordinator has played a key role in the watershed implementation and in advocating for the watershed. Some of the critical duties of the Watershed Coordinator include reducing administrative costs, increasing the capacity for projects, educating stakeholders, conducting outreach, gaining community support, and creating partnerships for project implementation.

Banklick Creek Regional Wetland

The Banklick Creek Regional Wetland is adjacent to the Banklick Creek and provides natural water quality treatment for the creek to reduce bacteria, sediment, and nutrients. However, the wetland recently was at risk of negatively affecting stream quality due to streambank erosion.

This erosion both undermined the basin and caused increased sediment into Banklick Creek. Sanitary District No. 1 of Northern Kentucky (SD1) has worked for several years to improve and maintain the wetland through 319(h) funds (Projects # 14-10 and 20-06). In Project # 14-10, SD1 addressed the streambank erosion through streambank stabilization and riffle enhancement. Sanitation District No. 1 also restored two wetland cells through the removal of about 10,000 cubic yards of sediment to increase the storage volume of the wetland. Since project completion, the site has withstood several flood events and erosive stream flows.

Currently, SD1 is fully restoring the wetland to its original design and functionality through Equilibrium Basin (EQ) Dredging and Outlet Basin Dredging. This project will restore full functionality to the basins and return them to their original design. The restoration of full treatment capacity will allow for an increase in the amount of water that can be treated, which will subsequently reduce pollution to the Banklick Creek.

Both the Banklick Watershed Council and the Sanitary District No. 1 of Northern Kentucky continue to work collaboratively as partners to address water quality issues within the Banklick Watershed and successfully implement the Banklick Watershed Plan.

Figure 8. *Banklick Creek Regional Wetland*

Featured Project:
Currys Fork Watershed

The Currys Fork watershed is located in Oldham County and is an important headwaters tributary of Floyds Fork. Most of the city of LaGrange is included in the northeast corner of the watershed, which extends southwest and roughly along Highway 146 to the eastern edge of the city of Crestwood. The health and condition of the streams and waterbodies in the Currys Fork watershed has been extensively assessed and documented (DOW 2008, DOW 2010, DOW 2012, DOW 2014, DOW 2014a, DOW 2016, SAI 2012) with suspected pollutants and challenges being sediment, bacteria, low dissolved oxygen and altered stream paths. The Curry's Fork Watershed Plan (WP), approved in 2012, details and prioritizes over 100 actions that are needed to reduce sources of water pollution, improve and protect water quality, and meet water quality standards (SAI, 2012). This WP addresses water quality impairments in the four sub-watersheds within the Currys Fork watershed: Currys Fork, North Currys Fork, South Currys Fork, and Ashers Run.

The Oldham County Fiscal Court (OCFC) is actively working towards attainment of water quality standards in the Currys Fork watershed through BMP implementation. Between the two active 319(h) grants for this area, there are 50 unique BMPs identified in the WP that will be wholly or partially implemented. The main goals of the Currys fork projects are to:

- Decrease pathogen loads entering Primary Contact Recreation (PCR) impaired segments caused by failing onsite wastewater systems
- Decrease sediment loads entering Wildlife Aquatic Habitat (WAH) impaired segments by improving riparian buffers as well as riparian habitat and stream connection to the floodplain.
- Decrease nonpoint source loads entering impaired segments in the Currys Fork Watershed through implementation of storm-water best management practices on private lands.
- Pursue alternative (non-319(h)) funding for full-scale stream restoration of priority stream segments.
- Foster the formation of a local watershed group.
- Provide oversight, collaboration and coordination of Watershed Plan implementation initiatives.

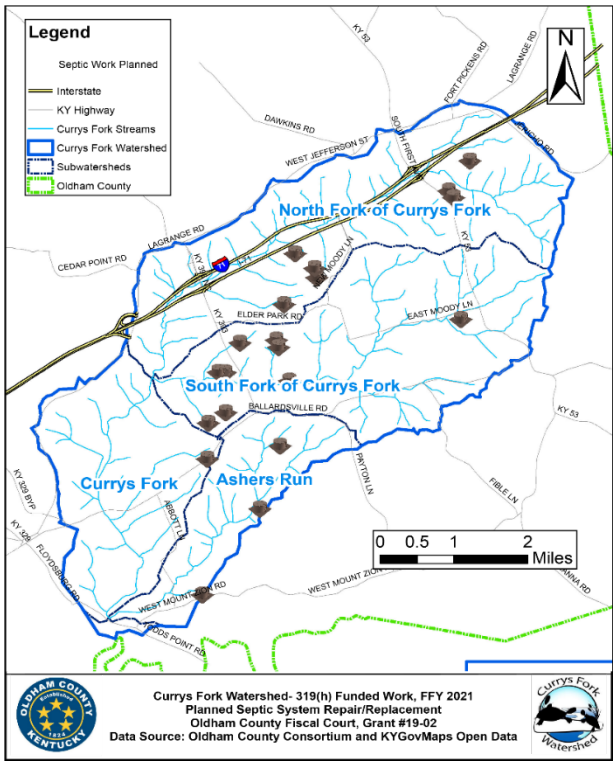


Figure 9. *Map of Currys Fork Watershed and planned septic work*

Septic Work

Oldham County Fiscal Court successfully targeted an onsite wastewater (WW) with a rehabilitation program in a pathogen priority area in the headwaters of Ashers Run using 319(h) grant funds. Oldham County Fiscal Court will continue these efforts, making eligible any homeowner in Currys Fork while prioritizing those closest to the stream. This program provides homeowners with education and training on onsite WW system management, operation, and maintenance, and offers cost-share assistance to repair or replace failing onsite WW systems.

Riparian Restoration

Currys Fork has aimed to improve riparian buffers through education and outreach programs. Oldham County Fiscal Court compiled existing educational and funding resources from partners related to restoring and protecting riparian buffers and these resources were then marketed to help ensure that all available programs and resources are being utilized to reach diverse stakeholders in the watershed. Riparian buffer trainings for landowners have been provided through a University of Kentucky Backyard Streams Workshop, riparian plantings, and tree giveaways. In spring 2021, over 900 bare root seedlings and live stakes were planted during three workshops at Fox Trail, Borowick Farms, and Oldham Reserve, and through a giveaway to streamside landowners.

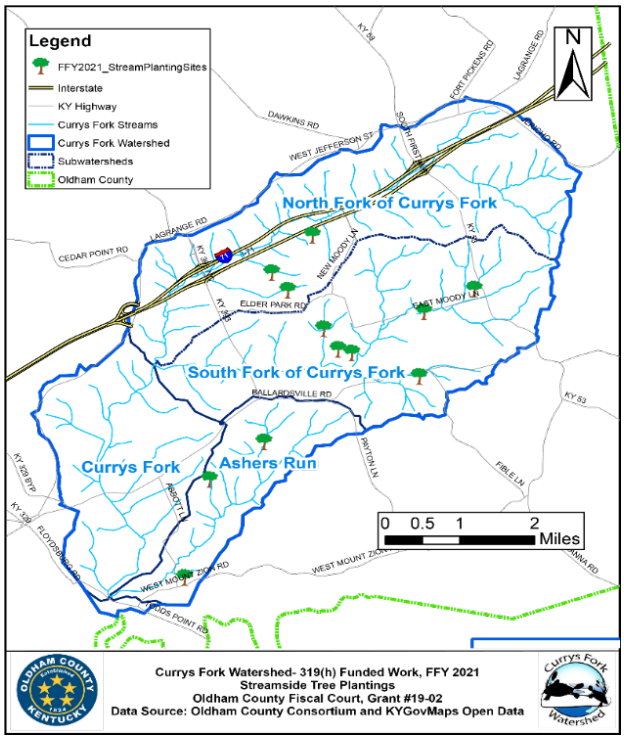


Figure 10. *Map of Currys Fork Watershed and planned riparian buffer plantings*

Rain Barrels and Rain Gardens

One of the ways Currys Fork has increased stakeholder engagement and decreased nonpoint source loads on private lands across the watershed has been through a multi-faceted approach involving homeowner BMP training, rain barrel installation, rain garden training, and rain garden demonstrations. Oldham County residents are eligible to participate in a Rain Barrel cost-share program where they could receive a 50 percent reimbursement, up to $50, for installing a rain barrel. Yew Dell, which is an internationally recognized center for gardening, plants and education, has collaborated with the Currys Fork Project on the installation of a rain garden which was installed on the Yew Dell property with the help of volunteers.

Continuing efforts for rain gardens will include a sign for the installation Yew Dell and signage and funding for future rain garden installations. Greensource maintained administrative and educational capacities, while local health departments conducted site evaluations, solicited bids, and administered final inspections for repair projects.

Figure 11. *Rain garden construction at Yew Dell Gardens in Oldham County*

Projects Started FFY 2021

Table 1. *Projects started in FFY 2021*

State Project Number	Project Title	Start Date
19-12	CVG Airport's Southwest Detention Basin Retrofit	7/1/2021
20-02	Cane Run Sanitary Sewer Line Connections	6/1/2021
20-06	Improving Water Quality Across Currys Fork Watershed	11/1/2021
20-07	Lower Pitman Creek Watershed Plan	6/15/2021
20-08	Dix River and Hinkston Creek Watershed Improvement Program	2/1/2021
20-09	Dairy Compliance Project II	7/1/2021
21-02	Cane Run MHP HAP	6/1/2021

Projects Completed in FFY 2021

Table 2. *Projects completed in Federal Fiscal Year 2021*

State Project Number	Project Title	Date Completed
17-02	Banklick Creek: Wolsing Woods Wetland Construction	9/30/2021
17-03	Project WET Program Implementation	10/1/2020
17-13	Bacon Creek Agriculture BMP Implementation Project	9/30/2021
17-14	Chestnut Creek WSP Implementation Project	11/30/2020
17-15	Hinkston Creek WSP Implementation Project	9/30/2021
17-17	Sulphur Creek WSP Implementation - Cheese Lick	9/30/2021
17-18	Damon Creek WSP Implementation Project	11/20/2020
18-06	Sulphur Creek Phase II Ag Implementation Project - Mercer Co	9/13/2021
18-09	Boone County Homeowner Assistance Program	2/12/2021

Load Reductions

Table 3 contains a compilation of load reduction estimates from BMPs implemented during FFY 2021 (October 1, 2020 – September 30, 2021). Load reductions were derived from direct calculation or by utilizing the EPA's Spreadsheet Tool for Estimating Pollutant Loads (STEPL) tool and then entered into the EPA's Grant Reporting and Tracking (GRTS) database.

Table 3. *Load reductions for projects from FFY 2021*

Award Year	State Project Number	Project Title	Load Reductions		
			Nitrogen (lbs/year)	Phosphorus (lbs/year)	Sediment (tons/year)
2017	17-13	Bacon Creek Agriculture Best Management Implementation	2914.1	734.7	514.9
2018	18-06	Sulphur Creek Phase II- Mercer Co.	14872.3	3454.0	1299.9
2018	18-07	Red River Gorge Implementation Project	791.1	228.8	142.0
2018	18-10	Marshall County Fiscal Court Chestnut Creek Implementation	731.1	146.2	0.0
2019	19-02	Reducing Nonpoint Source Pollution in Currys Fork Watershed	9.7	2.1	0.7
2019	19-05	Clarks Run, Hanging Fork, & Hinkston Creek Watershed Improvement Program	1763.7	497.5	332.8
2019	19-07	Banklick Watershed Plan Continued Implementation	86330.7	15642.7	9145.1
2019	19-09	Red Bird River Watershed Plan Implementation II	82.2	16.4	0.0
2019	19-10	Brushy Creek Watershed Project	6127.5	1843.2	1339.1
2020	20-03	Improving Water Quality Across Currys Fork Watershed	27.4	5.5	0.0
2020	20-05	Agriculture/Watershed Coordinator for Chestnut Creek	485.5	135.1	94.7
2020	20-06	Continued Improvements for Banklick Creek Regional Wetland	178.5	68.7	111.5

Kentucky Division of Water 2021 NPS Project Load Reductions*

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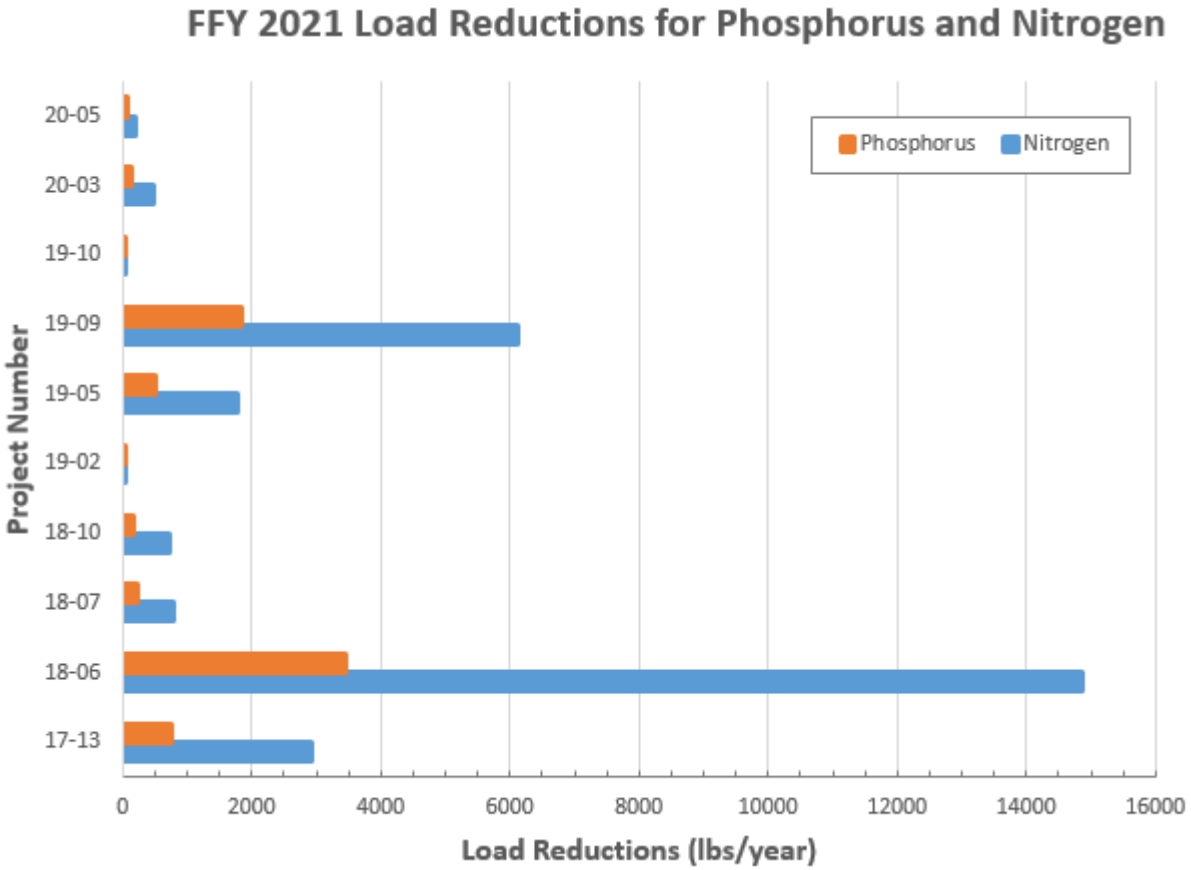

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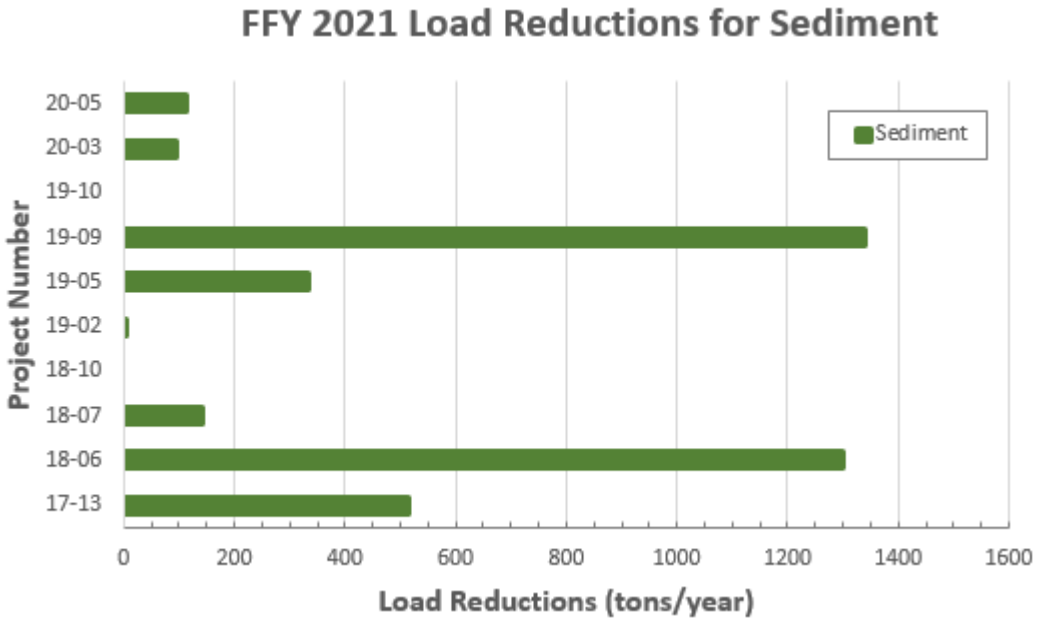


Figure 12. *Load reductions for projects from Federal Fiscal Year 2021. A.) Nutrients; B.) Sediment. *Project # 19-07 results (Banklick Watershed Plan Cont.) are not shown. The load reductions for that project were: Nitrogen: 86,331 lbs/year, Phosphorus: 15,643 lb.*

Chapter 2

Basin Coordination

Kentucky Division of Water Basin Coordinators

Communication with and coordination of watershed stakeholders is critical when attempting to achieve long-term improvements in water quality. Many parties share common interests and goals surrounding watershed health, and the best results are always found when these parties work together to share resources and knowledge.

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, Green and Tradewater Rivers, Licking River, Upper Cumberland River, and Salt River Basins) and two through outside contractors (Four Rivers and Kentucky River Basins), covering all seven of the state's watershed management units (Figure 13).

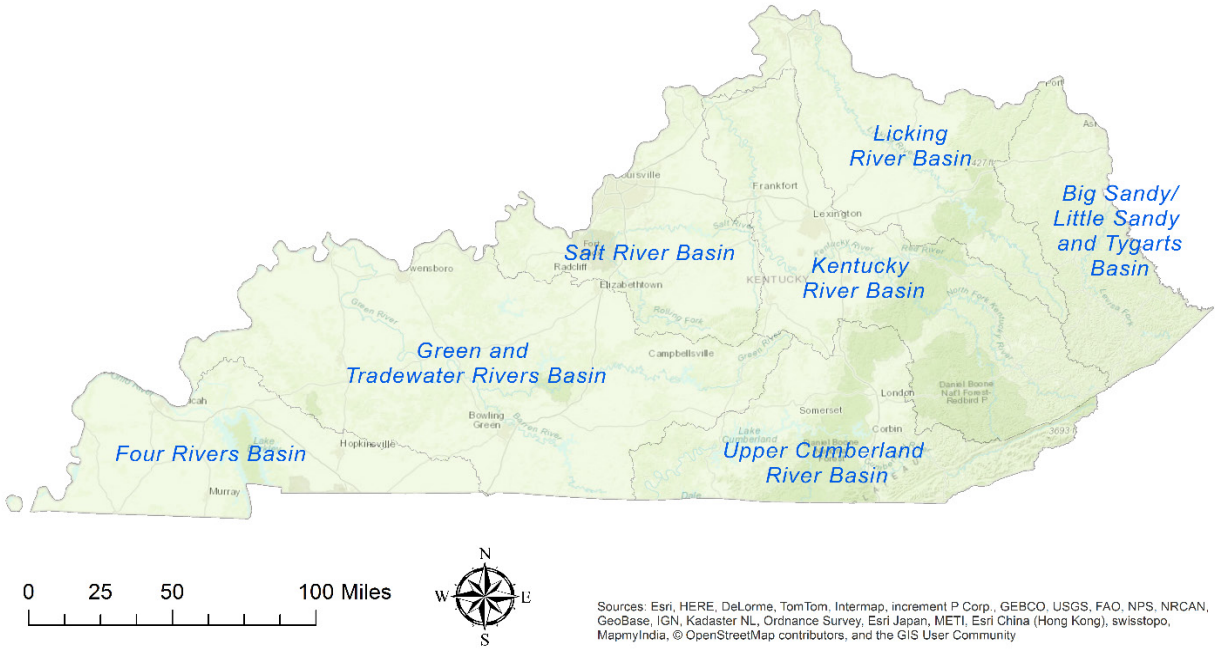


Figure 13. *Kentucky's Major River Basin Management Units*

DOW Priority Watersheds: 2021

A priority watershed is tool used to help coordinate and target watershed resources for improved water quality. They incorporate both information about known problems and area capacity (community interest, known active groups, and potential partners). Targeting implementation and watershed plan development in this way allows us to maximize the delivery of our conservation efforts and achieve greater improvements to water quality. Priority watersheds are not the only places Division of Water focuses its conservation efforts and they are not the Division's only priorities.

Each of Kentucky's major river basins are supported by Basin Teams, community members, and partners working to address water quality issues. The Basin Team model provides an opportunity for networking, information sharing, and leveraging funding with other resources. Priority Watersheds are selected in collaboration with Basin Teams to help the Division of Water focus our collective efforts.

Basin Teams help select priority watersheds through a balance of two factors: where work is being done and where work is needed. They provide the Division with information on capacity, active and developing watershed plans, and areas with higher chances for implementation. They also provide local knowledge to help identify emergent issues and communities interested in pursuing clean water policies. While ideally watershed planning occurs on a HUC 12 scale, our partners often think more at a city, county, or regional scale. Restricting the size and number of watersheds to a certain number of HUC 12s was inhibiting to the conversation, so instead all feedback was collected regardless of size. The Division then narrowed down selected areas by using existing data on watershed plans, source water protection areas, known impairments, outstanding state resource waters, high nutrient yield watersheds, TMDLs, and demographics (low-income and communities of color data).

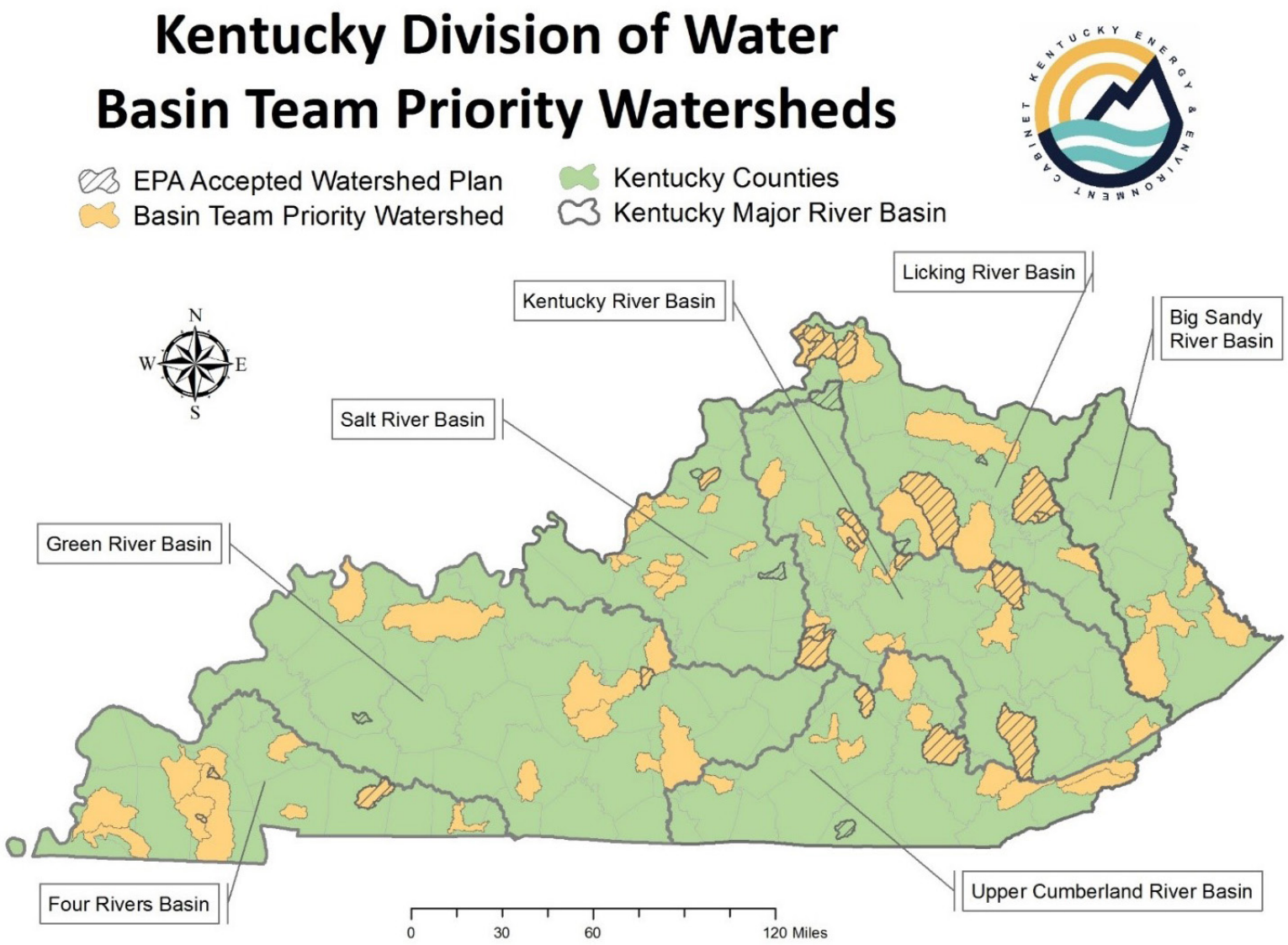


Figure 14. *Basin Team Priority Watersheds in the Commonwealth*

Priority Watersheds: Updates

Big Sandy River Basin

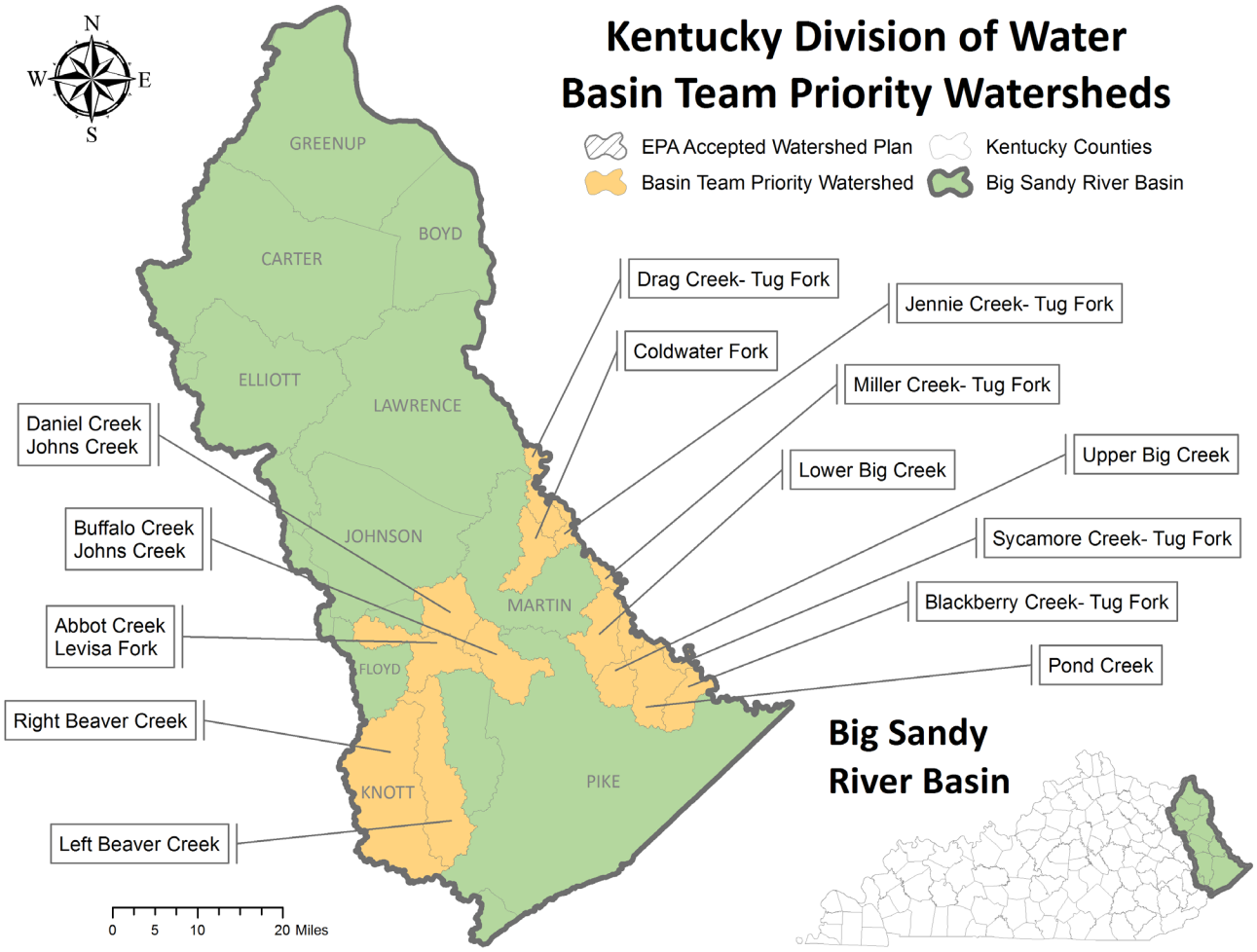


Figure 15. *Priority Watersheds identified by the Big Sandy River Basin*

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 the Friends of the Tug Fork was formed to share fishing photos and recreation information from the Tug Fork River. Today, that group has over 14,300 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, beginning volunteer water monitoring partnerships with both West Virginia's Save Our Streams Programs and Kentucky's Watershed Watch in Kentucky Program, and conducting tire cleanups in cooperation with both states. To date, the Friends of the Tug Fork's efforts have removed over 5,000 tires from the river. As this group expands and matures, the potential for significant, multi-state watershed projects increases.

The Big Sandy River Basin Coordinator is working actively with the Friends of the Tug Fork, Watershed Watch in Kentucky, Save Our Streams, and West Virginia's River Basin Coordinators to bolster projects in the area.

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.

Prestonsburg, Floyd County Watersheds (Buffalo Creek Johns Creek, Abbot Creek Levisa Fork, Daniel Creek Johns Creek)
Recognizing the importance of clean water to community and economic health, the City of Prestonsburg has expressed interest in the watershed planning process for its surrounding watersheds. The city would like to improve the ecological health of its waterways while improving upon recreational opportunities. The Big Sandy River Basin Coordinator is working with the city to prepare for watershed planning efforts.

Figure 16. *Tire cleanup on the Tug Fork River*

Green River Basin

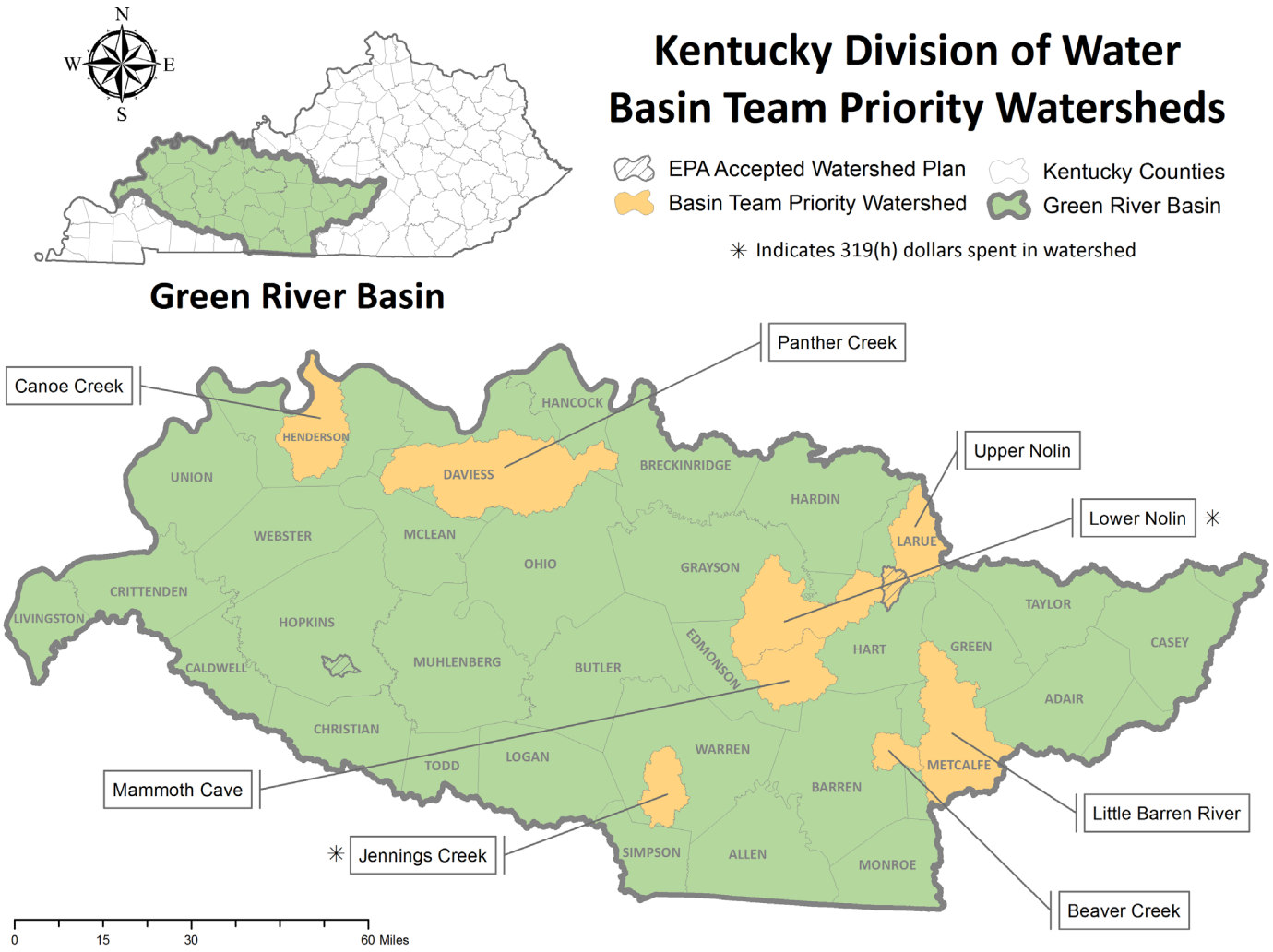


Figure 17. *Priority Watersheds identified by the Green River Basin*

Jennings Creek

Western Kentucky University is interested in developing a watershed plan for the Jennings Creek watershed, located in Bowling Green, KY. Students have collected water quality data over several years, providing a foundation for watershed planning efforts. The University has been approved for a FFY 2021 319(h) grant to develop a watershed plan. Since Jennings Creek is located in a high karst region, the watershed plan will provide a unique perspective by combining springshed and watershed data.

Panther Creek

Panther Creek was identified as a priority watershed for the NRCS Mississippi River Basin Initiative program and is currently in the planning phase. Division of Water also identified it as a high priority for nutrient reduction. The Nature Conservancy (TNC) has expressed interest in Wetland Restoration for the Owensboro area and has been working with the Soil Health Partnership to implement agricultural BMPs.

Canoe Creek

Canoe Creek was recently added to the priority watershed list due to local concerns and impending work in the area. This watershed encompasses an underserved community in Henderson, Kentucky where failing septic systems are a known issue. Multiple partners have expressed interested in focusing efforts within the watershed. The Natural Resources Conservation Service has selected it as a National Water Quality Initiative (NWQI) project for FFY 2023 and indicated it as a prime location for wetland restoration. Kentucky Division of Conservation identified it as a good candidate for state cost-share. The new Green River National Wildlife Refuge also lies within the watershed boundaries, highlighting the need for watershed protection. The Basin Coordinator plans to work closely with all involved partners and the community in the upcoming year.

Nolin River

Upper Nolin River

The LaRue County Judge Executive plans to apply for a FFY 2022 319(h) grant to write a watershed plan for the Upper Nolin – North Fork watershed. The main interest for the plan is to protect drinking water, as it is in a Zone 1 Source Water Protection Area. Division of Water has recently collected data for this watershed and will be working closely with LaRue County throughout the process.

Lower Nolin River

The Lower Nolin River Watershed includes Bacon Creek where LaRue County Conservation District has been using 319(h) funds (Project # 17-13) to implement a watershed plan by increasing agriculture education and best management practices. Funded projects have included improvements to heavy-use areas, forage and biomass plantings, watering facility, livestock pipeline, roof runoff, subsurface drain, and exclusion fencing. This year, their FFY 2017 project successfully closed out, and their FFY 2021 319(h) proposal has been accepted to continue their implementation project.

The Community Action Kentucky – Rural Community Assistance Partnership received 319(h) funds in the spring of 2020 (Project # 19-06) to implement a homeowner septic system program within the Bacon Creek Watershed. The project has experienced implementation set-backs due to the COVID-19 pandemic. However, they have created a website, which provides septic-related public education, and have held a virtual community meeting. They anticipate restarting in-person outreach and septic assistance in 2022, as soon as circumstances allow.

Nolin Lake lies in the southwestern portion of the Lower Nolin River Watershed. Operated by the U.S. Army Corps of Engineers, this lake is widely used by the public for recreation. Recently, there have been local concerns regarding sediment loadings and potential failing septic systems along the lakeshore. The Basin Coordinator plans to build on the momentum with partners to begin to address these issues.

Salt River Basin

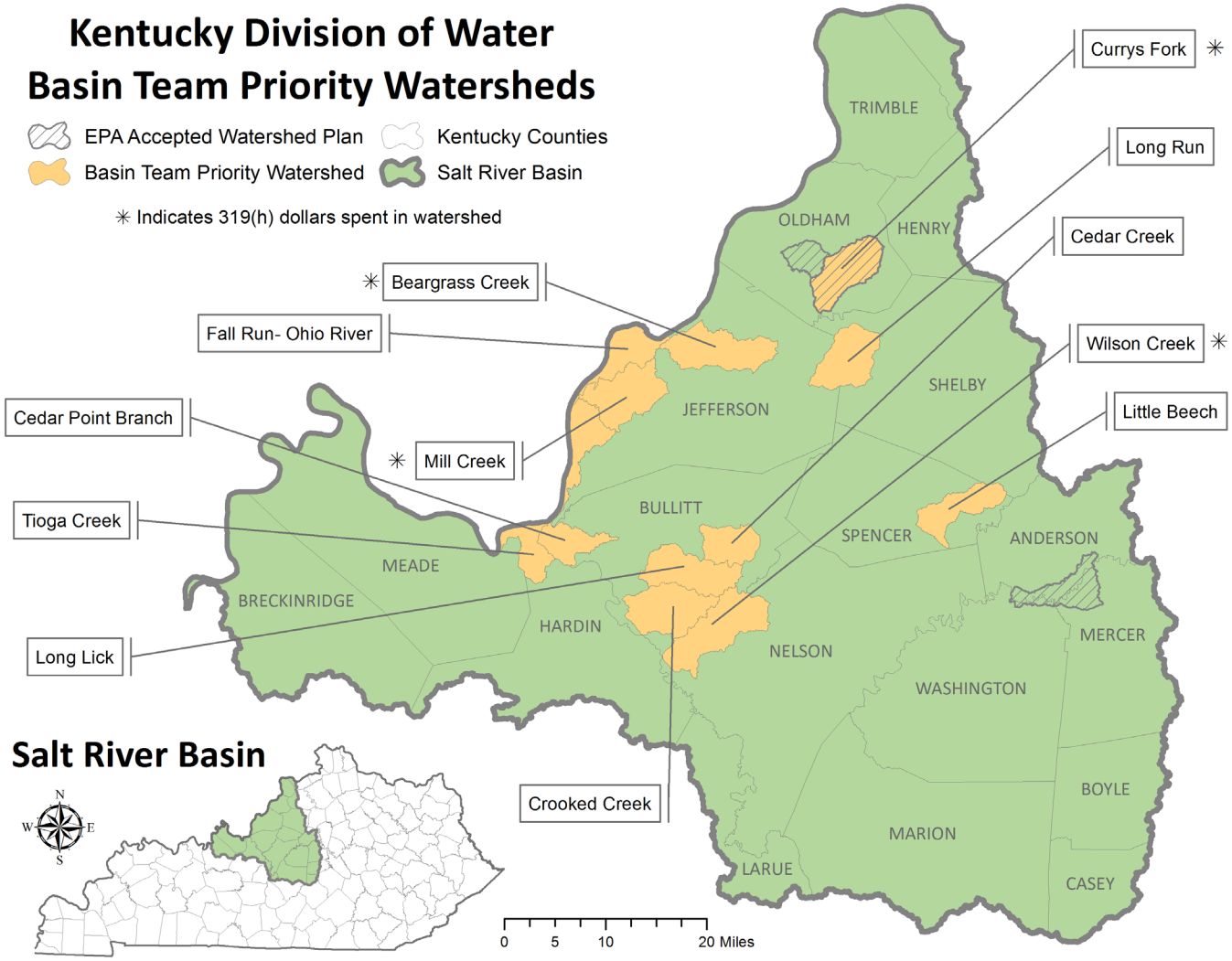


Figure 18. *Priority Watersheds identified by the Salt River Basin*

In the Salt River Basin, the process for selecting new candidates for priority watersheds provided an opportunity for the Salt River Collaborative (SRC) to use maps of the Basin developed for planning conservation projects. The Salt River Collaborative formed in 2015 to promote integrated planning across organizations and take collective action to improve the health and vitality of the Salt River Basin. For the purposes of selecting new priority watersheds (Figure 17), SRC served as the Salt River Basin Team, and in July 2021, DOW signed onto the *SRC Charter* as a member.

Currys Fork Watershed

Implementation of the Currys Fork Watershed Plan continues in subwatersheds of the target area. Education and outreach efforts are widespread and include tree planting events, live-staking workshops, mini-septic system workshops, rain garden planting demonstrations, stream crossing signs, rain barrel installations, stream erosion prevention projects, and organization of a watershed association called “Friends of Currys Fork.” Details of work accomplished in Currys Fork are provided above in the “Featured Projects” section. Future plans include

more intentional integration of stormwater management and nonpoint source pollution mitigation through implementation of nature-based solutions. Integrated water quantity and quality management in Currys Fork serves the dual purpose of improving waterways in the immediate area as well as those downstream in the larger Floyds Fork watershed.

Long Run Watershed
Long Run is located within Floyds Fork and is a candidate for both protection and restoration projects. Long Run is one of four areas within the larger Floyds Fork Watershed identified as focal points in a 2021 draft *Integrated Detailed Project Report and Environmental Assessment* Report for a Section 206 Aquatic Ecosystem Restoration Study of Floyds Fork Study by the US Army Corps of Engineers (USACE). The USACE assessment identifies a combination of in-stream restoration, wetland creation, and native planting projects in Long Run as well as three additional locations in the Floyds Fork watershed. The SRC identified Long Run as a good target for planning integrated water quality and aquatic habitat improvement projects as implementation continues in the Currys Fork headwaters of Floyds Fork.

Sulphur Creek Watershed
With two projects recently completed in the Sulphur Creek Watershed, there is local interest in continuing to build on the momentum created by these and earlier projects. All work focuses on agricultural BMPs to reduce E. coli contamination of Sulphur Creek.

Middle Fork Beargrass Creek Watershed
This year the Louisville Metropolitan Sewer District (MSD) completed a full draft of a watershed management plan for Middle Fork Beargrass Creek, including strategies for implementation of a *TMDL for E. coli*.

In addition, during 2021 the USACE released a *draft Ecosystem Restoration Feasibility Study*, identifying 12 project sites across the Beargrass Creek watershed, with four sites in the Middle Fork watershed. Meanwhile, the Beargrass Creek Alliance has reorganized, with renewed energy focused on taking action to restore and protect all three forks of Beargrass Creek.

Figure 19. *Glass from the Beargrass Creek*

Fall Run and Mill Creek Watersheds
Mill Creek and Fall Run were identified by the SRC as important to prioritize based on environmental justice considerations. In addition, the Mill Creek Watershed is the focus of an ongoing ecological restoration project through a partnership among Louisville Metro Parks, the Nature Conservancy, Kentucky Department of Fish and Wildlife, and Louisville MSD.

Cedar Creek, Long Lick, Crooked Creek, and Wilson Creek Watersheds

Four watersheds surrounding Bernheim Arboretum and Research Forest were identified as priorities by the SRC because a new (2021) grant from the Natural Resources Conservation Service's Regional Conservation Partnership Program (RCPP) will enable partner organizations to build on previous work to conserve natural lands across a wildlife corridor in the heart of the Salt River Basin. Led by the Bernheim Forest, project partners include The Office of Kentucky Nature Preserves and Kentucky Natural Lands Trust. SRC members noted that *The Greater Bernheim RCPP Project* includes plans for education and outreach activities focused on "conservation, water, and land stewardship."

Tioga Creek and Cedar Point Branch Watersheds

After severe damage caused by flooding over the past five years, the City of West Point, located at the confluence of the Salt River and Ohio River, has developed new strategies for managing water quantity and preventing erosion. Together with the City Council, the SRC anticipates planning integration of water quality and quantity management in Tioga Creek and Cedar Point Watersheds, including areas in and around West Point.

Figure 20. *Crooked Creek*

Four Rivers Basin

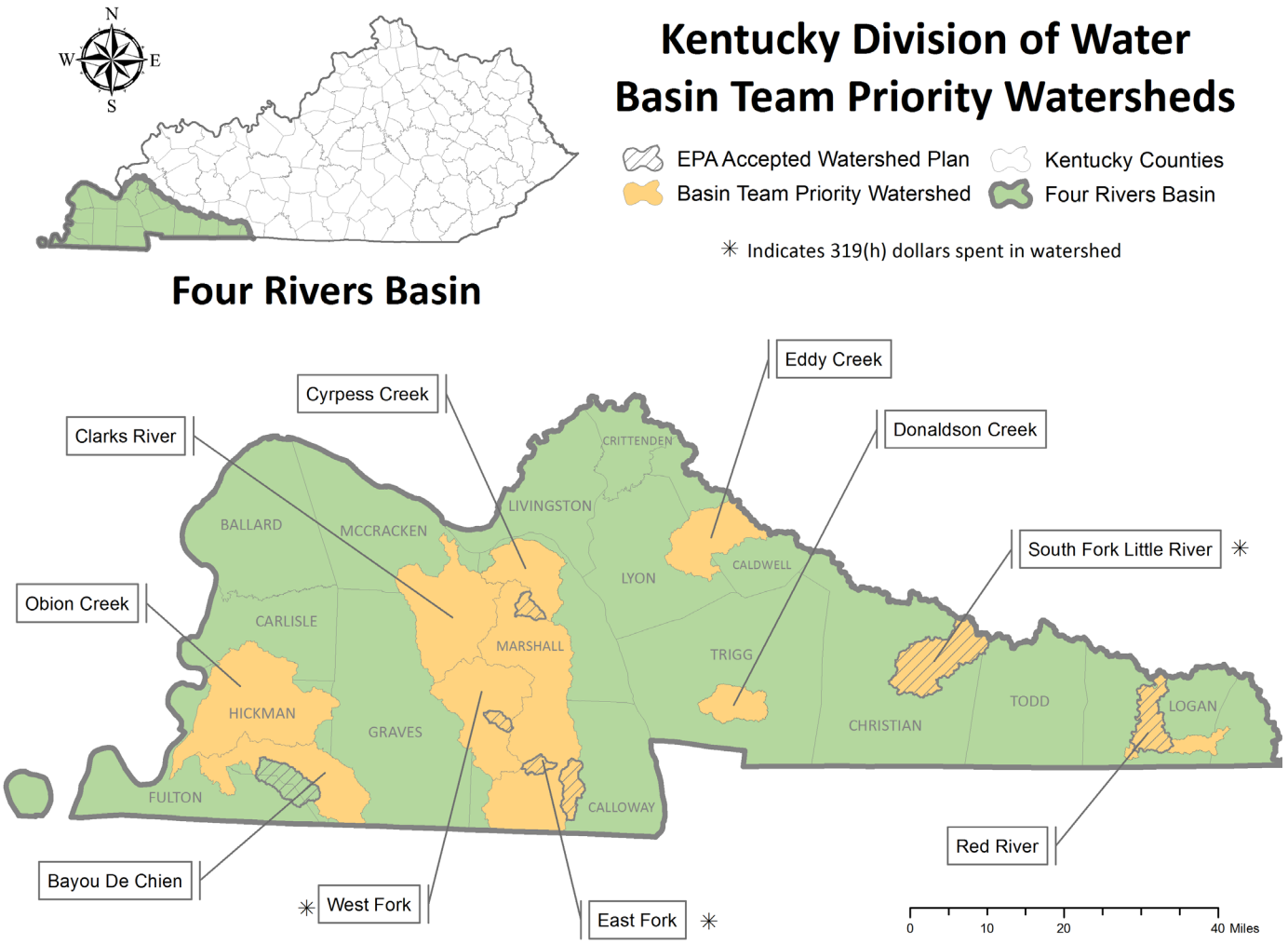


Figure 21. *Priority Watersheds identified by the Four Rivers Basin*

West Fork Clarks River

Damon Creek is a small tributary to the West Fork of Clarks River that drains approximately 5.6 square miles in Calloway County, Kentucky. The 2014 Integrated Report to Congress on the Condition of Water Resources in Kentucky Volume II 303(d) List of Surface Waters (KDOW, 2014) identifies the 0.0 to 1.8 miles stream segment of Damon Creek as impaired for the primary contract recreation use (nonsupport) and lists E. coli as the primary pollutant.

In FFY 2017, the Jackson Purchase Foundation was awarded Section 319(h) funding to implement the Damon Creek Watershed Plan. Several BMPs have been installed within Damon Creek Watershed, including an 80-foot fence line feeder and rotational grazing for approximately

200 head of cattle. The grant ended on September 30, 2020. The Four Rivers Basin Coordinator continues to work with landowners to identify needed practices and raise community awareness of nonpoint source issues within the Damon Creek Watershed.

Clarks River

In 2015, The Friends of Clarks River National Wildlife Refuge partnered with Murray State University and Third Rock Consultants to complete a watershed plan for Chestnut Creek. The watershed plan identifies several causes of water quality impairments: E. coli and excess nitrogen sourced from a local wastewater treatment plant; failing septic systems additionally loading E. coli into waterways; and agriculturally borne nutrient and sediment exceedances. The Marshall County Fiscal Court and Marshall County Sanitation District Number 2 have worked diligently over the past four years to address the failing local wastewater treatment plant, including mending equipment and instituting a fats, oils, and greases ordinance to prevent accumulation in sewer collection systems. To support wastewater centralization, a recent tap-on ordinance requires residences and businesses within 500 feet of a sewer line to tap on. Work is continuing to connect approximately 70 households to this new sewer line.

Through 319(h) Project # 17-14, the Friends group continues to employ a Watershed Coordinator to work with 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.

Like many projects active in calendar year 2021, implementations are progressing slowly in Chestnut Creek and Marshall County, due to issues related to the COVID-19 pandemic. The Chestnut Creek Watershed Coordinator has continued efforts towards improving community understanding of watershed issues through virtual education and outreach initiatives.

Within the Clarks River watershed there are additional efforts underway to develop watershed-based plans for two HUC-12 watersheds utilizing volunteer monitoring data: Bee Creek and Clayton Creek. 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. Clayton Creek and Bee Creek Watershed plans are currently being developed with plans to submit them to the DOW and EPA in FFY 2022.

South Fork Little River

The Little River Water Quality Consortium has completed a watershed planning project utilizing data collected by the U.S. Geologic Survey from a three-year study on the South Fork Little River. The watershed plan has been approved by DOW and EPA with a Best Management Practice Implementation Plan. 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 coordinator was hired in 2019 and is working to connect with local landowners to implement best management practices aimed at improving water quality.

Eddy Creek Watershed Focused Conservation Project (FCP)

This FCP is an individualized Environmental Quality Incentives Program (EQIP) that provides technical and financial assistance to producers in Caldwell, Lyon, and Trigg Counties to address soil erosion and impaired water quality in the Eddy Creek Watershed. Eddy Creek Watershed covers 47,811 acres with a majority of acres (over 65 percent) in agricultural production. Eddy Creek also serves as the municipal water source for the cities of Princeton and Eddyville. Significant water quality degraders include sediment, nutrients, and pathogens. Natural Resources technical staff will work with landowners within this watershed to develop a conservation plan that will address the resource concerns.

Donaldson Creek

Donaldson Creek Watershed has been submitted as the 2022 EQIP Focused Conservation Project. If the proposal is approved, stream bank and wildlife restoration BMPs will be installed to improve water quality within the Donaldson Creek Watershed.

Figure 22. *East Fork Clarks River in McCracken County*

Kentucky River Basin

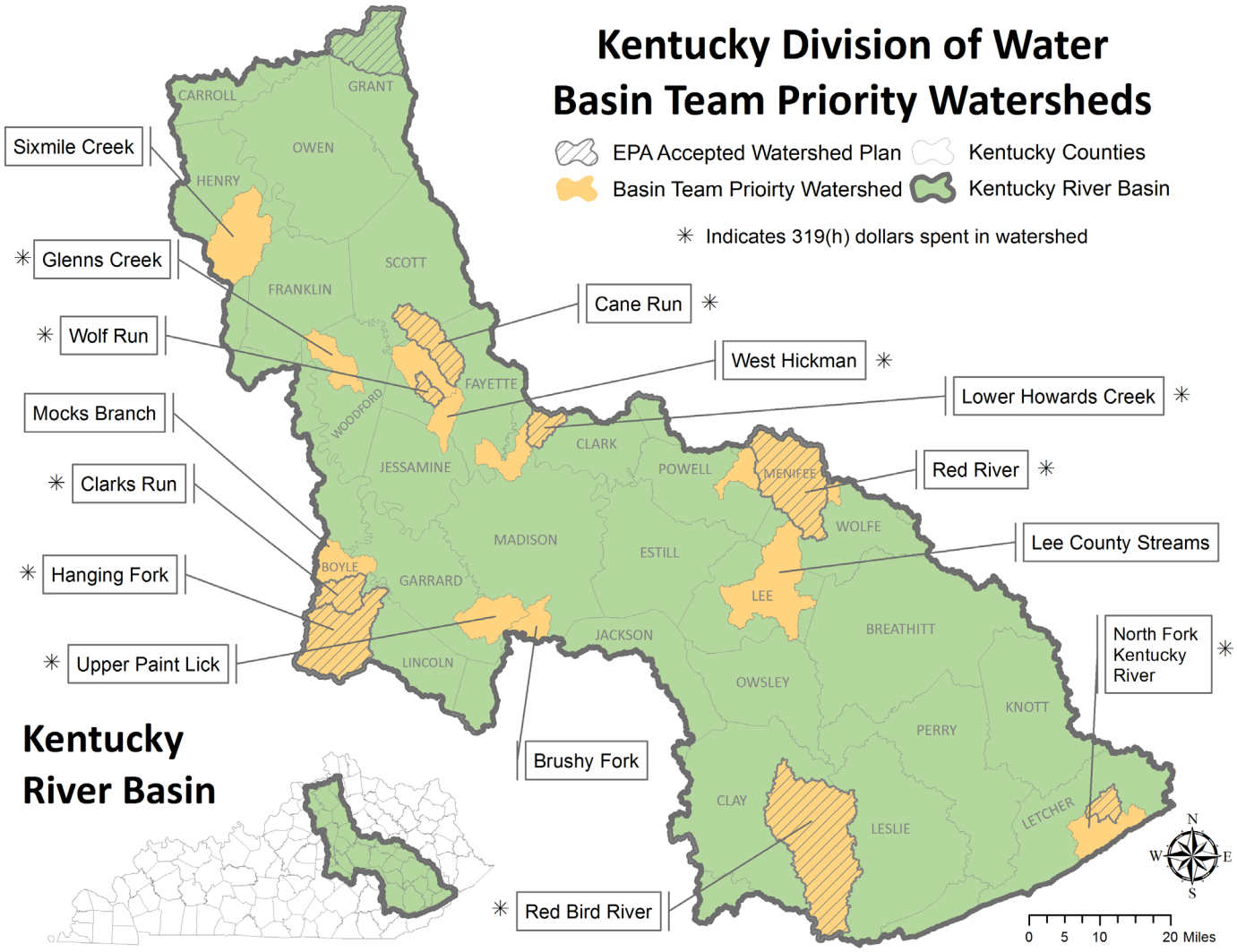


Figure 23. *Priority Watersheds identified by the Kentucky River Basin*

Cane Run of North Elkhorn

In 2021, a construction project to connect two large mobile home communities to Georgetown Municipal Water and Sewer Service began. Through funding from multiple sources, this project will install 16,000 linear feet of collector sewers and service laterals, along with a pump station and force mains. Section 319(h) funding will be utilized in this program to assist residents of the mobile home park with the costs associated with tapping on to the new sewer extension.

Clarks Run and Hanging Fork

With the assistance of a dedicated Watershed Coordinator and 319h grant funding, implementation activities in these two Dix River subwatersheds continue. Project activities in 2021 included a webinar series titled "Saving Our Streambanks," which provided extensive guidance on buffer revegetation. The coordinator also coordinated the ongoing septic education and repair program and designed a new mini-grant program to stimulate small-scale implementation projects throughout the watershed.

In the Hanging Fork watershed, the Lincoln County Sanitation District has begun Phase II of the sewer expansion project that will transition approximately 365 septic systems to sanitary sewer connections. This project helps to fulfill one the Hanging Fork watershed plan's primary recommendations: to add municipal sewer service to an area previously served by primarily failing onsite septic systems.

The Clarks Run Environmental and Educational Corporation (CREEC) received a Watershed Grant from the Kentucky River Authority to investigate potential stream restoration BMPS in an urbanized stretch of the creek that flows through Danville. Consultants are assisting this group with evaluating the feasibility of several options, including the removal of unused low-head dams.

Glenns Creek

In anticipation of a 319h grant to develop a watershed plan, the Kentucky Water Resources Research Institute began conducting intensive sampling of Glenns Creek and its tributaries. This 2021 grant project will continue with water quality sampling through March 2022, stakeholder focus groups, the formation of watershed leadership committee, and the completion of a watershed plan. A parallel research study conducted by KWRRI has provided significant insights about the challenges and willingness of the area's horse farm community to utilize conservation practices. The area also hosts several bourbon distilleries and there are plans to further engages these businesses in efforts to improve and protect water quality.

Figure 24. *Water quality sampling on Glenns Creek*

Figure 25. *The Clarks Run Environmental and Educational Corporation (CREEC) group leads an outing with stream restoration experts to discuss the potential removal of low heads dams on the creek.*

Lower Howards Creek

The City of Winchester applied for and received a 2021 319h grant to install a stormwater bioretention basin along an upstream tributary of Lower Howards Creek. This basin will reduce flooding and help inform the public about the importance of upstream retention and the impact that high velocity stream flows have on siltation, hydromodification, and in-stream habitat. It will also provide educational opportunities for the nearby school and visitors its sports complex.

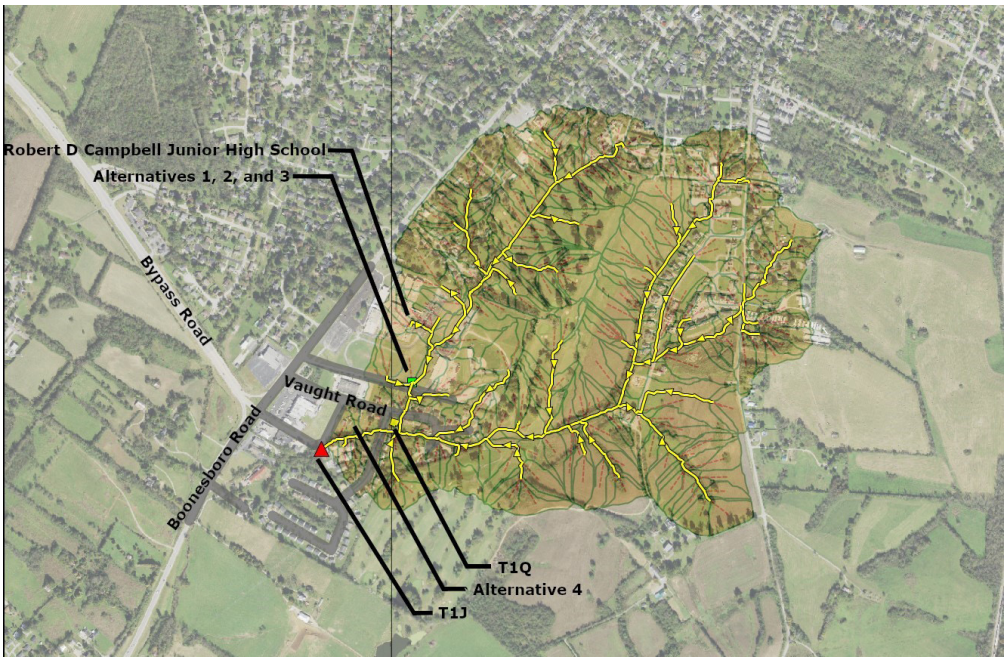


Figure 26. *Lower Howard project area map for bioretention basin installation*

activities, such as cleanups and tree plantings were successfully carried out.

The majority of US Forest Service efforts in the Red River Gorge watershed focused on rehabilitating unauthorized trails and campgrounds that have been causing erosion impacts throughout the area.

North Fork Kentucky River Headwaters

Some activities were possible in the implementation of the *North Fork Whitesburg Tributaries Watershed Plan* in 2021. This included a riparian buffer project along a segment of the North Fork Kentucky River that flows behind the Whitesburg Elementary School playground. Project partners for this effort included Headwater, the Kentucky Division of Water, the Kentucky Division of Forestry and Eastern Kentucky University.

Figure 27. *Planting native tree seedlings along the North Fork Kentucky River*

Red River

Red River Watershed Plan implementation activities continued to be carried out by the watershed coordinator, although outreach efforts were challenging. The Red River Festival had to be carried out virtually, with lower attendance than usual. And, some septic system education was possible through online workshops. As a result, several septic system repairs and installations were funded through the 319h implementation grant. A Red River Paddle Fest was held in May 2021, and other outdoor

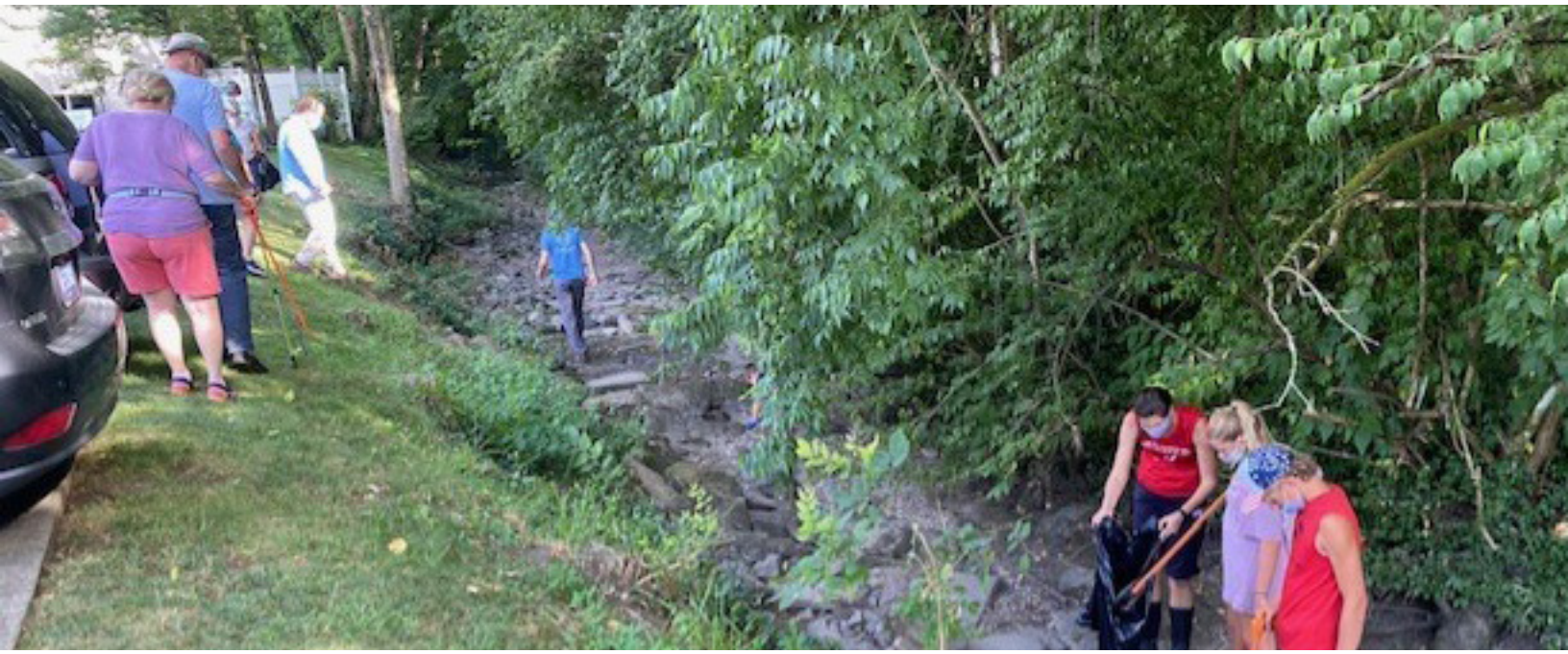
Red Bird River
The Watershed Coordinator continues to work with the U.S. Forest Service, the Red Bird Mission and others to help implement the Red Bird River Watershed Plan. The coordinator is continues to focus on addressing solid waste and onsite wastewater pollution, although pandemic limitations made outreach and engagement very challenging in 2021. Funding through the Kentucky River Authority and Rotary International provided additional assistance with septic pumpouts and installations.

Upper Paint Lick
Copperhead Consulting firm received 319(h) grant funds to develop a watershed- based plan for the upper reaches of the Paint Lick Watershed. Currently, the final chapters are in development, while DOW has approved chapters 1-5.

West Hickman Creek
Activity in the West Hickman Watershed remained steady throughout 2021. The newly formed Hickman Creek Conservancy organized many outdoor activities, including stream walks and trash cleanups, tree plantings, and a trail run fundraiser. Meanwhile, Palmer Engineering continued the development of the watershed plan for West Hickman Creek and is planning to present the draft plan for public feedback in December 2021.

Wolf Run
In May 2021, the Friends of Wolf Run, Lexington-Fayette Urban County Government and the University of Kentucky collaborated to provide a walking tour of stormwater management practices throughout the watershed. The Friend of Wolf Run organization continues to implement multiple stormwater management and stream restoration practices throughout the watershed. They also act as an important voice for stream protection by providing public comment on development activities that may impact Wolf Run and its tributaries.

Figure 28. *Stream walk and clean up along tributary of West Hickman Creek*



Licking River Basin

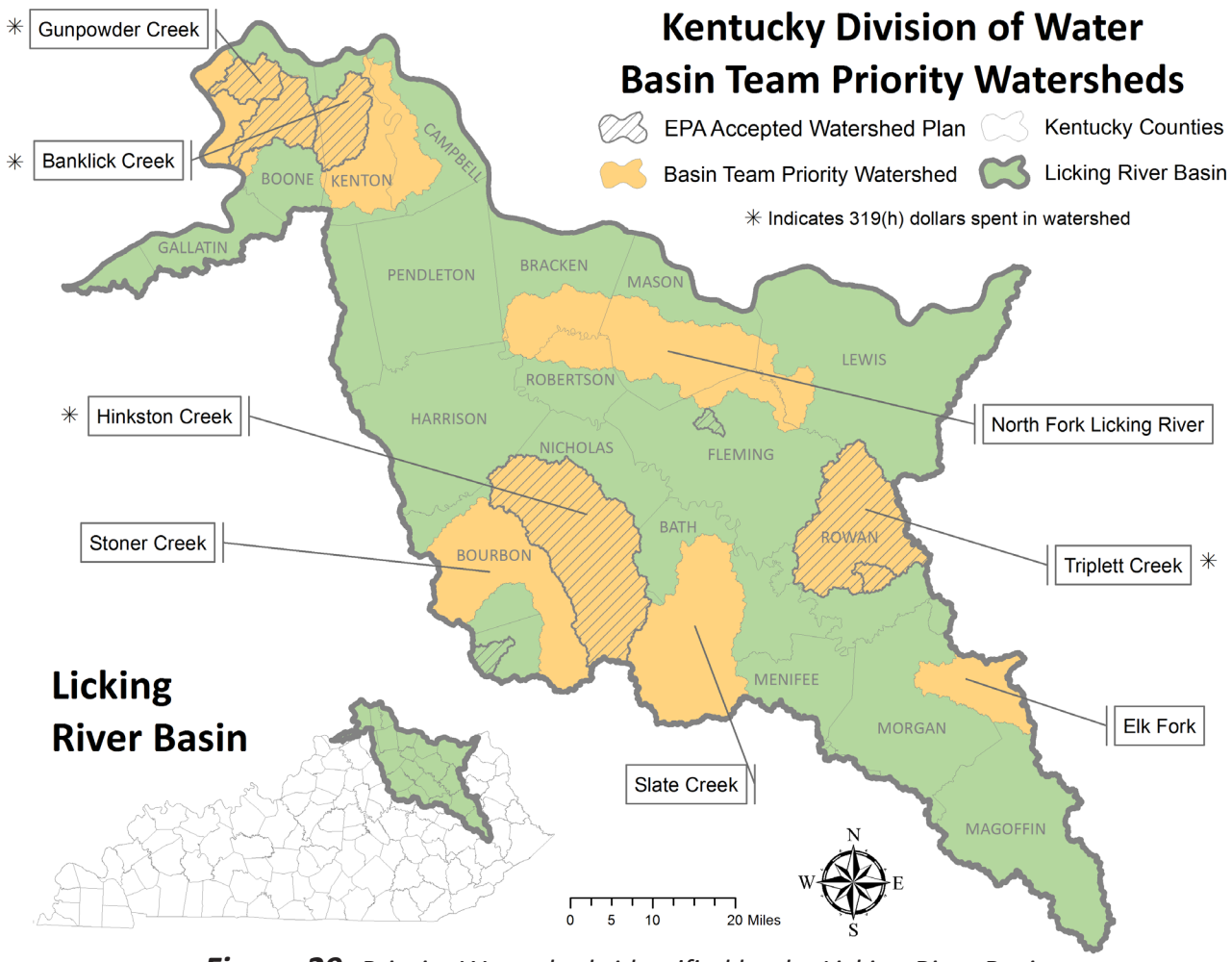


Figure 29. *Priority Watersheds identified by the Licking River Basin*

Northern Licking River Basin (Gunpowder Creek and Banklick Creek)

There is significant momentum in the northern parts of the Licking River Basin. Both Gunpowder Creek and Banklick Creek have active, EPA-approved watershed plans (and hired watershed coordinators), with Gunpowder Creek containing the state's only TMDL Alternative Plan. Both watersheds are highly interested in implementing nature-based solutions to reduce erosive stormwater flows and protect water quality.

In Gunpower, there are notable amounts of conservation dollars resulting from Kentucky Department of Fish and Wildlife Fee In-Lieu Of program, along with significant mitigation credits from a recently constructed 600 acre-large Amazon air hub.

Banklick Watershed Council is the local nonprofit implementing the watershed's management plan and recently partnered with Groundwork Ohio River Valley, a local chapter of a national organization designed to promote equity and youth workforce development in green careers, to complete trail work for a watershed project. The Banklick Creek Watershed Coordinator is additionally support plans to create a Banklick Creek TMDL Alternative Plan with SD1, Northern Kentucky's Sanitation District.

When asked about local concerns, stakeholders cited increasing development, climate change, and erosion due to mismanaged growth as top issues.

Central Licking River Basin (North Fork Licking River, Stoner Creek, Hinkston Creek, Slate Creek, Triplett Creek)

Within the central region of the basin, there are varying levels of stakeholder interest, though significant environmental concerns and potential for watershed projects.

Of the five priority watersheds, two have EPA-approved watershed plans (Triplett and Hinkston Creeks), though only one is active with a hired watershed coordinator (Hinkston). That said, 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 City of Morehead Floodplain Coordinator and Morehead Plant Utility Board regarding stormwater management and flash flooding impacting water treatment plants and wells. Morehead will also be the state's newest MS4 Program as a result of the 2020 Census. The Licking River Basin Coordinator has been in conversation with program staff to strategize 319/MS4 synergies.

Hinkston Creek was recently identified as a priority watershed for Kentucky's Nutrient Reduction Strategy. The Licking River Basin Coordinator is working with local partners, including Bluegrass Greensource, UK Cooperative Extension, NRCS, county Conservation Districts, and Kentucky Cattlemen's Association to fund a farmer-led conservation program for disadvantaged farmers to help increase widespread conservation practice implementation.

In the remaining three watersheds without management plans, there are varying levels of community interest; in the North Fork of the Licking River, there is existing community capacity cultivated through Licking River Watershed Watch, a nonprofit supporting volunteer water quality samplers. Stoner Creek contains an active watershed group, Friends of Stoner Creek, who actively pursues watershed engagement through volunteer sampling, water-focused school art competitions, watershed festivals, and other environmental education efforts. In Slate Creek, the local health department is concerned about failing septic systems in watershed and there is subsequent interest in an SRF project to address pervasive septic issues. Local partners voiced interest in educational awareness efforts around the Outstanding Water Resource in Slate Creek area. Slate Creek has also identified as a Mississippi River Basin Initiative watershed for NRCS (planning will begin in FFY 2022).

Headwaters Licking River Basin (Elk Fork Creek)

Historically, there have been no 319(h) dollars awarded to the headwaters of the Licking River. 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.

Upper Cumberland River Basin

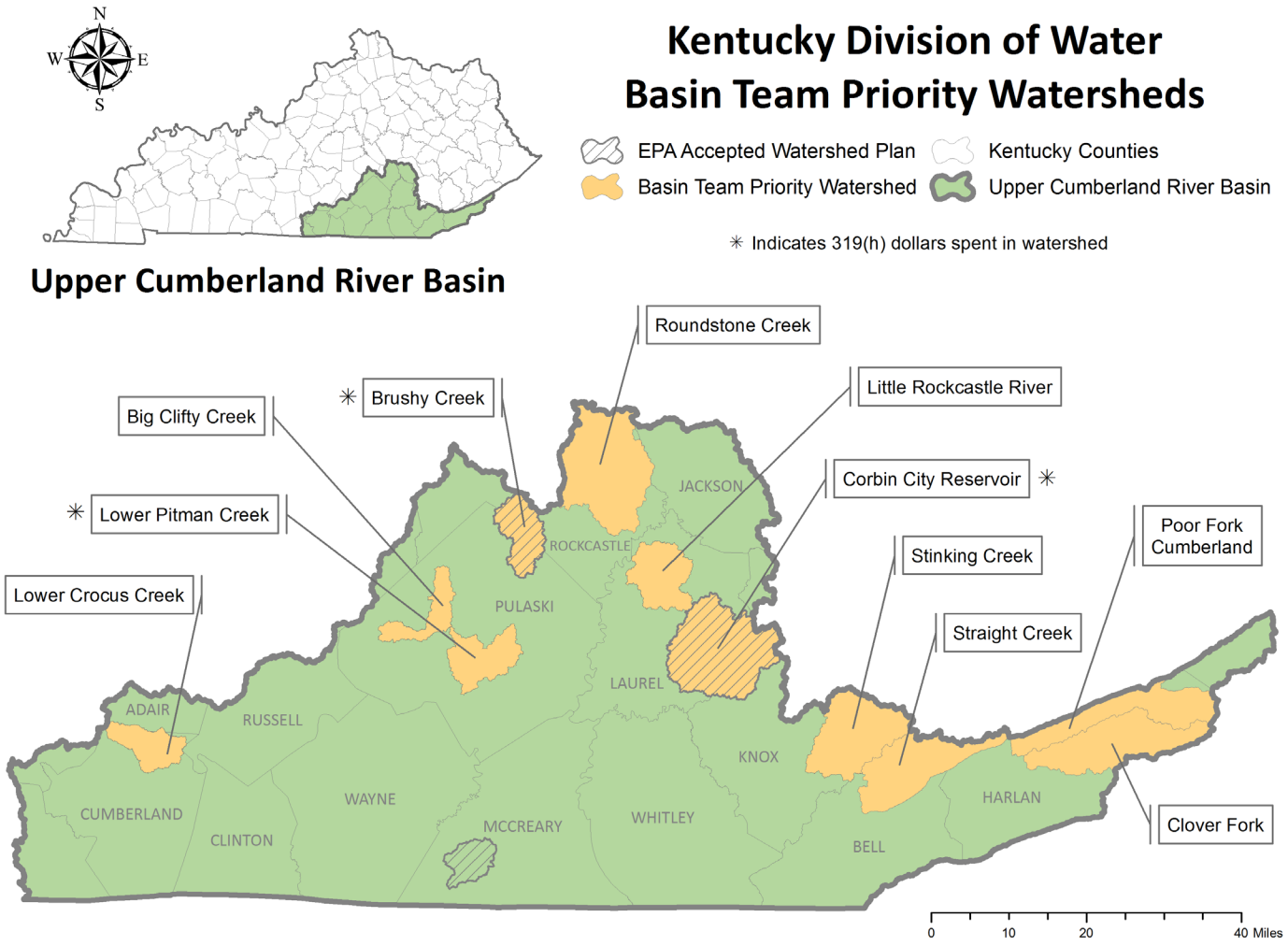


Figure 30. *Priority Watersheds identified by the Upper Cumberland River Basin*

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 largely be the results of runoff from surrounding agricultural, forestry, and urban land use.

In 2019, the Natural Resources Conservation Service and the Kentucky Division of Water began to lay the groundwork for water quality improvements in the watershed. The Natural Resources Conservation Service approved two subwatersheds of Roundstone Creek for focused conservation projects. The Division began collecting water quality data to establish a baseline for showing success. Through the NRCS programs, agricultural BMPs are currently being installed throughout the watershed. Watershed planning through the 319(h) program is expected to start in the next two years.

Brushy Creek
In 2019, the Pulaski County Conservation District (PCCD) was selected to receive additional Clean Water Act (CWA) 319(h) funding to continue reducing agricultural runoff in the Brushy Creek Watershed (Project # 19-10). An exciting part of the project is the inclusion of new technology; the PCCD purchased a drone with a normalized difference vegetation index (NDVI) sensor to analyse plant health.

This technology enables farmers to gain a bird's eye view of crops and use the visual display to indicate areas of poor plant health. The drone is then able to zoom in to identify if areas of declining health are due to insect infestations, lack of nutrition, or other types of crop damage. Once a determination is made, the farmer is then able to take a targeted approach to chemical applications, thus reducing the potential for nonpoint source pollution on the property. A farm tour demonstrated this process to the community. The 2019 project kicked off with another farm tour, this time hosted virtually at the Somerset Drive-In. The event was a partnership with the Pulaski County Cattlemen's Association, Natural Resources Conservation Service, the Kentucky Beef Network, and the University of Kentucky's Cooperative Extension Service. The project will continue through 2023 with a focus on highlighting and installing agricultural best management practices.

Lower Pitman Creek
The City of Somerset was approved for a 319(h) grant to address water quality concerns in the Lower Pitman Creek watershed. The watershed is a heavily karst area, so a major part of the watershed planning process is the collaboration with the Division of Water to conduct a groundwater study to identify major sinkholes, springs, and the flow patterns of the groundwater under the city. In addition, the Division is collecting water quality data to base the writing of a watershed plan to implement in the future.

Education and 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.

Tables four and five detail educational programming accomplished in FFY 2021. Basin Coordinators and technical advisors of the Nonpoint Source and Basin Team section typically reach thousands of stakeholders throughout outreach activities each year. Due to the ongoing COVID-19 pandemic, outreach to students in K-12 educational programs was limited. Education and outreach to our local partners and stakeholders relied heavily on the virtual format. Consequently, one main highlight from this year is the continuous increase of I Love KY Water Facebook page followers: from 3,709 in FFY 2020 to 21,257 in FFY 2021.

Figure 31. *Ollie the Otter at the Kentucky State Fair*

Table 4. *Education and outreach activities by Action Item*
The Division of Water reached more than 9,000 people through these events.

Action Items	Accomplishments
Action Item 1.1: Continue effective messaging for the Division of Water.	I Love KY Facebook Page was created in 2016 and has been maintained by the Basin Coordinator Staff. The page has increased followers from 3,709 (2020) to 21,257 followers (2021). The Basin Coordinators used MailChimp for monthly to quarterly newsletters. The mailing list contains 1,354 recipients.
Action Item 1.2: Partner with organizations on environmental education and outreach opportunities	Partnered with the following organizations: Kentucky Conservation Districts Kentucky Water Resources Research Institute Jackson Purchase Foundation Kentucky Association for Environmental Education Kentucky Department of Conservation University of Kentucky Cooperative Extension Calvert City Elementary School Watershed Watch in Kentucky Calloway County Middle School Kentucky Waterways Alliance Kentucky Association of Mitigation Managers Friends of Waterfront Park Kentucky Center for African American Heritage Louisville Free Public Library Louisville MSD Louisville Photo Biennial Louisville Photographic Society Louisville Water River City Paddle Sports University of Louisville College of Education and Human Development

Table 4 Cont'd. *Education and outreach activities by Action Item*
The Division of Water reached more than 9,000 people through these events.

Action Items	Accomplishments
Action Item 1.3: Develop content for social media, basin newsletters, and other print and non-print outlets	Social Media: Each Basin has sent out quarterly or monthly (Licking River) newsletters Each Basin Coordinator provides content for the Facebook Page Participated in the following Social Media Campaigns to promote various aspects of water, including Water Week in Kentucky, EPA's Septic Smart Week, and Earth Day Produced *Land, Air, and Water* webzine articles
Action Item 1.4: Coordinate and conduct public events and/or exhibits	Rippple Effects Exhibit at the Kentucky State Fair *Public events were limited this year due to the COVID-19 pandemic.

Table 5. *Education and outreach activities by type*

Type	Description	Community Reached
Presentation	Conducted presentations at various conferences and meetings throughout the State to educate the public about: Watershed Planning Bridging Silos Across Agencies Harmful Algal Blooms Nature-Based Solutions Nonpoint Source Pollution and Hazard Mitigation Planning Priority Watersheds General Water Quality Kentucky Volunteer Lake Monitoring Watershed Watch in Kentucky Green River Basin Team Meeting Licking River Basin Team Meeting Salt River Collaborative Water Quality and Best Management Practices Community Monitoring	Conducted **15** formal presentations reaching over **1,600** community members of all ages
K-12 Environmental Education	Conducted various water related activities using Project WET at partners events: Calvert City Elementary School Calloway County Middle School Environmental Science Days Red River Virtual Festival Envirothon Training Danville High School Leadership Program *School events were limited this year due to the COVID-19 pandemic.	Conducted **5** Environmental Education programs reaching ~ **350** students
Workshops (Hosted)	Conducted the following Workshops: Watershed Watch in Kentucky Training Volunteer Lake Monitoring Train-the-Trainer Watershed Academy	At the **24** workshops held throughout the State, ~ **300** community members and partners were taught by the Division of Water

***Table 5 Cont'd**. Education and outreach activities by type*

Type	Description	Community Reached
Workshops (Attended)	The Basin Coordinators Attended the following Training for Professional Development: Kentucky Association of Mitigation Managers Training Kentucky Watershed Academy Nonpoint Source Technical Exchange Workshops National Nonpoint Source Training Workshop 4-H Stream Team Training 303(d) Workshop Hazard Mitigation and Karst Planning Workshop Saving Our Streambanks Seminars	
Community Meetings Attended	Dix River Watershed Council Meeting Headwaters Advisory Team Meeting West Hickman Watershed Council Meeting Area Development District Meetings Banklick Watershed Council Meetings Calloway County Conservation District Board Meeting Farmer to Farmer Meeting Friends of Clarks River National Wildlife Refuge Little River Water Quality Consortium Meeting Mammoth Cave Biosphere Reserve Meeting NRCS Region Workgroup Meeting Obion Creek Watershed Conservancy Ohio River Restoration Workshops	Attended over **100** community meetings throughout the State

Table 5 Cont'd. *Education and outreach activities by type*

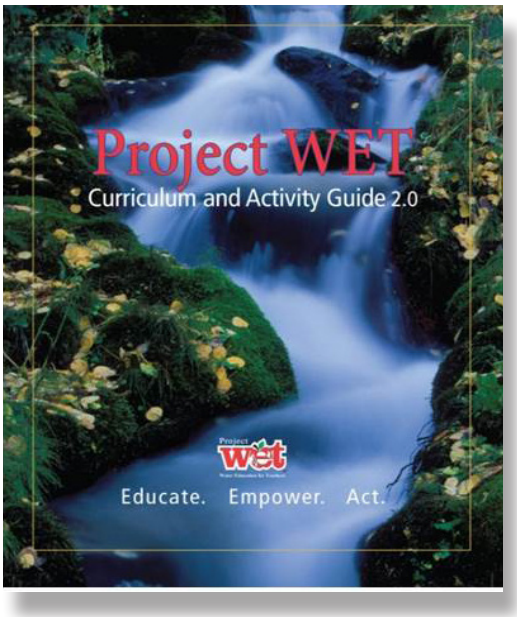
Type	Description
The Basin Coordinators are also responsible for watershed planning and implementation. In FFY 2021 the Basin Coordinators and Technical Advisors have worked in the following areas related to current or future watershed development:	Banklick Red River Brushy Creek Red Bird River Hinkston Creek Bacon Creek Sulphur Creek Upper Paint Lick South Fork Little River Cane Run Chestnut Creek Lower Pitman Creek North Fork: Whitesburg Currys Fork

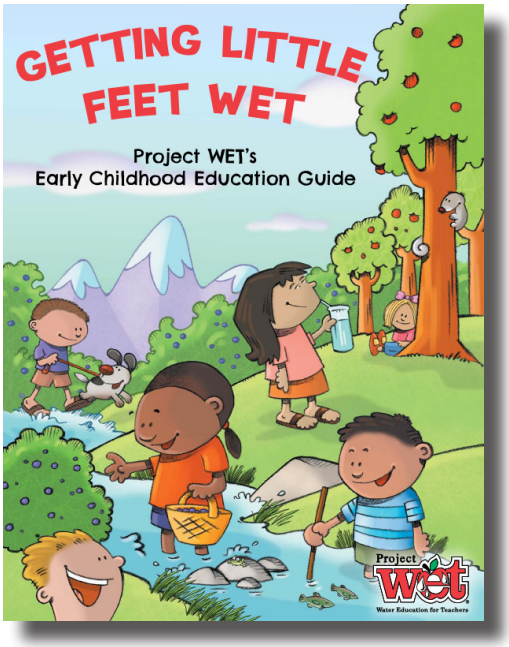
Project WET

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. Project WET's goal is to provide scientifically accurate and educationally sound water resources education materials, training courses, and networking services to citizens, organizations, governments, and corporations. The Kentucky Project WET Coordinator has multiple roles: training facilitators and educators across the Commonwealth; ensuring certified facilitators have all required forms to support their workshops; managing activity guide orders; developing and maintaining a database of certified facilitators and educators in Kentucky; and providing 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 state-wide water education.

In FFY 2021, KAEE continued work using Project WET in collaboration with the Next Generation Science Standards (NGSS), a model that is now used by Project WET coordinators nationwide. This work incorporating the Next Generation Science Standards is crucial to ensuring that environmental education is integrated into academic curricula; formal educators, guided by state-required and -assessed standards, can easily justify how Project WET activities correlate with NGSS. This carries further weight for non-formal educators engaging with formal educators and addressing their NGSS-driven scholastic needs.

During FFY 2021, KAEE's Project WET program conducted eleven educator workshops and reached 77 educators, including (K-12) educators, university educators, pre-service educators, and non-formal educators. Due to the ongoing COVID-19 pandemic, the 2021 facilitator trainings were virtual. Kentucky Association for Environmental Education is working with educators and facilitators around the state to improve the number of trainings held in the coming year and hopefully begin incorporating some in person trainings in the near future.





Outreach

Educational Equipment

The Division of Water has a large supply of environmental educational equipment that is available for checkout, allowing 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, Enviroscapes, display boards, and a stream table. In addition, an Ollie the Otter, DOW's Mascot, costume is available for events.

In a normal year, these items are in high demand, by both formal and non-formal educators. Due to the COVID-19 pandemic, equipment check outs were suspended due to issues related to social distancing, sterilizing equipment, and cancelled in-person events.

Outreach Material

As part of DOW's mandate to improve understanding of NPS issues within the Commonwealth of Kentucky, the NPS Section has worked with stakeholders, educators, journalists, and regulators to develop online outreach and print publications about water quality, DOW initiatives, and best management practices.

Nature-based Solutions Initiative

In 2018, the Kentucky Association of Mitigation Managers received a grant from EPA (in partnership with Kentucky Division of Water) to incorporate nature-based solutions (NBS) as a mitigation goal in Kentucky's State Hazard Mitigation Plan. To promote buy in from key stakeholders, such as regional planning groups (Area Development Districts), mitigation managers, and watershed planning professionals, the grant additionally funded statewide outreach and engagement efforts, which is where the Licking River and Salt River Basin Coordinators provided support, aligning with NPS outreach and education goals.

The Kentucky Nature-based Solutions Project Team (discussed in further detail under 'Partner Spotlights') began planning a four-part webinar series to introduce nature-based practice to target audiences. To initiate a two-way dialogue between stakeholders and the project team, and engage diverse stakeholder interests that are critical to both water quality management and hazard mitigation, a survey was designed and disseminated to tailor training material to best fit stakeholder needs and interests.

Survey results (from 120 entries) indicated an average understanding of nature-based solutions

Figure 32. *Social Media post advertising the upcoming summer series*

with primary interest in project and funding assistance. Respondents listed funding, stakeholder buy-in, and lack of awareness as the top three barriers to successful implementation.

The inaugural session introduced a Kentucky-centric overview to nature-based solutions, including the NBS Project Team and plans to integrate NBS into hazard mitigation plans, and situated them in the context of the Commonwealth's new weather and climate normal. Parts two and three delved into specific practices and planning approaches, such as managing for stormwater quality and quantity, integrating watershed management and hazard mitigation planning, examples across the Commonwealth, and tools for planning and implementation (e.g., The Nature Conservancy's Floodplain Prioritization Tool and NBS Benefits Explorer, a geospatial suitability model from US Army Corps of Engineers, EPA's Community-enabled Lifecycle Analysis of Stormwater Infrastructure Costs (CLASIC) and National Stormwater Calculator). Given the traditional urban/suburban emphasis of NBS outreach, there was a concerted effort to engage agricultural partners and stakeholders. To that end, University of Kentucky Cooperative Extension and NRCS presented opportunities to assist communities and private land owners with water quality and quantity problems. The concluding session of the webinar series touched in funding opportunities and planning resources, including presenters from the Department of Local Government, University of Kentucky Martin School of Public Policy, and Kentucky's State Revolving Fund program, and Kentucky Environment and Energy Cabinet's Environmental Justice Coordinator. In total, 137 attendees participated over the four-week series.

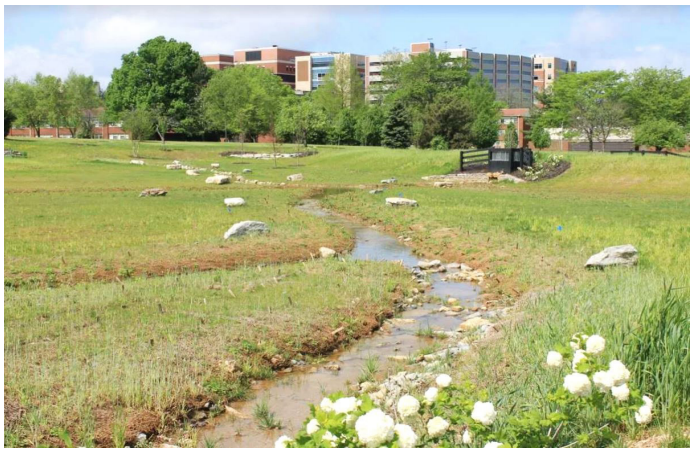


Figure 33. *A restored stream and wetland complex in Lexington, Fayette County, KY*
Image courtesy of the University of Kentucky

Nature-based Solutions Story Map

In conjunction with the NBS Summer Webinar Series described above, the NPS team collaborated with KAMM members to crowdsource examples of NBS already implemented across Kentucky. These examples were compiled in an interactive Story Map by summer intern Hannah Leibman.

The *Kentucky Nature-based Solutions Story Map* includes a broad suite of best management practices from rural, suburban, and urban settings. Strategies range from wetland creation in Fayette County (Figure 29) to vegetated swales in Shelby County, forest conservation in Livingston County, stream restoration in Boone County, and many more.

For more information about the Story Map and the process we used to create it, see the Kentucky Energy and Environment's Cabinet's Land, Air, and Water webzine article *Nature-based Solutions in Kentucky: New Ways to Keep Water and Nutrients on our Farms, in our Gardens, and off our Streets* (published November 8, 2021).

Naturally Connected Blog and Land, Air, & Water Articles

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

In FFY 2021, the NPS team worked with the Cabinet's communications office and intern Maggie Reilly to produce a video describing how harmful cyanobacterial blooms develop and how communities can participate in monitoring algae and cyanobacteria in their local waterways. The video included excerpts from an interview with Dr. Isabel Escobar, a professor of chemical engineering at the University of Kentucky, and the full interview was published, along with a *link to the video*, in a Land, Air, & Water article titled *Good Algae Gone Bad: An Interview with Dr. Isabel Escobar on Cyanobacteria and Algal Blooms*.

Webpages and Social Media

In FFY 2021, the Division's Nonpoint Source team implemented a social media plan to build upon and amplify the program's impact. Goals included 1) increasing the online audience, 2) producing interactive and engaging content, and 3) improving communication with partners, individuals, and communities. The social media platform used was the I Love KY Water Facebook page, an avenue to develop interest and capacity in the Kentucky.

To build the online audience, the team took inspiration from BuzzFeed Publisher, Dao Nguyen, and the cultural cartography theory to categorize content in relation to how it helps the viewer do a real job in their life. The theory identified five categories of jobs (Figure 30) performed by content and offered a way to understand how people use online content to connect and create culture. Of particular interest was the suggestion that the interactive nature of social media provides an opportunity to establish a deeper connection with communities through creating conversations. Using these categories, the NPS team created paid advertisements and tested them with targeted audiences.

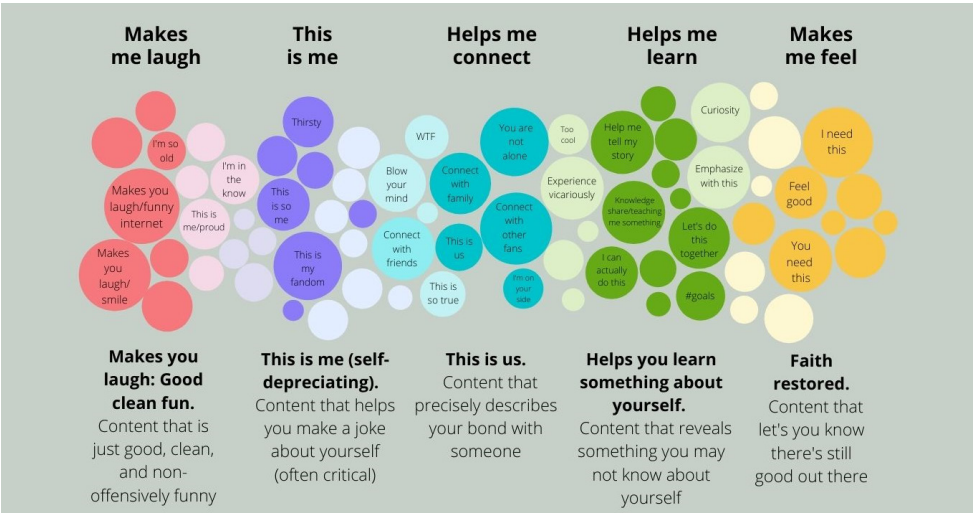


Figure 34. *Cultural cartography's five categories of content. Source: Dao Nguyen, What Makes Something Go Viral? Ted.com*

Figure 35. *Photo contest flyer*

One of the first advertisements was a scenic picture with a caption that read: "Keep Eastern Kentucky Beautiful. It's time to end straight pipes." The cultural cartography category was to help people connect. It's well known that the bond people share with eastern Kentucky is strong and very protective. This advertisement was meant to tap into those feelings and create a conversation about an ongoing water quality issue (straight pipes). It worked; the reactions were strong and the ad opened up several conversations with indivdual members of different communities, some of which were very emotionally charged. The response led to the belief that a well-funded, strong program to end straight pipes could be succesful in eastern Kentucky. After this experience, the NPS team will use social media to build an online community to influence change and create a trusted space for environmental conversations.

All together, the team ran over 100 advertisements while putting an emphasis on creating content to match the usefulness to the viewer. Our online audience grew from 3,000 to over 21,000 people. The advertisements reached over 600,000 people and brought over 37,000 engagements to the team's Facebook page.

To celebrate Earth Day, the NPS team hosted an interactive photo contest on the I Love KY Water Facebook page. Using a paid advertisement, the contest attracted 56 photos submissions and thousands of likes and comments. The winner received a donated free stay at a Kentucky State Park. The hope is to make this an annual, online event.

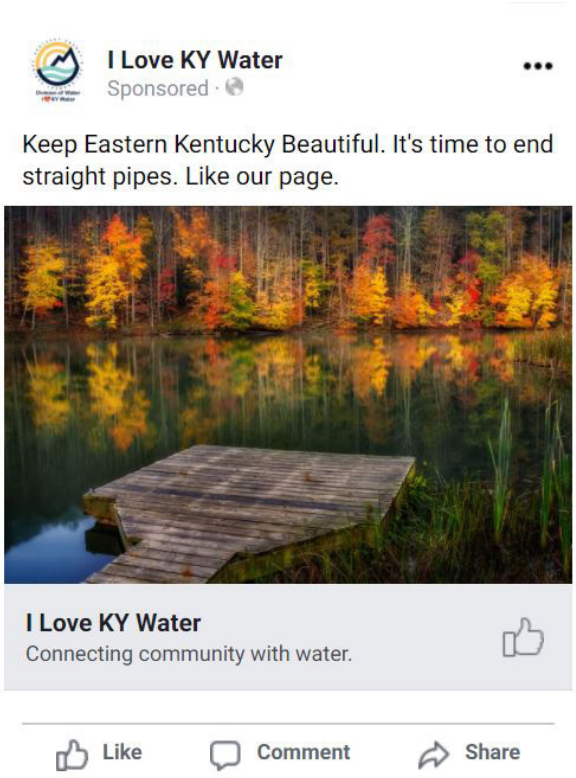
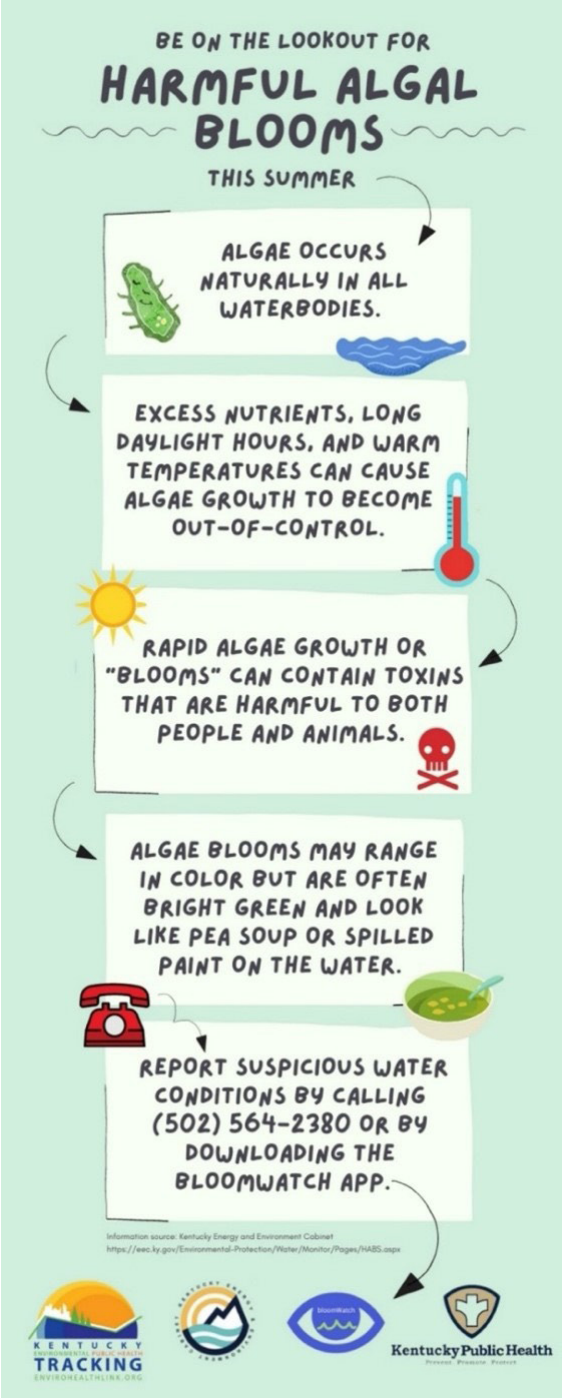


Figure 36. *Example of initial round of social media advertisements*

Before the water recreation season, the NPS team worked in collaboration with the Kentucky Environmental Public Health Tracking program to produce several infographics to inform the public about two water-related topics with human health impacts: harmful algal blooms and water safety tips. In a coordinated effort, the content was published on all forms of shared social media. Related content on these topics, along with a combined press release, will occur annually.



With COVID-19 making in-person events difficult – if not impossible – the Division is increasingly looking for virtual methods to reach stakeholders. In addition to Facebook, the DOW Nonpoint Source and Basin Team maintains *Nonpoint Source Pollution*, *Basin Coordination*, and *Watershed Planning* webpages on the Energy and Environment Cabinet's website. From these pages users have access to the *Kentucky Water Health Guide, Watershed Planning Guidebook for Kentucky Communities, EPA's Watershed Planning Module*, their local basin coordinator contact information, and all deadlines and forms for 319(h) project proposals and applications. Users can also access the *Water Maps Portal*, which contains user-friendly interactive maps that display water data ranging from water quality impairments to harmful algal blooms, as well as drought potential tools. The DOW *Story Map Gallery* also provides useful tools for users to explore specific projects, watershed planning initiatives, and programs.

Basin Coordinator Quarterly Newsletters

The Basin Coordinators create and send out monthly to quarterly newsletters to their basins. The information in these newsletters includes everything from Basin Team updates and highlighted basin successes to information on best management practices and watershed management-related funding. Each newsletter is catered to its basin's needs and interests, and is aimed at maintaining basin awareness of NPS issues, initiatives, funding availability, and partnering opportunities.

Chapter 3

Partnerships for Clean Water

Spotlight: Watershed Watch in Kentucky

Watershed Watch in Kentucky (WWKY) continues to support water quality monitoring that informs, connects, and empowers volunteers and their communities for the improvement and protection of Kentucky's water resources. WWKY, established in 1999, 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 in Kentucky programs implemented in FFY 2021 include:

1. ***Youth Stream Team Program***
   This fledgling program was established in partnership with Kentucky 4H Youth Development to engage youth across Kentucky, fostering community scientists that have a broader understanding and appreciation of our water resources. Through this program, 4H leaders and volunteers learn about WWKY and are trained to make scientific field observations and collect E. coli data. Additionally, leaders and volunteers are given a variety of hands on lessons related to water quality to perform with their stream teams. Stream teams collect samples throughout the year, analyze their data, and complete a community service project. In 2019, pilot Stream Teams were supported in the Four Rivers and Kentucky River Basins. During 2020, Basin Coordinators promoted development of Stream Teams across the Commonwealth. In 2022, assuming relaxation of COVID-19 spread-prevention requirements, new Stream Teams are anticipated in the Licking, Big Sandy, and Salt River Basins.

Figure 37. *Watershed Watch in Kentucky River Basin Units*

2. ***Volunteer Lakes Monitoring Program (VLMP)***
   Starting in 2017, this program was piloted on lakes in the Kentucky River and Four Rivers Basins. In 2019, WWKY began to promote VLMP across Kentucky, with an initial focus on monitoring lakes that serve as drinking water sources. Through this program, volunteers collect basic data about the general condition of lakes in Kentucky that is then used in tandem with remote sensing models to identify waterbodies that may be impacted by various problems, particularly harmful algal blooms. This program now includes 46 active lake monitors with 55 sites in five river basins. Sampling results are available for viewing and download on an *interactive map* maintained by the Kentucky Geologic Survey. In 2021, all VLMP data were uploaded to the *national Secchi Dip-In database* maintained by the North American Lake Management Society, where they were reviewed for quality before being published to the *National Water Quality Portal*.
3. ***Cyanobacteria Monitoring***
   In 2019, the Kentucky Division of Water introduced "bloomWatch," an app for citizens to use in monitoring cyanobacteria (blue-green) algae blooms As the number, intensity, and duration of cyanobacteria blooms increases across the Commonwealth, WWKY anticipates providing bloomWatch trainings in conjunction with both Core Monitoring and VLMP trainings.

Both continuing and new volunteers have access to the WWKY Data Portal, a tool that supports citizens in reviewing and analyzing the monitoring data they collect with an eye toward informing their communities and inspiring action. This resource was developed with funding from the Virginia Environmental Endowment, an organization that will support WWKY's Core Monitoring Program through 2023.
In FFY 2021, WWKY hired a part time Development Director with funds from the aforementioned Virginia Environmental Endowment grant. The Development Director is working with WWKY's Board and Finance Committee to create a fundraising plan and pursue new and sustainable funding sources for the organization. It is critical for WWKY to identify and partner with funding organizations to continue to pursue their mission and expand their reach within the Commonwealth of Kentucky.

WWKY also reinvigorated its six work committees to better support volunteers throughout the Commonwealth. The work committees met monthly in 2021 and plan to continue in 2022, beginning with updating WWKY's strategic plan based on the accomplishments and needs identified in the past year.

WWKY work committees include:

1. Finance Committee
Goal: Improve the financial health of the organization.
Accomplishments:
• Collected budget information from each of the basin affiliate organizations and determined funding needs.
• Formalized a budget for Watershed Watch in Kentucky.
• Hired a Development Director.
• Developed a six-month fundraising plan.

2. Organizational Capacity Committee
Goal: Review and build organizational capacity.
Accomplishments:
• Revised By-Laws (still pending final approval).
• Formalized working committees and supported their efforts.
• Worked with newly hired Development Director to determine organizational needs.

3. Basin Support Committee
Goal: Provide support, technical and organizational guidance to the basins.
Accomplishments:
• Basin-specific webpage template created.
• Met with all WWKY basin steering committees to better assess needs.
• Compiled a report for WWKY Board summarizing basin needs.
• Created a WWKY volunteer survey to better understand the needs and interests of volunteers.
• Drafted guidelines for conducting WWKY focus studies projects.

4. Outreach Committee
Goal: Increase visibility, networking opportunities and partnerships at both the state and local level.
Accomplishments:
• Developed a new, up-to-date website that serves as a model for individual basins.
• Supported basins in developing new websites.
• Created a welcome letter to send to all new volunteers along with the packet of sampling information they receive.
• Identified the need for a marketing platform, reviewed options, and identified MailChimp as a good fit.

5. Community Action and Education Committee
Goal: Inspire citizen action.
Accomplishments:
• Completed WWKY Action Policy Statement that clearly specifies appropriate avenues of action for WWKY or basin organizations.
• Completed a Menu of Water Quality Management Practices, a handout with avenues of action that addresses specific water quality concerns.
• Developed a draft Clean Water Act 101 presentation and voice recording, which outlines ways the CWA can be used to help WWKY volunteers in achieving water quality improvements.
• Created online submission form for collecting success stories.
• Began drafting Community Action Project guidance, which provides assistance for developing localized action plans and ways to track achievements.
• Began drafting Success Story contest to incentivize basin organizations.

6. Science Advisory Committee
Goal: Provides guidance and tests new sampling methods or technology.
Accomplishments:
• Developed "A Typical Stream Sampling Outing" video.
• Conducted a pilot of nutrient field kits in 28 locations in six basins.
• Initiated a pilot study of a transparent stream velocity flow rod.
• Developed and piloted a draft field app for stream sampling data.
• Developed a list of research publications that have utilized Watershed Watch data.
• Developed and approved a simplified habitat from, procedure, and training.
• Modified the data portal to allow for section of site data by HUC-10 watersheds.
• Lake Volunteer Monitoring Data was uploaded into the national Secchi Dip-In Database.

Partner Spotlight: Ripple Effects Project

Figure 38. *Advertisement for the Ripple Effects Project photo contest*

During winter and early spring 2021, collaborators from across Louisville Metro and beyond came together to support a water-focused photo context, promote volunteer monitoring of local waterways, and organize a popular exhibit for the Kentucky State Fair. Core partners included the Kentucky Center for African American Heritage, Kentucky Division of Water (the NPS team), Louisville Free Public Library, Louisville Photo Biennial, Louisville Photographic Society, Louisville Water Company, the University of Louisville, and Waterfront Park.

The Project's original inspiration was the current exhibit in the Louisville Free Public Library's Bernheim Gallery: "River of Life: Cities and Towns Along the Mighty Ohio"—featuring historical and contemporary photographs of the Ohio River. With input from partners, the Library organized a photo contest titled "Ripple Effects: Exploring Water in Louisville" (Figure 34) launched on Earth Day 2021 with good-quality digital cameras available for loan through library branches across Louisville Metro. During late April and early May, a series of virtual photography workshops were offered, each geared toward a different age group. Also offered, was an outdoor workshop in Waterfront Park, including photo opportunities on the Big Four Walking Bridge (across the Ohio River). By mid-June over 200 entries were entered in the photo contest. A team of professional photographers volunteered as judges, and five winners were selected in each of four age categories (Figure 35). Award-winning entries from the contest were featured in a popular exhibit at the Kentucky State Fair titled "Ripple Effects: Exploring the Confluence of Art, Culture, and the Environment Along our Waterways." Winning entries may also be viewed in a slide show on the Library's website.

Figure 39. *Award winners in the Ripple Effects: Exploring Water in Louisville Photo Contest*

Phase 2 of the Ripple Effects Project is community-led science activities and forums focused on the effects of extreme precipitation across Louisville Metro (scistarter.org/RippleEffects/). This portion of the project is supported by a grant from the National Oceanic and Atmospheric Administration to the Kentucky Center for African American Heritage.

Partner Spotlight: Kentucky Nature-based Solutions Project Team

Coalescing around mutual conservation interests, the Kentucky Nature-based Solutions Project Team (NBS Project Team) shares a vision of integrated water quantity and quality management that leads to long-term, ecological strategies for improving climate resilience. Team members include a collection of representatives from Kentucky Division of Water, Kentucky Association of Mitigation Managers, The Nature Conservancy in Kentucky, University of Kentucky Martin School of Public Policy, EPA Region 4, and Kentucky Emergency Management. The multi-level partner approach—ranging from regional coordinators with access to on-the-ground knowledge to federal agencies and nationwide organizations—allows the team to tap into varying, yet complementary strengths. For example, the Salt River and Licking River Basin Coordinators are both involved and help facilitate necessary community-level connections between water quality and water quantity managers. In the Salt River Basin, this partnership has resulted in a strategic planning process including the local watershed coordinator, regional hazard mitigation planner, and MS4 coordinator.

Since the initial January 2021 meeting, several external partners have expressed interest in joining the effort, including private companies, which would bring in a novel public-private partnership to the team. For FFY 2022, the Licking River Basin Coordinator will serve as a Regional Representative for KAMM Region 4, which encompasses Eastern and Southeastern Kentucky and includes four headwater regions (Kentucky River, Licking River, Upper Cumberland, and Big Sandy River). In this capacity, there is opportunity to further cultivate partnerships between traditionally sequestered water quality and quantity management programs and introduce much-needed climate resilience training to areas of Kentucky that are most at risk for increased precipitation.

Chapter 4

Workplan Reporting

FFY 2021 Goals and Objectives

The Kentucky Division of Water's Nonpoint Source Program committed to meeting specific goals, objectives, and action items within each year of the 2019 Nonpoint Source Management Plan. The table below includes both the five-year Management Plan commitments as well as summary descriptions of the work accomplished during FFY 2021 toward the completion of those commitments. In addition to the NPS Management Plan, Kentucky's NPS Program makes operational work commitments within the Annual Workplan submitted to EPA Region 4. Summary descriptions of the FFY 2021 Program annual workplan commitments and the work accomplished toward their completion are also included in the following tables.

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		In early 2017, state specific metrics at the 24K level matching KY's NHD data set were completed. The updated RPT was rolled out to DOW in February 2017, allowing watershed prioritization across multiple programs. In 2020 DOW began the process of adding an Environmental Health index and Demographic index to further refine priority watershed selection. A list of recoverable watersheds was not completed in 2021.
		Tracking measure:	Number and list of recoverable watersheds receiving targeted implementation.			X	X	X	In FFY 2021, despite the pandemic, DOW's Conservation District partners were able to support work in the Sulphur Creek watershed while following Centers for Disease Control and Prevention and Kentucky guidelines for COVID-19 spread prevention. Conservation District staff supported implementation of fifty-five (55) agricultural BMPs (with 18-06 funds).

	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	In early 2017, state specific metrics at the 24K level matching KY's NHD data set were completed. The updated RPT was rolled out to DOW in February 2017, allowing watershed prioritization across multiple programs. Sulphur Creek was identified as being highly recoverable for pathogens, and the NPS program has actively been implementing Ag and wastewater BMPs in the watershed for several years. A list of watersheds ID'd as recoverable for pathogens was not developed in FFY 2021, due to efforts to update the Recovery Potential Tool.
		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	As of the 2016 Integrated Report (IR), 12,613.8 stream miles have been monitored and assessed by DOW programs. The next IR is scheduled to be released in 2022.
		Tracking measure:	Number of stream miles impaired by NPS pollution.	X	X	X	X	X	As of the 2016 Integrated Report, 2,631.11 miles are known to be impaired by NPS causes and sources as of 2016 IR (categories 5, 4A, 4B, 4C).
		Tracking measure:	Number of pollutant/ waterbody combinations impaired by NPS pollution.	X	X	X	X	X	As of the 2016 Integrated Report, 983 pollutant/ waterbody combinations known to be impaired by NPS causes.

	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 2021, DOW staff or contractors conducted water quality monitoring in two (2) watersheds in preparation for watershed plan development: • Glenns Creek • Lower Pitman Creek
	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	The following watersheds will have completed assessments on the 2020 IR, pending EPA approval: • Little Pitman Creek of Green River (includes Trace Fork and Buckhorn Creek) • Martis Branch of Green River • North Fork Kentucky River Tributaries (includes Sandlick Creek, Dry Fork, Dry Fork UT, Little Dry Fork, Company Branch, and Crafts Colly Creek)

		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, as they are not yet submitted for the 2018/2020 combined Integrated Report.
		Tracking measure:	Number and list of streams that have a documented delisting approved by EPA.	X	X	X	X	X	Currently there are no EPA-approved stream delistings, as they are not yet submitted for the 2018/2020 combined Integrated Report.

	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 2021, monitoring was conducted in one (1) new watershed identified as needing baseline data for success monitoring and watershed planning: Glenns Creek. In addition, monitoring that was interrupted by COVID-19 restrictions was completed in three watersheds (3): Paint Lick Creek, West Hickman Creek, and Lake Linville/Renfro 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	Due to a lack of interest in farm bill conservation programs, NRCS elected to withdraw from the NWQI for 2020. As an alternative, NRCS instituted Focused Conservation Projects, that implement water focused agricultural best management practices in each of their twelve (12) districts. DOW assisted NRCS with selection of project areas and has been providing technical support in the form of monitoring and data in two (2) watersheds: Sinking Creek and Lake Linville. DOW also met with NRCS multiple times in FFY2020 to identify methods of tracking success for the FFY 2021 and FFY 2022 NWQI watersheds.
		Tracking measure:	Implement NWQI success monitoring as needed.	X	X	X	X	X	Success monitoring on the previous NWQI watersheds was not requested by NRCS in 2020, as they had withdrawn from the program. Instead DOW worked to support NRCS's new Focused Conservation Projects with collection of baseline data in two (2) of the selected watersheds. DOW will plan to return to collect data to evaluate success on the request of NRCS.
		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 when selecting 2021 and 2022 NWQI watersheds. DOW provided information on water quality conditions, background geology, climate and hydrology, existing monitoring locations, and DOW's nonpoint efforts in specific watersheds.

		Tracking measure:	Number of NWQI BMPs per selected HUC 12.	X	X	X	X	X	NRCS abandoned NWQI from 2019-2020 to pursue Focused Conservation Projects. DOW met with NRCS multiple times in FFY 2020 (May and June) to plan new NWQI watersheds for the FFY 2022 implementation year, and the FFY 2023 implementation year.
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	NPS personnel are part of a TMDL Workgroup that met nine (9) times in FFY 2021. Workgroup priorities include but are not limited to improved communication of program timelines and priorities, identification of potential TMDL Alt watersheds, and implementation strategies in TMDL watersheds. The group is also used to set coordinated monitoring priorities between NPS Success Monitoring and the TMDL section.
		Tracking measure:	Number of sub-grantee projects implementing BMPs in watersheds with approved TMDLs.	X	X	X	X	X	In FFY 2021 four (4) sub-grantees implemented BMPs in watersheds with TMDLs: • Bacon Creek • Chestnut Creek • Clarks Run and Hanging Fork • Currys Fork

	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	Three (3) watersheds are currently prioritized for Alternative Restoration Plan development. In 2021, Sanitation District 1 in Northern Kentucky indicated to DOW they are pursuing Alternative Restoration Plans for the Banklick Creek, Woolper Creek and Threemile Creek watersheds. Banklick and Woolper Creek watersheds both have an EPA 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 two (2) TMDL Alternative Plans: • Sulphur Creek • Gunpowder 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 2021, DOW worked with contractors toward development of six (6) additional watershed plans: • Middle Fork Beargrass Creek • Upper Paint Lick Creek • Lower Pitman Creek • Glenns Creek • Bee Creek • Clayton Creek

		Tracking measure:	Number and list of watershed plans approved by EPA Region 4 for implementation.	X	X	X	X	X	During FFY 2021, the DOW had twenty-eight (28) 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 • 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 • Wolf Run • Woolper 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 2021, the DOW had twelve (12) watershed plans approved by EPA Region 4 for implementation actively being implemented. • Bacon Creek • Banklick Creek • Brushy Creek • Chestnut Creek • Clark's Run- Dix River • Curry's Fork • Gunpowder Creek • Hanging Fork- Dix River • Hinkston Creek • Red Bird River • Red River Gorge • Sulphur 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 2021 DOW documented twenty seven (27) 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 160 partner meetings in FFY 2021.

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 one watershed project area during FFY 2021: Brushy Creek (19-10). Two (2) projects include an agricultural education component: Clarks Run (19-05) and Brushy Creek (19-10).
		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 three (3) quarterly AWQA meetings during FFY21, including three (3) meetings regarding e-workbork kickoff. Provided feedback to e-workbook development.
	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 2021, the Nonpoint Source Program funded four agriculture implementation projects: • Bacon Creek (17-13) • Sulphur Creek - Mercer (18-06) • Brushy Creek (19-10) • Chestnut Creek (20-05)

	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	In FFY 2021, three (3) projects coordinated with KY DOC to fund BMPs in their respective river basins. • Sulphur Creek - Mercer (18-06) • Brushy Creek (19-10) • Chestnut Creek (20-05)
		Tracking measure:	Coordinate with NRCS to fund BMPs in priority watersheds.	X	X	X	X	X	The Sulphur Creek - Mercer (18-06) and Brushy Creek (19-10) projects as well as the Lake Linville priority watershed coordinate with NRCS 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 2020, Kentucky NRCS withdrew from the NWQI program in favor of instead completing NRCS Focused Conservation Projects. DOW met with NRCS multiple times in FFY2020 to plan new NWQI watersheds for the FFY 2022 and FY2023 implementation year.
	Action 5:	Participate in state wide meetings and conferences that have a focus on Agriculture and Water Quality							
		Tracking measure:	Attend two (2) USDA NRCS State Technical meetings per year. Track number attended.	X	X	X	X	X	DOW participated in all scheduled NRCS State Technical Committee meetings in 2021.

		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 scheduled NRCS State Technical Committee meetings in 2021.
		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 2021.
		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: • Source Water Collaborative Series • River Rally • KWRRI's Watershed Academy • HAB webinar series • EPA Agricultural Municipal Partnerships • NRCS Conservation Outcomes Webinars • Soil and Water Conservation Society Annual Conference • Soil Health Resources, Indicators, Assessment, and Management Oral Presentations
		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 one agriculture related event in FFY 2021: Ripple Effects Booth at Kentucky State Fair.
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	In FFY 2021, four projects implemented GI,LID and/or stormwater management BMPs: • Currys Fork (19-02) • Dix River and Hinkston Creek (19-05) • Banklick Creek (19-07) • Banklick Creek (20-06)
		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 2021. 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.
	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				In FFY 2021, NPS staff worked with several partners (University of Kentucky, Kentucky Assocation of Mitigation Managers, The Nature Conservancy, Kentucky Emergency Management, and EPA Region 4) to develop a four-part nature-based solutions webinar series informing key stakeholders about planning, designing, funding, and implementing nature-based solutions in Kentucky. NPS staff had concurrently conversations with Area Development Districts about incorporating nature-based solutions into their Regional Hazard Mitigation Plans (HMPs). NPS Staff are assisting partners to write nature-based solutions as a Mitigation Goal for our state's HMP.

		Tracking measure:	Number of NPS BMPs included in the State Hazard Mitigation Plan.					X	As of FFY 2021, no NBS recommendations were integrated into the State Hazard Mitigation Plan; however, NPS staff are working closely with key partners to add NBS as a Mitigation Goal in our SHMP. Throughout the year, staff presented at several meetings to raise awareness of recommended steps towards integrating watershed management planning and hazard mitigation planning using nature based solutions, including two regional conferences and two nationwide conferences.
		Tracking measure:	Provide updated GIS resources to KAMM program annually.	X	X	X	X	X	GIS layers are updated annually. NPS staff virtually attended the 2021 KAMM Annual Conference and presented on work to mitigate harmful algal blooms while addressing natural hazards and climate change using nature-based solutions.
	Action 3:	Support Kentucky's MS4 program.							
		Tracking measure:	Number of Kentucky Stormwater Association meetings attended.	X	X	X	X	X	In FFY 2021, NPS staff attended two (2) virtual Kentucky Stormwater Association meetings and the 2021 Annual Conference.
		Tracking measure:	Provide technical and/or educational support to MS4 communities.	X	X	X	X	X	Planning efforts betweem DOW's NPS Program and the KSA Board to develop a strategic plan for using 319(h) funding to increase the effectiveness of local stormwater programs on a statewide basis was put on hold in FFY 2021 due to Covid 19 restrictions, but we anticipate returning to the project as soon as conditions are favorable. 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. Again due to Covid 19 we were unable to provide in person events, however NPS personnel have been exploring virtual educational tools in an effort to support our MS4 partners.

		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 available on 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	In FFY 2021, one (1) project actively implemented forestry BMPs to protect water quality: Red River (18-07).
	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 BMP Board did not hold a meeting in FFY 2021

		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 funding three (3) programs working on forestry related projects. The NPS section is also actively working with partners on forestry related issues including the Rockcastle Conservation Initiative, 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-six (36) Springs were sampled in FFY 2021.
		Tracking measure:	Number of groundwater samples collected for E. coli.	X	X	X	X	X	One (1) groundwater sample was collected for E. coli in FFY 2021.
		Tracking measure:	Number of groundwater samples collected for pesticides.	X	X	X	X	X	157 groundwater samples were collected for pesticides in FFY 2021.
	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	There were nine (9) GPP field reviews conducted in FFY 2021.
		Tracking measure:	Number of GPPs approved.	X	X	X	X	X	There were thirty-nine (39) GPPs approved in FFY 2021.
Objective 9:	Decrease nonpoint source pollution from onsite wastewater sources in Kentucky's water bodies. 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	In FFY 2021, five (5) projects actively implemented on-site wastewater BMPs: • Red River (18-07) • Marshall County HAP (18-10) • Currys Fork (19-02) • Dix River & Hinkston (19-05) • Red Bird River (19-09)
		Tracking measure:	Number of sub-grantee projects with an educational component for onsite wastewater treatment.	X	X	X	X	X	In FFY 2021, eight (8) projects included an educational component to their on-site wastewater programs: • Red River (18-07) • South Fork Little River (18-08) • Marshall County HAP (18-10) • Currys Fork (19-02) • Dix River and Hinkston (19-05) • Bacon Creek Homeowner Septic (19-06) • Banklick (19-07) • Red Bird River (19-09)
	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 twelve (12) 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	Fourty-six (46) active lake monitoring volunteers
		Tracking measure:	Number of volunteers receiving trainings.	X	X	X	X	X	One (1) volunteer received training in FFY 2021.
		Tracking measure:	Number of sites sampled.	X	X	X	X	X	There were fifty-five (55) lake monitoring sites recorded for May - September 2021
	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	In FFY 2021, there were twelve (12) projects implemting BMPs in watersheds with recreation use impairments: • Bacon Creek (17-13) • Sulphur Creek - Mercer (18-06) • Red River (18-07) • Marshall County HAP (18-10) • Currys Fork (19-02) & (20-03) • Dix River & Hinkston (19-05) • Banklick (19-07) & (20-06) • Red Bird (19-09) • Brushy Creek (19-10) • Chestnut Creek (20-05)

	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.
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 2021, there were no active projects implementing BMPs in resource extraction areas. However, the Big Sandy Basin Coordinator was able to restart the Big Sandy Basin Team and make contact with several potential partners in the Big Sandy/Little Sandy/Tygarts River Basins, which are heavily impacted by resource extraction. In 2022, we will continue to make in-roads in the hopes of spurring watershed plan development and implementation in this region.

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	The 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	In FFY 2021, there were four (4) projects implementing riparian buffer BMPs: • Red River (18-07) • Currys Fork (19-02) • Dix River and Hinkston (19-05) • Banklick (19-07)
		Tracking measure:	Number of projects monitoring for sediment impairments.	X	X	X	X	X	In FFY 2021, there were three (3) watershed planning projects which including monitoring activities for sediment impairments: • Middle Fork Beargrass Creek (18-04) • Upper Paint Lick Creek (18-05) • Red River (18-07)
	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	There are two primary methods that the NPS Program targets NRCS Farm Bill funding toward the implementation of watershed plans. The first is direct programmatic coordination between DOW and NRCS by requesting that priority and impaired watersheds receive priority funding through NRCS programs. DOW input was requested by NRCS to revise their sourcewater protection priority areas (SWPPA) which receive higher subsidies for conservation practices in a contributing watershed. DOW staff conducted an exhaustive review of contributing factors to sourcewater integrity including a history of harmful algal blooms, high nutrient watershed concentrations, and watershed planning areas. This revised list of watersheds representing 20% of the state was submitted to NRCS in September 2020, and adopted by NRCS without change. The second method is to coordinate on-the-ground implementation efforts with County Conservation Districts and local NRCS staff. The goal of both methods is that CWA Section 319(h) funding be used to augment the Farm Bill funding provided 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. NPS staff met with local NRCS staff regarding the Lake Linville and Roundstone projects, among others in FFY2020.

		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 2021.
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 approximately 7,200 stakeholders at educational events, meetings, and outreach events across the Commonwealth
		Tracking measure:	Number of educational events participated in.	X	X	X	X	X	NPS personnel attended approximately thirty (30) educational events in FFY 2021
	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 I Love KY Water Facebook page is up to 21,124 followers during this reporting period, a 479% increase over the last year.
		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 variety of education and outreach material for a variety of different audiences in FFY 2021 including: • Social Media content: harmful algal blooms • Water recreation safety tips, nutrient reduction, agricultural BMPs • Basin Newsletters • Recording on simultaneously managing for water quality and quantity issues using nature-based solutions • Stakeholder survey to guide NBS trainings • Priority watershed packet for Basin Team members • Video introduction to algae and cyanobacteria • Photography workshops (tailored to three different age groups) for Ripple Effects Project • Future creating workshop focused on community adaptation to extreme precipitation • Water-focused exhibit for Kentucky State Fair • Simplified habitat assessment protocol for WWKY
	Action 4:	Support the Watershed Watch program in Kentucky.							
		Tracking measure:	Number of active volunteers.	X	X	X	X	X	There are currently 876 active WWKY volunteers statewide.
		Tracking measure:	Number of volunteers receiving trainings.	X	X	X	X	X	Thirty-nine (39) volunteers received training in FFY 2021.
		Tracking measure:	Number of sites sampled.	X	X	X	X	X	WWKY volunteers collected 970 E.coli samples in FFY2021.

	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 2021, the Project WET program conducted eleven (11) educator workshops.
		Tracking measure:	Number of teachers trained.	X	X	X	X	X	In FFY 2021, the Project WET program trained seventy-seven (77) 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 Trust in FFY 2021. Lower Howards Creek remains our 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	Red River (18-07), Banklick (19-07) & (20-06), Red Bird (19-09), and Brushy Creek (19-10) are implementing BMPs to address the protection component of their approved watershed plan.
	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: 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	DOW plans to update the priority healthy watersheds list in FFY 2022.

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-three (23) 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 • 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) acive watershed plans that are actively implementing best managment practices and education & outreach in Source Water Protection Areas. • Bacon Creek • Banklick Creek • Chestnut Creek • Clarks Run • Currys Fork • Hanging Fork • Hinkston Creek • Red Bird River • Red River • South Fork Little River

	Tracking measure:	Number of Source Water Protection Plans developed and/or updated.	X	X	X	X	X	Two (2) Source Water Protection Plans were updated and one (1) was approved in FFY 2021.
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	KDOW 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 two (2) active watershed plans that are currently being implemented that contain a DOW Wellhead Protection Area: • Bacon Creek • Red River
	Tracking measure:	Number of Wellhead Protection Plans developed and/or updated.	X	X	X	X	X	There were twenty (20) Wellhead Protection Plans developed in FFY2021, fourteen (14) of which have been approved.

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. WBP summary documents are the next step to organize and share information regarding WBP's 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 database for permanent electronic storage purposes. Revisions and updates to the existing electronic file storage system will be further investigated in FFY 2022.

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 2021 DOW was able to hire two (2) additional technical advisors, thus filling all positions within the NPS section.
	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 ten (10) watershed coordinators who implement accepted watershed plans.
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 FFY21, the NPS team attended or hosted twenty-two (22) 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 28% ULO as of October 2021. 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 time frame.	X	X	X	X	X	Sub-grantee project contracts continue to operate on a two-year time frame.
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 2021 funding are currently being entered into GRTS.
	Tracking measure:	Complete biannual 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 2021 (March and September).
	Tracking measure:	Conduct biannual 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 2021 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 2021 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	One (1) WQ-10 delisting has already been selected and EPA approved as a success story in 2021 (Clarks River).
	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 Clarks River WQ-10 report was submitted in August and finalized prior to the September 30, 2020 deadline.
	Tracking measure:	Number of Kentucky Success stories on EPA webpage.	X	X	X	X	X	EPA has posted eleven (11) of Kentucky's Nonpoint Success Stories on their webpage. The 2021 NPS Success Story highlighting NPS driven collaboration in the Clarks River watershed was accepted and posted to EPAs webpage in October 2021.
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 2021, one (1) QAPP was approved by DOW for Glenns Creek.
	Tracking measure:	Number of data packages reviewed.	X	X	X	X	X	DOW Quality Assurance Staff reviewed one (1) data package for the Upper Paint Lick Creek from sub-contractors in FFY 2021.
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 have been integral to the development and refinement of Kentucky Nutrient Reduction Strategy (NRS) Update. Watershed planning, implementation, and outreach by NPS Program staff are critical to the success metrics built into the NRS Update. The NRS Update is slated for draft release by Q1 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 Water Health Guide serve as the primary resources to communicate the information previously contained within the Basin Status Reports. NPS personnel typically collaborates with Watershed Watch in Kentucky to develop and produce Basin Report Cards based on volunteer data. However, due to COVID-19 there were not enough data points collected by volunteers in FFY 2021 to create Basin Report Cards. Basin status updates are also regularly provided via quarterly newsletters.

	Tracking measure:	Annually update the Kentucky Water Health Portal.						The Kentucky Water Health Portal is updated with each new Integrated Report to Congress (IR) release. The next IR will be released in late 2021, or early 2022. In addition, NPS personnel have participated in a workgroup to provide suggestions for updating and improving the functionality of the Kentucky Water Health Portal. A draft version was created in 2021, with a final version expected in 2022.
	Tracking measure:	Update priority watersheds as determined by the River Basin Coordinators and Basin Team members.	X	X	X	X	X	During FFY 2021, DOW reviewed and updated the priority watershed selection process. Past efforts focused on capactiy, selecting active and developing watershed planning areas because of a possible higher implementation potential in these areas. In FFY 2021, DOW used internal data, such as watershed plans, source water protection areas, known impairments, outstanding resource waters, high nutrient yield watersheds, and demographics, paired with on-the-ground knowledge gathered from Basin Teams, which are basin-wide stakeholders and partners convened by the River Basin Coordinators. It should be noted that not all River Basins have a developed Basin Team due to varying cultures of conservation, government trust, and historical 319(h) funding. Additionally, due to previous staffing turnover, some Basin Teams are in the process of being rebuilt. For example, the Upper Cumberland Basin Coorindator was unable to receive stakeholder input and used knowledge of work being done by local partnrs and DOW data to identify several areas of concern. As of FFY 2021, draft priority watersheds have been selected and are under formal review, with an anticipated publication in FFY 2022.

FFY 2021 KY Nonpoint Source Program Commitments to EPA Region 4 (From the annual work plan):

General Program Management & Oversight	
Provide Administrative, Financial, and Technical oversight for FFY 2021 NPS Program sub-grantee projects.	The KY Division of Water's Nonpoint Source Program provides Administrative, Financial, and Technical support for approximately fifty (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 2021 is complete.
Submit 2017 Grant closeout package to EPA R4.	The 2017 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 December.
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 in Atlanta in 2018. In 2020 NPS personnel attended the conference virtually in November, due to Covid-19 restrictions.

Attend EPA National Biennial NPS Conference.	A representative of the KY Division of Water, Watershed Management Branch Manager, Nonpoint Source Program attended the National Nonpoint Source Program Conference in Colorado 2018. We anticipate attending the next National Conference when it is announced.
National Water Quality Initiative	
Continue to support the Hinkston Creek Watershed Coordinator that will work toward increased implementation of the Hinkston Creek Watershed Plan.	A Hinkston Creek Watershed Coordinator position is being funded through a FFY 2019 sub-grantee project with Bluegrass Greensource (BGGS). While this watershed has been withdrawn from the NRCS' NWQI watershed list, DOW anticipates following watershed progress in this region due to continuing 319 implementation efforts. See project workplan for more information. Kentucky NRCS is currently in a planning year for 3 new NWQI watersheds, and DOW will be working to find ways to support these efforts with technical assistance as needed/requested.
Work with KY NRCS on NWQI Pilot Project in "TBD" watershed.	Kentucky NRCS momentum on NWQI slowed in FFY 2019 with limited response to efforts to implement agricultural BMPs in the Hinkston Creek Watershed, and an internal shift in KY NRCS towards a new model of implementation in watersheds. Division of Water provided support and recommendations on the new process. In FFY 2020, NRCS rolled out the new Focused Conseravtion Project model, which selects 12 project areas across the state to focus EQIP dollars with the intent of improving water quality. In FFY 2021, DOW assisted NRCS with baseline monitoring data in two (2) watersheds for this program. In addition to the Focused Conservation Projects, DOW met with NRCS multiple times in FFY 2020 to plan new NWQI watersheds for the FFY 2022 and FFY 2023 implementation year. DOW provided recommendations, and will be assisting with monitoring success as needed in these watersheds.

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	NPS staff participated in NRCS local working group meetings where water focused best management practices were discussed, and Focus Conservation Projects proposals were presented. DOW assisted NRCS with selection of project areas and has been providing technical support in the form of monitoring and data in two (2) watersheds in FFY 2021: Sinking Creek and Lake Linville. DOW will continue to be in communication with NRCS staff throughout the implementation phases.
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. Compilation of this data into a format that is usable and comparative like GIS continues to be a significant hurdle in making 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 Conservations Agriculture Water Quality State Cost Share Program. In FFY 2021, all known data was incorporated into a BMP tracking spreadsheet and GIS layer which is being used to evaluate implementation on a watershed scale.

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 2021 Kentucky Division of Water Biologists monitored water quality parameters in West Hickman Creek, Lower Pitman Creek, and Renfro Creek as part of a collaborative 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.
Grant Reporting and Tracking System	
Enter FFY 2021 Load Reductions into GRTS.	FFY 2021 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 February 15, 2021 deadline along with specific BMP description information.
Attend National GRTS Conference.	DOW was not able to send staff to this training event in 2021, as it was not offered due to the on-going COVID-19 pandemic.
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 2021 Sub-grantee projects into GRTS.	Final FFY 2021 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 2021 Nonpoint Source Program Workplan was submitted to EPA Region 4 prior to the September 30, 2021 deadline
Submit Annual Report to EPA R4.	Kentucky's Nonpoint Source Program Annual Report was submitted to EPA Region 4 by the December 31, 2021 deadline.
Submit WQ-10 Nonpoint Source Success Story to EPA R4.	Kentucky's WQ-10 Nonpoint Source Success Story for Clarks River was submitted to EPA R4 in August 2021. 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, 2021 deadline.
Submit Watershed Plans to EPA R4 for review and comment.	No watershed plans were submitted to EPA Region 4 for review or comment during FFY 2021.
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.

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eec.ky.gov/Environmental-Protection/Water/Pages/default.aspx

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