2018 Nonpoint Source Pollution Annual Report

Contact:
Kentucky Division of Water
Watershed Management Branch
300 Sower Blvd.
Frankfort, KY 40601
(502) 564-3410
water@ky.gov
water.ky.gov

Kentucky
UNBRIDLED SPIRIT

Table of Contents

Figures

Tables

Introduction

Nonpoint Source Management in Kentucky

The Kentucky Nonpoint Source Management Program's mission is to protect surface and groundwater from nonpoint source pollution, to abate pollution threats, and to restore degraded waters so water quality standards are met and beneficial uses are supported. Management of nonpoint source pollution requires partnering with a wide variety of organizations to develop, coordinate, and implement the Kentucky Nonpoint Source Management Plan.

The program works with federal, state, local, and private partners to promote 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 U.S. 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 FFY 2018, the EPA awarded the DOW $2.58 million from the Clean Water Act Section 319(h) funding to operate the Nonpoint Source Management Program. This year, communities and organizations shared $1.72 million in federal funding to implement projects that control nonpoint source pollution within watershed planning areas. The DOW awarded those funds to implement six (6) watershed plans, develop two (2) new watershed plans, coordinate Agriculture Water Quality Authority efforts at a statewide level, and provide technical assistance and training to agricultural producers on water quality issues including nutrient management.

This report features accomplishments aligned with the program's goals that occurred during the Federal Fiscal Year (FFY) 2018 (October 1, 2017 – September 30, 2018).

Chapter 1
The Watershed Approach

Watershed Planning and Implementation

DOW staff provided technical assistance to watershed groups for the development of watershed plans by conducting reviews of two (2) draft watershed plans during FFY 2018 (October 1, 2017 – September 30, 2018). Both of those watershed plans, Damon Creek (Calloway County) and South Fork Little River are currently being reviewed by the DOW and will be reviewed by EPA Region 4 staff for approval in the near future.

Watershed plan reviews continue to be coordinated through the Kentucky Interbranch Watershed Implementation Workgroup, which provides the opportunity for all DOW branches to comment on or offer constructive feedback on watershed plans prior to acceptance. Currently, twenty-five (25) watershed plans have been accepted for full or partial implementation with Clean Water Act Section 319(h) funding. An additional four (4) watershed plans are currently under development.

During FFY 2018, implementation work occurred in fourteen (14) watershed planning areas through one or more Clean Water Act Section 319(h) funded contracts. Implementation projects are anchored by the employment of watershed coordinators who manage the implementation of on-the-ground best management practices to reduce of nonpoint source pollution coming from urban stormwater, failing on-site wastewater systems, agriculture, and the loss of riparian zones around water bodies. Watershed Coordinators also work through many channels to conduct water focused environmental education and outreach to the public, local officials, and school-aged children.



Watershed Planning Areas FFY 2018

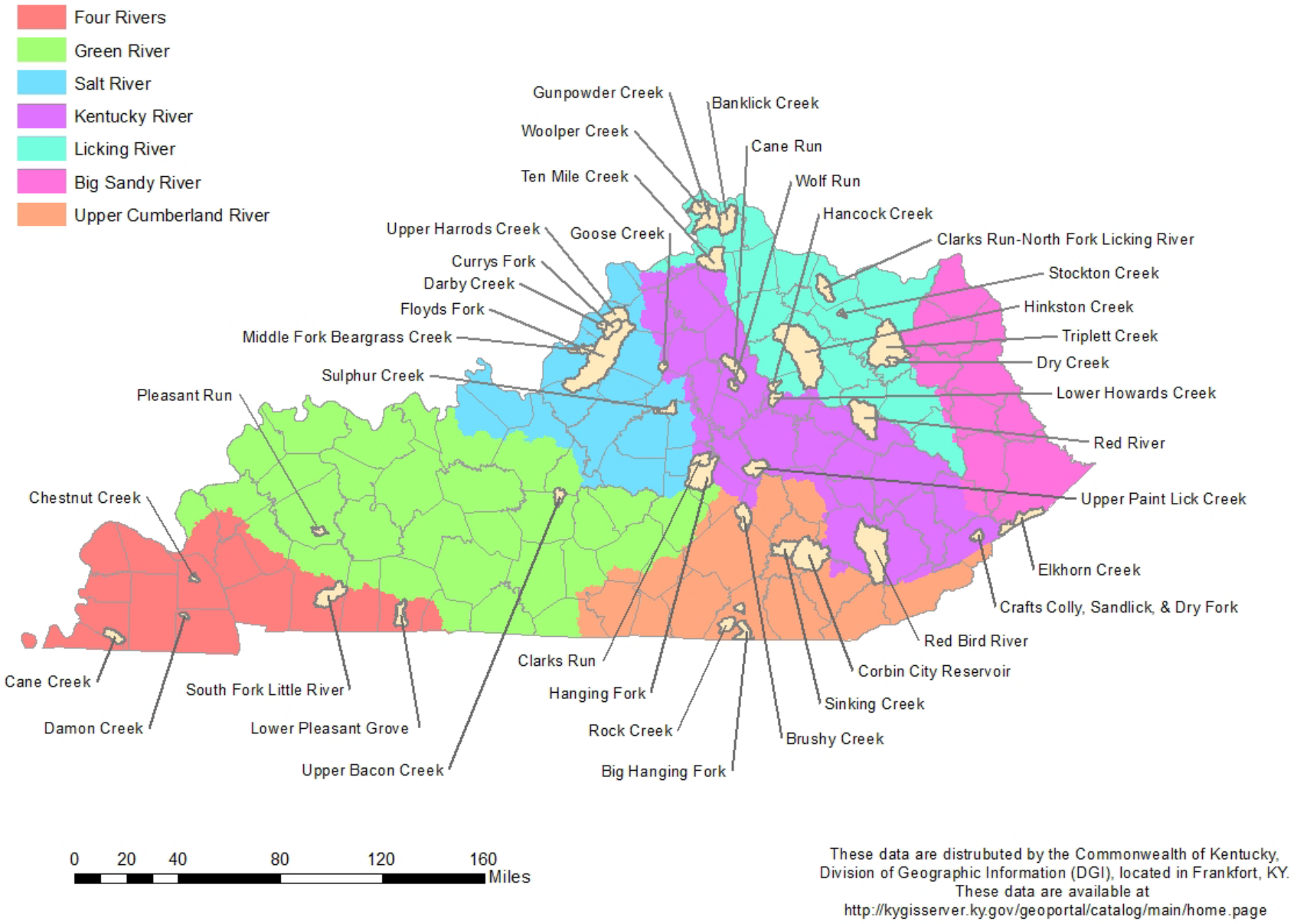


Figure 1. Watershed planning areas FFY 2018 indicated in yellow.

NPS Success Story

Implementing Best Management Practices Reduces Bacteria in Dix River

A 3-mile segment of the Dix River was listed on the 2008 Clean Water Act (CWA) section 303(d) list/Integrated Report as impaired for primary contact recreation due to Escherichia coli bacteria. The Dix River Watershed Council developed a watershed plan for the Dix River/Hanging Fork Creek watersheds in 2009, which led to the hiring of a watershed coordinator, cooperation between partners and implementation of best management practices (BMPs). Due to positive agency relationships and effective on-the-ground projects, the ambient water quality improved. Monitoring data from 2010–2013 indicated that the Dix River segment was meeting its water quality standards (WQS) for primary contact recreation use for bacteria; therefore, it was removed from the impaired waters list in 2016.

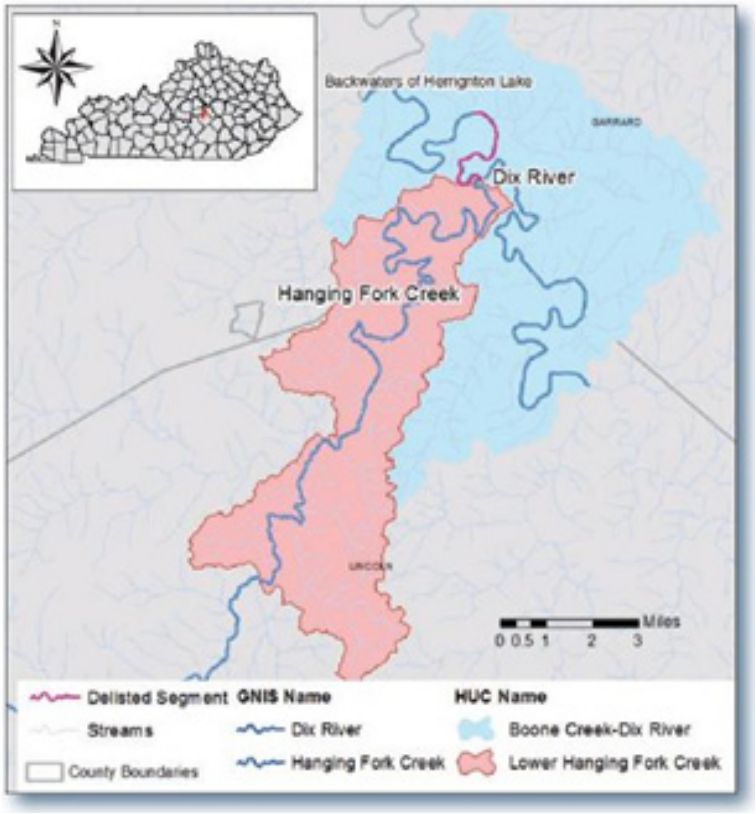


Figure 2. The Dix River and Hanging Fork Creek watersheds are in central Kentucky.

Problem

The Dix River watershed, which drains portions of Garrard, Lincoln, and Boyle counties, is a primary tributary of the Kentucky River (Figure 2). It contains two HUC12s that are the focus of this project: Boone Creek–Dix River (051002050504) and Lower Hanging Fork Creek (051002050503). The watershed is part of the Outer Bluegrass physiographic region of central Kentucky, which is characterized by rolling hills, moderate-to-rapid surface runoff, and moderate rates of subsurface drainage. This watershed is dominated by agricultural land and includes fragmented forest along stream and river corridors. Rural residences are primarily served by septic systems that are often situated in soils that are not best suited for on-site wastewater treatment systems.

Data collected on the Dix River in 2006 showed that *E. coli* bacteria levels exceeded the WQS and therefore did not support the river's primary contact recreation designated use.

Figure 3. Partners installed stream fencing in the watershed to restrict livestock access.

Monitoring for total maximum daily load (TMDL) development in 2006 also lent evidence that the Dix River segment was impaired for primary contact recreation due to high levels of *E. coli*. As a result, the Kentucky Division of Water (DOW) added the segment (river miles 33.1 to 36.1) to the 2008 CWA section 303(d) list. An inventory of the watershed indicated that sources of the impairment included animal feeding operations, livestock grazing, unrestricted cattle access and on-site treatment systems. A TMDL was completed in 2010 for this impaired segment of the Dix River.

Project Highlights

The 77-square-mile project area includes the Lower Hanging Fork Creek and Dix River watersheds. The Natural Resource Conservation Service (NRCS) and the Kentucky Division of Water (DOW) identified the need for a water quality Clean Water Action Plan in the Dix River watershed. A watershed plan was developed in 2009 for the Hanging Fork Creek watershed (a tributary to the Dix River). The Dix River Watershed Council drove much of the planning and implementation of the watershed plan, provided input into the TMDL development, helped to identify funding opportunities to install BMPs, and encouraged implementation of remediation efforts identified in the watershed plan.

A CWA section 319(h) grant was awarded in 2011 to the Lincoln County Conservation District to implement agriculture BMPs in the Hanging Fork watershed and to promote educational activities to inform local citizens and governments of the importance of water quality. The partners installed winter feeding areas, prepared new and revised nutrient management plans for farm management, excluded cattle from streams and planted riparian corridors along stream banks (Figure 3). These grant funds were also used to hire a watershed coordinator to serve as a project technical adviser and to coordinate farm field days highlighting effective BMPs throughout the watershed.

In 2012 a CWA section 319(h) grant was awarded to Bluegrass Greensource to install and repair on-site wastewater systems, and to hold workshops to educate school managers and homeowners about the relationship between septic

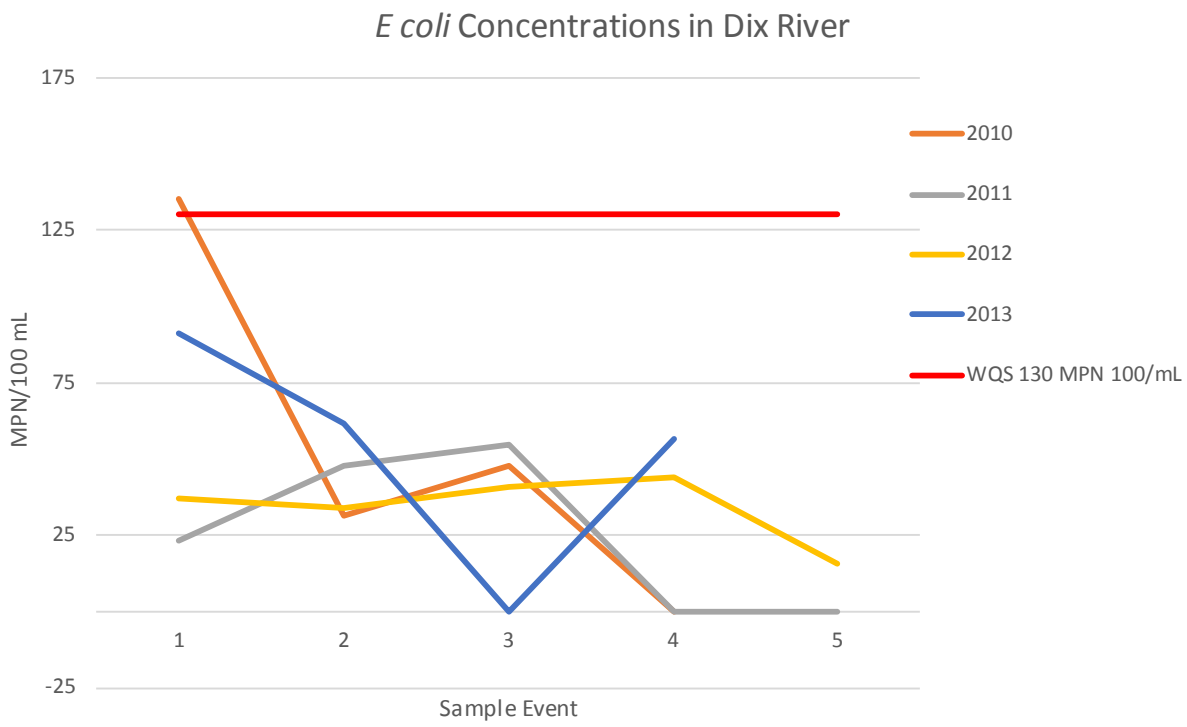


Figure 4. Ambient monitoring results for E. coli in 2010-2013 shows improvement.

systems and water quality. Bacterial source tracking was conducted that identified human waste from wastewater contributions. Targeted activities included educating septic system owners about maintaining and replacing septic systems as needed. Over the course of the restoration effort, partners completed 17 heavy use area protection projects, 7,920 feet of fencing, and multiple onsite wastewater treatment system projects (18 pump-outs, 325 repairs/maintenance, and 1,250 units converted to centralized systems).

Water quality improved due to bacteria loading reductions achieved through implementation of agricultural, onsite wastewater management, and educational practices. Water quality results collected from the ambient monitoring station from 2010–2013 (Figure 4) showed full support of the designated use over four consecutive years, with a geometric mean below the standard of 130 most probable number per 100 milliliters. Based on water quality assessments of *E. coli* from 2010 to 2013, the Dix River segment downstream of Hanging Fork Creek now fully supports its designated use for primary contact recreation; as a result, DOW removed it from the impaired waters list in the 2016 Integrated Report.

Partners and Funding

Farm field day with partners from across the region.

Key partners in this watershed effort included the NRCS, the Dix River Watershed Council, the city of Danville, Bluegrass Greensource, the Kentucky Water Resources Research Institute, Third Rock Consultants, the Lincoln and Boyle county health departments and conservation districts, the Herrington Lake Conservation League, the Kentucky Division of Conservation, and local producers and farmers.

Grants were awarded in 2011 and 2012 for project work in the Dix River Watershed for a total of $556,035 in CWA section 319(h) funds. Other funding provided by partners totaled $247,757. From 2009 to 2016, the NRCS provided cost assistance through the Environmental Quality Incentives Program to farmers for implementing agricultural BMPs for a total of $192,779 in the two project watersheds.

Flyer for a septic workshop and a yard with septic effluent surfacing.

For more information, please contact:

Lisa Hicks
Kentucky Division of Water
502-782-6972
lisa.hicks@ky.gov

FFY 2018 Projects

Featured Projects

Hanging Fork Watershed Plan Implementation

Hanging Fork (HUC 051002050503) is a tributary to the Dix River, which is impounded near its confluence with the Kentucky River to form Herrington Lake. Herrington Lake serves as the primary drinking water supply source for all or part of five counties in Central Kentucky. As such the maintenance of water quality entering this lake has been a local concern for many years. This mutual concern eventually led to the formation of the Dix River Watershed Council and the initial pursuit of developing a Watershed Based Plan for the Dix River to provide a strategic framework for reducing nonpoint source pollution in the watershed. This planning effort was partially funded by a 319(h) grant from FFY 2002 funds. The initial watershed plan for the Dix River was refined into individual watershed plans for the two primary tributaries of concern: Hanging Fork and Clarks Run. Both watershed plans were accepted for implementation in 2009. For the purposes of this feature, only implementation work that has occurred in the Hanging Fork

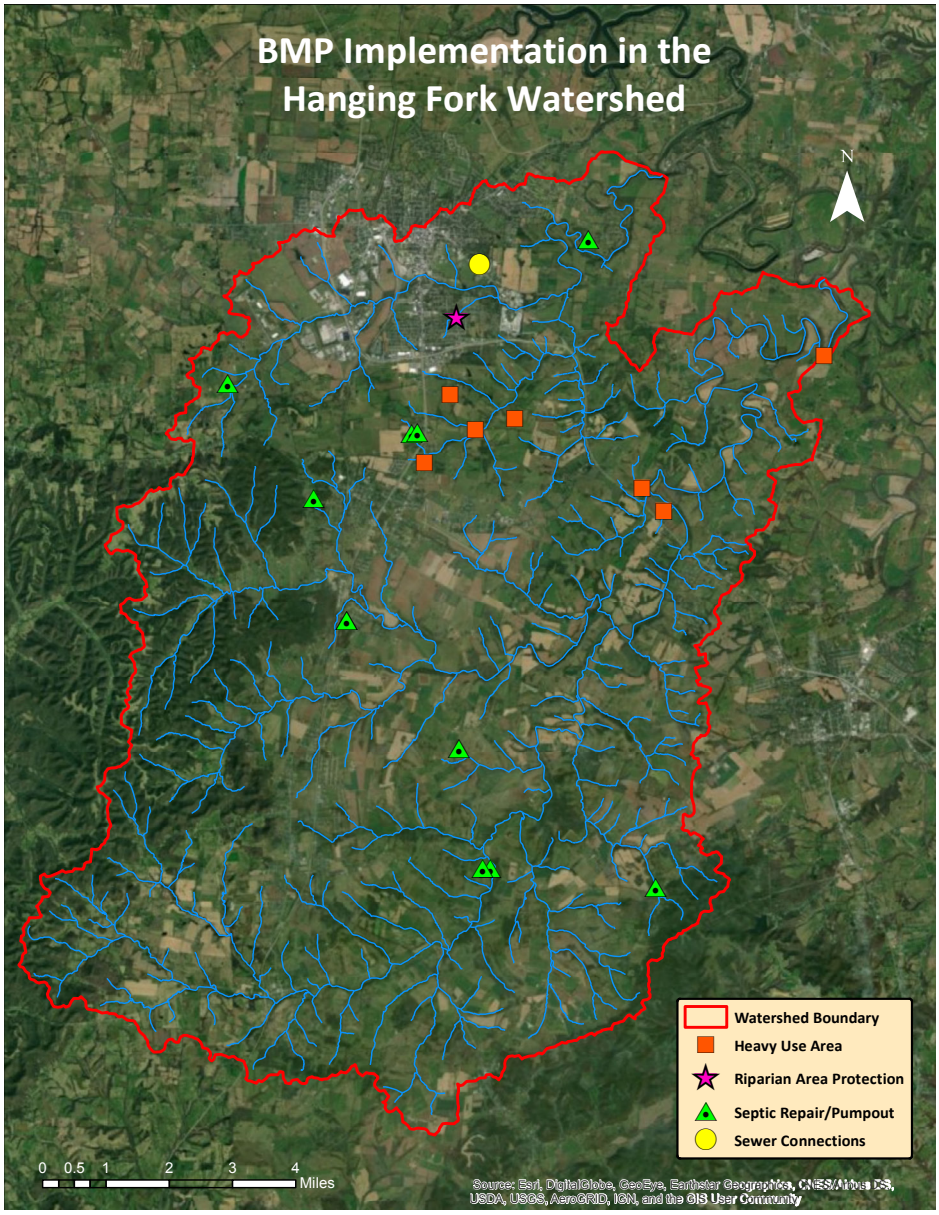


Figure 5. Hanging Fork Watershed Planning Area.

watershed will be summarized.

Dairy cows fenced out of a waterway to prevent water contamination.

The Hanging Fork watershed (Figure 5) covers 96.4 square miles (61,720 acres), primarily in northwestern Lincoln County (81%) but also in a small portion of southern Boyle County (14%) and eastern Casey County (5%). Two hundred thirty four (234) stream miles are located in the Hanging Fork watershed. Tributaries to Hanging Fork include Blue Lick Creek, Martin's Branch, Peyton Creek, Knoblick Creek, White Oak Creek, Harris Creek, Spears Creek, Baughman Branch, and Frog Branch. Numerous small farm ponds are also scattered throughout the region. The land is primarily in the Outer Bluegrass physiographic region, characterized by undulating terrain, moderate to rapid surface runoff, and moderate rates of subsurface drainage. To the northwest and southeast, some of the land is located in the higher gradient Knobs and Hills regions. This watershed is dominated by agricultural land and includes fragmented forest along stream and river corridors. Rural residences are primarily served by septic systems that are often situated in soils that are not best suited for onsite wastewater treatment systems. Municipalities found within the watershed include Junction City and Hustonville. Danville is located north of the watershed and Stanford and Lancaster to the east.

During the development of the Hanging Fork Watershed Plan, water quality sampling indicated that almost half the stream miles in the Hanging Fork watershed were unsafe for human recreation due to *E. coli* concentrations. Results displayed concentrations of *E. coli* ranging from 10 to 1,000 times greater than the water quality standard for safe swimming and wading (240 cfu/100 mL). Microbial source tracking determined that the sources for *E. coli* in the watershed where primarily human and cattle, with human inputs accounting for approximately 75% of the fecal bacteria in the watershed. Cattle were identified as the second most abundant source, contributing 50% of fecal matter in some places, but averaging 25% or less watershed-wide. Additionally, it was shown that poor aquatic habitat is common throughout the watershed, including specific areas where excessive nutrients produce algal blooms that can reaches levels toxic to fish and other aquatic life. Based upon the data, structural and non-structural BMPs that reduce *E. coli* and nutrient contributions were prioritized for implementation in the Hanging Fork watershed.

The Dix River Watershed Council was instrumental in the planning and implementation of the watershed plan, providing input about the TMDL development, helping to identify funding

opportunities to install BMPs, and encouraging implementation of the remediation efforts identified in the watershed plan. To date, many 319(h) projects have been funded in order to address the NPS pollution in the Hanging Fork watershed including the following projects as summarized below.

Project #10-11 Dix River Watershed Implementation Project

After the completion of the Hanging Fork (and Clarks Run) Watershed Plan(s), the City of Danville was selected for funding through the 319(h) program to start initial implementation of the watershed plan(s). The primary goals of the project were to reduce the number of failing onsite wastewater systems within Hanging Fork (and Clarks Run), to improve water quality through the restoration and reforestation of urban riparian zones, to establish a rain garden program, and to improve education related to nonpoint source pollution.

Through this project, three priority areas for sanitary sewer line extension were identified: an area containing approximately 176 homes in the southern portion of Boyle County and the northern region of Lincoln County, an area in the Stanford Road area of Danville, and an area on the outskirts of Junction City. Ultimately, the City

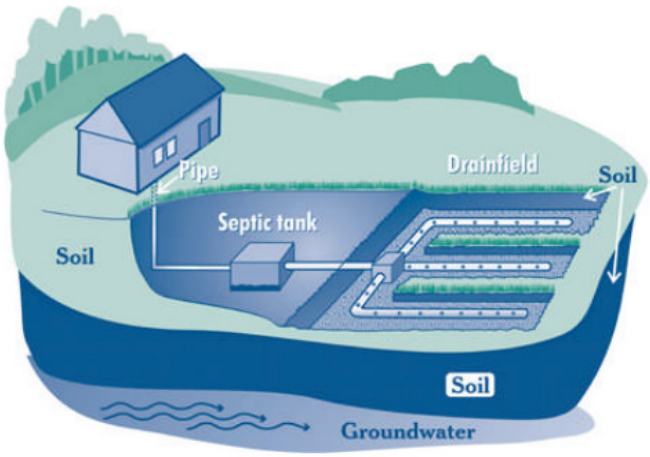


Figure 6. Conventional septic system.

A septic lagoon under construction. It replaces the leach field in the septic system. (Photo credit: KY Dept. for Public Health)

of Danville, with the support of United States Rural Development and the KY Department of Local Government, was able to provide public sanitary sewer service (project cost approximately $2.5 million) to the first identified priority area without the use of 319(h) funds. However, 319(h) funds from this project were utilized to provide technical and financial assistance to address the second priority area, the Stanford Road area, which is primarily in the Clarks Run watershed. In this priority area, the extension of the public sanitary sewer eliminates septic systems serving 10 buildings and a campground with more than 30 hook-ups.

To address the second and third objectives identified by the Dix River Watershed Council the City and the UK Water Resources Research Institute identified an area located on Butler Drive in Danville where these stated goals could be achieved. Specifically the project would enable the mitigation of flooding on three properties, restore and reforest the riparian zones along the properties while managing downstream runoff. The project area was conceived as an area accessible to the public which would result in

long-term opportunities for public education and outreach.

Although the majority of BMP implementation work for this project occurred in the Clarks Run watershed as opposed to the Hanging Fork watershed, this project along with the original watershed planning project spurred the formation of the Lincoln County Sanitation District. This entity was formed to work towards providing sanitary sewer service to western portions of Lincoln County including the Hustonville and Mooreland Areas, focused primarily around the HWY 127 corridor. This area of Lincoln County is almost exclusively within the Hanging Fork watershed.

Project #11-07 Clarks Run & Hanging Fork Agricultural BMPs

As mentioned, the land use in the Hanging Fork watershed is dominated by agricultural, with some fragmented forest along stream and river corridors. Utilizing funds from the FFY 2011 grant, the Lincoln County Conservation District was selected for 319(h) funding to implement agricultural BMPs in the Hanging Fork (and Clarks Run) watershed. Through this project, the Lincoln County Conservation District was able to hire an Agricultural Watershed Coordinator who was able to promote and provide technical assistance for BMP implementation. Furthermore, 319(h) funds were utilized to provide financial assistance for BMP implementation to landowners. As a result of the project, thirteen winter feeding areas were installed in the Hanging Fork and Clarks Run watersheds. This BMP serves as a convenient way for farmers to feed and rotate their cattle in a confined localized area without the commonly associated environmental degradation, thereby reducing nonpoint source pollution. Additionally, a field day was held with over 150 people in attendance viewing innovative conservation practices and participating in discussions on cattle feeding areas, riparian buffers, forages, and rotational grazing systems.

Project #12-04 Dix River Watershed Septic System Education and Improvement Program

Utilizing funding from the FFY 2012 319(h) grant, Bluegrass Greensource was selected for funding to implement a septic system education and repair program in the Hanging Fork (and Clarks Run) watershed. The project included two main goals: reducing human pathogen inputs to the Dix River Watershed, and providing watershed education to local communities. The objectives created to implement these goals included: building watershed stakeholder capacity for the greater appreciation and improvement of the Dix River Watershed and other area waterways, educating local homeowners, youth and other citizens about local water quality and septic system function, and enabling better septic system function throughout the watershed.

As a result of the project, financial and technical assistance were provided to facilitate the repair of 33 septic systems and the pump out of an additional 23 septic systems. Furthermore, this project succeeded in providing educational opportunities to over 18,880

individuals throughout the Hanging Fork and Clarks Run watersheds. Specific educational opportunities included: septic system and watershed homeowner workshops, K-12 educational programming, stakeholder meetings, presentations to local organizations and governments, six community watershed festivals, and other community events.

Project #16-07 River Watershed Implementation Project: Clarks Run, Hanging Fork, and Hinkston Creek

From the FFY 2016 grant, Bluegrass Greensource was selected for funding to continue to implement the Hanging Fork (and Clarks Run) Watershed Plan. The goals of this project are to reduce human and livestock pathogen inputs, create or improve riparian buffer areas, and reduce urban and agricultural runoff through the objectives of educating local homeowners, landowners, and other citizens, enabling better septic system function, enhancing riparian zones, and building watershed stakeholder capacity for the appreciation, understanding, and improvement of each watershed and its tributaries. This project is still ongoing.

Project #s 15-13, 16-08, and 16-09 Lincoln County Homeowners Assistance Program

These three projects are all working towards implementing the Hanging Fork Watershed Plan by reducing *E. coli* and excess nutrients from failing onsite wastewater systems in the Hanging Fork watershed. This goal is being accomplished by connecting un-sewered homes to a new sanitary sewer line. This new sanitary sewer line was constructed by the Lincoln County Sanitation District in June 2017, and has the capability of servicing approximately 600 homes and businesses along the US 127 corridor. The project area is centered around the Hustonville and Mooreland areas in Lincoln County, Kentucky.

When area residents expressed concern about the sewer connection costs, the Lincoln County Sanitation District worked with the Kentucky Division of Water (DOW) and Rural Community Assistance Partnership (RCAP) to develop the Homeowner Assistance Program (HAP) for sanitary sewer line connections. The purpose of this reimbursement program is to provide financial assistance for homeowners for costs associated with connecting to sewer lines for regional wastewater treatment plants. Homeowner reimbursements are income-based. The goals of HAP are to: improve water quality by eliminating marginal or failing on-site wastewater systems, ease the financial burden of

Example of a door hanger used to advertise the Homeowners Assistance Program in Lincoln Co., KY.

homeowners connecting to the sewer line, improve public perception of the Sanitation District's (or other Agency's) efforts, and provide a platform for water quality education.

To date, over 300 homes have applied for financial assistance through the Homeowner Assistance Program, with 240 homeowners having received assistance through the program. During FFY 2019, additional efforts will be made to assist the already approved homeowners to connect and to help additional homeowners apply for the program.

Results

Hanging Fork is a tributary to the Dix River, with their confluence being approximately 3 miles upstream of Herrington Lake. This 3 mile segment of the Dix River was listed on the 2008 Clean Water Act (CWA) section 303(d) list/Integrated Report as impaired for primary contact recreation due to Escherichia coli bacteria. The Dix River Watershed Council developed watershed plans for two tributaries to the Dix River, Clarks Run and Hanging Fork Creek watersheds in 2009.

Due to effective on-the-ground implementation projects targeting agricultural and onsite wastewater sources of nonpoint source pollution, the ambient water quality has improved. Monitoring data from 2010–2013 indicated that the Dix River segment was meeting its water quality standards (WQS) for primary contact recreation use for bacteria. Based on these data, the Dix River segment downstream of Hanging Fork Creek was removed from the impaired waters list in the 2016 Integrated Report.

Herrington Lake.

Gunpowder Creek

The Gunpowder Creek Watershed, located in Boone County, Kentucky, is the largest watershed in the county (582 square miles). Along with the mainstem of Gunpowder Creek, there are four distinct subwatersheds within the Gunpowder Creek Watershed: South Fork Gunpowder Creek, Fowler Fork, Long Branch, and Riddles Run (Figure 7). The headwaters originate near the Greater Cincinnati/Northern Kentucky International Airport (CVG) in the northern region of the watershed and flow approximately 36 miles southwest to the Ohio River. There are a total of 143.1 miles of blue line streams in the watershed. As an important note, the headwaters region of the Gunpowder Creek watershed is highly urbanized and rapidly developing.

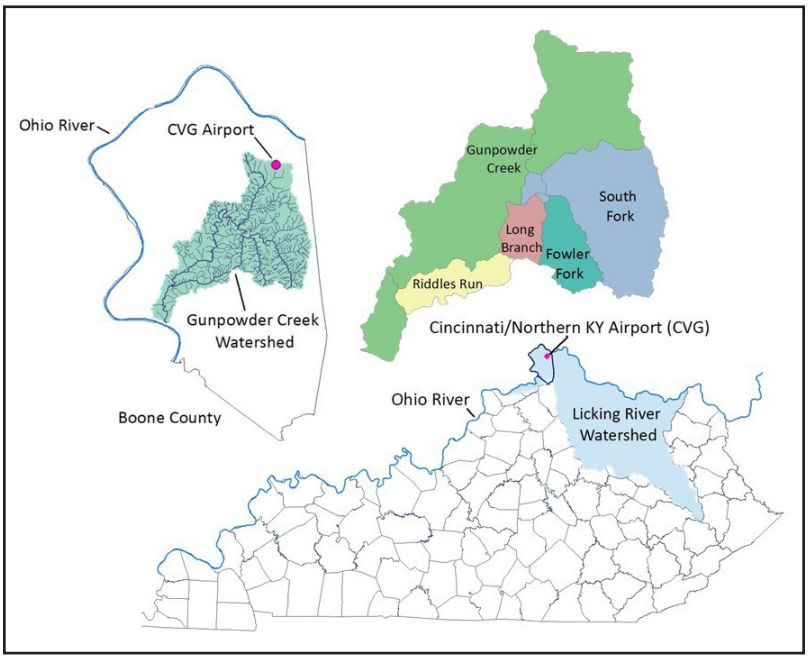


Figure 7. Gunpowder Creek Watershed and surrounding area.

Gunpowder Creek is listed on the Kentucky Division of Water's (DOW) 303(d) List for Impaired Waters for sediment, bacteria, and nutrients as a result of the streambank erosion/instability, excess sedimentation, degraded biological communities, and loss of ecological function. The Gunpowder Creek Watershed Initiative (GCWI) was formed to assess the extent of stream impairments and to develop a Watershed Plan to improve the health of the streams. The GCWI works under the leadership of the Boone County Conservation District (BCCD). Utilizing funding from a FFY 2009 grant, the Gunpowder Creek Watershed Plan was developed and approved for implementation in 2015.

Stream bank erosion has been identified as the dominant source of sediment pollution. The primary cause of stream bank erosion is excess stormwater runoff that has created more powerful flows in creeks draining developed portions of the watershed. This is true even in watersheds with developments that had conventionally-designed stormwater controls. Bacteria and nutrients also tend to be more elevated during wet weather, which is indicative of nonpoint source pollution being carried by untreated stormwater runoff during rain events or failing sanitary sewer infrastructure. Because much of the watershed has insufficient stormwater controls for capturing, treating, and slowly releasing runoff, pollutants can be washed directly into the streams.

The FFY 2014 319(h) grant enabled the GCWI to conduct many activities, both structural and non-structural BMPs as identified by the watershed plan, in order to combat these impairments. Several detention basin retrofits were completed with funds in this grant. Documented improvements associated with detention basin retrofits include reduced flows during high flow (storm) periods, and more prolonged flows during baseflow periods, all indicating that the receiving stream is less flashy than before the retrofit was installed.

Additional BMPs implemented under this grant include stormwater control and demonstration BMPs, native plantings, coordination with stakeholders, and the installation of twelve pet waste stations in the watershed. Six stations were installed in Florence, within the South Fork Gunpowder Subwatershed. Two of the capstone BMP projects that this FFY 2014 grant accomplished will

be summarized in more detail below: the YMCA bankfull wetland and the campus-wide stormwater improvement project at Gateway Community and Technical College.

YMCA Bankfull Wetland

Gunpowder Creek is impacted by a large amount of impervious area that is not routed through stormwater BMPs such as conventional detention basins or green infrastructure. Consequently, new storage may also be needed to mitigate the effects of untreated runoff from impervious surfaces. Extended detention basins and wetlands are some of the most cost-effective BMPs for stormwater storage and treatment, particularly for providing channel protection from erosion and removing total suspended solids.

The YMCA wetland (Figure 8) was designed using funds from the 2009 319(h) grant cycle and was constructed under the FFY 2014 319(h) grant by Advanced Enterprises, Inc. The design included ~8 acre-feet of new storage along Gunpowder Creek that is used to offload flows greater than the determined Q-critical value (the minimum flow velocity that will cause erosion). Monitoring predicts that the project should decrease the frequency of streambed disturbance and erosion by ~20 to 25%.

Additionally, streambed sediment mobility monitoring was completed at the wetland by the GWCI in partnership with SD1 to evaluate the effects of the bankfull wetland on streambed mobility. These data have validated the Q-critical design value of 2,000 cfs for this stretch of Gunpowder Creek, and flows have been documented being diverted into the bankfull wetland during events that exceeded 2,000 cfs, meaning that this BMP is performing as intended.

Following construction, the vegetation at the YMCA floodplain wetland has established, and flow that has entered the basin is partially detained as designed, supporting wetland hydrology for a wetland and restoration of a more natural flow regime in Gunpowder Creek. All projects completed during this implementation grant that included vegetation planting used native species. Approximately 100 trees were planted at the YMCA floodplain wetland location, along ~250 feet of bank of Gunpowder Creek.

Figure 8. Gunpowder Creek YMCA Bankfull Wetland under construction.

Figure 9. Gunpowder Creek YMCA Bankfull Wetland in 2018.

Aerial, Gunpowder Creek YMCA Bankfull Wetland under construction.

Gateway Community & Technical College – Best Management Practices Implementation

Gateway Community and Technical College partnered with the Boone County Conservation District for the implementation of a campus-wide stormwater improvement project. This project implemented stormwater BMPs to restore watershed-scale ecological and hydrological processes, including two detention basin retrofits, swale stabilization, two catch basin retrofits, and native grass prairie installation. Educational signs (Figure 10) have been installed at the features. With the location (i.e., college campus), there are endless benefits to this project over and above the obvious water quality and channel protection benefits, including reduced maintenance for campus crews from a reduction of mowing and re-grading of rilling, etc. and beautification of a college campus (Figure 11).

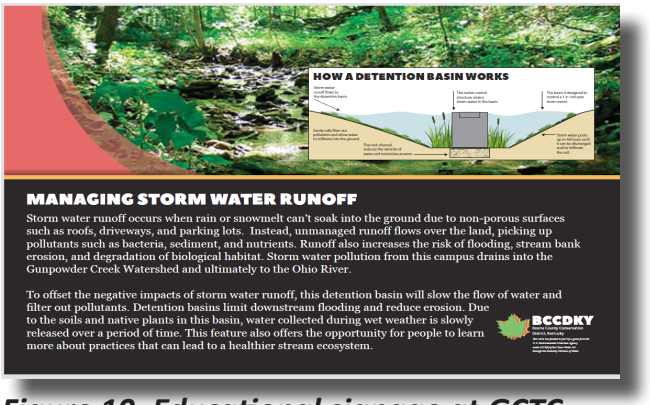


Figure 10. Educational signage at GCTC.

Figure 11. Before and after pictures of a stormwater improvement project at Gateway Community and Technical College.

Projects Started FFY 2018

Table 1. Projects started in FFY 2018.

State Project Number	Project Title
15-13	Lincoln County Homeowners Assistance Project CAK
17-03	Project WET Program Implementation
17-04	Mini-Grant: Campbellsville
17-05	Mini-Grant: Big Sandy Watershed Watch
17-06	Mini-Grant: City of Shelbyville
17-07	Mini-Grant: Pennyrile RCD Four Rivers
17-08	Mini-Grant: Clarks Run, Licking River
17-09	Mini-Grant: KYH2O Podcasts
17-10	Mini-Grant: Wolf Creek Fish Hatchery
17-11	Sulphur Creek Septic BMP
17-12	UK CES NPS Program Staff Support - Ag Water Quality Liaison and Nutrient Management Planning Specialist
17-13	Bacon Creek Agriculture BMP Implementation Project
17-14	Chestnut Creek WSP Implementation Project
17-16	UK BAE NPS Program Staff Support
17-18	Damon Creek and Clark's River WSP Planning and Implementation Project

Completed Projects FFY 2018

Table 2. Projects completed in FFY 2018.

State Project Number	Project Title	Date Completed
14-02	Clarks River-Damon Creek Watershed Based Plan	9/30/2018
14-04	University of Kentucky Cooperative Extension Service - KY Nutrient Management Planner	9/30/2018
14-05	Gunpowder Creek Watershed BMP Implementation Project	9/30/2018
14-06	Chestnut Creek Watershed Based Plan Implementation	9/30/2018
14-07	Project WET	5/30/2018
14-08	Triplett Creek Watershed Based Plan Implementation	9/30/2018
14-09	UK Winter Feeding Demo and Forestry Field Guide	9/30/2018
14-10	Banklick Creek Streambank Stabilization	9/30/2018
14-12	Mini-Grant: Clarks Run, Danville	6/1/2018
14-13	Mini-Grant: SRWW Beargrass Creek	6/1/2018
14-14	Mini-Grant: FORE's River REACH Program	3/15/2018
14-15	Mini-Grant: Jeffers Bend Environmental Center Water Quality Education	3/1/2018
14-16	Mini-Grant: Preston Miller Park	5/1/2018
14-17	Mini- Grant: Stormwater Management at South Marshall Middle School	8/1/2018
14-18	Mini-Grant: Liberty Nature Center Rain Harvesting and Rain Garden	5/1/2018
15-09	Sulphur Creek Septic Implementation	9/30/2018
15-10	Sulphur Creek Ag Implementation	3/30/2018
17-04	Mini-Grant: Campbellsville	9/30/2018
17-06	Mini-Grant: Shelbyville	9/30/2018
17-11	Sulphur Creek Septic Implementation BMP	9/30/2018

Load Reductions

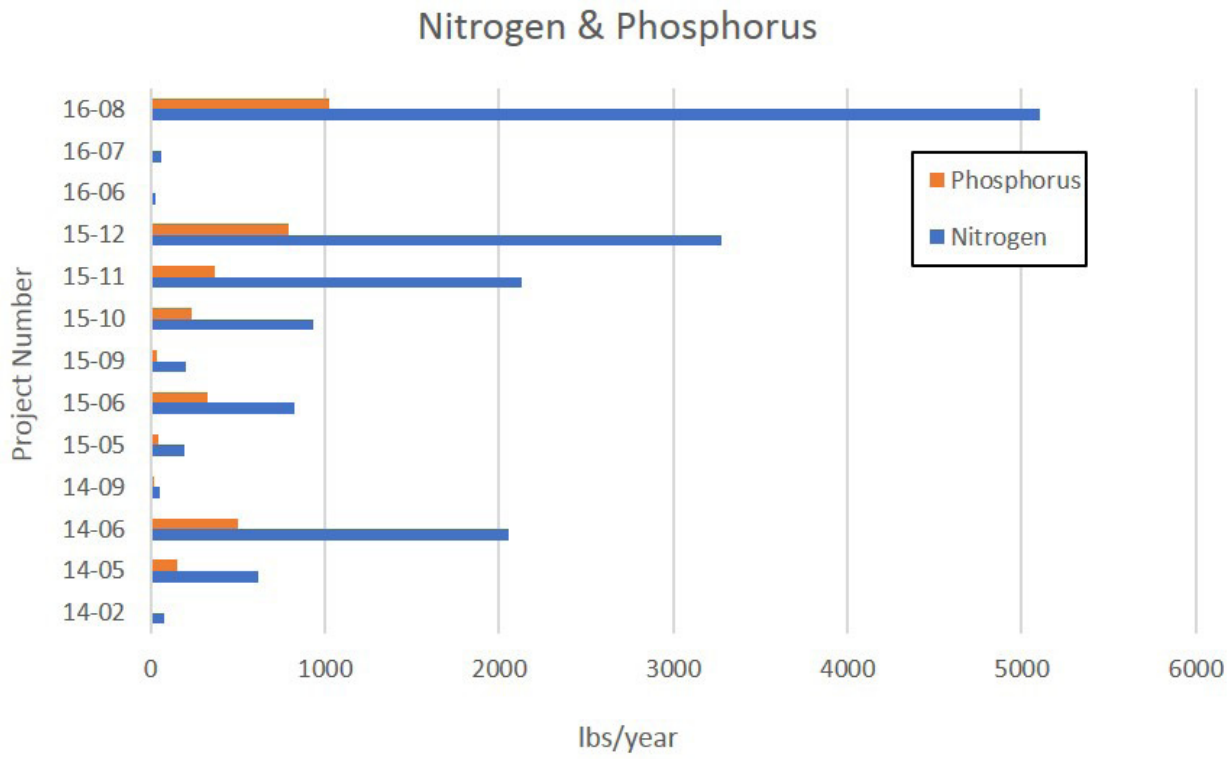
Table 3 contains a compilation of load reduction estimates from Best Management Practices (BMPs) that were implemented during FFY 2018 (October 1, 2017 – September 30, 2018). Load reductions were derived by direct calculation or by utilizing STEP-L BMP Modelling, and then entered into the EPA's Grant Reporting and Tracking (GRTS) database prior to the February 15, 2018 deadline.

Table 3. Load reductions for projects from FFY 2018.

Appropriation Year	State Project Number	Project Title	Load Reductions		
			Nitrogen (lbs/year)	Phosphorous (lbs/year)	Sediment (tons/year)
2014	14-02	Damon Creek	77.1	13.6	1.3
2014	14-05	Gunpowder	616.7	151.5	82.2
2014	14-06	Chestnut Creek	2,052.6	501.1	327.5
2014	14-09	UK Winter Feeding	55.6	17.1	12.9
2015	15-05	Red Bird	194.2	44.9	7.8
2015	15-06	Red River	825	327.9	229.8
2015	15-09	Sulphur Creek Septic	201	40.2	0
2015	15-10	Sulphur Creek Ag.	931	237.1	167.5
2015	15-11	Banklick WC	2,132.4	365.2	2.2
2015	15-12	Brushy Creek	3,276.5	795.3	573.9
2016	16-06	Curry's Fork	27.4	5.5	0
2016	16-07	Clark's Run Hanging Creek Hinkston	57.6	11.5	0
2016	16-08	Lincoln County HAP	5108.3	1,021.7	0
2017	17-02	Banklick Wolsing	155,379.6	24,807.6	13,267.9

Kentucky Division of Water
2018 NPS Project Load Reductions*

A.)



B.)

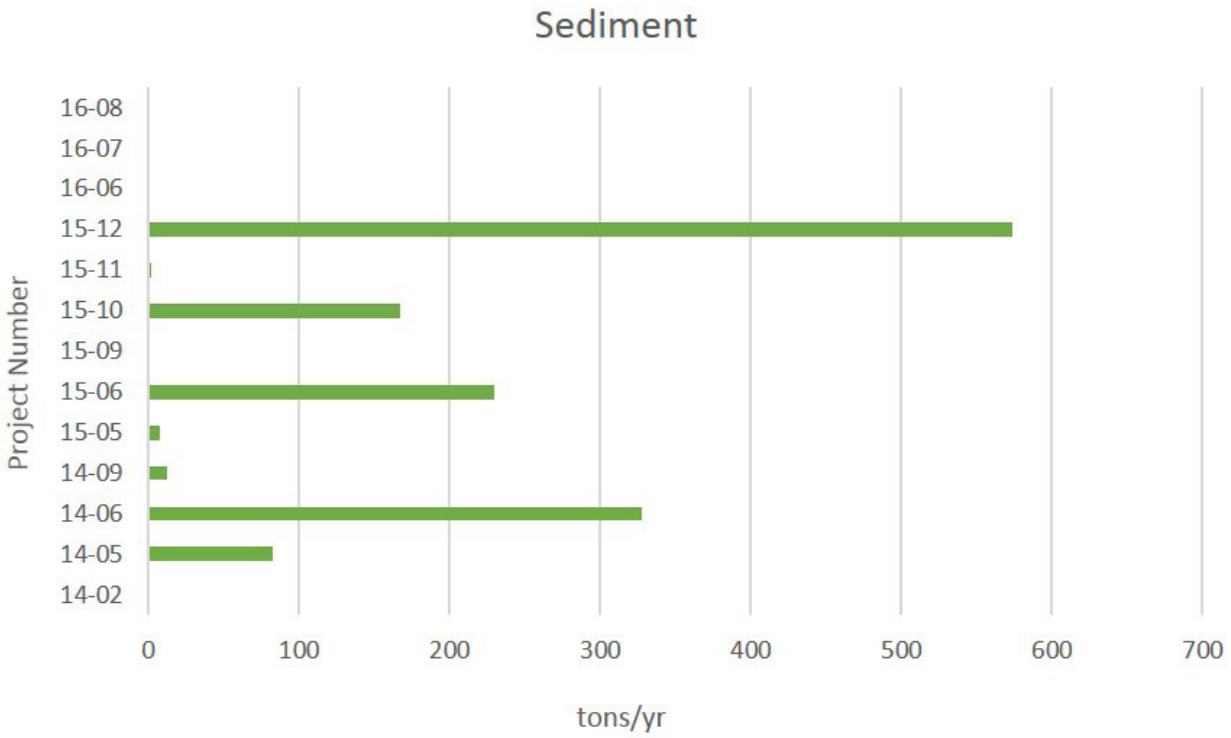


Figure 12. Load reductions for projects from FFY 2018. A.) Nutrients; B.) Sediment. *Project 17-02 results (Banklick, Wolsing) are not shown. The load reductions for that project were: Nitrogen: 155,379 lbs/year, Phosphorus: 24,807 lbs/year, and Sediment: 13,267 tons/year.

Chapter 2

Basin Coordination

Kentucky Division of Water Basin Coordinators

The Kentucky Division of Water and partners maintain Basin Coordinators in six of the state's seven Major River Basin Management Units; Green and Tradewater Rivers, Four Rivers, Kentucky, Licking, Salt, and Upper Cumberland (Figure 13). Basin Coordinators serve an essential function in the watershed management process by acting as facilitators for agency activities and as points of contact for local organizations interested in addressing water issues. At the end of FFY 2018, the Green/ Tradewater Rivers and the Licking River Basin Coordinators were vacant, but efforts are underway to have those positions filled in the next FFY.

Basin Coordinators enhance communication with stakeholders via regular newsletter releases and Basin Team Meetings in addition to additional program facilitation and multiple forms of Education and Outreach. They help involve the pubic in setting management priorities, develop watershed plans, provide grant assistance, and search for innovative ways to improve water health at the community level.

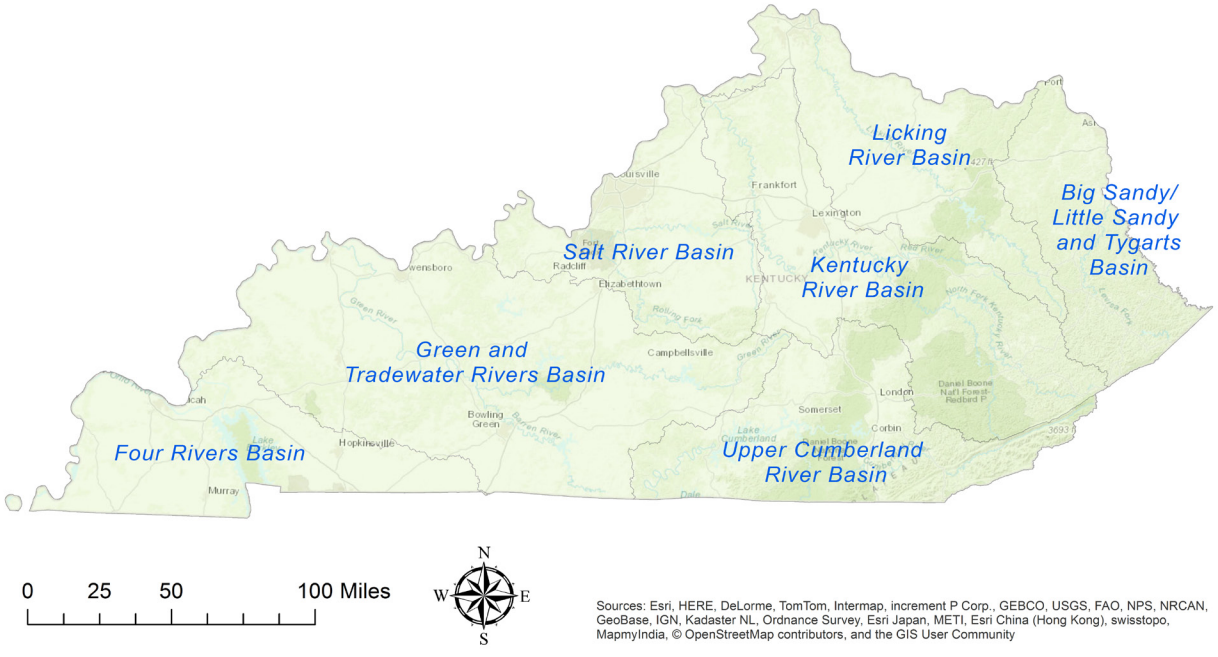


Figure 13. Kentucky's Major River Basin Management Units.

Priority Watersheds: 2018

Priority watersheds are selected based on factors such as the degree of water quality impairment and potential for recovery through implementation of Best Management Practices. The purpose of selecting these areas is to focus limited resources on areas where positive change is reasonably attainable. A priority watershed should ideally have a completed watershed plan in process of implementation or an ongoing watershed planning effort and a potential for strong community support for implementation of recommended watershed projects.

The Basin Team's knowledge and input is valuable to helping the Basin Coordinators and DOW make the watershed selections with the most current and localized knowledge.

Basin Team Meetings were utilized in FFY 2016 to assist in establishing the current priority watersheds of the Commonwealth. From all the identified watersheds, three priority watersheds were selected for each major river basin in Kentucky, taking into consideration Basin Team input. These watersheds will be considered for focused funding and technical support in state agency programs, including US EPA 319 (Nonpoint Source) Grant Program funding, state revolving funds for water and wastewater infrastructure, and state agricultural cost-share programs (Figure 14).

Priority watersheds will be reevaluated on a regular basis to ensure that limited resources are being directed most optimally.

Creek bank erosion.

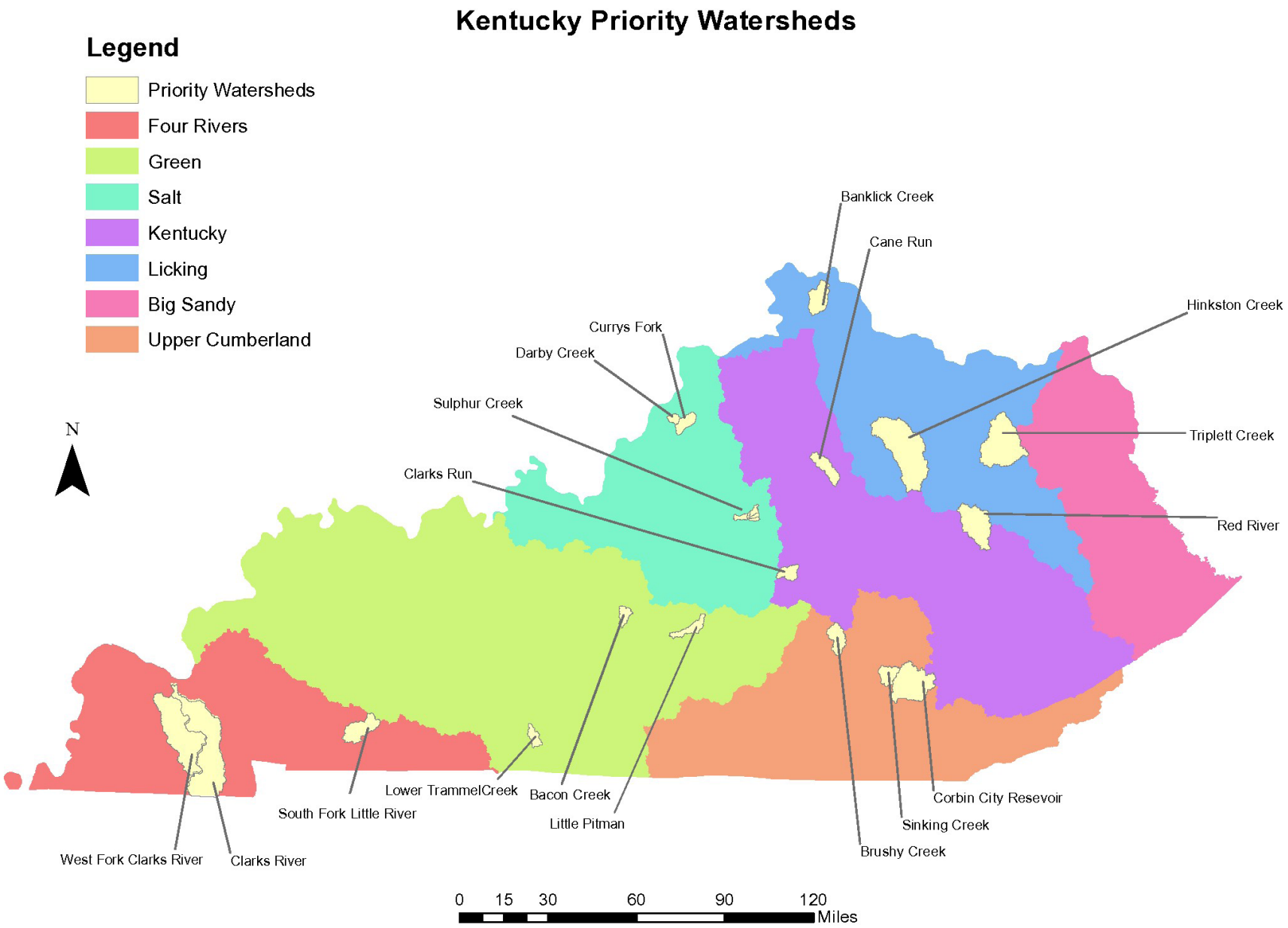


Figure 14. Priority watersheds in Kentucky.

Priority Watersheds: Updates

Green River Basin

Bacon Creek Priority Watershed
The Bacon Creek Agriculture Best Management Implementation project is underway. The goal is to implement a 75:25 cost-share program to install agriculture related BMPs in the Upper Bacon Creek Watershed. BMPs will be directed at landowners with livestock. High priority BMPs are: livestock exclusion fencing (alternative water source), heavy use areas, winter feeding pads, fence-line feeders, rotational grazing, etc. This project will fund the Agriculture Watershed Coordinator and Technical Advisor and allow Ag BMP installation to continue. The Agriculture Watershed Coordinator and Technical Advisor will work with local farmers and landowners to identify natural resource issues, identify appropriate BMPs, and implement the BMPs to reduce nonpoint source pollution. All of these will contribute to a healthier watershed and will address water quality issues.

Little Pitman Priority Watershed
With *E. coli* samples collected in 2016, basic watershed planning has begun. Education and outreach remains the priority in the watershed to cultivate interest and activity. The Soil Conservation District is the current driver of interest in the watershed.

Trammel Creek Priority Watershed
Initial water quality sampling took place during FFY 2018, and basic watershed planning has begun for the Trammel Creek Watershed. Education and outreach remains the priority in the watershed to cultivate interest and activity.

Salt River Basin

Darby Creek Priority Watershed
Seven septic systems were serviced or replaced in the Darby Creek Watershed in FFY 2017. Further implementation is anticipated once a new Watershed Coordinator is hired for the area.

Curry's Fork Priority Watershed
During FFY 2018, implementation of the Curry's Fork Watershed Plan through work accomplished using FFY 2016 funds, including the successful launch of a septic repair and replacement program in prioritized subwatersheds of Curry's Fork. Education and outreach efforts were widespread and has included tree planting events, mini-septic system workshops, and stream erosion prevention projects.

Sulphur Creek Priority Watershed
In FFY 2018 the Sulphur Creek Septic System Reclamation project (15-09, 17-11) installed 13 new septic systems and provided 2 pump-outs. The Sulphur Creek Watershed Ag Implementation project (15-10) completed the initial round of agricultural BMP installations in Mercer County, presented 2 farm field days, and conducted one watershed tour. Additionally, using FFY 2017 funds, a new project that will seek to install agricultural BMPs in the Anderson County portion of the Sulphur Creek watershed started. Furthermore, utilizing FFY 2018 funds, a second round of agricultural BMP implementation project will be pursued in the Mercer County portion of the watershed.

Agricultural BMP implementation in Sulphur Creek Watershed.

Four Rivers Basin

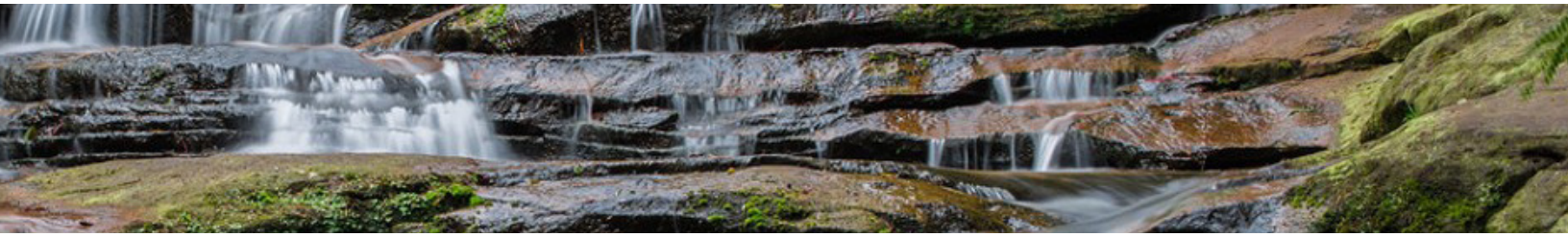
West Fork Clarks River
The Jackson Purchase Foundation is working towards finalizing the watershed plan for the Damon Creek subwatershed in Calloway County. Using funds from the FFY 2014 grant, best management practices identified in the preliminary plan were implemented in 2018 to improve water quality in Damon Creek by reducing runoff and fecal pollution, preventing erosion, and building a more educated community. This included replacing two failing septic systems and connecting one homeowner with a failing septic system to a community wastewater lagoon system, erosion control practices in combination with the establishment of rotational grazing on a livestock pasture, and the installation of two fence-line feeder systems for livestock. Several educational field days with schools were conducted in conjunction with this implementation project. A litter pickup event was also held in the Damon Creek watershed as part of the Four Rivers Watershed Sustainability Summit, discussed below.

Through a new 2018 project, the watershed plan will be finalized and the watershed coordinator will be working with landowners in the watershed to develop plans to fence cattle out of Damon Creek on their properties.

Clarks River
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 in 2015. The watershed plan identifies several sources of water quality impairments, including the local wastewater treatment plant as a source of *E. coli* and nitrogen exceedances, failing septic systems as a source of *E. coli*, and agriculture as a source of nutrient and sediment exceedances.

In 2017-2018, the Marshall County Sanitation District #2, with a loan from the Marshall County Fiscal Court, has addressed many of the issues related to the failing wastewater treatment plant. In 2018, the Marshall County Fiscal Court pursued an expansion project for the newly repaired wastewater plant, that will connect Marshall County High School (which currently has a package treatment plant), and several businesses and residences in the area. Additionally, the watershed coordinator worked with many landowners in the Chestnut Creek watershed to install best management practices on their property, including replacing four septic systems, one erosion control practice, two stream crossings and one rain garden in conjunction with Marshall County High School. In addition to BMP implementation, several education and outreach projects occurred as part of the project, including educational field trips for several local schools in the four county area, participation in several outreach events, and one litter pickup event.

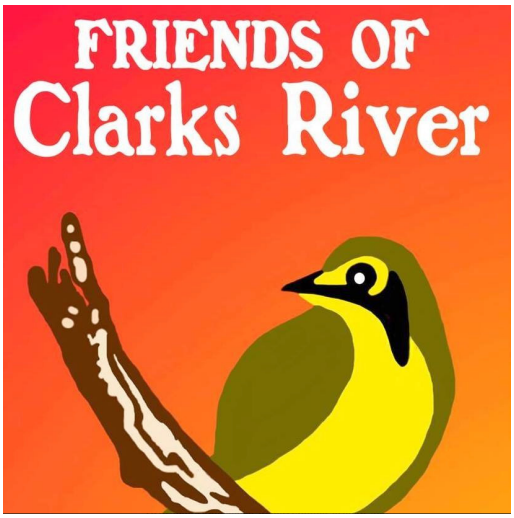
In FFY 2018, a watershed festival, the second annual Four Rivers Watershed Sustainability Summit, was held at Murray State University, located in the Clarks River watershed. This festival was designed to celebrate the abundant water resources that are important to the Four Rivers region of Kentucky, and allowed participants to



learn about local projects occurring to improve and protect our water resources, and things individuals can do to help protect our waters. In addition to the summit, a Project WET Educator workshop was held as part of the festival. Also in the Clarks River watershed, the Jackson Purchase Foundation hosted their annual Summer Conservation Series in partnership with the City of Murray and Calloway County Conservation District. Three workshops were held for homeowners to showcase different best management practices that can be implemented at residences.

In FFY 2017, the Jackson Purchase Foundation and Four Rivers Watershed Watch undertook another watershed planning project in the Clayton Creek subwatershed of the Clarks River. With a grant from Murray State University and assistance from the Calloway County watershed coordinator, *E. coli* monitoring and field chemistry analyses were conducted on nine sites in the Clayton Creek subwatershed of the Clarks River in Calloway County during the primary contact recreation season (May through October, 2018). Data has been compiled and is being analyzed with a goal of completing a watershed plan in FFY 2019.

Through a new 2018 project, the Friends group will continue to employee a watershed coordinator to work in conjunction with NRCS, the U.S. Fish and Wildlife Service Partners Program, and other local partners to recruit landowners in Marshall County and the Chestnut Creek Watershed to implement best management practices that will address problems with *E. coli*, nutrients, sediment and altered hydrology. This will include several agricultural practices, fixing failing septic systems, and conducting a septic pump out program. The watershed coordinator will also partner with the Marshall County Fiscal Court to assist them with a homeowner assistance program that will begin in 2019.



The Friends of Clark's River group is working with project partners to implement the watershed plan.

South Fork Little River

The Little River Water Quality Consortium began a watershed-planning project in 2017 to utilize data collected over a three year period by USGS to develop a plan identifying water quality threats to the South Fork Little River and best management practices that could be implemented to address these threats. The watershed plan is currently under review by the Kentucky Division of Water. It is expected to be fully approved in FFY 2019, with an implementation project beginning thereafter.

In addition to the watershed-planning project pursued by the Little River Water Quality Consortium, several education and outreach activities occurred. The Pennyrile RC&D Area Council, Inc. received a mini-grant to host educational presentations for schools throughout the year, host a Water Festival in conjunction with National Drinking Water Week in May of 2018, and host Nature Fest in September of 2018. A Project WET/WILD workshop was held for educators in June of 2018.

Kentucky River Basin

Clarks Run and Hanging Fork
Bluegrass Greensource, County Health Departments, Clarks Run Environmental and Educational Corp. (CREEC), and the City of Danville are partnering to implement the Hanging Fork Watershed Plan and the Clarks Run Watershed Plan. The Watershed Coordinator has been working to implement the septic system education and repair/replacement program, stormwater education, and riparian buffer education and assistance programs in this region. The Saving Your Streambanks Workshop Series is an example of the effective partnership in both counties, including each of the Conservation Districts and University of Kentucky Extension offices.

Of particular note, in the Hanging Fork watershed, implementation of the Homeowners Assistance Program (HAP) for sanitary sewer line connections (project numbers 15-13, 16-08, and 16-09) got underway. The program seeks to provide financial and technical assistance for homeowners connecting to the new sanitary sewer line. During FFY 2018, two hundred and forty (240) homeowners were partially reimbursed through the program.

Bluegrass Greensource Workshop flyer.

Cane Run of North Elkhorn
Lexington-Fayette Urban County Government, Third Rock Consultants, UK College of Agriculture, Food and Environment, and Bluegrass Greensource have been working to revise and geographically expand the existing Cane Run Watershed Plan. The project is currently working on selecting and prioritizing BMPs to implement in the Cane Run Watershed to address NPS pollution.

Commitments have been made by the City of Georgetown, Scott County, and LFUCG for a "South Sewer Extension" project. Leveraging funding from multiple sources, the project will install 16,000 linear feet of collector sewers and service laterals, along with a pump station and force mains, such that residents of two mobile home parks will be served by the Georgetown Municipal Water and Sewer Service. The mobile home parks are currently served by failing/inadequate private package wastewater treatment plants, and are a known source of pathogens and excess nutrients in Cane Run.

Red River
The Red River Watershed Plan is being implemented by the U.S. Forest Service, Kentucky Waterways Alliance, Eastern Kentucky PRIDE, and the Red River Gorge Trail Crew. These groups have been successful at building a functional program by solidifying partnerships with local people and groups through meetings and events including work on a septic pump-out, repair, and replacement program and environmental education and community engagement. In 2018, the Red River watershed coordinator received a grant from the National Environmental Education Foundation to organize a Bioblitz event (Photo 1). Due to the synergy and momentum around this project, the U.S. Forest Service has been selected to receive additional 319(h) funds from the FFY 2018 grant to continue implementation work in the Red River watershed.

Licking River Basin

Hinkston Creek Priority Watershed

During FFY 2018, Bluegrass Greensource in partnership with the local Health Department and Extension Offices have been working to implement the Hinkston Creek Watershed Plan. Specifically, the Watershed Coordinator has been working to continue implement the septic system education and repair/replacement program, stormwater education, and riparian buffer education and assistance programs in this watershed. Furthermore, utilizing FFY 2017 funds, a new project with the Nicholas County Conservation District began that will target agricultural BMP implementation in this watershed. This project will build on the successes of the previous agricultural BMP implementation projects, including a project with the Nicholas County Conservation District, which resulted in strong interest and BMP cost-share participation by producers in Nicholas and Bourbon Counties.

Banklick Creek Priority Watershed

In FFY 2018, the Banklick Watershed Council used 319(h) funding to implement the following practices: wetland installation at Wolsing Woods, riparian buffer establishment, septic systems replacements, and stormwater infiltration BMPs.

The Wolsing Wetland is a stream stabilization and wetland installation project at the Wolsing Woods property, which is held through the Kenton Conservancy. Construction of the wetland began in 2018, and will be open to the public in the Fall of 2019. The wetland will provide water quality improvement and excess stormwater storage benefits to the watershed. Furthermore, due to the properties appeal with recreation, several education and outreach BMPs will be installed including additional habitat enhancements such as 7 bat trees, 3 vernal ponds, and a wet meadow. Educational signs are currently being designed to increase public awareness of water quality issues and will be installed in key sites around the property. Additionally, a riffle stone crossing was installed to provide streambed and bank stability, provide access to the other side of the property, and to bring people close to the creek.

The Banklick Watershed Council and the watershed coordinator continue to improve water quality in the watershed as well as looking for ways to bridge the gap between the agricultural community and watershed restoration.

Wolsing Wetlands project.

Triplett Creek Priority Watershed
During FFY 2018 the Triplett Creek project with Morehead University (FFY 2014) was completed. BMP implementation in this project included a streambank stabilization and tree planting along the main stem of Triplett Creek, agricultural BMPs in the Big Brushy subwatershed, and installation of pervious walkway and native plantings in an outdoor classroom. Future work will focus on stream stabilization and water quality BMPs activities on Triplett Creek, along with additional agriculture BMPs installed on Morehead State University's (MSU) farm. The BMPs installed through this project are highly visible and will serve to educate the public about practices that benefit water quality. Among the planned agricultural BMPs planned for MSU, the school will use 319(h) funding in collaboration with funding from the Natural Resources Conservation Service and the Governor's Office of Ag. Policy to install rainwater harvesting systems for use in livestock watering, animal and green house cooling systems, and prevention of erosion and water quality degradation.

Derrickson Agricultural Complex is MSU's agricultural research farm. BMPs installed here will be used to educate the community as well as students about Agricultural Best Management Practices.

Upper Cumberland River Basin

Brushy Creek Priority Watershed
During FFY 2018, the Pulaski County Conservation used 319(h) funding to focus on agricultural BMP installations in the Brushy Creek watershed, including five heavy use areas, two watering facilities, cover crops, pipelines, and a fence. If the project continues to prove successful, the watershed coordinator would like to pursue additional 319 funding to further enhance efforts.

Corbin City Reservoir Priority Watershed
Corbin City Reservoir has an approved Watershed Based Plan, but no active 319(h) projects during FFY 2018 occurred. Work is anticipated to continue as opportunities arise.

Sinking Creek Priority Watershed
Sinking Creek has a partially completed Watershed Based Plan. Upon completion of the plan, likely in-house, the plan can be implemented.

Education and Outreach

The DOW 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 the citizens of the Commonwealth in order to create a more informed population and improve Kentucky's Water Health.

Tables 4 and 5 detail the educational programming accomplished in FFY 2018. Basin Coordinators and technical advisors of the Nonpoint Source and Basin Team section reach thousands of stakeholders through outreach activities each year. In FFY 2018 they reached an estimated 3900 students in K-12 educational programs.

Education and outreach activities reach a wide variety of stakeholders throughout the state.

Table 4. Education and outreach activities by Action Item. DOW reached more than 5000 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. To date the page has 614 followers. • The Basin Coordinators continue to use MailChimp for quarterly newsletters. The mailing list contains 619 recipients
Action Item 1.2: Partner with organizations on environmental education and outreach opportunities	Partnered with the following organizations:
	• University of Kentucky Cooperative Extension
	• Kentucky State University
	• Louisville Water Company
	• Kentucky Environmental Education Council
	• MS4 Stormwater programs
	• Kentucky Conservation Districts
	• Division of Conservation
	• US Fish and Wildlife Service
	• Kentucky Association for Environmental Education
	• Kentucky Department for Public Health
Action Item 1.3: Develop content for social media, basin newsletters, and other print and non-print outlets	Social Media:
	• Each Basin (Salt, Licking, Cumberland & Green) has sent out quarterly newsletters. Each newsletter was posted to the FB Page and on the Basin web pages
	• 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
Action 1.4: Coordinate and conduct public events and/or exhibits	DOW has participated in tabling events throughout the state, including:
	• Energy & Environmental Cabinet Earth Day Celebration
	• Children's Environmental Health Summit
	• Kentucky Stormwater Association Annual Conference
	• Kentucky Associations for Environmental Education Annual Conference
	• Reforest Frankfort
	• Wolf Creek National Fish Hatchery Earth Day
	• Governor's Conference on Energy and Environment

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:	Conducted 20 formal presentations reaching over 1000 community members of all ages
	Basin Coordinators and how we can help with projects	
	Watershed Watch	
	Nonpoint Source Pollution and the 319 program	
	Clean Water Act 101 & TMDLs	
	Stormwater Management	
	Rain Barrels	
	Land Use Management	
K-12 Environmental Education	Conducted various water related activities using Project WET at partners events:	Conducted 21 Environmental Education programs reaching ~3,900 students
	Louisville Water Company	
	U.S. Fish and Wildlife	
	Warren County/Bowling Green Stormwater	
	University of Kentucky Cooperative Extension Services	
	Calloway County Schools	
	McCracken County Schools	
	Marshall County Schools	
Workshops (Hosted)	Conducted the following Workshops:	At the 9 workshops held throughout the State, ~200 educators and partners were taught by the Division of Water
	Project Wet Workshop (3)	
	Getting Little Feet Wet/Early Childhood Education Workshop (1)	
	Two (2) Watershed Coordinator Meetings	
	Watershed Academy Training	
Workshops (Attended)	The Basin Coordinators Attended the following Trainings for Professional Development:	
	Kentucky Association for Environmental Education Early Childhood Educator Training	
	Watershed Academy Training	
	Septic Workshops (statewide)	

Type	Description	Community Reached
Community Meetings Attended	As Basin Coordinators, we are responsible for engaging with the general public about water quality issues. General public community meetings included:	
	Watershed Council Meetings	
	Mason Co. Conservation District Dinner	
	Murray Womens Club Talk	
	Herrington Lake Sampler Meeting	
	Stormwater Association Meetings	
	Agriculture and Water Quality Meetings	
	Cumberland River Compact Meetings	
	Area Development District Meetings	
	Friends Groups Meetings	
The Basin Coordinators are also responsible for watershed planning and implementation. In 2018 the Basin Coordinators and Technical Advisors have worked in the following areas related to current watersheds or future watershed developments:	Little River Watershed	The Basin Coordinators attended 14 community meetings
	Clarks River Watershed	
	Curry's Fork Watershed	
	Middle Fork Beargrass Creek	
	Hanging Fork Watershed	
	Cane Run Watershed	
	West Hickman Watershed	
	Chestnut Creek	
	Gunpowder Creek Watershed	
	Little Pitman Watershed	
	Obion Creek Watershed	
	Trammel Creek Watershed	
	Banklick Watershed	
	Darby Creek Watershed	
	Bacon Creek Watershed	

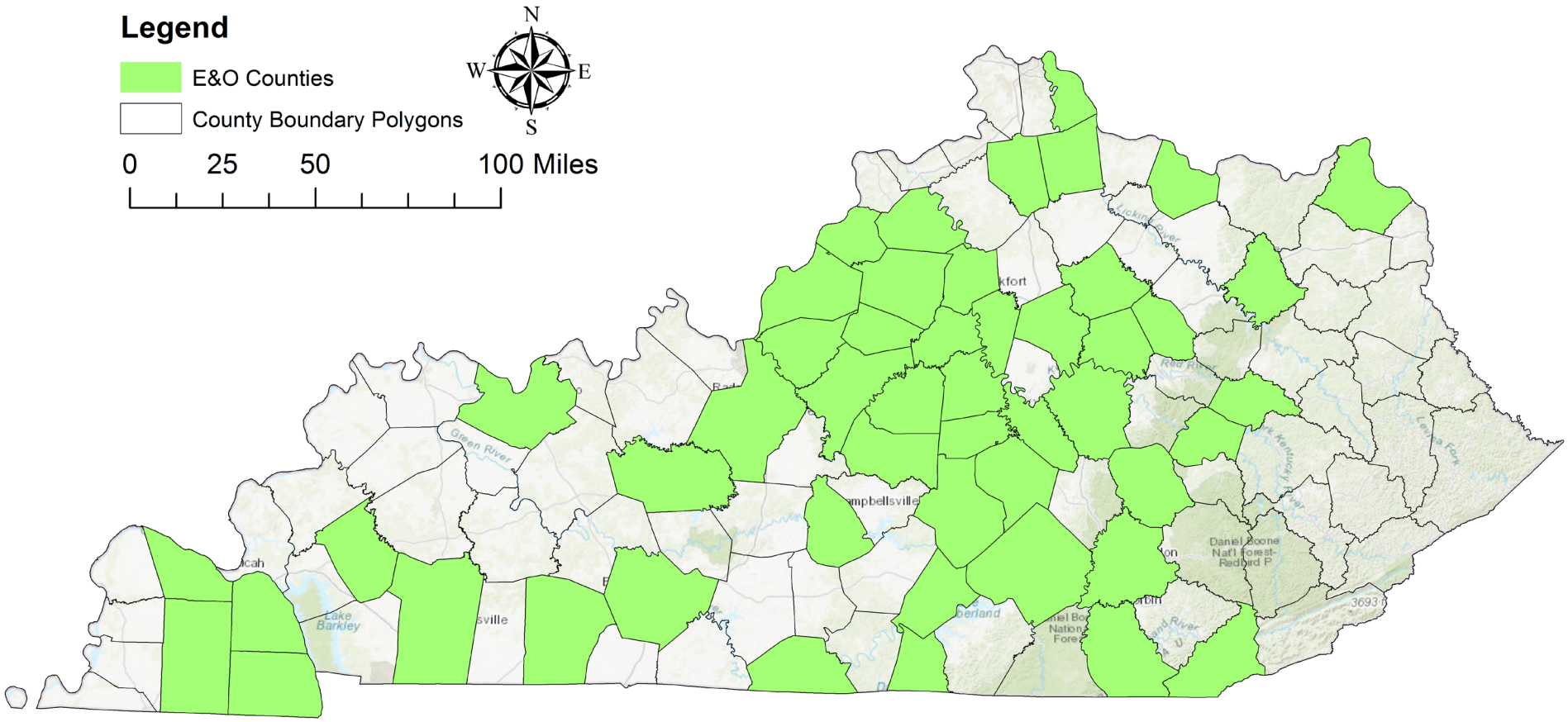


Figure 15. Counties in which E&O events were provided.

2018 Mini-Grants

In FFY 2018, using FFY 2017 funds, the DOW awarded seven (7) small $5,000 grants to watershed groups throughout KY. The purpose of the mini-grants is to engage groups interested in improving their water, with the hope that relatively small grants can help build capacity in communities with limited public involvement in watershed issues.

The seven grants awarded included:

The Green River Institute:

The Institute will provide local high school students with the opportunity to tour the watershed and participate in activities that will highlight the biological significance and water quality of the Green River. Students will also achieve a deeper understanding/appreciation for the threat of nonpoint source pollution to the biota and the role of best management practices in the reducing this threat. Students will focus on *E. coli* issues, fertilizer and pesticide issues as well as learning to test for pH, Dissolved Oxygen and conductivity to better understand the nonpoint source pollution issues in this basin.

Pennyrile Resource Conservation and Development (RC&D) Project – Focus on Water and Water Quality:

This project seeks to educate the local community about how their actions may be contributing to water pollution issues in their region. The program will use hands on presentations and distribution of educational materials focused on how nonpoint source pollution enters the streams and their effects on water quality with a special focus on regions with karst geology.

Trash in sinkholes can be a significant problem in karst regions.

KYH2O Podcast Series:

The podcast series will address a variety of NPS and water quality issues related to water resources conservation, protection, and restoration. Science-based and social-based perspectives will be explored. An initial list of nearly 30 podcast topics has been developed. These topics include water quality, stormwater, green lawn care, groundwater, low impact development, livestock BMPs, crop BMPs, urban trees, macroinvertebrates, drinking water, etc.

The KYH2O podcast series is designed to provide the listener, in a 10-12 minute time frame, with information on each topic, an understanding of why the topic is of importance, and information on how citizens can modify their behavior to protect water resources and the environment. Podcasts include a mixture of expert interviews, in the field whenever possible, coupled

with interspersed discussions between the hosts, Drs. Carmen Agouridis and Amanda Gumbert. Drs. Agouridis and Gumbert help frame podcast topic, provide points of

Crayfish.

clarification (as needed) for listeners, and provide suggestions for listeners who wish to delve deeper into podcast topics. At the end of each podcast, listeners will be directed to the podcast series website where they can learn more about a particular topic. The website will contain aired podcasts, podcast transcripts, relevant UK Cooperative Extension publications, and educator resources. Podcasts will be aired on WUKY, Lexington's National Public Radio affiliate with an audience of over 30,000 across central Kentucky.

BMP Demonstration Site - Wooden Observation Walkways:

Awarded to the City of Shelbyville, this grant is part of an overall project that started over five years ago to make the Public Works Office a green BMP demonstration campus to serve the region. Currently the site contains several wetland cells and there are plans to add to these BMPs every year. However the site needs walkways to provide access for groups to tour the site. This project will 1) Establish a base for outdoor classroom, 2) Provide safer access for school age children tours, and 3) Provide access for engineering and development community for viewing acceptable BMPs for new construction. It is anticipated that additional BMPs will be added to the existing 8 BMPs /cells every one to two years post walkway installation.

Watershed Improvements Through Outreach and Education:

Awarded to the Wolf Creek National Fish Hatchery (NFH), this mini-grant will be used to enhance 3 planned Wolf Creek NFH events:

1. Earth Day- Each year Wolf Creek NFH and Friends of Wolf Creek NFH host an Earth Day event that focuses on educating the public about conservation, promoting a clean and healthy planet, we give away free trees and CFL bulbs.

2. Rain Garden Signage – In 2017 a large rain garden was installed on site at Wolf Creek NFH that is designed to catch and filter rain runoff from the parking lot and road. The rain garden also mitigates the erosion caused to a nearby nature trail and stream that leads to Hatchery Creek. The rain garden sign will the purpose of educating the public about what a rain garden is and the benefits of installing one. Smaller signs will also provide education on the benefits of certain plants for runoff mitigation and pollinators.

3. Catch A Rainbow Kids Fishing Derby (CAR)

– Trout not Trash Campaign: A joint event sponsored by Wolf Creek NFH and Friends of Wolf Creek NFH, this annual event is held the first Saturday in June and coincides with National Fishing and Boating Week, reaching over 1,200 youth participant and 2,000 adults. The 2018 event will be the 42nd Annual CAR Derby. This event will focus on elimination disposable materials, to promote healthy/ clean waterways and to teach families ethical fishing practices. Each participant at this event will receive a "Trout not Trash" goodie bag. The grant money will be used to support sustainable items that will promote reuse and recycling and clean waterways; such as reusable drawstring bags, reusable water bottles and personal waste fishing line collection containers.

Clark's Run

Awarded to the Mason County Conservation District, this project seeks to lay the ground-work for the development of a watershed plan for Clark's Run-North Fork Licking River. It will work with local school groups to identify resource concerns and raise awareness of watershed issues. Through the program, local students will receive training in water quality monitoring and the effects of bacteria and excess nutrients on healthy streams. The project will employ Project Based Learning methods, taking teachers and students into the field to sample and collect macroinvertebrates for ID kits. Field trips to local water treatment plant and agricultural operations will provide information about Best Management Practices (BMPs) for water health. Students will be encouraged to share their results and find ways to implement BMPs in their communities, like green infrastructure and stormwater management.

Adult Educational Outreach Program to Citizens in Boyd and Lawrence Counties, Kentucky

Awarded to the Big Sandy River Watershed Watch, this grant seeks to provide an adult education program to citizens in Boyd and Lawrence Counties that will help increase the number of volunteer stream monitors in the region and improve community understanding of water quality issues.

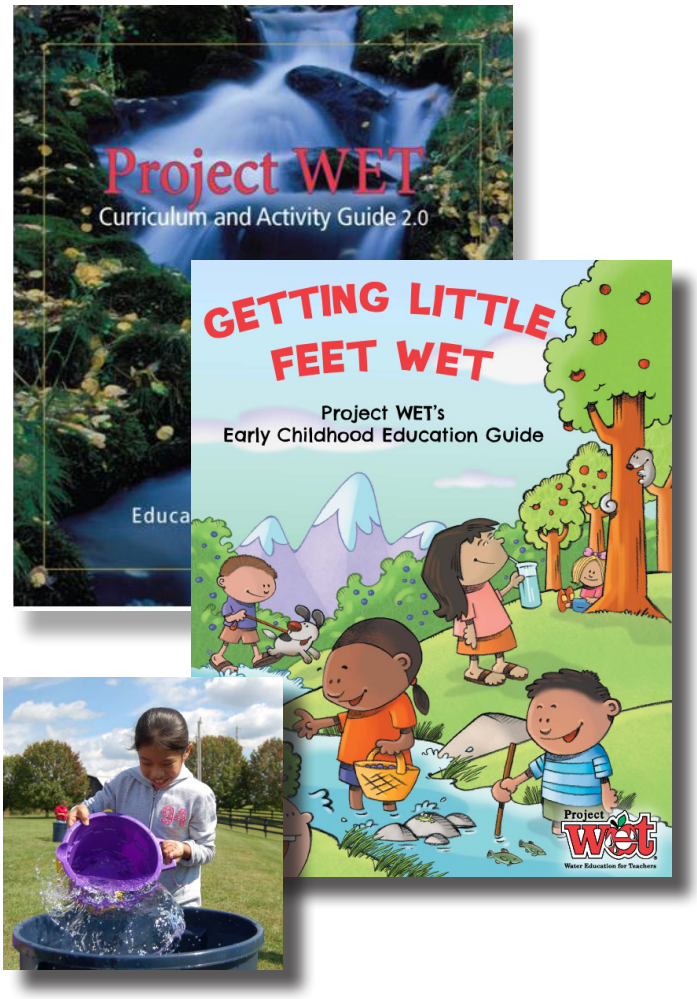
The program will consist of 2 training sessions. The first event will introduce the participants to the Watershed Watch training which includes learning how to test stream water for dissolved oxygen, pH, temperature and conductivity. They will also learn how to properly take a grab sample to be tested for bacterial contamination. Other information covered in this session includes how the lay of the land impacts runoff into streams and address sources of nonpoint source pollution like agricultural and mining activities.

For the second session, the participants are asked to bring in a water sample from a local stream and do a general assessment of the landscape around the stream. The participants will test the water sample during the session for bacterial contamination and learn how to prepare their sample for professional testing at a certified laboratory.

Project WET

KDOW is the host institution for Project WET 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 KY 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 in Kentucky. KDOW has formed a partnership with the Kentucky Association for Environmental Education (KAEE) to coordinate project trainings and further promote water education in Kentucky.

Basin Coordinator Joanna Ashford with students in the Green River Basin.



Project WET and Getting Little Feet WET.

In FFY 2018 KAEE and Project WET worked to improve Early Childhood Education in water education by incorporating the new Getting Little Feet WET curriculum to its available trainings.

During FFY 2018 KAEE's Project WET program conducted 2 Facilitator workshops and 9 Educator workshops. Educator training reached 110 educators including in-service (K-12) educators, university educators, pre-service educators and non-formal educators.

Enviroscapes are available for checkout through the DOW.

Equipment and Resource Development

Educational Equipment

DOW 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 can be viewed and checked out on their website. Formal teachers love the website because it allows them to check out the equipment to accompany their lessons. Many non-formal environmental educators use the equipment as well.

In FFY 2018 the program had 33 check outs of Educational Equipment including Enviroscapes, display board, and the stream table. Ollie Otter, KDOW's Mascot has also been in high demand. He attended events across the state, including the 2018 Children's Health Summit. He is always a popular addition to any environmental gathering.

Outreach Material

As part of the DOW's mandate to improve understanding of NPS issues within the state of KY, the NPS Section has worked with stakeholders, educators, journalists, and regulators to develop online and print publications to teach the public about water health.

Stream Health Pocket Guide

Stream Health Pocket Guide

In FFY 2017 the NPS section developed the *Stream Health Pocket Guide* to teach the public how to use aquatic macroinvertebrates to assess water health. This printable resource has been distributed to school groups, Watershed Watch volunteers, and been made available online to the broader public. In FFY 2018 we developed a printable handout that contains a simplified version of this resource that is more easily printed for handing out in bulk to interested stakeholders at conferences and event.

Fact Sheet Development

In 2018, the Basin Coordinators developed 4 new Fact Sheets on topics related to water quality. These resources were developed in preparation for Water Week in KY 2018, but follow the standard DOW format and are useful in a variety of situations. Topics included, “Mussels, Nature’s Filters”, “Invasive Species”, “Reducing Waste Comes Naturally”, and “Natural Solutions for Gulf Hypoxia”. Each fact sheet contains general topic information and helpful suggestions about how the community can make choices in their daily lives that impact these issues.

Fact sheets developed for Water Week will be posted on the DOW website and available for the public’s use.

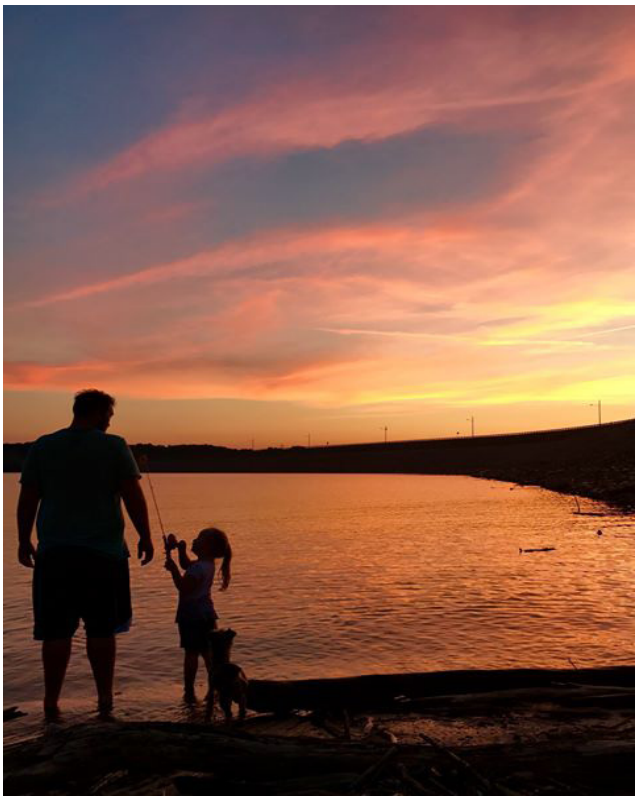
Naturally Connected Blog and Land, Air, & Water Articles

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

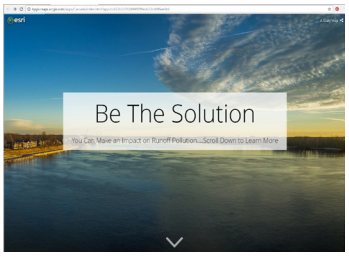
Water Week in Kentucky 2018

Efforts by the NPS section resulted in Governor Matt Bevin making an official proclamation, designating March 19-25, 2017 to be *Water Week in KY*. The goal of the initiative was to plan a week of educational water events centered around World Water Day on March 22. The Basin Coordinators collaborated with UK Extension, the Kentucky Water Resources Research Institute, Kentucky State University, McConnell Springs Park, and the Explore Kentucky Initiative to put on a variety of educational workshops and events. These included Project WET workshops, rain barrel workshops, and a river clean up.

In FFY 2018, Water Week in KY (March 18-24) focused on the theme *Nature for Water*, and explored topics of nature-based solutions for water issues and how they can be considered for water management policy and practice. We focused heavily on web-based resources that highlight the DOW's Water Maps Portal, which contains user friendly interactive maps that display data on water ranging from water quality impairments to harmful algal blooms and drought potential tools. The Water Week website contained specific articles and resources on Wetlands, Green Infrastructure, and Ag Best Management Practices. Links to the 2017 resources (educational colouring sheets, resources for checkout, story maps, the Kentucky Stream Health Pocket Guide) remained active in the 2018 site. We also conducted a social media campaign, releasing water week fact sheets throughout the week, hosting small giveaways, and organizing an I Love Kentucky Water Facebook photo contest. The winning photo was selected to be the Facebook Page cover photo.



The winning entry to the I Love KY Water photo contest was submitted by Miranda Inez Nalley.



Water Week In KY 2018 produced a variety of educational resources about water quality and nature-based solutions to water issues. The 2018 website will remain active until Water Week 2019.

Chapter 3

Spotlight: Collaboration

Partnerships for Clean Water

To successfully restore and protect water quality through watershed planning, all the major stakeholders in the watershed must be involved in the process. Building functional partnerships can be simultaneously the most challenging and most rewarding part of watershed projects.

Water-related needs or problems often cannot be addressed by individuals. Nonpoint source pollution by definition comes from multiple diffuse sources and most situations require a community response in order to correct them. Approaching the problem with partners allows stakeholders to pool resources, bring in diverse expertise and specialized local knowledge, and impact a wider network to develop creative solutions.

In FFY 2018 the Division of Water worked with a variety of partners to develop programming to address nonpoint source pollution across the state. In this chapter we will highlight three programs that formed partnerships with local volunteer groups, state agencies, and nonprofits to address water quality in KY.

Watershed Watch in KY

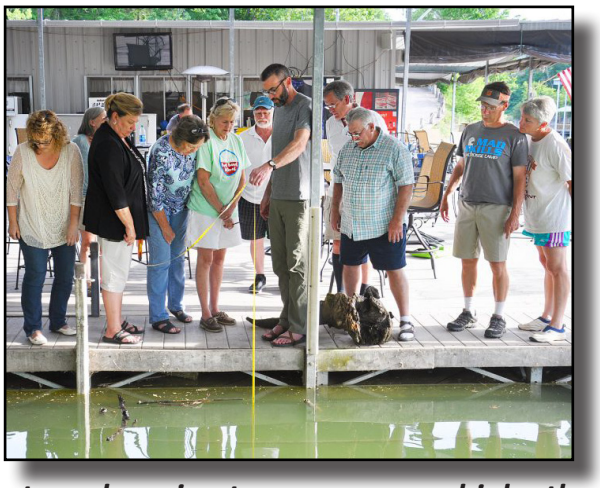
Watershed Watch in Kentucky (WWKY) is a statewide citizens monitoring effort to improve and protect water quality by raising community awareness and supporting implementation of the goals of the Clean Water Act and other water quality initiatives. The Kentucky Division of Water (DOW) has been an integral partner to the WWKY since its inception 20 years ago, serving as one of the founding members and committing staff support to the organization annually. Watershed Watch organizations across the state host training sessions for volunteers to educate them on water quality issues and proper sample collection methods, coordinate three volunteer sampling events per year, and present data to volunteers at annual conferences. Science advisors assist volunteers with interpretation of their data, and coordinate additional sampling efforts or citizen action as needed. Since the inception of the program in 1997, over 4,000 volunteers across the state have been trained about water quality through the Watershed Watch program.

In 2018, WWKY's focus was on providing support, technical and organisational guidance to the volunteers by reinvigorating the statewide Science Advisory Committee (SciAd). DOW facilitated the process by chairing the committee in its first year. The purpose of the SciAd is:

- To ensure that all basin organizations are trained and using the appropriate level science so that they can assess water quality health in the state of Kentucky.
- To advise the WWKY on appropriate monitoring objectives and methodology statewide for potential water quality health in the state.
- To provide standard statewide interpretive and communicative tools that may be used by basins to identify problem areas, direct action planning, collaborate with regulators and guide research goals.

The WWKY SciAd was able to review standard monitoring methodologies and training materials, generate new guidelines for basin science committee organization, create new standardized data presentation templates and develop basin report cards for better communication of sampling results with the public. The SciAd was also able to direct some small focus studies in areas of interest for bacterial contamination and explore alternative testing methods for current field chemistry parameters.

In addition to the WWKY SciAd, in 2018 DOW partnered with WWKY to improve monitoring of lakes in KY with the Volunteer Lakes Monitoring Program. A pilot program for citizen volunteers



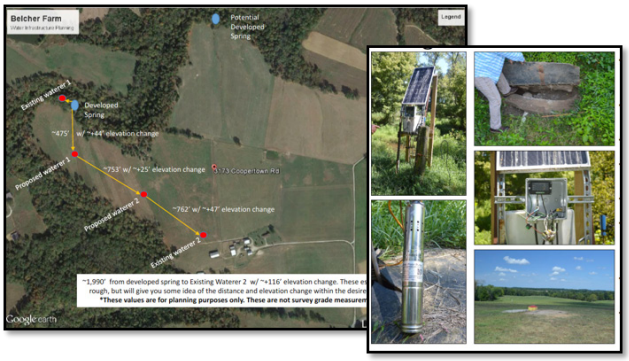
Volunteers learning to measure secchi depth at a Watershed Watch Lakes Monitoring Program training, June 2017.

to assist with water quality sampling of lakes, the primary purpose of this program is to create a network of volunteers who can assist with the detection of harmful algal blooms, prompting the Division of Water to follow up with further testing to determine if swimming advisories are necessary. In FFY 2018 sampling was conducted at 4 lakes: Herrington Lake, Kentucky Lake, Lake Barkley, and Lake Linville.

- Herrington Lake, Kentucky Lake, and Lake Barkley was sampled in May through October 2018. Lake Linville was sampled in September 2018.
- When possible, sampling was conducted in coordination with LANDSAT flyover dates.
- Lake observations were submitted on paper reporting forms and entered into the ArcGIS Survey123 database.

On-Farm Water Management Program

The DOW often seeks to partner with other governmental organizations or working groups to



A potential PIP project with the On-Farm Water Management program that seeks to use springs to water cattle

attempt to leverage funding and resources to implement Best Management Practices. In 2018, DOW, as part of the Energy and Environment Cabinet's Kentucky Water Resources Board (WRB), partnered with the Governor's Office of Ag. Policy's (GOAP) Kentucky Agricultural Development Board (KADB) to develop a new program to address issues of water quantity and quality in agricultural production.

The On-Farm Water Management Program (OFWMP) seeks to promote water resilience on farms by funding programs that develop and implement new water management practices.

The program aims to showcase the value of water as the most important ingredient in life and in agriculture, utilizing demonstration farms to reach out to producers and show opportunities for economic development in agricultural industry. Water on-farm may be limited by weather in times of drought, topography, and lack of access to municipal supplies, which can severely restrict agricultural operations. In addition, excess water can generate problems where in pastures are damaged by erosion, flooding, and animal usage during wet conditions. Often mismanagement of stormwater runoff from agriculture can lead to serious water quality impairments, in addition to lost revenue from damage to the operation's resources. Producers also recognize that contaminated water is unavailable to them for use, so BMPs that manage stormwater runoff to protect water quality are highly desirable.

The OFWMP contains two project categories: Research, Development, and Demonstration Farms (RDD) and Practical Implementation Projects (PIP). The RDD category is for water management practices on large publicly

A potential RDD project that seeks to use rainwater harvesting and pond construction to supply a re-circulating water table system for a greenhouse.

accessible farms that have an education focus. The hope is to develop regional educational centers that will be able to develop, test, and teach the public about BMPs for water harvesting, storage, and redistribution for beneficial use. These farms are required to be available for public tours/inquiries and involve multiple practices including, at minimum, one water harvesting practice.

The PIP category is designed for producers who wish to implement one or two practices for water management but do not wish to implement an educational program. These producers will however be required to share information about the costs/benefits of the practices, and any relevant metrics for project success/failure with the program (ex. improved herd health, pasture quality, crop yield, lower water bill, etc.). The collected data will allow evaluation of whether or not a practice should be incorporated further into existing cost-share programs like EQIP or CAIP.

The DOW is currently acting as the primary point of contact, recruiting applicants, visiting farms, developing program materials, and coordinating the Technical Advisory Group (TAG). On selection, the project is administered through the Governor's Office of Ag. Policy (GOAP). Project selection is done through a joint committee made up of three representatives from the GOAP Agricultural Development Board and three members of the Water Resources Board who review the TAG recommendations and present the project to the main Ag. Development Board for final approval.

To date, two RDD projects have been funded through the OFWMP. Morehead State's research farm, the Derrickson Agricultural Complex, will be installing four BMPs through the program including water harvesting for use in greenhouse and livestock cooling systems, water harvesting for livestock consumption, water redirection, and erosion prevention. The second RDD will be installing water harvesting on a new compost bedded pack barn to preserve pasture quality and decrease pollutants entering waterways due to erosion. In addition, they will be implementing practices to decrease nutrient runoff.

Homeowners Assistance Program

In June of 2017, the construction of the new sanitary sewer line in west Lincoln County was completed as part of an effort by the Lincoln County Sanitation District (LCSD) to implement the Hanging Fork Watershed Plan. During the development of the Hanging Fork Watershed Plan, water quality sampling indicated that almost half the stream miles in the Hanging Fork watershed were unsafe for human recreation due to *E. coli* concentrations. Results displayed concentrations of *E. coli* ranging from 10 to 1,000 times greater than the water quality standard for safe swimming and wading (240 cfu/100 mL). Microbial source tracking determined that the sources for *E. coli* in the watershed where primarily human and cattle, with human inputs accounting for approximately 75% of the fecal bacteria in the watershed.

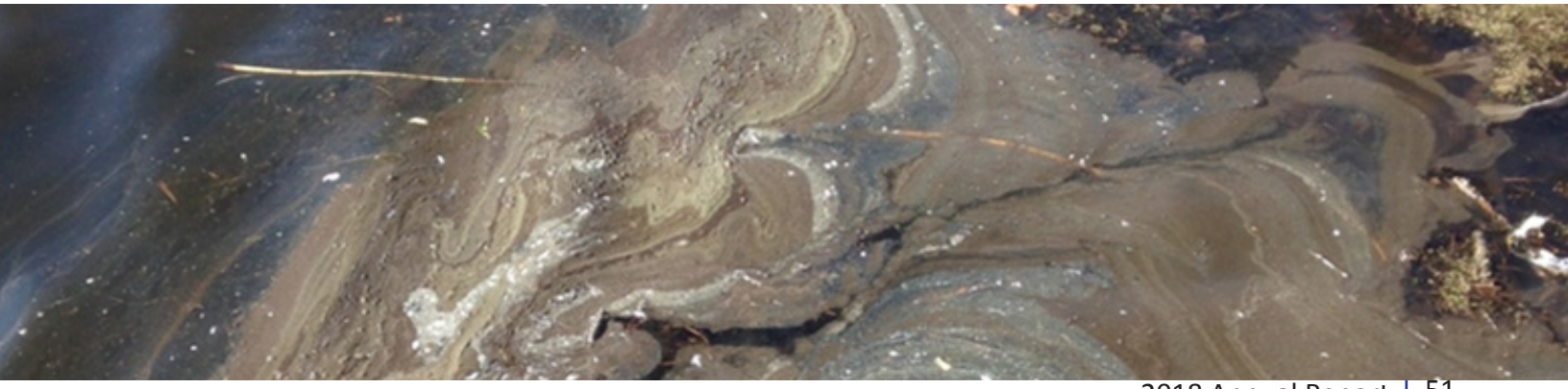
In 2011, the Lincoln County Sanitation District was formed with the intent of working towards providing sanitary sewer service to western portions of Lincoln County including the Hustonville and Mooreland Areas, focused primarily around the HWY 127 corridor. This area of Lincoln County is almost exclusively within the Hanging Fork watershed.

The Lincoln County Sanitation District pursued and received multiple grants and loans to install a sanitary sewer line from Hustonville to Junction City, from which the waste would then be transported to Danville for treatment. This new sanitary sewer line can provide service to about 600 un-sewered homes, which once connected will reduce nonpoint source pollution, such as *E. coli* and excess nutrients, from failing onsite wastewater systems.

When area residents expressed concern about the sewer connection costs, the Lincoln County Sanitation District worked with the Kentucky Division of Water (DOW) and Rural Community Assistance Partnership (RCAP) to develop the Homeowner Assistance Program (HAP) for sanitary sewer line connections. This purpose of this reimbursement program is to provide financial assistance for homeowners for costs associated with connecting to sewer lines for regional wastewater treatment plants. Homeowner reimbursements are income-based. The goals of HAP are to: improve water quality by eliminating marginal or failing on-site wastewater systems, ease the financial burden of homeowners connecting to the sewer line, improve public perception of the Sanitation District's (or other Agency's) efforts, and provide a platform for water quality education.

The HAP in the Hanging Fork watershed is being funded by multiple 319(h) grants (Project Numbers 15-13, 16-08, and 16-09), and is truly a collaborative effort between multiple partners. To date, over 300 homes have applied for financial assistance through the Homeowner Assistance Program, with 240 homeowners having received assistance through the program. During FFY 2019, additional efforts will be made to assist the already approved homeowners to connect and to help additional homeowners apply for the program.

Based on the initial success of the HAP project in Hanging Fork, Kentucky's Nonpoint Source Pollution Management Program has been pursuing additional HAP projects in watershed planning areas with known needs. Utilizing FFY 2018 funding, HAP projects in Gunpowder Creek and Chestnut Creek are being pursued. The HAP project in Gunpowder Creek will provide assistance for approximately 100 homes to connect to a new sanitary sewer line, and the HAP project in Chestnut Creek will provide assistance for approximately 70 homes to connect to a new sanitary sewer line. The majority of the work for both projects is expected to occur during FFY 2019.



Chapter 4

Workplan Reporting

FFY 2018 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 2014 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 2018 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 2018 Program annual workplan commitments and the work accomplished toward their completion are also included in the following tables.

Kentucky stream.

Long Term Goal #1: Restore Nonpoint Source Impaired Waters		Targeted Completion					Annual Reporting
Objective 1:	**Prioritize waters based on an assessment of restoration potential**	2014	2015	2016	2017	2018	
Action 1:	Utilize EPA Recovery Potential Screening Tool to select watersheds for implementation, within existing watershed planning areas.						
	Tracking Measure: Number and list of watersheds identified as recoverable within areas of watershed plans.		X	X	X	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 KDOW in February, allowing watershed prioritization across multiple programs. A list of recoverable watersheds was not developed this year. However, the Sulphur Creek watershed was identified as recoverable (utilizing the RPT), and a watershed plan was completed and accepted for implementation in FFY 2015.
	Tracking Measure: Number and list of recoverable watersheds receiving targeted implementation.		X	X	X	X	During FFY 2018, two (2) projects (15-09 and 15-10) implemented BMPs in the Sulphur Creek watershed (identified as recoverable by the RPT). At the end of FFY 2018, a new project (17-17) for BMP implementation work in Sulphur Creek started, and an additional new project (18-06) was selected for funding (to begin in FFY 2019).
Action 2:	Utilize EPA Recovery Potential Screening Tool to identify 303(d) listed impaired watersheds that have a high potential of showing measurable water quality improvement after targeting 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 KDOW in February, allowing watershed prioritization across multiple programs. A list of watersheds identified as recoverable for
	Tracking Measure: Number of recoverable watersheds receiving targeted implementation.				X	X	

Long Term Goal #1: Restore Nonpoint Source Impaired Waters		Targeted Completion					Annual Reporting
Objective 1:	**Prioritize waters based on an assessment of restoration potential**	2014	2015	2016	2017	2018	
Action 3:	Work to develop local capacity and implement actions necessary to address the pollution in prioritized watersheds.						
	Tracking Measure: Number of new watershed groups formed.	X	X	X	X	X	During FFY 2017 KDOW documented fifty four (54) 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 watershed plans implemented.	X	X	X	X	X	KDOW has provided funding and technical assistance for the implementation of twenty-five accepted (25) watershed plans statewide to date. During FFY 2018, implementation occurred in eleven (11) watershed planning areas with an approved plan: Chestnut Creek, Gunpowder Creek, Triplett Creek, Banklick Creek, Red Bird River, Red River, Curry's Fork, Sulphur Creek, Clarks Run, Hanging Fork, and Hinkston Creek.
	Tracking Measure: Number of straight to implementation plans developed.			X	X	X	As of the end of FFY 2018, KDOW has funded the development of five (5) Straight to Implementation Watershed Plans: Sulphur Creek, Tenmile Creek of Eagle Creek, Pleasant Run, Damon Creek, and Rock Creek.
	Tracking Measure: Number of straight to implementation plans implemented.				X	X	All five (5) of the straight to implementation plans that have been developed to date have been implemented. During FFY 2018, implementation work occurred in Damon Creek and Sulphur Creek.

Long Term Goal #1: Restore Nonpoint Source Impaired Waters		Targeted Completion					Annual Reporting
Objective 2 Cont'd:	**Monitor and assess Kentucky's waters**	2014	2015	2016	2017	2018	
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, 12,753 stream miles have been monitored and assessed by KDOW programs.
	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 KDOW 303(d) and TMDL programs as it is completed. Specifically, during FFY 2018, 36.91 miles of Gunpowder Creek were assessed for TMDL alternative development (and improvement). Additionally, 8.06 miles of Cane Run were submitted for assessment (monitoring data collected for watershed plan development).

Long Term Goal #1: Restore Nonpoint Source Impaired Waters		Targeted Completion					Annual Reporting
Objective 2 Cont'd:	**Monitor and assess Kentucky's waters**	2014	2015	2016	2017	2018	
Action 2 Cont'd:	Conduct monitoring and perform assessments of targeted watersheds for the development of new watershed plans or to revise existing plans.						
	Tracking measure: Number of streams with monitoring being conducted in preparation for watershed plan development or improvement.	X	X	X	X	X	During FFY 2018 KDOW staff or contractors were conducting water quality monitoring in approximately six (6) watersheds in preparation for Watershed Plan development: Clarks Run (5.8 miles), Crafts Colly (5.78 miles), Dry Fork (4.4 miles), Lees Creek (6.1 miles), Sandlick Creek (4.5 miles), and Trammel Creek (28 miles).
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	Obion Creek - Prior Assessments on this stream (pre-2016) exist. Will be submitted for assessments in 2020. Gunpowder Creek has been assessed previously to 2017. Current assessments will be done for the 2018 IR. Rock Creek - identified as a priority for future assessment. Hinkston Creek - identified as a priority for future assessment. KDOW staff are closely monitoring current implementation efforts to determine optimal time frame for assessment.

Long Term Goal #1: Restore Nonpoint Source Impaired Waters		Targeted Completion					Annual Reporting
Objective 2 Cont'd:	**Monitor and assess Kentucky's waters**	2014	2015	2016	2017	2018	
Action 3 Cont'd:	Conduct monitoring and perform assessments of watersheds targeted through the Division of Water's Success Monitoring Program.						
	Tracking measure: Number and list of streams that have a documented change in use support awaiting EPA approval.	X	X	X	X	X	There are currently no streams awaiting EPA approval a change in use support; all 2016 IR streams with a proposed change of use support were approved by EPA. The 2017 data from Obion Creek was not submitted for assessments in 2017.
	Tracking measure: Number and list of streams that have a documented change in use support approved by EPA.	X	X	X	X	X	There are currently no streams awaiting EPA approval a change in use support; all 2016 IR streams with a proposed change of use support were approved by EPA.
Action 4:	Develop and implement a Division level watershed success monitoring program.						
	Tracking measure: Develop a tracking tool for areas in need of future success monitoring.	X					In FFY 2018, significant progress was made towards compiling on-the-ground BMP implementation data from internal and external sources (state and federal agencies), including developing a GIS layer for analysis purposes. Existing watershed plans are being evaluated for current and future success monitoring, and the data are being evaluated for changes in use status.
	Tracking measure: Number of watersheds identified as needing success monitoring.	X	X	X	X	X	Success monitoring selection for FFY 2018 was based upon preliminary BMP implementation information in addition to staff technical knowledge. Six (6) watersheds were monitored for assessment in FFY 2018: Clarks Run, Crafts Colly, Dry Fork, Lees Creek, Sandlick Creek, and Trammel Creek.

Long Term Goal #1: Restore Nonpoint Source Impaired Waters		Targeted Completion					Annual Reporting
Objective 2 Cont'd:	**Monitor and assess Kentucky's waters**	2014	2015	2016	2017	2018	
Action 4 Cont'd:	Develop and implement a Division level watershed success monitoring program.						
	Tracking measure: Conduct annual meeting to coordinate locations appropriate for success monitoring within the watershed framework.		X	X	X	X	KDOW 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 KDOW 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: Design NWQI success monitoring plan and develop QAPP.	X	X				The Headwaters of Hinkston Creek NWQI watershed was extensively sampled for one calendar year during 2014-2015 to establish baseline water quality conditions. On the ground implementation efforts are being assessed to determine if and when watershed scale "Success Monitoring" should be conducted. No additional monitoring was conducted during FFY 2018.

Long Term Goal #1: Restore Nonpoint Source Impaired Waters		Targeted Completion					Annual Reporting
Objective 2 Cont'd:	**Monitor and assess Kentucky's waters**	2014	2015	2016	2017	2018	
Action 5 Cont'd:	Conduct post-BMP implementation Water Quality Monitoring for National Water Quality Initiative (NWQI) watersheds.						
	Tracking measure: Implement NWQI success monitoring plan.	X	X	X	X	X	The Headwaters of Hinkston Creek NWQI watershed was extensively sampled for one calendar year during 2014-2015 to establish baseline water quality conditions. On the ground implementation efforts are being assessed to determine if and when watershed scale "Success Monitoring" should be conducted. No additional monitoring was conducted during FFY 2018.
	Tracking measure: Compile water quality data for trend analysis in NWQI watersheds.			X		X	Insufficient data exists for trend analysis at this point in time.
	Tracking measure: Number of NWQI watershed sampling locations						In FFY 2018, KDOW collected baseline assessment data for Lees Creek and Clarks Run in anticipation of these watersheds being selected as NWQI watersheds. Ten (10) sampling locations were assessed.
	Tracking measure: Number of NWQI BMPs per selected HUC 12						The Hinkston Creek monitoring report was attached to the FFY 2016 NPS Program Annual Report as Appendix A, and is available upon request in the future.

Long Term Goal #1: Restore Nonpoint Source Impaired Waters		Targeted Completion					Annual Reporting
Objective 3:	Implement the Nonpoint Source component of Approved TMDLs of restoration strategies in prioritized impaired watersheds	2014	2015	2016	2017	2018	
Action 1:	Coordinate with the Division's TMDL Program in order to prioritize development of Nine-Key Element Watershed or "Alternative" plans for watersheds with approved or under development TMDL documents.						
	Tracking measure: Number and list of TMDL watersheds prioritized.		X	X	X	X	KDOW's Nonpoint Source and TMDL Programs have been coordinating efforts since 2005. Twenty-four (24) of KDOW's watershed planning areas also have TMDL documents either existing or being developed: Bacon Creek, Banklick Creek, Brushy Creek, Cane Run, Clarks Run, Corbin City Reservoir, Currys Fork, Dry Creek, Gunpowder Creek, Hancock Creek, Hanging Fork Creek, Hinkston Creek, Kinniconick Creek, Pleasant Run AML, Red Bird River, Rock Creek AML, Sinking Creek, Sulphur Creek, Ten Mile Creek, Triplett Creek, Wolf Run, Woolper Creek and UEF of Clarks In addition, the Statewide Bacteria TMDL (when approved) will also include all pathogen impaired segments throughout the state, which will include many additional watershed planning areas. Furthermore: there are 434 pollutant waterbody combinations listed as priorities from the TMDL Vision, as submitted to EPA under the TMDL program: 29 for TMDL alternatives, 342 for the Statewide Bacteria TMDL, and 54 from the approved Pond Creek TMDL.

Long Term Goal #1: Restore Nonpoint Source Impaired Waters		Targeted Completion					Annual Reporting
Objective 3 Cont'd:	Implement the Nonpoint Source component of Approved TMDLs of restoration strategies in prioritized impaired watersheds	2014	2015	2016	2017	2018	
Action 2:	Develop Nine-Key Element Watershed or "Alternative" Plans for prioritized TMDL watersheds.						
	Tracking measure: Number and list of TMDL watersheds with a watershed or alternative plan under development.		X	X	X	X	During FFY 2018, two (2) watershed plans are being developed in TMDL watersheds: Cane Run and South Fork Little River. Additionally, in FFY 2018, one (1) watershed with an approved watershed plan is being considered for a TMDL alternative plan: Sulphur Creek.
	Tracking measure: Number and list of TMDL watersheds with an approved/ completed watershed or alternative plan.	X	X	X	X	X	During FFY 2018, ten (10) TMDL or TMDL alternative watersheds with approved watershed plans were actively implemented in utilizing 319(h) funding: Bacon Creek, Banklick Creek, Chestnut Creek, Clark's Run, Curry's Fork, Hanging Fork Creek, Hinkston Creek, Sulphur Creek, Triplett Creek, and Wolf Run. During FFY 2018, the Gunpowder Creek TMDL Alternative Plan was approved by EPA. Gunpowder Creek has an approved watershed plan, and implementation occurred in this watershed during FFY 2018 with 319(h) funding.

Long Term Goal #1: Restore Nonpoint Source Impaired Waters		Targeted Completion					Annual Reporting
Objective 4:	Implement restoration strategies for prioritized impaired watersheds that will result in measurable water quality improvements	2014	2015	2016	2017	2018	
Action 1:	Continue development and implementation of accepted watershed plans developed under the existing prioritization strategy.						
	Tracking measure: Number and list of watershed plans currently accepted for implementation.	X	X	X	X	X	At the end of FFY 2017, KDOW had accepted twenty five (25) Watershed plans for implementation. All twenty-five (25) plans have been accepted for implementation with 319(h) funding: Chestnut Creek, Pleasant Run, Clarks Run, Sulphur Creek, Darby Creek, Currys Fork, Gunpowder Creek, Woolper Creek, Tenmile Creek, Banklick Creek, Cane Run, Wolf Run, Hancock Creek, Stockton Creek, Hinkston Creek, Triplett Creek, Dry Creek, Red River, Red Bird River, Rock Creek AML, Bacon Creek, Brushy Creek, Hanging Fork Creek, Lower Howards Creek, and Corbin City Reservoir. All KDOW and EPA R4 accepted watershed plans can be found in the GRTS Watershed Plan Tracker During FFY 2018, no additional watershed plans were finalized or submitted to EPA for approval, however six (6) watershed plans were actively under development during this time frame: Cane Run, Crafts Colly, Dry Fork, and Sand Lick, Trammel Creek, Lees Creek and Clarks Run, South Fork Little River, and Damon Creek. All KDOW accepted watershed plans can be found in the GRTS Watershed Plan Tracker.

Long Term Goal #1: Restore Nonpoint Source Impaired Waters		Targeted Completion					Annual Reporting
Objective 4 Cont'd:	Implement restoration strategies for prioritized impaired watersheds that will result in measurable water quality improvements	2014	2015	2016	2017	2018	
Action 1 Cont'd:	Continue development and implementation of accepted watershed plans developed under the existing prioritization strategy.						
	Tracking measure: Number and list of watershed plans currently implementing an accepted watershed plan.	X	X	X	X	X	During FFY 2018 KDOW had twenty six (26) active 319(h) funded watershed plan implementation projects implementing fourteen (14) watershed plans from the 2014-2017 grant years: Chestnut Creek, Damon Creek, Gunpowder Creek, Triplett Creek, Banklick Creek, Curry's Fork, Clark's Run, Hanging Fork, Hinkston Creek, Red Bird, Red River, Sulphur Creek, Brushy Creek, and Bacon Creek.
	Tracking measure: Number and list of watershed plans under development.	X	X	X	X	X	During FFY 2018 KDOW worked with contractors toward development of six (6) additional watershed plans: Cane Run, Crafts Colly, Dry Fork, and Sandlick Creek, South Fork Little River, Trammel Creek, Lees Creek and Clarks Run, and Damon Creek.

Long Term Goal #1: Restore Nonpoint Source Impaired Waters		Targeted Completion					Annual Reporting
Objective 4 Cont'd:	Implement restoration strategies for prioritized impaired watersheds that will result in measurable water quality improvements.	2014	2015	2016	2017	2018	
Action 2:	Actively plan, engage project partners, and manage multiple implementation strategies and functional areas for each prioritized impaired watershed.						
	Tracking measure: Number and list of priority impaired watersheds where active management planning has been completed.	X	X	X	X	X	At the end of FFY 2018, fourteen (14) Priority Watersheds have completed and approved watershed plans: Bacon Creek, Darby Creek, Curry's Fork, Sulphur Creek, Chestnut Creek, Red River, Clarks Run, Hanging Fork, Triplett Creek, Banklick Creek, Hinkston Creek, Gunpowder Creek, Brushy Creek, and Corbin City Reservoir. Additionally, during FFY 2018, implementation work using 319(h) funds occurred in the following Priority Watersheds: Curry's Fork, Sulphur Creek, Chestnut Creek, Damon Creek, Red River, Clarks Run, Hanging Fork, Triplett Creek, Banklick Creek, Gunpowder Creek, and Brushy Creek.
	Tracking measure: Number and list of priority impaired watersheds where active management planning is being developed.	X	X	X	X	X	At the end of FFY 2018, eight (8) Basin Team selected Priority Watersheds have watershed plans that are under development: Sinking Creek, Cane Run, Damon Creek, South Fork Little River, Little Pitman, and Trammel Creek.

Long Term Goal #1: Restore Nonpoint Source Impaired Waters		Targeted Completion					Annual Reporting
Objective 5:	Decrease input of pollutants from agricultural sources	2014	2015	2016	2017	2018	
Action 1:	Support projects that educate the agricultural community.						
	Tracking measure: Number of projects with an agricultural BMP demonstration event.	X	X	X	X	X	Agricultural BMP demonstration events were held in two (2) watershed planning or project areas during FFY 2018: 14-09 UK Winter Feeding and 15-12 Brushy Creek
	Tracking measure: Provide financial and technical support to educate producers about the Agriculture Water Quality Act. Participate in at least one event per year.	X	X	X	X	X	KDOW staff updated the AWQA Minimum BMP descriptions for the "Streams and Other Waters" BMPs to bring them into compliance with current CWA 401/404 Program regulations, and presented the revisions to the KY Ag Water Quality Authority. KDOW staff attended at least one Ag Water Quality Authority meetings held during FFY 2018. KDOW's NPS Program continued to fund the Water Quality Liaison position with the University of Kentucky Cooperative Extension Service (FFY 2017 and FFY 2018 grants).

Long Term Goal #1: Restore Nonpoint Source Impaired Waters		Targeted Completion					Annual Reporting
Objective 5 Cont'd:	Decrease input of pollutants from agricultural sources	2014	2015	2016	2017	2018	
Action 2:	Support projects that install Best Management Practices to control NPS pollution from agricultural sources.						
	Tracking measure: Number of agricultural BMPs installed through implementation of a watershed plan.	X	X	X	X	X	During FFY 2018 KDOW's Nonpoint Source Program funded the implementation of forty nine (49) on-the-ground agricultural conservation practices installed through a total of eight (8) projects in eight (8) different watershed planning areas: Chestnut (3 BMPs, 14-06), Damon Creek (3 BMPs, 14-02), Gunpowder (1 BMP, 14-05), Triplett Creek (3 BMP, 14-06), UK Winter Feeding (5 BMPs, 14-09), Sulphur Creek (6 BMPs, 15-10), Banklick WC (1 BMP, 15-11), and Brushy Creek (27 BMPs, 15-12).

Long Term Goal #1: Restore Nonpoint Source Impaired Waters		Targeted Completion					Annual Reporting
Objective 5 Cont'd:	Decrease input of pollutants from agricultural sources	2014	2015	2016	2017	2018	
Action 2 Cont'd:	Support projects that install Best Management Practices to control NPS pollution from agricultural sources.						
	Tracking measure: Amount of funding for state cost share practices spent in priority watersheds.	X	X	X	X	X	KDOW maintains a cooperative working relationship with the KY Division of Conservation regarding the State Cost Share and other programs. As a result of this working relationship, priority points are given to Agricultural Water Quality Best Management Practices being installed within KDOW Priority watersheds.
	Tracking measure: Coordinate with NRCS to fund BMPs in priority watersheds.	X	X	X	X	X	KDOW maintains a cooperative working relationship with NRCS through State Technical Committee and EQIP sub-committee. As a result of this working relationship, NRCS gives priority points through the EQIP ranking process to KDOW priority watersheds.

Long Term Goal #1: Restore Nonpoint Source Impaired Waters		Targeted Completion					
Objective 5 Cont'd:	Decrease input of pollutants from agricultural sources	2014	2015	2016	2017	2018	
Action 3:	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	KDOW participated in one (1) NRCS State Technical Committee meeting, one (1) Gunpowder Creek NWQI meeting, and assisted with an additional NWQI application for Lees Creek during FFY 2017. This was in addition to several local conservation district/NRCS meetings and facilitating the EPA Region 4 annual site visit meeting with NRCS regarding NWQI in FFY 2018.
	Tracking measure: Participate in the four (4) quarterly Kentucky Agriculture Water Quality Authority Meetings per year.	X	X	X	X	X	KDOW participated in Agriculture Water Quality meetings during FFY 2018. Additionally, the Streams and Other Waters BMPs were updated and presented to the Authority for review and approval. KDOW also participated with the AWQA Pesticides and Fertilizers sub-committee where the minimum BMP standards were updated.

Long Term Goal #1: Restore Nonpoint Source Impaired Waters		Targeted Completion					Annual Reporting
Objective 5 Cont'd:	Decrease input of pollutants from agricultural sources	2014	2015	2016	2017	2018	
Action 3 Cont'd:	Participate in state wide meetings and conferences that have a focus on Agriculture and Water Quality						
	Tracking measure: Participate in the Kentucky Agriculture Science and Monitoring Committee meetings	X	X	X	X	X	Only one KASMC meeting was held during FFY 2018, and a representative for KDOW was unable to attend.
	Tracking measure: Number of staff attending agriculture related technical training	X	X	X	X	X	KDOW NPS Program staff received training on agricultural sources of NPS pollution during FFY 2018 through attendance at educational events and farm field days.
	Tracking measure: Present information or a booth at one agriculture related event each year	X	X	X	X	X	KDOW staff attended the KY Association of Conservation Districts Annual Conference. KDOW staff conducts water quality educational events with agricultural producers on an annual basis.

Long Term Goal #1: Restore Nonpoint Source Impaired Waters		Targeted Completion					Annual Reporting
Objective 6:	Decrease input of pollutants from developed lands	2014	2015	2016	2017	2018	
Action 1:	Support projects that demonstrate green infrastructure (GI) and good stormwater management.						
	Tracking measure: Number of GI BMPs installed.	X	X	X	X	X	Two (2) sub-grantee projects implemented GI BMPs in FFY 2018: Gunpowder (11 BMPs, 14-05) and Chestnut (2 BMPs, 14-06).
	Tracking measure: Have a staff member complete one training course each year on stormwater management or GI to increase technical capacity.	X	X	X	X	X	NPS staff participated in the Kentucky Stormwater Association Annual Conference in FFY 2018. This conference serves as a forum for information and technology transfer with regards to GI practices, general stormwater management strategies, and MS4 program implementation.

Long Term Goal #1: Restore Nonpoint Source Impaired Waters		Targeted Completion					Annual Reporting
Objective 6 Cont'd:	Decrease input of pollutants from developed lands	2014	2015	2016	2017	2018	
Action 2:	Provide technical assistance for Urban/LID/Stormwater/Smart Growth efforts throughout the Commonwealth.						
	Tracking measure: Participate in at least one training event per year for local officials, contractors or the public about the benefits of GI and stormwater management.	X	X	X	X	X	NPS staff participated in the FFY 2018 Kentucky Stormwater Association Annual Conference through general attendance, and by giving a presentation detailing ways in which citizen water quality monitoring through Watershed Watch in Kentucky can assist MS4 communities with identifying potential illicit discharges, gathering data about general water quality trends, and the education and outreach benefits of empowering citizen samplers.

Long Term Goal #1: Restore Nonpoint Source Impaired Waters		Targeted Completion					Annual Reporting
Objective 6 Cont'd	Decrease input of pollutants from developed lands	2014	2015	2016	2017	2018	
Action 3:	Continue partnership with Stormwater/Urban lands groups locally, regionally and statewide.						
	Tracking measure: Attend one (1) Kentucky Stormwater Association meeting per year.	X	X	X	X	X	NPS staff participated in the Kentucky Stormwater Association Annual Conference, and attended two (2) Kentucky Stormwater Association Quarterly Meetings in FFY 2018.
	Tracking measure: Provide financial and technical support to educate MS4 and other communities about developing stormwater monitoring programs.	X	X	X	X	X	KDOW's NPS Program staff continues to work with 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. In FFY 2018, KDOW partnered directly with Sanitation District #1 (a MS4) in Northern Kentucky to complete a streambank stabilization project in Banklick Creek (14-10). Furthermore, in FFY 2018, the following 319(h) projects implemented BMPs within the boundaries of an MS4: Gunpowder (14-05) and Banklick (14-10, 15-11, and 17-02).
Action 4:	Participate in Division of Water development of the revised Construction General and Phase II MS4 permits.						
	Tracking measure: Provide technical support for the development of the SWQMP guidance.		X				This action was completed in FFY 2016, and as such, not implemented during FFY 2018.

Long Term Goal #1: Restore Nonpoint Source Impaired Waters		Targeted Completion					Annual Reporting
Objective 7:	Decrease NPS Pollution impacts from forestry activities	2014	2015	2016	2017	2018	
Action 1:	Support statewide and regional projects that focus on sustainable forestry management with water quality being the primary concern.						
	Tracking measure: Number of forestry BMPs installed through watershed plans	X	X	X	X	X	In FFY 2018 four (4) projects actively implemented forestry BMPs: Gunpowder Creek (1 BMP, 14-05), Red Bird River (4 BMPs, 15-05), Red River (170 BMPs, 15-06), and Banklick WC (1 BMP, 15-11)
Action 2:	Partner with the KY Division of Forestry (KDF) and USFS to reduce NPS pollution.						
	Tracking measure: Attend and participate in 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 2018 due to member changes.

Long Term Goal #1: Restore Nonpoint Source Impaired Waters		Targeted Completion					Annual Reporting
Objective 7 Cont'd:	Decrease NPS Pollution impacts from forestry activities	2014	2015	2016	2017	2018	
Action 2 Cont'd:	Partner with the KY Division of Forestry (KDF) and USFS to reduce NPS pollution.						
	Tracking measure: Provide sub-grantee funding to the KDF for the purpose of regularly conducting an assessment of Forest Conservation Act BMP Compliance.	X				X	The KY Division of Forestry completed the last BMP Compliance study during FFY 2015. KDF's efforts during 2016-2008 were centered around improved training for their Ranger staff, and improvements to the Master Logger training.
	Tracking measure: Provide sub-grantee funding and technical assistance for the development and distribution of the Forest Conservation Act Education and Outreach materials.			X	X	X	FFY 2014 Programmatic funding was provided to the University of Kentucky Forestry Extension for the printing distribution, and training on the updated KY Forestry BMP Field Guide. The guide was completed and printed during FFY 2018.

Long Term Goal #1: Restore Nonpoint Source Impaired Waters		Targeted Completion					Annual Reporting
Objective 8:	Protect and Assess Kentucky's Groundwater	2014	2015	2016	2017	2018	
Action 1:	Provide administrative, financial, and technical support for the assessment of groundwater impacts from Nonpoint Source Pollution.						
	Tracking measure: Number of springs assessed.	X	X	X	X	X	In FFY 2018, forty four (44) springs were assessed, and thirty two (32) of these springs were sampled.
	Tracking measure: Number of groundwater samples with positive pathogen readings.	X	X	X	X	X	In FFY 2018, eight (8) groundwater samples included testing for pathogens, and five (5) were positive for total coliform, and two (2) were positive for *E. coli.*
	Tracking measure: Number of groundwater samples with positive pesticide readings.	X	X	X	X	X	Of the one hundred and forty three (143) groundwater samples collected in FFY 2018, fifty seven (57) of these had at least one pesticide detection.
Action 2:	Provide technical assistance regarding groundwater protection.						
	Tracking measure: Number of BMPs installed for protection of groundwater sources.	X	X	X	X	X	For FFY 2018, the Groundwater Protection Program conducted seventy four (74) field reviews of groundwater protection measures at facilities, and approved one hundred and ninety eight (198) new Groundwater Protection Plans. The Source Water Protection / Wellhead Protection Program staff provided technical assistance directly to PWSs relative to SWP/WHP plan development and implementation of management strategies.

Long Term Goal #1: Restore Nonpoint Source Impaired Waters		Targeted Completion					Annual Reporting
Objective 8 Cont'd:	Protect and Assess Kentucky's Groundwater	2014	2015	2016	2017	2018	
Action 3:	Support the use of Best Management Practices that protect groundwater and promote groundwater recharge.						
	Tracking measure: Number of BMPs installed promoting infiltration in karst prone areas.	X	X	X	X	X	During FFY 2018, the Source Water Protection Assistance Program (SWPAP) was not funded. Additionally, KDOW's NPS Program did not directly implement BMPs that promote infiltration in karst prone areas during FFY 2018.
Objective 9:	Decrease human sewage in Kentucky's water bodies	2014	2015	2016	2017	2018	
Action 1:	Provide financial and technical support to projects that decrease the negative impacts on water quality from sewage.						
	Tracking measure: Number of sub-grantee projects that implement the on-site wastewater components of an accepted watershed plan.	X	X	X	X	X	In FFY 2018 eight (8) projects actively implemented on-site wastewater BMPs: Damon Creek (3 BMPs, 14-02), Chestnut Creek (4 BMPs, 14-06), Red Bird River (27 BMPs, 15-05), Sulphur Creek Septic (13 BMPs, 15-09), Banklick WC (2 BMPs, 15-11), Curry's Fork (1 BMP, 16-06), Clarks Run, Hanging Fork, and Hinkston (28 BMPs, 16-07), and Lincoln County Homeowners Assistance Program - RCAP (240 BMPs, 16-08)

Long Term Goal #1: Restore Nonpoint Source Impaired Waters		Targeted Completion					Annual Reporting
Objective 9 Cont'd:	Decrease human sewage in Kentucky's water bodies	2014	2015	2016	2017	2018	
Action 1 Cont'd:	Provide financial and technical support to projects that decrease the negative impacts on water quality from sewage.						
	Tracking measure: Coordinate efforts with the Division's Clean Water SRF to abate failing on-site wastewater systems.			X	X	X	During FFY 2018, NPS Program Staff coordinated with the Division's SRF program to prioritize funding for a new sanitary sewer line in the Cane Run watershed (to be constructed starting in 2019). NPS Program staff are pursuing a future 319(h) project to assist with homeowner connections to the new sanitary sewer line in the Cane Run watershed. Furthermore, the Lincoln County Homeowner Assistance Program (HAP) projects (16-08 and 16-09) are also an example of KY's NPS Program and SRF funds coordinating to increase overall project success. Both of the 319(h) Lincoln County HAP projects are working towards providing financial and technical assistance for homeowners connecting to the new sanitary sewer line. This new sanitary sewer line was partially funded with the Division's Clean Water SRF funds. Additionally, the Hanging Fork Watershed Plan identified failing onsite wastewater systems as a primary contributor to NPS pollution in this watershed.

Long Term Goal #1: Restore Nonpoint Source Impaired Waters		Targeted Completion					Annual Reporting
Objective 9 Cont'd:	Decrease human sewage in Kentucky's water bodies	2014	2015	2016	2017	2018	
Action 2:	Develop working partnerships with the Kentucky Department for Public Health, local health departments, KY Onsite Wastewater Association, Eastern KY PRIDE, and Bluegrass Greensource.						
	Tracking measure: Number of partner meetings attended.	X	X	X	X	X	In FFY 2018, eight (8) project partners actively implemented, or assisted with the implementation of, on-site wastewater BMPs, including the Lincoln County Sanitation District, Kentucky Waterways Alliance, Eastern Kentucky PRIDE, and Bluegrass Greensource. Additionally, the NPS Program has developed partnerships with the local health departments in projects where said entity was not the sub-grantee to ensure that on-site wastewater implementation efforts were successful. Projects include: Damon Creek (3 BMPs, 14-02), Chestnut Creek (4 BMPs, 14-06), Red Bird River (27 BMPs, 15-05), Sulphur Creek Septic (13 BMPs, 15-09), Banklick WC (2 BMPs, 15-11), Curry's Fork (1 BMP, 16-06), Clarks Run, Hanging Fork, and Hinkston (28 BMPs, 16-07), and Lincoln County Homeowners Assistance Program - RCAP (240 BMPs, 16-08)

Long Term Goal #1: Restore Nonpoint Source Impaired Waters		Targeted Completion					Annual Reporting
Objective 9 Cont'd:	Decrease human sewage in Kentucky's water bodies	2014	2015	2016	2017	2018	
Action 2 Cont'd:	Develop working partnerships with the Kentucky Department for Public Health, local health departments, KY Onsite Wastewater Association, Eastern KY PRIDE, and Bluegrass Greensource.						
	Tracking measure: Number of targeted watersheds with pathogen education performed.	X	X	X	X	X	In FFY 2018, eight (8) projects, actively implemented on-site wastewater BMPs. Of these eight, all of them have an educational component: Damon Creek (3 BMPs, 14-02), Chestnut Creek (4 BMPs, 14-06), Red Bird River (27 BMPs, 15-05), Sulphur Creek Septic (13 BMPs, 15-09), Banklick WC (2 BMPs, 15-11), Curry's Fork (1 BMP, 16-06), Clarks Run, Hanging Fork, and Hinkston (28 BMPs, 16-07), and Lincoln County Homeowners Assistance Program - RCAP (240 BMPs, 16-08)
Objective 10:	Protect and restore waters at risk from recreational impacts	2014	2015	2016	2017	2018	
Action 1:	Support projects that protect Outstanding State Resource Waters and other Special Use Waters with known recreational impacts.						
	Tracking measure: Number of BMPs installed in areas of Special Use Waters.	X	X	X	X	X	In FFY 2018 five (5) sub grantee projects actively implemented BMPs in areas of Special Use Waters: Brushy Creek (15-12), Red Bird (15-05), Red River (15-06), Sulphur Septic (15-09), and Sulphur Ag (15-10)

Long Term Goal #1: Restore Nonpoint Source Impaired Waters		Targeted Completion					Annual Reporting
Objective 10 Cont'd:	Protect and restore waters at risk from recreational impacts	2014	2015	2016	2017	2018	
Action 2:	Promote green infrastructure with dual use as recreation areas.						
	Tracking measure: Number of green infrastructure areas also utilized for recreation.	X	X	X	X	X	During FFY 2018, three (3) projects implemented GI BMPs at a location utilized for public recreation. • Gunpowder (14-05) – native meadow installation, swale renovation • Chestnut Creek (14-06) – raingarden installation • Banklick Wolsing (17-02) – wetland installation
Action 3:	Provide technical assistance for CWSRF funded projects addressing Nonpoint Source impacts from marinas.						
	Tracking measure: Number of marina applications.					X	This action was not implemented during FFY 2018.

Long Term Goal #1: Restore Nonpoint Source Impaired Waters		Targeted Completion					Annual Reporting
Objective 11:	Decrease Nonpoint Source Pollution from resource extraction	2014	2015	2016	2017	2018	
Action 1:	Support and provide technical assistance for projects in areas of brownfields, acid mine drainage, abandoned mine lands and other resource extraction activities.						
	Tracking measure: Number of projects implementing BMPs in previously mined areas.	X	X	X	X	X	KDOW 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.
Objective 12:	Decrease the negative impacts of excessive sedimentation in Kentucky's Streams	2014	2015	2016	2017	2018	
Action 1:	Provide financial and technical support for education on the subject of stream restoration and stream bank stabilization techniques.						
	Tracking measure: Provide funding to maintain the Natural Channel Design Working Group and participate in meetings. 1 per year.	X	X	X	X	X	For FFY 2018, no meetings or activities occurred without the funding being provided to a project that was to facilitate the Natural Channel Design Working Group (NCDWG). In FFY 2017, NPS Staff discussed with previous workgroup partners whether it was practical and beneficial to continue this group, and it was not determined to be an effective use of time because of logistics of coordinating the effort without the previous lead group's involvement. This measure is completed.

Long Term Goal #1: Restore Nonpoint Source Impaired Waters		Targeted Completion					Annual Reporting
Objective 12 Cont'd:	Decrease the negative impacts of excessive sedimentation in Kentucky's Streams	2014	2015	2016	2017	2018	
Action 1 Cont'd:	Provide financial and technical support for education on the subject of stream restoration and stream bank stabilization techniques						
	Tracking measure: Develop and distribute guidance to landowners on how to properly maintain stream banks and riparian areas.			X	X	X	KDOW NPS Program staff created a brochure "Guidelines for Stream Obstruction Removal" that provides guidance for removal of debris, gravel, and other obstructions in a stream. Two (2) project groups provided guidance to landowners regarding stream banks and riparian areas: Red Bird River (15-05) and Red River (15-06).
	Tracking measure: Number of plans implementing riparian buffer BMPs or tree plantings. Target one per year.	X	X	X	X	X	Riparian Buffer projects and initiatives were implemented in two (2) watershed planning areas during FFY 2018: Gunpowder (14-05) and Banklick (14-09, 15-11 and 17-02).

Long Term Goal #1: Restore Nonpoint Source Impaired Waters		Targeted Completion					Annual Reporting
Objective 12 Cont'd:	Decrease the negative impacts of excessive sedimentation in Kentucky's Streams	2014	2015	2016	2017	2018	
Action 2:	Provide financial support for projects that assess in-stream sediment impairments, and generate implementation strategies through watershed plan development.						
	Tracking measure: Number of projects monitoring for sediment impairments.	X	X	X	X	X	In FFY 2018, two (2) watershed planning projects actively conducted water quality monitoring for sediment impairments: Trammel and Lees Creek and Clarks Run.
Action 3:	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 KDOW and NRCS by requesting that priority and impaired watersheds receive priority funding through NRCS programs. This work was completed during FFY 2016 through attendance and coordination at the State Technical Committee and EQIP sub-committee meetings. 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 being 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 on an annual basis and often on a project-by-project basis through meeting with local NRCS, Conservation District, and Division of Conservation staff as needed.

Long Term Goal #1: Restore Nonpoint Source Impaired Waters		Targeted Completion					Annual Reporting
Objective 12 Cont'd:	Decrease the negative impacts of excessive sedimentation in Kentucky's Streams	2014	2015	2016	2017	2018	
Action 3 Cont'd:	Target additional sources of funding for stream restoration projects that will positively address sediment impaired streams.						
	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	KDOW has directed one (1) project to seek FILO funding for stream restoration work, without success: Triplett Creek (14-08).
Objective 13:	Support education and outreach	2014	2015	2016	2017	2018	
Action 1:	Support education and outreach programs across Kentucky.						
	Tracking measure: Number of student contacts per year. Goal of 500.	X	X	X	X	X	In total, the Basin Coordinators and technical advisors of the Nonpoint and Basin Team section reached an estimated six thousand seven hundred and ninety three (6,793) stakeholders through outreach activities in FFY 2018. Roughly three thousand nine hundred and thirty three (3,933) of those were school age students reached through educators, festivals and other forms of outreach.
	Tracking measure: Conduct at least one Project WET educator training each year.	X	X	X	X	X	Ten (10) Project WET Educator workshops and one (1) Getting Little Feet WET Early Childhood Education workshop conducted in FFY 2018.
	Tracking measure: Number of teachers trained in Project WET.	X	X	X	X	X	One hundred and forty two (142) educators were trained in Project WET in 2018.

Long Term Goal #1: Restore Nonpoint Source Impaired Waters		Targeted Completion					Annual Reporting
Objective 13 Cont'd:	Support education and outreach	2014	2015	2016	2017	2018	
Action 2:	Revise nonpoint source website and continue social media development.						
	Tracking measure: Number of Likes on the I Love KY Water Facebook page.	X	X	X	X	X	The I Love KY Water Facebook is up to six hundred and twelve (612) followers during this reporting period.
	Tracking measure: Annually update information on DOW NPS website.	X	X	X	X	X	The KDOW Nonpoint Source Program web pages are updated as needed. The NPS grant web pages are updated once per year.
Action 3:	Develop a watershed planning education and outreach fact sheet.						
	Tracking measure: Development of fact sheet.			X	X	X	Educational materials were produced as needed throughout FFY 2018. These included a brochure on septic system maintenance, guidelines for debris removal from Kentucky Waterways "Watershed Friendly Stream Maintenance", the "Stream Health Guide", and updated Basin Coordinator contact sheets. All educational information including standard fact sheets are available on the Division of Water website.
	Tracking measure: Number of fact sheets distributed. Target 50 each year.				X	X	All NPS fact sheets are available online.

Long Term Goal #1: Restore Nonpoint Source Impaired Waters		Targeted Completion					Annual Reporting
Objective 13 Cont'd:	Support education and outreach	2014	2015	2016	2017	2018	
Action 4:	Support the Watershed Watch program in Kentucky.						
	Tracking measure: Number of active volunteers.	X	X	X	X	X	There are currently nine hundred and thirty two (932) Active Watershed Watch Volunteers statewide who collected water quality samples during the three (3) annually scheduled sampling events.
	Tracking measure: Number of volunteers receiving trainings.	X	X	X	X	X	During FFY 2018 Watershed Watch in Kentucky trained one hundred and nine (109) new volunteers and recertified fifty four (54) existing volunteer samplers.
	Tracking measure: Number of sites sampled.	X	X	X	X	X	Watershed Watch volunteers collected one thousand one hundred and ninety one (1,191) individual water quality samples during the Spring, Summer, and Fall sampling events in addition to collecting field parameters and for each sampling site. Habitat and Biological assessments were also conducted at thirty seven (37) of those sites.

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	2014	2015	2016	2017	2018	
Action 1:	Provide technical and financial support for the KY Wild Rivers Program.						
	Tracking measure: Develop a comprehensive Land Management Plan for each new Wild Rivers Program land acquisition.		X	X	X	X	The Wild Rivers Program was moved from the KY Division of Water to the Office of the Nature Preserves in late calendar year 2016. KY's Nonpoint Source Program no longer provides CWA Section 319(h) funding to support the program.
	Tracking measure: Utilize a combination of 319(h) Programmatic and HLCF funding for implementation of land management plans for Wild Rivers.			X	X	X	No 319(h) funds were used to implement Wild Rivers land management during FFY 2018.
	Tracking measure: Coordinate the use of Heritage Land Conservation Funding as non-federal match for Nonpoint Source Program sub-grantee projects.		X	X	X	X	During FFY 2018, Heritage Land Conservation Funds were approved for an appraisal of a property in Banklick Watershed. Additionally, no current NPS projects utilized Heritage Land Conservation Funds as non-federal match in FFY 2018.

Long Term Goal #2: Protect waters currently meeting designated uses		Targeted Completion					Annual Reporting
Objective 1 Cont'd:	Promote the identification and protection of healthy watersheds throughout Kentucky	2014	2015	2016	2017	2018	
Action 2:	Provide technical and financial support for Nonpoint Source Program projects that protect Special Use Waters.						
	Tracking measure: Number of watershed protection plans currently accepted for implementation.	X	X	X	X	X	To date, there have been three (3) watershed plans accepted for implementation with protection of a Special Use Water as their primary focus: Sulphur Creek, Red River, and Brushy Creek.
	Tracking measure: Number of watershed plans currently implementing an accepted watershed protection plan.	X	X	X	X	X	During FFY 2018, implementation work occurred in three (3) watershed planning areas with watershed plans accepted for implementation with protection of a Special Use Water as their primary focus: Sulphur Creek,
	Tracking measure: Number of watershed protection plans under development.	X	X	X	X	X	There are two (2) watershed plans that are under development with protection of a Special Use Water as their primary focus: Sinking Creek and Kinniconnick Creek.

Long Term Goal #2: Protect waters currently meeting designated uses		Targeted Completion					Annual Reporting
Objective 1 Cont'd:	Promote the identification and protection of healthy watersheds throughout Kentucky	2014	2015	2016	2017	2018	
Action 3:	Utilize the EPA Recovery Potential Tool to identify priority watersheds for protection and/or restoration						
	Tracking measure: Number and list of current priority Healthy Watersheds.	X	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 KDOW in February, allowing watershed prioritization across multiple programs. The Sulphur Creek watershed was identified as recoverable (utilizing the RPT), and a watershed plan was completed and accepted for implementation in FFY 2015. During FFY 2018, two (2) projects (15-09 and 15-10) implemented BMPs in the Sulphur Creek watershed (identified as recoverable by the RPT). At the end of FFY 2018, a new project (17-17) for BMP implementation work in Sulphur Creek started, and an additional new project (18-06) was selected for funding (to begin in FFY 2019).
	Tracking measure: Number and list of new priority Healthy Watersheds			X	X	X	

Long Term Goal #2: Protect waters currently meeting designated uses		Targeted Completion					Annual Reporting
Objective 2:	Prioritize Source Water and Wellhead Protection areas for protection from nonpoint sources of pollution	2014	2015	2016	2017	2018	
Action 1:	Coordinate with EPA's Nonpoint Source Program in order to ascertain the minimum requirements for the development of Nine-Key Element "Alternative" watershed plan to protect and/or restore Source Water and Wellhead Protection areas.						
	Tracking measure: Finalized NPS Program strategy for the development of acceptable alternative plans to protect Source Water and Wellheads.		X	X	X	X	KDOW's NPS and Source Water Protection and Wellhead Protection programs have worked cooperatively during FFY 2018, and will continue to coordinate in watershed planning and implementation efforts. Currently, KDOW has not completed developing a formal NPS Program strategy for the development of Source Water and Wellhead Protection Plans that contain the nine-key elements of a watershed plan.

Long Term Goal #2: Protect waters currently meeting designated uses		Targeted Completion					Annual Reporting
Objective 2 Cont'd:	Prioritize Source Water and Wellhead Protection areas for protection from nonpoint sources of pollution	2014	2015	2016	2017	2018	
Action 1 Cont'd:							
	Tracking measure: Number and list of Source Water and Wellhead Protection Areas prioritized			X	X	X	KDOW Priority watershed planning areas within a Source Water Protection Area and/or Wellhead Protection Area are: Bacon Creek, Darby Creek, Red River, Clarks Run, Hanging Fork, Triplett Creek, Hinkston Creek, Gunpowder Creek, Corbin City Reservoir , Banklick Creek, Cane Run, and Crafts Colly, Dry Fork, and Sandlick. Source Water Protection Areas: Corbin City Utilities Commission, Mountain Water District, Beech Fork Water Commission, Wilmore Water Works, Louisville Water Company, Northern KY Water District, Morehead State University, Cynthiana Municipal Water Works, Laurel County Water District #2, Harrodsburg Municipal Water Department, Pikeville Water Department, Flemingsburg Utility System, Danville City Water Works, McCreary County Water District, Stanford Water Works, Kentucky-American Water Company River Station II/ Hardins Landing Plant, Bullock Pen Water District, Winchester Municipal Utilities, Nicholasville Water System, and Jenkins Water System Wellhead Protection Areas: Green River Valley Water District, Georgetown Municipal Water & Sewer Service, Nortonville Water Works, Camp Turnabout, and Mother Nature

Long Term Goal #2: Protect waters currently meeting designated uses		Targeted Completion					Annual Reporting
Objective 2 Cont'd:	Prioritize Source Water and Wellhead Protection areas for protection from nonpoint sources of pollution	2014	2015	2016	2017	2018	
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	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. In FFY 2018, the state Drinking Water & Wastewater Advisory Council initiated the Source Water Protection Subcommittee which is intended to be held quarterly and is composed of a diverse group of stakeholders and program staff.
Action 3:	**Develop Nine-Key Element "Alternative" Watershed Plans for prioritized Source Water and Wellhead Protection Areas.**						
	Tracking measure: Number and list of Source Water Protection Areas with an alternative watershed plan under development.		X	X	X	X	There are two (2) watershed plans under development that fall within KDOW Source Water Protection Areas: South Fork Little River and Crafts Colly, Dry Fork, and Sandlick Creek.
	Tracking measure: Number and list of Source Water Protection Areas with an accepted alternative watershed plan.			X	X	X	There are twelve (12) Accepted watershed plans that fall within KDOW Source Water Protection Areas: Dix River (Hanging Fork and Clarks Run), Corbin City Reservoir, Red River, Lower Howard, Darby Creek, Hinkston Creek, Triplett Creek, Ten Mile Creek, Woolper Creek, Gunpowder Creek, and Banklick Creek. During FFY 2018, implementation occurred in Hanging Fork, Clarks Run, Red River, Triplett Creek, Gunpowder Creek and Banklick Creek.

Long Term Goal #2: Protect waters currently meeting designated uses		Targeted Completion					Annual Reporting
Objective 2 Cont'd:	Prioritize Source Water and Wellhead Protection areas for protection from nonpoint sources of pollution	2014	2015	2016	2017	2018	
Action 3 Cont'd:	**Develop Nine-Key Element "Alternative" Watershed Plans for prioritized Source Water and Wellhead Protection Areas.**						
	Tracking measure: Number and list of Wellhead Protection Areas with an alternative watershed plan under development.			X	X	X	There is one (1) watershed plan under development that contains a KDOW Wellhead Protection Area: Cane Run.
	Tracking measure: Number and list of Wellhead Protection Areas with an accepted alternative watershed plan.				X	X	There are two (2) accepted watershed plans that contain KDOW Wellhead Protection Areas: Gunpowder Creek and Bacon Creek. During FFY 2018, implementation occurred in Gunpowder Creek, and a new project for implementation work in Bacon Creek started (FY 2017 grant).

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.	2014	2015	2016	2017	2018	
Action 1:	Develop tools for increased efficiency.						
	Tracking measure: Complete development of a tracking spreadsheet for Watershed Based Plans.	X	X				The Watershed Plan tracking spreadsheet was developed during FFY 2014. No updates were made during FFY 2018. 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: Develop electronic storage system for 319(h) program.	X	X				During FFY 2016 all existing (active and historical) NPS sub-grantee project files were scanned into the Department's TEMPO (now called ARM) database for permanent electronic storage purposes. Revisions and updates to the existing electronic file storage system were made as needed during FFY 2018.
	Tracking measure: Develop electronic project management for 319(h) projects.			X	X		During FFY 2018, electronic project management activities for all 319(h) projects were performed. Additionally, significant work was accomplished towards developing the file structure and workflow activities for the NPS Program for the Department's new ARM database (formerly TEMPO). Once the file structure and workflow activities for the NPS Program in the Department's new ARM database are finalized, electronic project management for 319(h) projects will transition to this platform.

Long Term Goal #3: Efficient and effective implementation of Kentucky's Nonpoint Source Program		Targeted Completion					Annual Reporting
Objective 1 Cont'd:	Develop NPS program components to increase program effectiveness and maintain current program staff	2014	2015	2016	2017	2018	
Action 2:	Maintain staffing for effective NPS program coordination and on the ground implementation.						
	Tracking measure: Number of DOW NPS Program technical staff.	X	X	X	X	X	KDOW maintains eighteen (17) full time staff members working on Nonpoint Source Pollution Control issues on a statewide and targeted watershed basis. Of those staff members, approximately fifteen (15) function as technical staff in their respective program capacities.
	Tracking measure: Number of River Basin Coordinators.	X	X	X	X	X	KDOW maintains six (6) full-time River Basin Coordinators to cover seven (7) major River Basin Management Units.
	Tracking measure: Number of watershed coordinators in grants.	X	X	X	X	X	In FFY 2018, KDOW maintained fourteen (11) watershed coordinators who worked to implement eleven (11) accepted watershed plans.

Long Term Goal #3: Efficient and effective implementation of Kentucky's Nonpoint Source Program		Targeted Completion					Annual Reporting
Objective 2:	Meet Federal Requirements	2014	2015	2016	2017	2018	
Action 1:	Reduce KY's NPS Program Unliquidated Funding Obligation to less than 20%, and maintain that level throughout the Federal Fiscal Year.						
	Tracking measure: Draw-down percentage in comparison to ULO goal of 20%	X	X	X	X	X	KDOW's NPS Program is reported as having a ULO of 5.09% for all open grant years and 25.43% for active grant years as of September 30, 2018. As was discussed in the Annual Site Visit with EPA Region 4 Staff in August of 2018, the ULOs for the FY 2016 grant is not being calculated correctly. That being said, KY's NPS Program will continue to make additional adjustments in a effort to keep the ULO percentage as low as possible. However, due to EPA's shift from 7 year to 5 year grant frames, the 20% ULO goal set by EPA is no longer achievable.
	Tracking measure: Continue to manage KY's NPS sub-grantee projects with the goal of completing work in a 3 year contract time frame.	X	X	X	X	X	KDOW's NPS Program has maintained a three year maximum project term, contracted projects in a timely manner, and provided pro-active technical assistance to sub-grantee project contractors in an effort maintain an Unliquidated Obligation below 20%. However, starting with the FFY 2017 grant year, sub-grantee project contracts have been shifted to a two-year time frame in most cases.

Long Term Goal #3: Efficient and effective implementation of Kentucky's Nonpoint Source Program		Targeted Completion					Annual Reporting
Objective 2 Cont'd:	Meet Federal Requirements	2014	2015	2016	2017	2018	
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 2018 funding have been 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 2018 (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 15th of each year.	X	X	X	X	X	All load reductions generated during the FFY 2018 time period were calculated and entered into GRTS by the deadline.

Long Term Goal #3: Efficient and effective implementation of Kentucky's Nonpoint Source Program		Targeted Completion					Annual Reporting
Objective 2 Cont'd:	Meet Federal Requirements	2014	2015	2016	2017	2018	
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 2018 NPS Program Annual Report will be submitted to EPA Region 4.
Action 4:	Submit at least one (1) Nonpoint Source Success Story to fulfil 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	Four (4) waterbodies with quantifiable water quality improvement were considered for WQ-10 development in FFY 2018: Stoner Creek, Sulphur Creek, Woolper Creek, and Dix 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 Dix River WQ-10 report was submitted in July and finalized prior to the September 30, 2017 deadline.
	Tracking measure: Number of Kentucky Success stories on EPA web page.	X	X	X	X	X	EPA has posted nine (9) Nonpoint Source Success Stories on their web page.

Long Term Goal #3: Efficient and effective implementation of Kentucky's Nonpoint Source Program		Targeted Completion					Annual Reporting
Objective 2 Cont'd:	Meet Federal Requirements	2014	2015	2016	2017	2018	
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 must be 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 2018, there were zero (0) QAPPs developed for NPS water quality data collection projects.
	Tracking measure: Number of data packages reviewed.	X	X	X	X	X	DOW Quality Assurance Staff and Water Quality biologists analyzed and approved two data package from water quality monitoring projects; South Fork Little River and Cane Run.

Long Term Goal #3: Efficient and effective implementation of Kentucky's Nonpoint Source Program		Targeted Completion					Annual Reporting
Objective 3:	Provide technical assistance and support to the division regarding watershed impacts and the watershed perspective	2014	2015	2016	2017	2018	
Action 1:	Participate in DOW projects requiring technical experience from NPS staff						
	Tracking measure: Provide information for the Kentucky Nutrient Reduction Strategy draft	X					Information from the current Nonpoint Source Management Plan was used in the construction of KY's Nutrient Reduction Strategy draft. KDOW's Nonpoint Source Program will be directly involved in updating, implementing, tracking and reporting on components of the Nutrient Reduction Strategy.
	Tracking measure: Provide information for Integrated Report and TMDL implementation narratives	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 KDOW Water Quality Branch to be used in the assessment of watersheds for the Integrated Report and TMDL development if applicable. In FFY 2018, pre-watershed plan data was collected in six (6) watersheds: Trammel Creek, Lees Creek, Clarks Run, Sandlick Creek, Crafts Colly, and Dry Fork.
	Tracking measure: Number of SPEARs reviewed	X	X	X	X	X	The Nonpoint Source Program is not a primary reviewer of SPEAR documents for KDOW. During FFY 2018 the NPS Program conducted no SPEAR reviews.

Long Term Goal #3: Efficient and effective implementation of Kentucky's Nonpoint Source Program		Targeted Completion					Annual Reporting
Objective 3 Cont'd:	**Provide technical assistance and support to the division regarding watershed impacts and the watershed perspective**	**2014**	**2015**	**2016**	**2017**	**2018**	
Action 2:	**Update the Watershed Framework**						
	Tracking measure: **Update of Basin Status Report template**	**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. In addition Basin status updates are regularly provided via quarterly newsletters.
	Tracking measure: **Update priority areas in the Basins with Basin Coordinators**		**X**	**X**	**X**	**X**	During FFY 2016 KDOW established an updated prioritization strategy centered around programmatic capacity to complete on the ground water quality projects. Factors such as existence of a local watershed group, having an accepted nine-key element watershed plan, and extensive opportunities to implement those plans were all decision factors. The River Basin Coordinators completed a reprioritization effort with each of their respective River Basin Teams which resulted in three (3) Priority Watersheds being selected in each of the seven (7) basin management units. Many of the new priority watersheds were already being worked on, but additional focused effort is being established to more completely implement those existing watershed plans. Progress in the priority watersheds was ongoing in FFY 2018.

FFY 2018 KY Nonpoint Source Program Commitments to EPA Region 4 (From the annual work plan):

General Program Management and Oversight:	
Provide Administrative, Financial, and Technical Oversight for FFY 2016 NPS Program sub-grantee projects.	The KY Division of Water's Nonpoint Source Program provides Administrative, Financial, and Technical support for approximately 50 sub-grantee projects at any given point in time. This work is in addition to providing the same type assistance to watershed groups, Health Departments, and Conservation Districts for the development of future projects. Coordination with local, state, and federal government agencies is also done on a regular basis to create synergistic on-the-ground watershed plan implementation efforts.
Obligate all grant funding within one year of grant award date.	Obligation of FFY 2017 Grant funds is complete.
Submit 2009, 2011, and 2012 Grant closeout package to EPA Region 4.	The FFY 2014 Grant received an extension until September 30, 2019. As such, no grant closeout package for FFY 2014 has been submitted to EPA Region 4 at this time.
Maintain NPS Program Watershed Project GIS Coverage	Kentucky's Nonpoint Source Program GIS Coverage was updated annually in December.
Maintain NPS Program web pages – Update Watershed Plans, and Watershed Plan Maps	Kentucky's Nonpoint Source Program web pages were updated annually in December. 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.
Attend EPA National Biennial Nonpoint Source Program 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 in 2018.

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 the FFY 2016 sub-grantee project with Bluegrass Greensource. See project workplan for more information.
Work with KY NRCS on NWQI Pilot Project in Gunpowder Creek	Gunpowder Creek was selected by NRCS Headquarters as an NWQI "Readiness" project. KDOW and KY NRCS staff worked cooperatively to establish an NRCS NWQI Implementation Plan based upon the existing Gunpowder Creek Nine-Key Element Watershed Plan. KY NRCS with support from KDOW applied for additional NWQI funding through NRCS Headquarters to implement the Gunpowder Creek Readiness Plan during FFY 2018. If funded, KY NRCS will target its effort in the Lower Gunpowder Creek watershed to control pollution from small farming operations. During FFY 2018, the Boone County conservation District completed their FFY 2014 319(h) project that implemented stormwater BMPs in the headwaters region of the Gunpowder watershed.

Watershed Success Monitoring Program:	
Continue development of Success Monitoring Program by compiling watershed scale implementation data.	Nonpoint Source Program continue 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, KDOW Nonpoint Source Program, State Revolving Fund, and the Division of Conservations Agriculture Water Quality State Cost Share Program. Efforts are ongoing to build a GIS Layer including all on-the-ground implementation practices funded by 319(h) over the past ten years.
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 2018, six (6) watershed received pre-implementation water quality monitoring: Clarks Run, Crafts Colly, Dry Fork, Lees Creek, Sandlick Creek, and Trammel Creek.

Watershed Success Monitoring Program Cont'd:	
Conduct watershed success monitoring for watershed plan implementation projects.	Kentucky Division of Water Biologists monitored water quality parameters in Gunpowder Creek during FFY 2018 as part of a collaborative effort to develop a TMDL alternative plan.
Grant Reporting and Tracking System:	
Enter FFY 2017 Load Reductions into GRTS.	FFY 2017 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, 2018 deadline along with specific BMP description information.
Attend National GRTS Conference.	KDOW was not able to send staff to this training event.

Grant Reporting and Tracking System Cont'd:	
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 2017 Sub-grantee projects into GRTS.	Final FFY 2018 Nonpoint Source Program sub-grantee projects have been preliminarily entered into GRTS.
EPA Required Reporting:	
Submit Annual Nonpoint Source Program Workplan to EPA Region 4.	An updated version of Kentucky's FFY 2018 Nonpoint Source Program Workplan was submitted to EPA Region 4 prior to the September 30, 2018 deadline.
Submit Annual Report to EPA Region 4.	Kentucky's Nonpoint Source Program Annual Report was submitted to EPA Region 4 in December 2018.

EPA Required Reporting Cont'd:	
Submit WQ-10 Nonpoint Source Success Story to EPA Region 4	Kentucky's WQ-10 Nonpoint Source Success Story for Dix River in Hickman was submitted to EPA R4 prior to the July 30, 2018 deadline. 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, 2018 deadline.
Submit Watershed Plans to EPQ R4 for review and approval.	No new watershed plans were submitted to RPA Region 4 for review or comment during FFY 2018. However six (6) watershed plans were actively under development during this time frame: Cane Run, Crafts Colly, Dry Fork, and Sand Lick, Trammel Creek, Lees Creek and Clarks Run, South Fork Little River, and Damon Creek.

Copies of this publication are available for use through the KDOW NPS website:
water.ky.gov

Published and distributed by the Kentucky Division of Water