

FY 2019 *Annual Report* of Tennessee's  
**319 Nonpoint Source Grant Program**

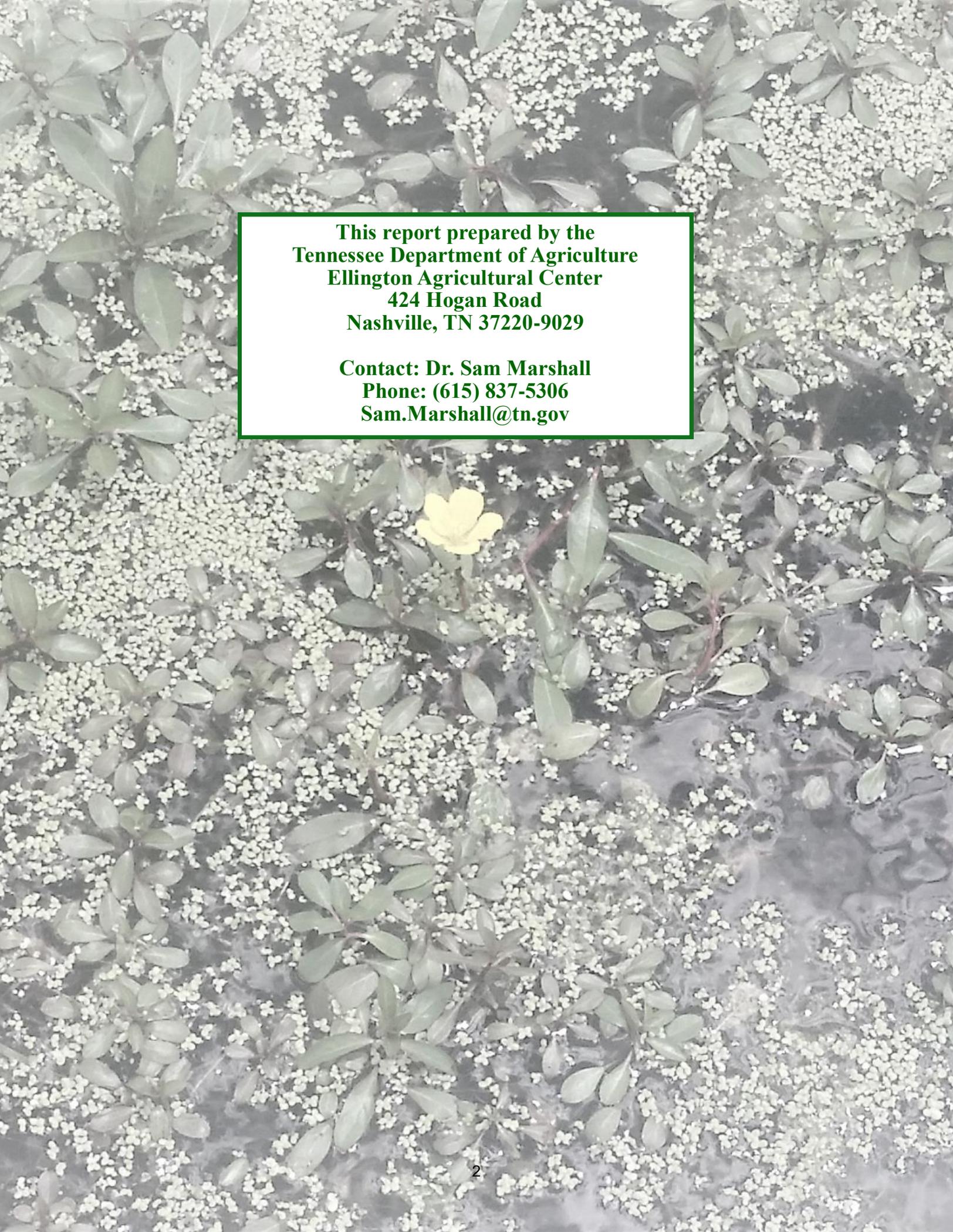


TENNESSEE DEPARTMENT OF AGRICULTURE  
LAND & WATER STEWARDSHIP SECTION



*Restoring...*  
*Protecting...*  
*Tennessee's Water Resources*

Submitted to US EPA, Region IV - December 20, 2019



**This report prepared by the  
Tennessee Department of Agriculture  
Ellington Agricultural Center  
424 Hogan Road  
Nashville, TN 37220-9029**

**Contact: Dr. Sam Marshall  
Phone: (615) 837-5306  
Sam.Marshall@tn.gov**

## Table of Contents

<u>Topic</u>	<u>Page</u>
List of Acronyms	4
Executive Summary	5
Overview	6
Program Highlights	7-12
Guiding Principles	13
Status of Active Projects	14-15
Individual Active Projects (In alphabetical order by grantee)	16-46

### List of Appendices

Appendix A: Long Term Goals—Current Progress Summary

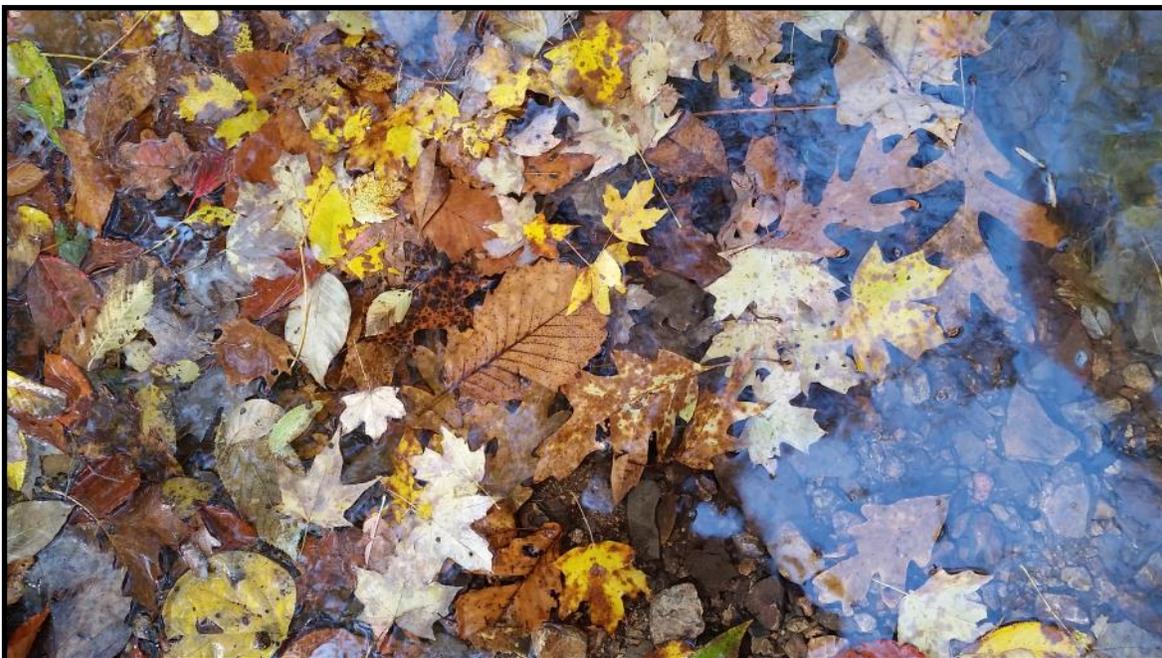
Appendix B: Measures of Success Checklists

Appendix C: FFY2019 Success Stories

Appendix D: *Watershed Based Plan Development* Workshop

Appendix E: Section 319(h) Grant Participant Annual Survey

Appendix F: National Water Quality Initiative (NWQI) Status Update



# Acronyms

Ac	Acre
ARAP	Aquatic Resources Alteration Permit
ARCF	Agricultural Resources Conservation Fund
BFEC	Brushy Fork Environmental Consulting
BMP	Best Management Practice
CAFO	Concentrated Animal Feeding Operation
CRC	Cumberland River Compact
CWA	Clean Water Act
<i>E. coli</i>	Escherichia coli
EQIP	Environmental Quality Incentives Program
FFY	Federal Fiscal Year
GIS	Geographic Information System
GRTS	Grants Reporting and Tracking System
MNWA	Middle Nolichucky Watershed Association
MOU	Memorandum of Understanding
MPD	Management Program Document
MTSU	Middle Tennessee State University
NPS	Nonpoint Source
NRCS	Natural Resources Conservation Service
OWCA	Obed Watershed Community Association
RC&D	Resource Conservation and Development Council
SCD	Soil Conservation District
STEM	Science, Technology, Engineering and Mathematics
TDA	Tennessee Department of Agriculture
TDEC	Tennessee Department of Environment and Conservation
TEC	Tennessee Environmental Council
TN	Tennessee
TNC	The Nature Conservancy
TN-NPS	Tennessee Nonpoint Source Program
TSU	Tennessee State University
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
UT	University of Tennessee
UTM	University of Tennessee—Martin
WTRBA	West Tennessee River Basin Authority

# Executive Summary

## Introduction

The Tennessee Department of Agriculture (TDA) manages the Nonpoint Source Program (aka, 319 Program) in Tennessee with approval and oversight of the US Environmental Protection Agency (USEPA). This federal program provides funds to states, territories and Indian tribes for installing Best Management Practices (BMPs) to stop NPS pollution; providing training, education, and demonstrations; and monitoring water quality.

The Tennessee Nonpoint Source Program (TN-NPS) is non-regulatory and promotes voluntary, incentive-based solutions. The program is a cost-share program, meaning that it pays for 60% of the cost of a project. It is the responsibility of the grantee to provide the remaining 40%, usually in cash and “in-kind” services. While the 319 Grant is the primary focus of this Annual Report, it is important to note that the TN-NPS extends beyond the USEPA grant; Tennessee funds additional projects under State-funded programs such as the Agricultural Resources Conservation Fund (ARCF). Together, the goal of the TN-NPS program is restore impaired waterbodies, prevent decline of high-quality waterbodies, and promote education of non-point source issues.

## Notable Accomplishments

In FFY2019, \$1,065,000 was awarded to watershed projects, and \$58,630 was awarded to statewide/education/outreach projects. Approximately 177 BMPs were implemented in FFY2019, including septic system repairs/replacements, fencing for livestock exclusion, and heavy use areas.

The TN-NPS continued the implementation of a web-based application tracking system for site visits and education/outreach activities performed. (The results can be found incorporated in Appendices A and B.)

After evaluation of the 2018 Clean Water Act (CWA) *List of Impaired Waters*, two Success Stories were developed and submitted to USEPA in FFY2019—one update for a previous Success Story, and one new waterbody Success Story. Copies of the approved Success Stories can be found in Appendix C.

In August, 2019, the draft *2020—2024 Management Program Document* was completed and submitted to USEPA Region IV for review, comment, and approval. The document, which updated and revised the 2015—2019 Management Program Document, is currently being implemented to steer the TN-NPS.

Also in FY2019, TN-NPS staff developed a workshop for partners to assist in the development of Watershed Based Plans. The workshop has been presented to two not-for-profit partners, and has been advertised at the 2019 Sustainable Tennessee Policy & Practice Forum and the Tennessee Resource Conservation and Development Council’s Annual Meeting. Summary slides for the workshop are included in Appendix D

The Annual Participant Survey was conducted in the Summer of 2019 to evaluate applicants’ needs, as well as the TN-NPS performance managing the 319 Grant program. Two of the most requested technical services, per the survey (help with writing a Watershed Based Plan and modeling/load reduction estimates) were addressed with the Watershed Based Plan Development workshop. The full results of the Annual Participant Survey can be found in Appendix E.

## Areas for Improvement

In the past year, a majority of the practices installed with 319 Grant assistance have been in the agricultural and septic sectors. Additional outreach to engage the other sectors is needed to make progress in those areas.

## Conclusion

The TN-NPS continues to make progress in promoting the protection of Tennessee waters through a combination of on-the-ground measures and education/outreach. With additional technical assistance provided to potential applicants through the development of the workshop, we hope to see additional engagement by new partners.

## FFY2019 Program Highlights

- ◆ **Funded \$1,065,000 in watershed projects and \$58,630 in statewide/education/outreach projects for FFY2019.**
- ◆ **177 BMPs were implemented in FFY2019.**
- ◆ **Two Success Stories were submitted and approved by USEPA.**
- ◆ **Draft 2020—2024 Management Program Document was submitted to USEPA Region IV for review and approval.**
- ◆ **Watershed Based Plan Development Workshop was created, and roll-out to partners is in-progress.**
- ◆ **Annual Participant Survey was conducted in the Summer of 2019.**

# Overview

The Tennessee Department of Agriculture (TDA) manages the 319 Nonpoint Source Program with approval and oversight of the US Environmental Protection Agency (USEPA). The TN-NPS applies for and is awarded a grant from the USEPA each year in order to implement this program. This Annual Report is required under a provision of each year's grant award. Specifically, the report fulfills the requirements of Section 319(h)(11) of the federal Clean Water Act. This report is written each year to inform the public, the USEPA, and ultimately the U.S. Congress of the state's progress in the area of reducing nonpoint source pollution in Tennessee. While this report should not be construed to be a complete description of all TN-NPS program activities, it does describe the most important features of the program within the federal fiscal year 2019 (i.e., October 1, 2018– September 30, 2019).

Today, nonpoint source (NPS) pollution is the nation's largest source of water quality problems. It's the main reason that approximately 40 percent of our surveyed rivers, lakes, and estuaries are not clean enough to meet basic uses such as fishing or swimming. NPS pollution occurs when water runs over land or through the ground, picks up pollutants, and deposits them into rivers, lakes, and coastal waters or introduces them into ground water. NPS pollution is widespread because it can occur any time activities disturb the land or water.

To address this diffuse type of pollution, congress established the Nonpoint Source Program, funded by the USEPA through Section 319 of the [Clean Water Act](#). The Tennessee Department of Agriculture administers the Nonpoint Source Program in Tennessee on behalf of USEPA. This program provides funds to states, territories and Indian tribes for installing Best Management Practices (BMPs) to stop NPS pollution; providing training, education, and demonstrations; and monitoring water quality.

The TN-NPS is non-regulatory and promotes voluntary, incentive-based solutions. The program is a cost-share program, meaning that it pays for 60% of the cost of a project. It is the responsibility of the grantee to provide the remaining 40%, usually in cash and "in-kind" services. It primarily funds two types of projects:



*Students learning about aquatic life in Mountain Creek.*

1. **Watershed Restoration Projects** improve an impaired waterbody, or prevent a non-impaired water from becoming placed on the List of Impaired Waters (formerly the 303(d) List). Projects of this type receive highest priority for funding. All projects involving BMPs must be based on an approved "Watershed Based Plan".

2. **Educational Projects** funded through TN-NPS raise awareness of practical steps that can be taken to eliminate NPS pollution. Projects funded can either have a statewide, general public aim or can focus in on local, targeted audiences with specific messages.

No funds from the TN-NPS are given directly to individual landowners. All grant money is awarded to organizations/entities that administer and oversee the local project. Eligible applicants include non-profit organizations, local governments, state agencies, soil conservation districts, and universities. These organizations then can enter into work agreements with individual landowners to reimburse them for work done on their land. All payments made with grant funds are on a reimbursement basis.

# Program Highlights from FY2019

The Tennessee Department of Agriculture (TDA) relies on the cooperation of stakeholders, partnerships, and local land-owner support to implement many components of the Tennessee Nonpoint Source Program (TN-NPS) statewide. The information contained in this Annual Report highlights many of the accomplishment that have been collectively achieved by these collaborative efforts during FFY2019.

## **SIGNIFICANT GRANT MILESTONES IN FISCAL YEAR 2019:**

### **TN-NPS Management Program Document Implementation**

In FFY2019, the TN-NPS program continued to implement the Management Program Document (MPD) approved for FY 2015 through FY 2019. Under this recently expired plan, we continued to track and evaluate our “Measures of Success”. The interim measures of success of long-term goals, as well as annual milestones, are reported in Appendices A and B. In addition, the tracking of best management practices (BMPs) by sector continued to be recorded and tracked. An online application for more efficiently tracking site visits has been fully introduced this year to our HQs and field staff. We also continued to increase our attempts to “market” our program to past and potential partners in an effort to increase the number of proposals we receive each year.

While working this year under our FY15-19 MPD, we revised that document and submitted it to USEPA - Region 4 in August 2019. We have received comments back from Region 4 staff and are working to make revisions and incorporate their suggestions. We anticipate that our new MPD will be approved in early 2020 for FY 2020 through FY2024.

### **Success Stories / Impaired Waters Delistings**

In FFY2019, the TN-NPS developed two Success Stories that were written, accepted by EPA, and published on their website. One Success Story was an update for Lick Creek in Marshall and Rutherford Counties, in which a waterbody previously delisted for habitat impairments, was further improved to the point that it was no longer listed for pathogens. The second Success Story detailed the delisting of East Rock Creek in Marshall County for nutrients, siltation, and habitat alterations. To read each of these newest Success Stories, please see Appendix C. All Success Stories generated by the TN-NPS are also available on our website - <https://www.tn.gov/agriculture/farms/conservation/nps-success-stories.html>



*Above: Nickajack Reservoir in Marion County*

### **Grant Awards Recipients for FFY2019**

In FFY2019, the TN-NPS received a total of ten proposals. Of the proposals received, five were wholly or partially funded with 319 grant dollars, as well as providing support to the Tennessee Department on Environment and Conservation (TDEC) for water quality monitoring. The total amount awarded was \$1,065,000 for watershed projects, and \$58,630 in statewide education and outreach projects.

## **Best Management Practices Installation for FFY2019**

Grant recipients used grant funds (from all open grants) to install 177 BMPs in FFY2019. The top five BMPs installed in FFY2019 were (in descending order of frequency): septic system replacements/repairs, fencing (all types), watering facilities, heavy use area protection, and pipelines. The installation of BMPs this fiscal year was complicated by severe, widespread flooding across the state, and the subsequent recovery efforts.

*Below: Inundated pasturelands during the Spring 2019 floods near Bear Creek in Maury County*

*Below: Flooded park near the Duck River in the Spring 2019*



## **Attendance at National and Regional Nonpoint Source Meetings**

In the past year TN-NPS staff have attended several regional and national meetings:

- ◆ Heidi McIntyre-Wilkinson attended the Middle Tennessee Geographic Information Council Middle Tennessee Regional Meeting at Lane Agri-Park, Murfreesboro, TN—November 7-8, 2018.
- ◆ Heidi McIntyre-Wilkinson attended the Tennessee Water Resources Symposium at Montgomery Bell State Park, Burns, TN—April 11-12, 2019.
- ◆ Heidi McIntyre-Wilkinson has attended a series of *Tennessee One Health* meetings in FFY 2019, as well as the inter-agency *Harmful Algal Bloom Working Group*.
- ◆ Sam Marshall attended the National Nonpoint Source Managers Meeting in Colorado Springs, CO - November 5-8, 2019
- ◆ Sam Marshall was the keynote speaker at the University of Tennessee's 7th Annual Watershed Symposium in Knoxville, TN - March 26, 2019
- ◆ John McClurkan attended the Tennessee Association of Conservation Districts' Annual Meeting in Knoxville, TN - November 19-21, 2019.
- ◆ Sam Marshall and John McClurkan attended several meetings of the Tennessee Nutrient Reduction Strategy Taskforce throughout the fiscal year.



*Above: Presentation at the Annual Watershed Symposium*

## **FFY 2015 Grant Closeout**

The FFY 2015 grant expired on September 30, 2019. The Closeout Report for FFY 2019 will be submitted to USEPA on December 27, 2019.

**FFY2019 Grant Awarded**

The TN-NPS released a Request for Proposals on September 4, 2018 in anticipation of the 319 Grant award expected for FFY2019. Proposals were due by December 1, 2018 and a total of nine proposals were received. All together, these proposals requested a total of \$1,861,507 in grant funding. Funding for Tennessee in FY2019 was \$2,505,000 with \$1,252,500 available for projects. Funding was provided for six of the nine project proposals submitted in FFY2019. Due to the allocation restrictions (program versus watershed funds), several education/outreach projects could not be funded. Furthermore, many of the projects that received funding were not awarded the requested amount, due to budget limitations.

The FFY2019 grant of \$2,505,000 was awarded on July 1, 2019. All funds have been obligated and contracts are currently being written and signed. The following table provides a list of projects funded from the FY2019 grant and how much grant funding each received.

**Table 1: FFY2019 Grant Awards**

Name of Applicant	Name of Project	319 Grant Money Allocated	Funding Type
Austin Peay University— Center of Excellence for Field Biology	Project WET	\$16,500	Program
Cumberland River Compact	River Friendly Farms Certification Program	\$42,130	Program
Giles County SCD	Pigeon Roost Creek Project	\$325,000	Watershed
TenneSEA (Student Environmental Alliance)	Reducing Nonpoint Source Pollution in Shoal and Middle Creek Watersheds	\$280,000	Watershed
Tennessee Department of Environment and Conservation	Water Quality Monitoring of NPS Impaired Streams 2019	\$250,000	Watershed
University of Tennessee	Bat Creek Restoration Project	\$210,000	Watershed
<b>TOTAL</b>		<b>\$1,065,000 *</b>	

*\* Additional watershed proposals were accepted after the initial deadline in order to allocate the remaining \$187,500 in funds.*

## Total NPS Spending in FFY2019

In FFY2019, the TN-NPS again demonstrated the ability to put federal 319 grant money on the ground in an effective way. During FFY2019, 319 money was spent from federal grants received in years FFY2015 through FFY2018. From across all of the open grant years, a total of approximately \$2,291,314 was spent in FFY2019. The following table breaks down how the money was spent.

**Table 2: 319 Program Spending in Tennessee – FFY2019**

Nature of Expense	Amount of 319 Dollars Spent
NPS Program Management	\$1,108,850.50
Watershed Restoration Projects	\$1,020,316.47
Educational Projects	\$162,147.35
<b>TOTAL:</b>	<b>\$2,291,314.32</b>

Program Management costs consist of salaries and benefits for 13.33 FTEs, travel, supplies, and indirect costs; all stemming from the TN-NPS.

The following two figures illustrate the spending from FFY2019. Figure 1 is a geographical representation of where 319 money was spent in FFY2019 across the state on best management practices from watershed restoration projects. Please note that each marker may represent more than one BMP on a particular site.

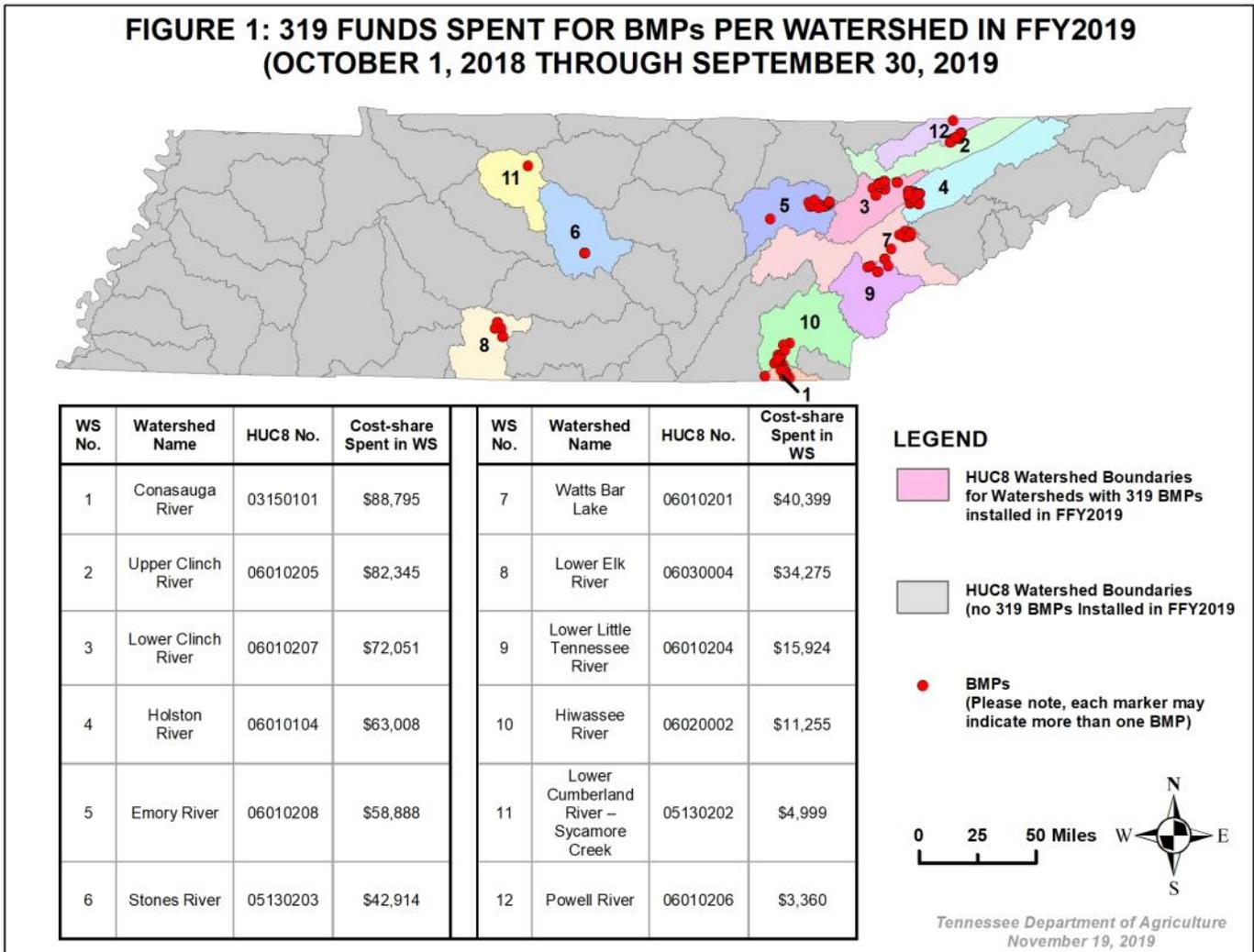


Figure 2 shows a number of things related to 319 spending. The red bars show the amount of grant money spent in FFY2019 from each of our active grants. The green bars show the cumulative amount spent or drawn-down from each of our active grants. We have recently closed out the FFY2015 grant, with a \$0 balance. Each subsequent grant year has less and less money spent as each year is more and more recent, but the TN-NPS program has a strong history of spending all of the money from each grant before it is closed out.

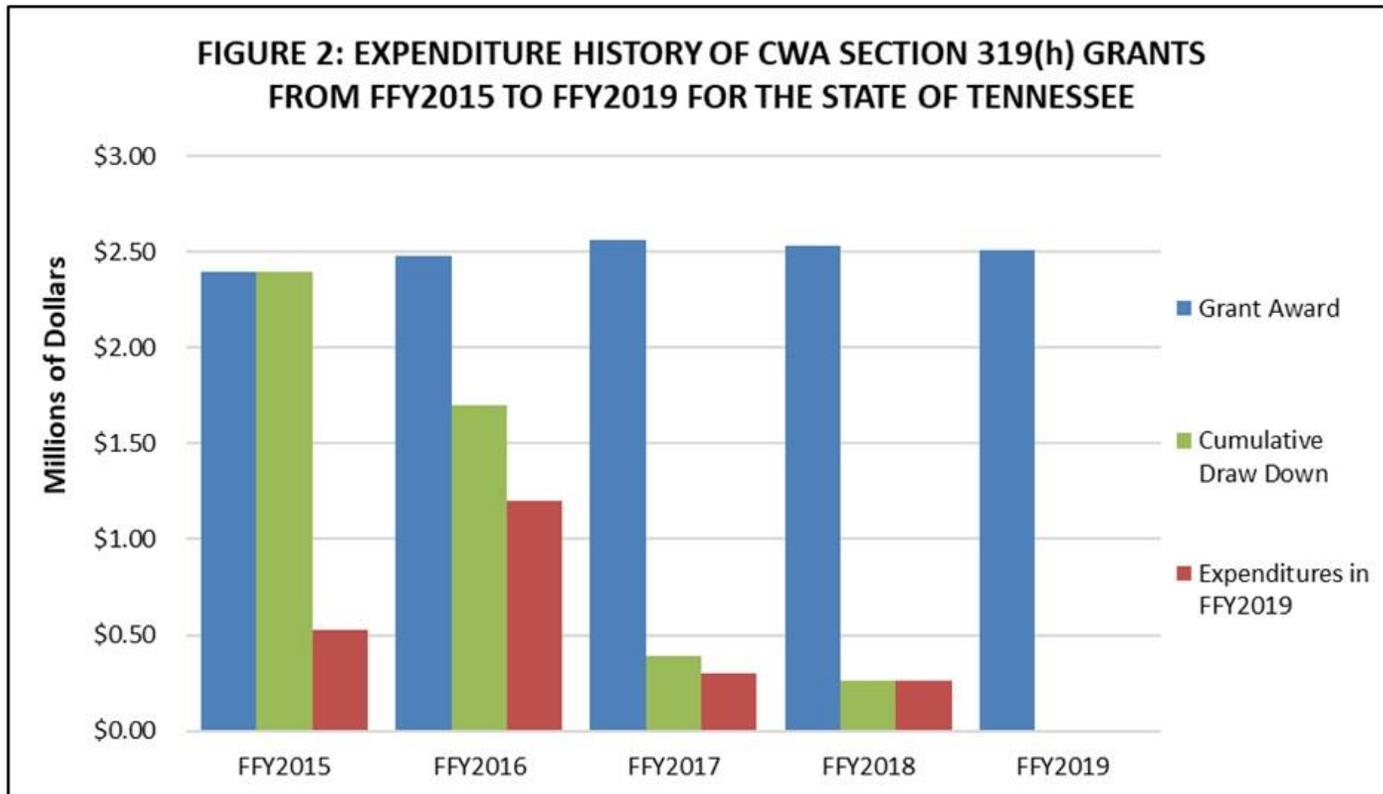
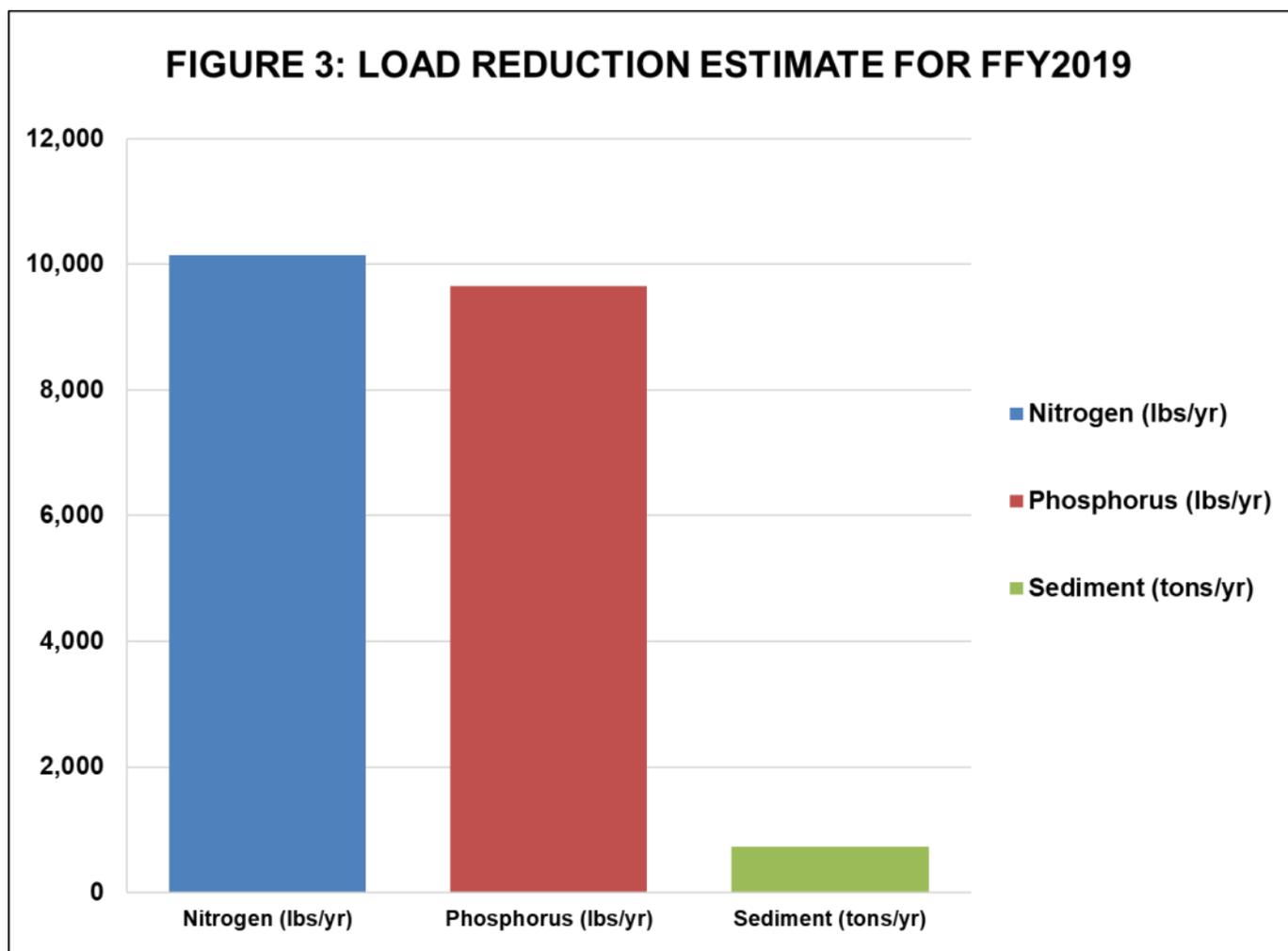


Figure 3 shows our estimated load reductions for N, P, and sediment from all projects with BMPs for FFY2019. Estimates were derived using the STEPL Model. This year saw particularly modest load reduction estimates when compared with previous years. The decreased load reduction can likely be traced to two primary causes. First, a new version of the STEPL model was released last year; however, this is the first full fiscal year in which it had been implemented. The new model decreases the estimated load reduction for several common practices. Second, Tennessee experienced severe flooding across much of the State in February, 2019. The record-setting rainfall led to a Presidential Major Disaster Declaration for Tennessee on April 17, 2019. Recovery efforts, especially in rural communities, are still underway as of this report. The flooding and its aftermath likely had a negative impact on the number of conservation practices installed.

Approximately 177 BMPs were installed throughout the state in FFY2019. Load reduction estimates are indicated in the chart below. Pollutant load reductions are key to removing stream reaches and bodies of water from the *List of Impaired Streams*. Since delisting streams from the *List of Impaired Streams* is the #1 priority of the Tennessee NPS program, these estimates represent significant progress towards that goal, even if it does normally take several years for these reductions to manifest themselves in actual monitoring results.

The data was derived from GRTS entries and database query dating from October 1, 2018 to September 30, 2019. **NOTE: Data units for sediment are in tons/yr.**



## GUIDING PRINCIPLES

The successful administration of any program requires some level of planning and the establishment of goals. The TN-NPS's new Management Program Document is part of that process, and one significant aspect of that plan is the goals that have been set. Both long term goals and annual goals have been identified, all of which correspond to the four elements of TN-NPSs overriding mission statement.

### TN-NPS Program Mission Statement

*The mission of the TN-NPS is to: measurably reduce nonpoint source pollution in Tennessee, measurably improve Tennessee's water quality, continuously strengthen and expand partnerships, and increase the water resources stewardship of Tennessee's citizens.*

The specific long and short term goals will be the basis of all future NPS program projects in Tennessee. The TN-NPS will tie each future project to specific long term goals and annual milestones. These goals are fully described in Section 3 (*Strategy for Addressing Nonpoint Source Pollution Issues*) of the new Management Program Document.

### 2015 - 2019 TN-NPS Long Term Goals

#### Long Term Goal No. 1:

Restore impaired water bodies (i.e., those on the 303(d) list\*) by implementing best management practices (BMPs) that address nonpoint source pollution.

#### Long Term Goal No. 2:

Build citizen awareness of problems and solutions related to nonpoint source pollution through local and statewide education efforts targeting various audiences.

#### Long Term Goal No. 3:

Build capacity for future TN-NPS projects in local watersheds by engaging stakeholders and potential partners through outreach and personal contact.

#### Long Term Goal No. 4:

Track interim progress towards restoration of impaired water bodies.

#### Long Term Goal No. 5:

Protect unimpaired/high quality waters (i.e., those not on the 303(d) list\*) by implementing appropriate BMPs where warranted.

#### Long Term Goal No. 6

Fulfill all obligations under grant award agreement with USEPA annually.

\* *The State of Tennessee's List of Impaired Waters is now used in lieu of the 303(d) list, as it includes all impaired waters, not only those waters for which a Total Maximum Daily Load (TMDL) still requires development.*

## Status of All Projects Active in FFY2019—as of 12/06/19 (balance)

Grantee Name—Project Name	Amount Awarded (\$)	Balance (\$)	Expiration Date
Anderson County SCD— <i>Hinds Creek</i>	\$75,000.00	\$0.00	07/31/2019
Appalachian RC&D— <i>Roan Creek Restoration</i>	\$230,000.00	\$19,596.95	01/15/2019
Blount County SCD— <i>Baker &amp; Centenary Creeks Restoration</i>	\$120,000.00	\$0.00	12/31/2018
Blount County SCD— <i>Baker &amp; Centenary Creeks Restoration , Ph. III</i>	\$213,000.00	\$189,877.70	07/31/2022
Blount County SCD— <i>Pistol Creek Watershed Restoration Initiative</i>	\$330,000.00	\$324,309.63	07/31/2022
Boone Watershed Partnership— <i>Outdoor Classroom at Jacob's Park</i>	\$25,000.00	\$11,022.15	06/30/2021
Caribbean SEA (WaterWays!)— <i>Reducing Nonpoint Source Pollution in Mountain Creek Watershed, Ph. II</i>	\$200,000.00	\$200,000.00	07/31/2021
City of Athens— <i>Denso Eco Park/North Mouse Creek</i>	\$145,000.00	\$130,486.79	07/31/2020
Claiborne County SCD— <i>Little Sycamore Creek</i>	\$165,200.00	\$3,304.00	07/31/2019
Clinch-Powell RC&D— <i>Lower Clinch River Restoration</i>	\$190,000.00	\$58,918.61	02/29/2020
Cumberland River Compact— <i>Bank Stabilization at Moss Wright Park and Mansker Creek Watershed Restoration Project: Phase I</i>	\$174,000.00	\$28,974.70	07/31/2020
Cumberland River Compact— <i>Bank Stabilization at Moss Wright Park and Mansker Creek Watershed Restoration Project: Phase II</i>	\$160,000.00	\$160,000.00	07/31/2022
Cumberland River Compact— <i>Brown's Creek Restoration, Ph. I</i>	\$103,000.00	\$103,000.00	07/31/2021
Cumberland River Compact— <i>Sustainable Farming Education</i>	\$34,371.00	\$0.00	12/15/2018
Giles County SCD— <i>Richland Creek/Blue Creek</i>	\$235,000.00	\$0.00	07/31/2019
Hamblen County SCD— <i>Nolichucky Sediment Reduction Project</i>	\$165,000.00	\$132,645.00	07/31/2020
Harpeth River Watershed Association— <i>Harpeth River Headwaters Restoration-Phase IV</i>	\$28,000.00	\$28,000.00	07/31/2021
Knox County— <i>Roseberry Creek</i>	\$144,000.00	\$86,698.42	03/14/2020
Knox County SCD— <i>Flat Creek Restoration</i>	\$195,000.00	\$11,609.31	07/31/2019
Knox County SCD— <i>Stock Creek Restoration, Ph. II</i>	\$115,000.00	\$78,922.24	07/31/2022
Lauderdale County SCD— <i>Cold Creek Restoration, Ph. II</i>	\$345,000.00	\$324,695.24	07/31/2021
Middle Nolichucky WS Alliance— <i>Holley Creek Restoration</i>	\$122,500.00	\$0.00	02/14/2018
Morgan County SCD— <i>Crooked Fork Restoration Project</i>	\$224,000.00	\$86,381.79	07/31/2020
Obed Watershed Community Association— <i>Crossville Headwaters, Ph. IV</i>	\$56,000.00	\$37,331.83	07/31/2020
Southeast Tennessee RC&D— <i>Conasauga River Pathogen TMDL Implementation, Ph. 2</i>	\$275,000.00	\$55,454.19	07/31/2021
Southeast Tennessee RC&D— <i>Hiwassee River Tributaries Project, Phase I</i>	\$245,000.00	\$181,070.43	07/31/2022
TN Dept of Environment & Conservation/Water Resources— <i>Water Quality Monitoring of NPS Impaired Streams 2015</i>	\$150,000.00	\$0.00	03/15/2019
TN Dept of Environment & Conservation/Water Resources— <i>Water Quality Monitoring of NPS Impaired Streams 2016</i>	\$150,000.00	\$0.00	03/31/2020
TN Dept of Environment & Conservation/Water Resources— <i>Water Quality Monitoring of NPS Impaired Streams 2017</i>	\$155,000.00	\$0.00	12/31/2020

## Continuation of Status of All Projects Active in FYY2019

Grantee Name—Project Name—Grant Year	Amount Awarded (\$)	Balance (\$)	Expiration Date
TN Dept of Environment & Conservation/Water Resources— <i>Water Quality Monitoring of NPS Impaired Streams 2018</i>	\$154,573.00	\$0.00	07/31/2022
TN Dept of Environment & Conservation/Water Resources, West TN River Basin Authority— <i>Turkey Creek</i>	\$230,000.00	\$230,000.00	06/30/2021
Tennessee Environmental Council— <i>Lytle Creek Phase I</i>	\$115,000.00	\$7,145.31	07/31/2019
Tennessee Environmental Council— <i>Rutherford Creek Phase IV Restoration Plan Implementation – Grassy Branch Restoration Project</i>	\$81,000.00	\$79,123.75	07/31/2022
Tennessee Aquarium— <i>Watershed Wisdom</i>	\$75,483.00	\$22,489.68	01/30/2020
Tennessee RC&D— <i>Tennessee Envirothon 2017</i>	\$20,000.00	\$0.00	12/31/2018
Tennessee RC&D— <i>Tennessee Envirothon 2018</i>	\$40,000.00	\$19,932.81	07/31/2022
The University of Tennessee Agricultural Extension Service— <i>Welcome Wagon</i>	\$23,000.00	\$1,018.47	01/31/2019
The University of Tennessee, Institute of Agriculture— <i>Getting the Job Done Right: Landscape Contractor Training for Small-Scale Water Quality Protection Solutions</i>	\$66,656.00	\$65,978.11	06/30/2021
Urban Green Lab— <i>Mobile Lab: Sustainable Practices Education</i>	\$15,000.00	\$0.39	07/31/2020

# Project Summaries for FY2019

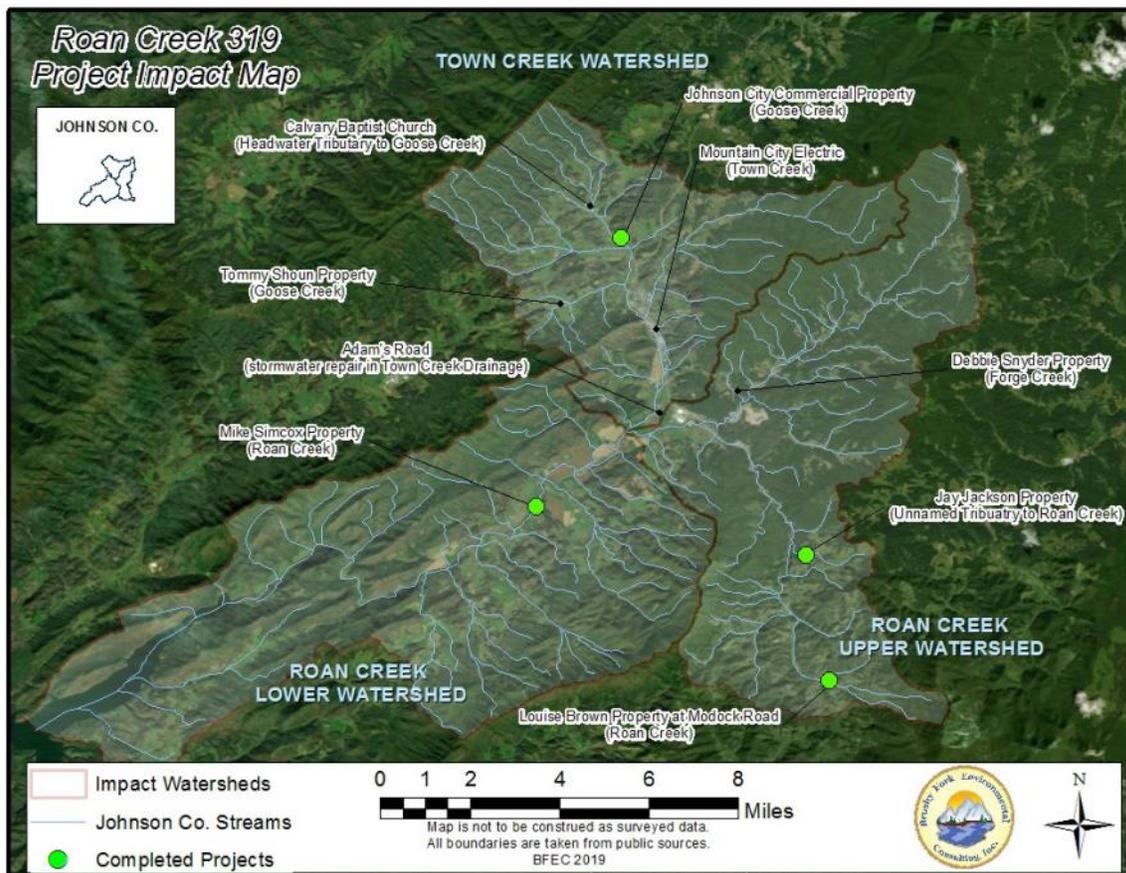
(In alphabetical order, by grantee)

GRANTEE: Appalachian Resource Conservation & Development District  
PROJECT NAME: Roan Creek Restoration  
GRANT YEAR: FY2015  
WEBSITE: <http://arcd.org/>



The Roan Creek Section 319 project was successful in targeting degraded stream reaches throughout the Roan Creek watershed, including the Roan Creek Lower, Roan Creek Upper, Goose Creek, and Town Creek sub-basins. The most common practice implemented along reaches was streambank protection/stabilization, along with livestock exclusion and riparian buffer planting. Most landowners in Johnson County, Tennessee are not conservation-minded, and are unaware of how their actions may negatively affect streambank stability and water quality. Typical streambank stabilization practices implemented by landowners include straightening and dredging streams to reduce flooding, creating berms with dredged spoil that restricts the stream's floodplain access, mowing or spraying herbicides on riparian vegetation, allowing livestock access to streams, etc.

Most of the first conversations initiated with landowners began with educating them as to the benefits of allowing native vegetation to thrive and generate deep rooting which hold the erosive streambanks in place. Riparian buffers (ranging in widths) were a requirement of grant and therefore became a sticking point for many landowners who were unwilling to allow riparian vegetation to grow along streambanks. Most landowners also preferred "hard bank" protection or rock armoring of streambanks. Throughout this project Brushy Fork Environmental Consulting, Inc. attempted to show landowners that not only are "hard bank" fixes expensive, but they also pass the problem downstream, doing little to mitigate stream velocities. Roan Creek and many associated tributaries are listed as impaired for "excessive nitrate + nitrite, loss of biological integrity due to siltation, and *Escherichia coli*." Livestock exclusion specifically addressed the agricultural *E. coli* issue. Streambank stabilization via natural channel design methods has reduced nonpoint sedimentation found throughout the watershed.



Above: Map of completed projects along Roan Creek

GRANTEE: Anderson County Soil Conservation District  
PROJECT NAME: Hinds Creek Watershed Restoration Initiative  
GRANT YEAR: FY2015  
WEBSITE: <https://www.tn.gov/agriculture/farms/conservation/ag-farms-sscc/ag-farms-east-soil/anderson-county-scd.html>



This project has been a very successful one and now has been closed out. These completed projects have improved water quality by reducing the number of livestock in the creeks and ponds and much improvement has been made for soil health.

Good farm management includes rotational grazing, access control, and clean water for livestock. Well over 200 acres of farmland has been improved in Union and Anderson counties.

The Anderson County Soil Conservation District has learned that sticking with their goals does pay off. Agriculture is a definite part of our future. We must be good stewards of our land in order to have great success as a nation..... and truthfully, to be plain old good neighbors. There is no greater need than to prepare our future farmers to fill our shoes for when we are gone. Helping people to help our land only leads to success.

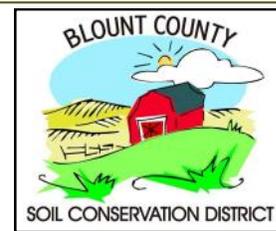


*Left: Heavy use area and alternative watering system installed for prescribed grazing.*



*Right: Fencing installed in Anderson County.*

GRANTEE: Blount County Soil Conservation District  
 PROJECT NAME: Baker and Centenary Creek Restoration Initiative—Phase III  
 GRANT YEAR: FY2018  
 WEBSITE: <https://www.blounttn.org/294/Soil-Conservation>



Below is a summary of (319) grant programming for reporting period October 1, 2018 thru September 30, 2019.

**I. Implementation of Agricultural Best Management Practices:**

Four, individual operators representing five contracts have completed their planned practices for this reporting period.

Implemented practices included:

Practice	NRCS Code	Quantity Installed
Cross-fencing	382(d)	1726 Feet
Stream Crossing	578	1
Access Road	560	238 Feet
Grade Stabilization Structure	410	Two, Rock Waterbars
Heavy Use Area (Feed Pad)	561	6942 square feet
Grassed Waterway	412	25 Linear Feet

*Below: Cross fencing installed for prescribed grazing in Blount County.*



**II. Septic System Repair and Restoration for Low-income Households:**

Three planning meetings have occurred for this reporting period in regard to this aspect of grant programming. Specifically, a revised application process has been developed in conjunction with the Blount County Environmental Health Department which oversees septic installation to ensure state mandated protocols are met. Two systems have been approved for repair for this reporting period.

Outreach for this event has included workshops, displays at a local farmers market, and notification to septic system installers.

**III. Correct Eroded Steep Banks along U.S. Highway 411:**

Section I of III of a 1500 linear foot stretch along U.S. Highway 411 has been completed. This work was approved and supported by the Tennessee Department of Transportation Maintenance Department for Region 1 who assisted in completing the work. Private property owners were contacted and made aware of this work where possible and positive feedback was received in approval of the work. This action was taken to correct eroded areas created during a highway widening project in 1997.

The process of restoring this area to a stable site involved excavation to remove gullies and stabilize slopes for planting. Mushroom compost was applied to provide a suitable seedbed for fall and spring planted cover crops including grasses, legumes, and brassicas. All disturbed areas were covered with erosion control fabric following seeding practices.

Additionally, restoration of Section II of III began for this reporting period following a similar procedure as outlined above. Assistance was given via The University of Tennessee—Native Plants Class

**IV: Conduct Homeowner Outreach Workshops:**

Targeted workshops for the Baker Creek Watershed have been tentatively scheduled for 2020. Marketing for the workshops will be facilitated by the Watershed Association of the Tellico Reservoir (WATeR).

**V: Implement Riparian/Stormwater Practices:**

Stormwater Best Management Practices including rain gardens, grass-lined swales and pervious concrete have been planned for the campus of Carpenters Elementary and Middle Schools as part of a broader environmental education curricula. An ecological landscape plan for intensive restoration of a courtyard at Carpenters Elementary School has been developed (See Figure III). Implementation of these practices are tentatively scheduled for summer/fall 2020.



*Above: Students from the UT College of Plant Sciences Install Erosion Control Fabric*

**VIII. Grant Management:**

All aspects of grant programming are reviewed on a monthly basis by the Board of Supervisors of the Blount County Soil Conservation District as part of an adaptive management policy to ensure project integrity.

**GRANTEE:** Blount County Soil Conservation District  
**PROJECT NAME:** Pistol Creek Watershed Restoration Initiative - Phase I  
**GRANT YEAR:** FY2018  
**WEBSITE:** <https://www.blounttn.org/294/Soil-Conservation>



Project goals met during this year are described and photos of select efforts are provided. During the first year of the grant period, progress was made with respect to the following milestone: Low-Income septic assistance program, riparian restoration, urban stormwater BMPs, agricultural BMPs, homeowner outreach and workshops, and outdoor learning areas. There was no progress to report for the Hwy 321 roadside rehabilitation milestone.

The **low-income septic assistance program** was updated to reflect current low-income requirements and the collaboration with Blount County Environmental Health has been revived to facilitate septic repair or replace projects. Outreach efforts for the program through collaborators and public events have been successful. As of Sept. 30<sup>th</sup>, two applications were approved and awaiting bids for implementation and one application was under review.



*Below: Volunteers stabilizing streambanks in Springbrook Park*

**Riparian restoration** efforts included the seeding and planting of 100 ft. of streambank with native riparian plants to help stabilize a section of Springbrook Creek at a local park. Additionally, approximately 0.64 acres of forest buffer was enhanced along another 150 ft. of Springbrook Creek through removal of invasive species and nurturing of native plants to better establish a stabilizing riparian plant community. These practices will help to mitigate active erosion observed at both sites.

The first **stormwater BMPs** retrofit in the Phase 1 Pistol Creek Watershed Initiative is the construction of a large (0.25 acre) wetland at the Blount County Operations Center that will mitigate runoff from approximately 5 acres of impervious or highly disturbed land cover. This rain garden has been partially implemented as of Sept. 30<sup>th</sup>, with three of five rain garden basins excavated, two of which are planted. Project completion is anticipated in Spring 2020. Another effort includes the assessment of Eagleton Village for stormwater infrastructure

(mapping), issues (flooding/erosion), and planning (proposed BMPs). This effort is a collaboration among Blount County Soil Conservation District, Blount County stormwater, Alcoa City Stormwater, Maryville City Stormwater, Blount County Planning, and the University of Tennessee and will include the creation of a working digital model that will better identify areas of issue, target areas for urban stormwater BMPs, and will project the impacts of planned BMPs on stormwater flows.

One agricultural operator was approved and has implemented the following **agricultural BMP practices**: 1) heavy use area protection (1,312 ft<sup>2</sup>); 2) roof run-off control structure (96 ft); 3) underground outlet (162 ft); and 4) grade stabilization structure – rock seep (1 unit).

With respect to **Homeowner outreach and workshops**, several events were hosted and well attended. One of five targeted workshops was completed, covering the topic of 'Landscaping with Native Plants' (23 attendees). Three events at the Maryville Farmer's Market were attended to provide community outreach regarding the Pistol Creek Watershed initiatives (157 people directly reached). Further, an additional six education or outreach events were attended or hosted, reaching at least 351 people of all ages.

Several events and efforts contributed to the ongoing development and enhancement of the **Outdoor Learning Area** at Eagleton Middle School. These events included wetland buffer enhancement, wetland buffer protection, wetland outdoor classroom development, and a native tree planting (30 trees, 75+ students) which was implemented in collaboration with Keep Blount Beautiful.



*Above: Outreach conducted at the Maryville Farmer's Market*

**GRANTEE:** Boone Watershed Partnership  
**PROJECT NAME:** Outdoor Classroom with a Living Roof in Jacob's Nature Park at Sinking Creek  
**GRANT YEAR:** FY2017  
**WEBSITE:** <http://boonewatershed.org/>



Use of TDA grant funds has been surprisingly delayed with this project. In its TDA grant proposal, Boone Watershed Partnership envisioned a certain location within a meadow to build the Outdoor Classroom with a Living Roof in Jacob's Nature Park at Sinking Creek. The proposed structure required a natural floor and a natural roof upheld by six posts to be easily accessible from the main entrance, which appeared to be simple. BWP learned that the Johnson City Department of Development Services required a third-party general contractor to submit a building permit application and oversee construction, whose cost was not included in the original budget. The BWP Project Manager was able to find Hoilman Construction Company, who volunteered to participate as the general contractor. Since the first day of the grant contract until May, 2019, the BWP Project Manager learned that the originally intended site and two subsequently selected sites were deemed environmentally and/or economically inappropriate due to floodplain guidelines. A third site was located outside of the floodplain and accepted for a building site, so BWP purchased the building materials and coordinated with Johnson City Department of Parks & Recreation to set the pavilion pillars. In April, 2019 upon drilling the post holes, the site was determined as too wet. BWP and the City of Johnson City agreed that a site on high ground near another less-developed park entrance at the other end of the park would be the best location. Each change of site location within the park required an amended building site plan submitted by Hoilman Construction Company to the Johnson City Department of Development Services.



*Above: Initial pavilion construction at Jacob's Park.*

In July 2019, heavy equipment arrived to clear the site for developing a chat stone driveway, parking spaces, and platform for building the outdoor classroom with a living roof. The project received substantial assistance from the Johnson City Department of Public Works for this unexpected phase of the project. Maintenance staff from the Johnson City Department of Parks & Recreation quickly worked during August to set the pillars for inmates from the Tennessee Department of Corrections (TDOC) to build the pavilion structure up to the placement of the living roof. Expecting the project to be completed by October 30<sup>th</sup>, the BWP Project Manager began planning for placement of the living roof upon the structure. However, upon completion of the pillars during mid-August, the BWP Project Manager learned that the intended TDOC construction crew had just begun a six-week project. Another setback occurred during the end of September and into October with some riots that occurred at the Northeast Correctional Complex in Johnson County. Although our TDOC crew was from the TDOC Carter County Work Camp, they were also placed on lockdown through October. Finally, during the first week of November, the TDOC crew arrived and began building the structure to hold the living roof. BWP now expects to plant the living roof and landscape around the classroom in March, 2020.



*Above: Student sampling at the Red Bank Elementary.*

GRANTEE: City of Athens  
PROJECT NAME: Denso Eco Park/North Mouse Creek  
Restoration  
GRANT YEAR: FY2016  
WEBSITE: <http://www.cityofathensstn.com/trails/ecopark/>



The Denso Eco Park project is moving along. With construction of the bathroom completed, the City has been able to begin on the green parking lot. In between city projects, the City has removed the tile that was between the large pond and smaller ones downstream. The wetland plants are thriving and helping to clean the ponds.



*Top Left: Wetland plants established in the park  
Above: Constructed waterfall and streambank stabilization  
Left: Installation of the green parking lot*

The parking lot area was cut down 18". Number 3 stone was then hauled in and drainage pipe installed. As of right now the forms are being installed for curb and sidewalk. The #57 rock will be hauled in, then the #8 leveling rock installed, and then pervious pavers.

GRANTEE: Claiborne County Soil Conservation District  
PROJECT NAME: Little Sycamore Creek Watershed Restoration Initiative  
GRANT YEAR: FY2015  
WEBSITE: <https://www.tn.gov/agriculture/farms/conservation/ag-farms-sscc/ag-farms-east-soil/ag-scd-claiborne.html>



All funds on this project have been spent. Completed practices since Claiborne County SCD's last report total \$72,798.00 and consists of the following:

- 2,800 square feet of access road;
- 13,004 square feet of heavy use area protection;
- 7,542 feet of fencing;
- 9 watering facilities;
- 1 storage tank; and,
- 6,652 feet of livestock pipeline.



*Above: Examples of fencing installed in the Little Sycamore Creek watershed  
Bottom Left: Heavy use area and watering facility  
Bottom Right: Heavy use area (feeding pad)*



GRANTEE: Clinch-Powell Resource Conservation and Development Council

PROJECT NAME: Lower Clinch River Watershed Restoration

GRANT YEAR: FY2016

WEBSITE: <http://www.clinchpowell.net/>



As the Council works to close out the award, they are seeing the benefits of the project from a community standing. Landowners have bought into the idea of watershed protection, and word of mouth is now the most effective outreach tool. In the spring of 2019, east Tennessee experienced one of the worse floods in recent history, and the farms with streamside riparian areas seem to have suffered less damage than those without. This has resulted in a greater interest in streamside buffer protection. To date the Council has installed 40,000 feet of fencing to protect riparian buffers and other sensitive areas—which has been one of the most effective BMPs for the project.



*Above: Exclusion fencing and seeding at a former feeding pad site*



*Above: Exclusion fencing and riparian buffer zones*

Another favorite BMP has been concrete heavy use area pads. Since most of the nearby landowners are feeder cattle producers, the Council began to see extensive damage to gravel HUAPs installed in the past. Feeder cattle are all about eating as much as possible and the gravity feeders most landowner use were not designed to be on gravel. The result was the cattle digging into the gravel to get closer to the feed wagons and thus damaging the gravel pads. When the landowner then scraped the pad to remove manure, they would take a large amount of gravel with it. The concrete pads have eliminated this problem and become a more effective conservation tool.

**GRANTEE:** Cumberland River Compact  
**PROJECT NAME:** Bank Stabilization at Moss Wright Park & Mansker Creek Restoration Project, Phase I  
**GRANT YEAR:** FY2016  
**WEBSITE:** <http://cumberlandrivercompact.org/>



**CUMBERLAND RIVER COMPACT**  
 OUR WATER. OUR FUTURE.

The Compact is in the final stages of work on Manskers Creek. The primary and secondary bank stabilization projects are complete. Immediately downstream of the main stabilization work, the Compact engaged volunteers to reforest approximately half an acre of the park. With Moss Wright Park staff, the Compact identified locations for pet waste bag dispensers and pet waste bags. Park staff were provided with both, and are currently awaiting the Park staff to install. The City of Goodlettsville hosted annual cleanups, part of which was along several drainages and storm drains along I-65 that lead directly to Mansker Creek. The educational component of this project consisted of a pair of summer festivals and a pair of educational talks. The first festival, "Waterfest!" grew out of an existing program the Compact hosts each year in downtown Nashville. Goodlettsville Waterfests was held in Moss Wright Park, and attracted approximately 200 kids and 300+ total attendees each year. The event features 8 educational booths, and attendees were required to visit a minimum of 6 of the booths in order to gain entry into a prize drawing. Educational booths were staffed by the Compact, TDA, NOAA, TWRA, Sumner County Stormwater, and the Goodlettsville Parks and Stormwater Departments, and covered topics such as litter, aquatic macroinvertebrates, watersheds, urban runoff, headwater streams, soil health, and more. A large rain garden was approved to substitute for 10 small rain gardens. That will be constructed in December 2019 for the project close out.



Some of the lasting results of this grant funding include reduced sediment loading, enhanced riparian buffer, dog waste bags and education, and permanent educational signage installed by the streambank restoration project. Specifically, the Compact has estimated that as a result of the bank stabilization projects in Moss Wright Park, sediment loading in Mansker Creek has been reduced by 100 tons/year.



*Top Left: Tree planting with the Session Recovery Court*

*Left: Stream clean-up volunteers*



*Right: Manskers Creek project signage in Moss Wright Park*



GRANTEE: Cumberland River Compact  
PROJECT NAME: Bank Stabilization at Moss Wright  
Park & Mansker Creek Restoration  
Project, Phase II  
GRANT YEAR: FY2018  
WEBSITE: <http://cumberlandrivercompact.org/>



**CUMBERLAND  
RIVER COMPACT**  
OUR WATER. OUR FUTURE.

The Compact began Phase 2 of our Mansker Creek Restoration project this year. Permitting for the engineered bank stabilization began was submitted to TDEC and the USACE. Unlike the bank stabilization project for Phase I, the Compact submitted an archeological survey early on. This requirement delayed the restoration such that the commencement of work was going to conflict with Moss Wright Park events. So, the restoration will begin in the fall of 2020. The Compact started a smaller, 500-foot bank stabilization using volunteer labor, Tennessee Environmental Council technical assistance, and Americorps volunteers. This progress on this milestone is going very well, and nearing completion.



*Above: Streambank stabilization project in progress*



*Above: Streambank during stabilization activities*



*Above: Streambank prior to stabilization in Mansker Creek*

GRANTEE: Cumberland River Compact  
 PROJECT NAME: Sustainable Farming Education  
 for the Cumberland River Basin  
 GRANT YEAR: FY2015  
 WEBSITE: <http://cumberlandrivercompact.org/>



This project was critical to helping the Cumberland River Compact expand its mission further into rural areas of the Cumberland River Basin that have been historically difficult for the Compact to reach. It is believed that this is largely due to the great partnerships that the Compact was able to establish through this project funding, and through those partnerships, a greater opportunity to serve as a nonprofit partner to advance agricultural conservation practices. As a result of this funding, the Cumberland River Compact is now invited to stakeholder meetings, the State Technical Advisory Committee Meetings, and other unique opportunities to partner with Soil Conservation Districts (SCDs) and Natural Resources Conservation Service (NRCS). The Compact also received the Tennessee Association of Conservation Districts—Conservation Partner of the Year award!



Above: Example of exclusion fencing



Above: Cross fence and alternative watering facility

As a result of outreach efforts over the life of this project, the Compact now feels they have a strong foundation and support for the development of a River Friendly Farms certification program. Feedback from the farmer survey, as well as feedback from their partners, has been overwhelmingly positive; and, the Compact feels they can see the potential for a market-based incentive program that promotes farmers employing best management practices (BMPs) on their farms. The Compact is currently seeking funding to develop this program.



Above: River Friendly Farm brochure

The momentum gained from this project has offered exciting opportunities moving forward to take all that they have learned and, with the help of partners, develop it into a unique program that the Compact envisions will serve growers in a positive way and continue to encourage the adoption of BMPs. The Cumberland River Compact looks forward to seeing more research unfold about

the economic and environmental benefits of these practices so that they may have a better understanding of the potential impact for this program.

GRANTEE: Giles County Soil Conservation District  
PROJECT NAME: Richland Creek—Blue Creek-  
Watershed Project  
GRANT YEAR: FY2016  
WEBSITE: <http://www.gcscd.com/>



The initial objective of the Richland Creek—Blue Creek Watershed project was to have it removed from the 303(d) impaired list by educating landowners regarding water quality and its environmental effects in their watershed. Employees from the Giles County SCD met with clients in the project area promoting Best Management Practices (BMPs) that were to be funded through the Section 319 Grant. Those practices included filter strips, field borders, forested riparian buffers, fencing, pipeline, watering facilities, heavy use area, stream crossing, spring development, clearing and snagging, forage and biomass planting, and cover crop. It was explained that upon contract approval these practices would be cost shared at 75%.

From October 2018 to June 2019, the District worked with two landowners on completing BMPs and receiving cost share. The results of all completed practices were:

- 8,467 feet of cross fencing;
- 1,120 square feet of heavy use area;
- 1,876 feet of pipeline; and,
- Two watering facilities.



*Above: Heavy use area, alternative watering facility and cross fencing for rotational grazing*



*Above: Cross fencing for a rotational grazing system*

GRANTEE: Hamblen County Soil Conservation District  
PROJECT NAME: Nolichucky Sediment Reduction Project  
GRANT YEAR: FY2016  
WEBSITE: <https://www.tn.gov/agriculture/article/ag-scd-hamblen>



East Tennessee experienced quite a wet fall and winter as the District began the second year of the Nolichucky Sediment Reduction Project. The heavy rainfall and high runoff caused quite a bit of sediment. Because TVA has no ability to manipulate reservoir water levels upstream of the dam, there is virtually no downstream flood control effecting the designated uses of downstream water, including domestic water supply, industrial water supply, fish and aquatic life, recreation, livestock water and irrigation, reaching the HUC sections of the Nolichucky River, which are meeting their designated uses in TDEC's 2018 final *List of Impaired Waters*.



*Above: Nolichucky River flooding, Spring 2019*

Multiple cooperating counties within the project held a very successful specialty crop meeting held in Washington County in February, 2019. Special guest speaker and cover crop coach, Steve Groff, presented information to stakeholders about the effectiveness of cover cropping methods to improve soil health. The conference hosted over 60 landowners across multiple counties and focused on current technologies critical in managing soil loss, understanding ground cover and living roots in the soil to maximize ecological benefits, and treating your cover crops like cash crops. Steve's approach to "knowing your cover crop", has significant down stream effects on soil. Additional speakers for this conference included Karen Hammitt, and University of Tennessee Vegetable Extension Specialist, Annette Wszelaki, Ph.D.; evaluated the cost and benefits of weed control and pest management for cover crops.

*Below: Specialty crop seminar held in Washington County, Winter 2019*



GRANTEE: Harpeth Conservancy  
PROJECT NAME: Harpeth River Headwaters Restoration  
Project—Phase IV  
GRANT YEAR: FY2017  
WEBSITE: <http://www.harpethconservancy.org/>



The Harpeth Conservancy is working to implement agricultural and stormwater best management practices in the headwaters of the Harpeth River watershed, specifically Kelley Creek and Cheatham Branch located in the city of Eagleville. The headwaters are listed on the *List of Impaired Waters* for loss of biological integrity due to siltation and low dissolved oxygen due to organic enrichment. To mitigate these impairments, the Conservancy is pursuing projects such as stream buffer reforestation, stream bank stabilization, green infrastructure, rain gardens, and channel detention basins. The Conservancy is currently working with Hellyn Riggins (city administrator of Eagleville) and Will Owen (P.E. at Griggs & Maloney, Inc. and project engineer for the city of Eagleville) to identify and design storm water best management projects in downtown Eagleville.



*Above: Location of potential stormwater project on Cheatham Branch in Eagleville, Tennessee*

Harpeth Conservancy is still in the planning phase of this project due in part to staff turnover. The Watershed Science and Restoration Director that was previously the project leader in 2018 found another job and without a project leader the nonpoint source program was left unmanaged. The new Watershed Science and Restoration Director didn't start until spring 2019, and it has taken several months to catch up on the project and start project planning once again. Eagleville is receptive to storm water best management projects, and it is anticipated that designs will be finalized within the next couple months as talks between the Conservancy and Eagleville continue.



*Left: View of downtown Eagleville*

GRANTEE: Knox County  
 PROJECT NAME: Roseberry Creek Watershed Initiative  
 GRANT YEAR: FY2016  
 WEBSITE: <http://www.knoxcounty.org/>



**Education/Outreach** – Knox County focused last fiscal year on continuing to advertise and educate the citizens on the grant opportunities available:

- Targeted agricultural brochure mailings with farmer testimonial was mailed to about 700 households;
- Roseberry Creek Grant was advertised in the Shopper News, weekly, from March to May 2019;
- Posted flyers throughout watershed with grant information;
- Mailed 125 more septic postcards to targeted areas;
- Ten social media posts;
- Washington Presbyterian Apple Festival Roseberry Creek booth – October 20, 2019; and,
- Grant article in the Compass online newspaper – October 26, 2019

Also, Knox County met with East Knox Elementary several times to plan on how to re-establish their outdoor classroom with water quality buffers, etc. to protect the stream on the property and enhance the educational opportunities for the school. A workday is planned next quarter. A total of four septic repairs and two sewer connections were completed, with an additional three septic repairs and two agricultural projects currently in progress.



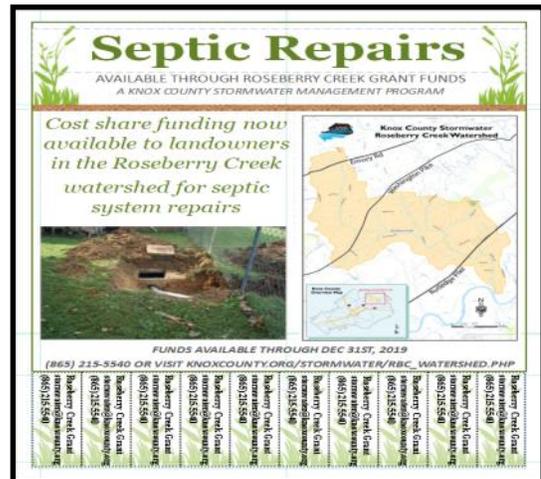
Above: Informational booth at the Apple Festival



Above: East Knox County Elementary Outdoor Classroom



Above: Agricultural project advertisement



Above: Septic repair flyer

GRANTEE: Knox County  
PROJECT NAME: Stock Creek Initiative—Phase II  
GRANT YEAR: FY2018  
WEBSITE: <http://www.knoxcounty.org/>



The first 9 months of the Stock Creek Initiative – Phase II have been productive. Ten failed septic systems have been repaired, with another four in process. The Soil Conservation District is in conversation with several farmers in the watershed who are considering having agricultural practices installed on their properties.

Three educational events have been held in the watershed this year. In May, the Initiative had a booth at Bonny Kate Fun Night, an Elementary School fundraiser that draws approximately 1,000 Stock Creek residents. Two events were held in September. A Farmer's Breakfast drew 31 people and the Initiative interfaced with 60 residents at a booth at John Sevier Day, a period celebration at Marble Springs, home of Governor John Sevier.



*Left: Informational booth at John Sevier Day*

*Below: Informational booth at Bonny Kate Fun Night*



*Above: Informational Farmer's Breakfast*

*Right: Speaker and cooperater at Farmer's Breakfast*



**GRANTEE:** Knox County Soil Conservation District  
**PROJECT NAME:** Flat Creek Watershed Restoration Plan  
**GRANT YEAR:** FY2015  
**WEBSITE:** <http://www.knoxcounty.org/epw/soilconservation.php>



The Knox County Soil Conservation District (SCD) held a farm tour/field day called the Grazing School at Mike Roth's farm in the Flat Creek watershed. The farm had a project funded through the Flat Creek Section 319 grant, and a project funded through NRCS (Natural Resources Conservation Service) EQIP (Environmental Quality Incentives Program). The Grazing School was conducted by the Knox County field office staff and Tennessee Association of Conservation Districts (TACD) grazing specialist Greg Brann. Grazing best management practices were demonstrated and the use of 319 funding to achieve producer and resource management goals were discussed. The school was attended by 34 producers/grazing managers. The use of temporary electric fencing was demonstrated as a cost-effective way to manage pastures and improve grass stands, infiltration and grazing efficiency. Assistance was provided by NRCS, TACD, Knox County, TDA, and AmeriCorps. As an additional outreach measure the Knox SCD with assistance from their AmeriCorps member conducted an interview with livestock producer and cooperater Bill Benziger. The interview was turned into a brochure, and through a collaboration with Knox County Stormwater it was sent to Flat Creek and Roseberry Creek landowners. Information about available programs, grant funding, and assistance was included in the tri-fold brochure.

In FY19 Knox SCD distributed \$35,180.31 to six agricultural projects, and \$3,238.00 to a septic system repair project. The agricultural projects included: 2,605 feet of exclusion fence, 1,608 feet of cross fence, 7,880 feet of polywire cross fence, 3,014 feet of pipeline, one heavy use area, and one rural water connection (meter). All agricultural practices gave producers the tools to better manage pasture, and reduce nutrient and pathogen linden runoff. Three of the projects directly excluded livestock from surface water sources. Education to the six agricultural funding recipients was provided to give them the knowledge they needed to manage pastures in a way that has less impact on surface water quality. Furthermore, the District continued to work with landowners who have been funded in previous years on improving their grazing management, and thus reducing their negative impact on water quality.



*Left: Septic system repairs in progress*



*Right: Heavy use area and alternative watering system*

*Below: Grazing school held in Knox County*



GRANTEE: Lauderdale County Soil Conservation District  
PROJECT NAME: Cold Creek Restoration, Phase II  
GRANT YEAR: FY2017  
WEBSITE: <https://www.facebook.com/lauderdaleacd/>



This year (2019) has been a year of struggle in Lauderdale County. A very wet, rainy fall and winter and extended, prolific back-water flooding has made harvesting, planting, and structure work extremely difficult for our local producers. Nevertheless, work, although slow proceeded.

In January, cultural resource work was done on multiple contracts. In May, construction work began on two contracts. Field staff worked on site visits, surveying, and evaluating construction. June saw new interest from producers and new applications. In September, administrative staff sent out letters to current and prospective applicants to assure interest was still there and check project progress. Although this year has not been ideal for producers and field staff alike, the District is pleased with everyone's perseverance and progress considering the circumstances.



*Left: Heavy use area protection (feeding pad) under construction*



*Right: Initial dam construction*

**GRANTEE:** Morgan County Soil Conservation District (SCD)  
**PROJECT NAME:** Crooked Fork Restoration Project  
**GRANT YEAR:** FY2013  
**WEBSITE:** <https://www.tn.gov/agriculture/article/ag-scd-morgan>



During the period of October 1, 2018 to September 30, 2019, there were septic practices completed impacting 13.09 acres. The total cost share for the 12 septic repairs was \$43,404.00. The District had a total of four seeding practices completed impacting 93.5 acres, for a total cost share of \$11,776.00. A total of \$10,692.00 was requested for the administrative work for the grant completed by the District Secretary. This leaves a remaining balance of \$87,531.09 of the original \$224,000.00 Grant ending July 31, 2020. Presently, the District has 12 applications for septic repair/replacement and 3 applications for pasture/hay land seeding.

The Morgan County Soil Conservation District has been committed to reaching out to the communities within the Crooked Fork Creek Watershed to educate on resources available. Education on water resource conservation and information on the 319 Grant has been made available through posters, flyers, news articles and advertisements, an outdoor show. About 4,000 people attended the Outdoor Show and brochures with grant information was handed out. The District has an Awards Picnic every year where educational information is delivered to landowners. The District and Earth Team Volunteers do a lot of outreach with the students throughout the county including Farm Day, Kindergarten Day, Ag in the Classroom, poster contest, etc. The Soil Conservation District really appreciates the work completed in Morgan County from this project and the support from TDA.



*Right: Turtle Man at the Morgan County Soil Conservation District Soil Train*

*Bottom: Section 319 Grant information presented at the 2018 Awards Banquet*



GRANTEE: Obed Watershed Community Association  
PROJECT NAME: Crossville Headwaters Restoration  
Project, Phase IV  
GRANT YEAR: FY2016  
WEBSITE: <http://www.obedwatershed.org/>



This year was spent primarily between projects. The Association began the year with planting on the Polebridge project, which had been completed in August and September of 2018. It was inspected in January of 2019, and has been performing well, despite the torrential rains of the winter of 2019. The next six months was spent finding and designing two projects to be completed in the fall of 2019 – one on the Little Obed (over 3,000 feet of stream) and the other on the North Branch of Lick Creek (over 2,000 feet of stream) . These projects were approved in August, but permits were not received until late September and early October. While work began on the Little Obed, removing invasives and debris dams prior to the receipt of environmental permits, only one day of work installing structures occurred before the end of September.



*Above: Examining bank erosion at Lick Creek*



*Above: Installation of cedar revetments in the Little Obed River*

These two projects will be the final projects under this contract, and the construction work is expected to be completed by December, followed by planting. Inspections will follow and final invoices will be submitted shortly after.



*Above: Identifying restoration sites on the Little Obed River*



*Above: Headcutting along North Branch Lick Creek*

**GRANTEE:** Southeast Tennessee Resource Conservation & Development Council

**PROJECT NAME:** Conasauga River Pathogen TMDL Implementation Phase 2

**GRANT YEAR:** FY2017

**WEBSITE:** <http://setnrcd.org/>



The Southeast Tennessee Resource Conservation & Development Council is roughly halfway through the Conasauga River Pathogen TMDL Implementation Phase Two Section 319 program and are seeing some amazing results. Already, the Council has completed their expected amount of septic system repairs and are making progress on the agriculture portion with participants who are currently planning their projects.

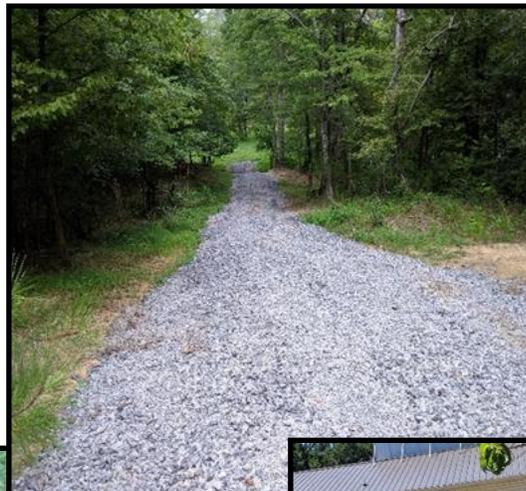
This past year, the Council has seen a change of guard with Alex Ward being replaced with Mark Dillard as Bradley County's Groundwater specialist, he has carried the torch and has been doing a fantastic job not only in the permitting process but also helping get the word out on the grants. Additionally, the Council staff has become more familiar with septic contractors in the area who act as their eyes and ears in parts of the community that they can't reach. With that being said, the Council expected to have 20 septic system jobs done in a three year time frame – in a year and half they have completed 28.

On the agriculture end of things the future is looking bright. The past three years this region has seen the driest year in half a century and the wettest year on record, and with that a lot of the fields have taken a heavy toll in terms of sediment loss. Right now the Council is looking at a number of seeding jobs to help with that problem, as well as the typical agriculture practices completed in the past.

Looking forward, the Council hopes to have all of planned jobs completed for this grant contract done within the next six months, and going above and beyond the grant's requirements.



*Above: Failing septic tank (uncovered)*



*Above: Completed access road*



*Right: Failing septic system*



*Right: Failing septic system repair in-progress*

**GRANTEE:** Southeast Tennessee Resource Conservation & Development Council  
**PROJECT NAME:** Conasauga River Pathogen TMDL Implementation Phase 2  
**GRANT YEAR:** FY2017  
**WEBSITE:** <http://setnrcd.org/>



The Southeast Tennessee Resource Conservation & Development Council is almost a year into the Hiwassee River Phase One Section 319 grant, and are starting to make progress both on septic system repairs and agriculture best management practices. The Council is slowly being recognized throughout the community, and with time has been educating the septic contractors on the expanded area.

Mark Dillard has done a fine job in the past few months as the new permitting officer for Bradley County, with his help the Council has been reaching out to individuals who have some of the worst septic system failures that were identified. Reception to the area has overall been warm, and the Council intends to do more door-to-doors in the fall months in order to get the word out about the grant.



*Above Stormwater control project at Charleston Elementary School*

On the agriculture end of things, the Council is seeing the start of suc-

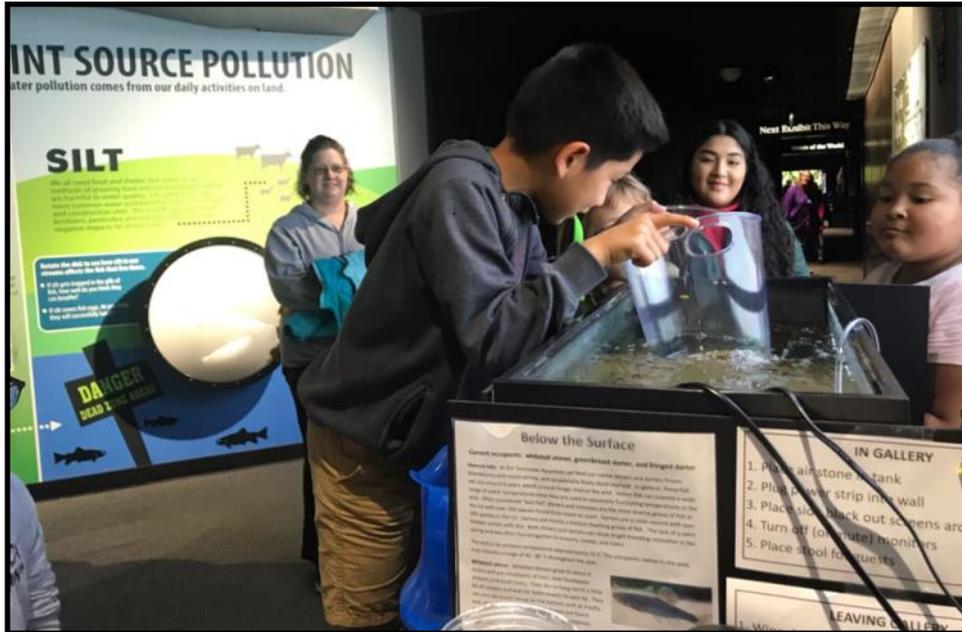


*Above: Installation of an access road in progress in the Hiwassee River watershed*

cess, but more work needs to be done. The community in this area for agriculture is different than what staff usually works with, with a small amount of individuals owning large portions of land – just under different business entities and names. With that being said, it is believed the Council can still accomplish their goals.

The Council is looking to make a big push in the coming fall and winter to get the program more recognition. As of now, progress looks to be going towards completing their goals, but just at a slower pace compared to the other grant programs.

**GRANTEE:** Tennessee Aquarium Conservation Institute  
**PROJECT NAME:** Watershed Wisdom: A Stormwater Mitigation and Best Practice Demonstration Site at the Tennessee Aquarium Conservation Institute  
**GRANT YEAR:** FY2016  
**WEBSITE:** <http://www.tnaqua.org/protect-freshwater>



### Objectives

1. Decrease non-point source pollution and improve quality of remaining water flowing into the Tennessee River.
2. Increase the quantity and quality of wetlands capable of supporting native wildlife.
3. Minimize impacts of human development and use of municipal water supply.
4. Increase public awareness of point and nonpoint pollution sources, watershed management challenges and solutions that can be implemented community-wide.

*Above: A young visitor enjoys an exhibit at the new educational program*

### Activities supporting Objectives 1, 2, and 3

For this year of activity, the staff continued to remove non-native and invasive species from the meadow at the Tennessee Aquarium Conservation Institute, as well as plant more native species. During the flooding of February 2019, the increased wetlands helped to mitigate the impact of flood waters in and around the Conservation Institute. For the Activity Focused on Interpretation, staff continued tours of the Conservation Institute as a demonstration site for human development and the impact on non-point source pollution. These tours included audiences of Aquarium members, school groups, scientists, developers, and water quality managers.

### Activities supporting Objective 4

At the Conservation Institute facility, along with tours, staff continues to provide in-depth training and professional learning to groups of all kinds. For example, the ongoing River Teachers week-long summer program takes advantage of the facility to learn about topics such as non-point source pollution and how to teach these topics in the classroom. In the two years since opening, the Tiny, But Mighty Important exhibit in the Aquarium's River Journey building has welcomed more than 1,300,000 guests. This exhibit is a refresh of the former Barrens Topminnow Lab, opening up the space for guests to learn about both the Barrens Topminnow project at the Aquarium and the causes and effects of nonpoint source pollution, specifically siltation in streams. Additionally, the Education Team has created a new program, "Below the Surface," specifically designed to be held in the space that connects guests to nature and gives them another way to see how important clean water is to our native animals. We are excited about this new program, especially as, along with the refreshed exhibit, it will last a number of years past this grant program.

**GRANTEE:** Tennessee Environmental Council  
**PROJECT NAME:** Lytle Creek Restoration, Phase I  
**GRANT YEAR:** FY2015  
**WEBSITE:** <https://www.tectn.org/>



From 2016-2019, the Tennessee Environmental Council completed approximately 3,322 linear feet of stream bank restoration along Lytle Creek and concluded the project contract in July 2019. In 2019, the Council focused primarily on bank stabilization and riparian restoration. Working with partners across the Middle Tennessee region, the Council completed approximately 500 feet of cedar revetment stabilization and over 2,000 feet of riparian planting at 10-25 foot buffer zones. Restoration focused on private property near the Lytle Creek headwaters in south Murfreesboro utilized

Community outreach and education played an important role in the final stages of Phase I implementation. In March, the Council participated in a public meeting about Lytle Creek at the Patterson Community Center in Murfreesboro with representatives from Middle Tennessee State University (MTSU), Murfreesboro Stormwater, and Cumberland River Compact (CRC). In June, the Council hosted a hands-on, in-the-creek training session on how to install cedar revetments with volunteers and members of MTSU and CRC. In July, the Council hosted a "Friends of Lytle Creek Community Event" celebrating accomplishments, teaching about restoration and how they can participate, and lending an ear to community concerns from landowners and business owners who hope for a long term solution to Lytle Creek impairment. The Council also completed an educational video about the Lytle Creek Restoration Project, interviewing 319 representatives, a landowner whose property the Council worked on, and stormwater representatives -- highlighting the work, the attributes of Lytle Creek, and about the 319 program. Throughout all these accomplishments, two interns from MTSU geology and biology department gained knowledge and first hand experience about best management techniques and assisted in restoration implementation.



*Above: Cedar revetment installation workshop in June, 2019*

*Above (both): Volunteers plant trees along Lytle Creek in March, 2019*

GRANTEE: Tennessee Environmental Council  
 PROJECT NAME: Rutherford Creek Restoration,  
 Phase IV  
 GRANT YEAR: FY2018  
 WEBSITE: <https://www.tectn.org/>



In 2019, the Tennessee Environmental Council is in the process of assessing, planning, gathering permissions, and building a volunteer base for restoration activities. Approximately 350 feet of stream bank has been identified in Grassy Branch Creek, a tributary to Rutherford Creek, near the Wyngate Estates subdivision in Spring Hill. These areas have been surveyed with landowner approval as well as viewed and approved by 319 grant administrators for riparian planting and bank stabilization utilizing cedar revetments. Additional areas are being reviewed downstream of these sites.

Highlights of 2019 include a "Friends of Grassy Branch" community event and community group formation, permit approval, and development of relations with City of Spring Hill municipality for potential labor match. On September 27th, over 25 members of the community came together to learn about the Section 319 Grant project and how they could get involved in future work objectives, ultimately forming a friends group through social media and newsletters, with support from the Wyngate Estates Home Owners Association, that will be a primary base for in-kind match and educational campaigns throughout the next two years of the projects implementation.



*Above: Riparian vegetation planted during a previous phase—still wearing protective guard*



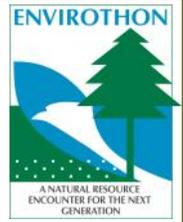
*Above and Below: Sites identified for bank stabilization*

Throughout September and October, meetings with City of Spring Hill were held and in-kind match for machinery use in bank stabilization is being considered. The Aquatic Resources Alterations Permit (ARAP) has been approved within the Rutherford Creek Watershed. With these main highlights, and ongoing meetings to determine efficient and effective methods for implementing practices, the Rutherford Creek Phase IV Project timeline is set to begin bank stabilization in 2020.

*Below: Informational booth at a Spring Hill Community Meeting*



GRANTEE: Tennessee Resource Conservation and Development Council  
PROJECT NAME: Envirothon  
GRANT YEAR: FY2018  
WEBSITE: <http://www.tnrcd.org/index.php/envirothon-home>



This year's competitions involved 102 (111 total) teams and over 800 students, coaches, and volunteers assisting in 10 separate contests. Our teams and volunteer numbers remained the same as the previous year. Regional Contests are sponsored by individual local/regional Tennessee Resource Conservation and Development (RC&D) Councils with the Tennessee Envirothon Program sponsored by the TN RC&D Council, Inc. Teams without TN RC&D Council representation are allowed to compete in the Envirothon contests closest to them. This year continued the practice of Area Contests hosted by local Soil Conservation Districts. The Tennessee Association of Conservation Districts (TACD) sponsors those teams without Council representation. Those teams without Council representation completed for one state-wide slot in an 'At-Large' category. The generosity of our partnership allowed for an additional high scoring 'Wild Card' team to attend the State TN Envirothon competition for a total of 9 teams competing at the State Tennessee Envirothon.

The winning team this year was the team from Clinton High School, in Anderson County, representing the Cumberland Mountain RC&D Council. They will be advancing in July to the National Contest being held at North Carolina State University. Placing Second was David Crockett High School, from Appalachian RC&D Council, with Morgan County FFA from Cumberland Mountain RC&D Council placing Third.

The \$20,000 in grant funding allowed provision for nine TN Envirothon competitions - eight Area or Regional contests and the final State Envirothon contest funded from site selection, logistical assistance, meal provision, award recognition, and program management. Environmental education and conservation stewardship values instilled with this next generation of Tennessean students through the TN Envirothon will remain throughout their lifetimes.



*Above: First Place Team from Clinton High School*



*Above: Second Place Team from David Crockett High School*



*Above: Third Place Team From Morgan County FFA*

GRANTEE: The University of Tennessee Extension  
 PROJECT NAME: Welcome Wagon  
 GRANT YEAR: FY2015  
 WEBSITE: <http://www.tnforestry.com/>



During October 2018, the final "Welcome to Your Woods" mailing was conducted. The correspondence targeted landowners whom had purchased forested properties during 2018. The final mailing reached 676 new forest landowners.

The implementation team consisting of representatives from the Tennessee Division of Forestry and the Tennessee Forestry Association met to evaluate the material that was being sent and to continue progress. The mailed material consisted of:



## HELPFUL FORESTRY EDUCATION SITES

ALL SITES CAN BE ACCESSED HERE:  
[www.tnforestry.com/welcometoyourwoods](http://www.tnforestry.com/welcometoyourwoods)

<p style="text-align: center;"><b>Tennessee Division of Forestry</b></p>  <p style="text-align: center;"><a href="http://goo.gl/hE7i7U">http://goo.gl/hE7i7U</a></p> <hr/>  <p style="text-align: center;"><a href="http://PlantTNTrees.org">http://PlantTNTrees.org</a> (tree seedlings)</p>	<p style="text-align: center;"><b>Tennessee Forestry Association</b>  <i>"The voice of forestry in Tennessee"</i></p>  <p style="text-align: center;"><a href="http://www.tnforestry.com/">http://www.tnforestry.com/</a></p>
<p style="text-align: center;"><b>University of Tennessee Extension Forestry Publications</b></p>  <p style="text-align: center;"><a href="http://tinyurl.com/je2k7nu">http://tinyurl.com/je2k7nu</a></p>	<p style="text-align: center;"><b>American Tree Farm System</b></p>  <p style="text-align: center;"><a href="https://www.treefarmssystem.org/">https://www.treefarmssystem.org/</a></p>
<p style="text-align: center;"><b>Log-on before you Log</b></p>  <p style="text-align: center;"><a href="http://www.tnforestry.com/Log-on_before_You_Log/">www.tnforestry.com/Log-on_before_You_Log/</a></p> <p style="text-align: center;"><a href="http://www.tnforestry.com/Log-On Before You Log/">http://www.tnforestry.com/Log-On Before You Log/</a></p>	 <p style="text-align: center;"><a href="http://ProtectTNForests.org">http://ProtectTNForests.org</a></p>
 <p style="text-align: center;"><a href="http://BurnSafeTN.org">http://BurnSafeTN.org</a></p>	

- Cover letter signed by the State Forester, the Head of the University of Tennessee Department of Forestry, Wildlife and Fisheries, and the Executive Director of the Tennessee Forestry Association,
- Forest\*A\*Syst and Marketing Timber in Tennessee publications,
- Summary sheet with links to helpful forestry websites,
- Tennessee Division of Forestry core business brochure,
- Information on forest pests and the Tennessee State Nursery, and,
- An invitation to join both the Tennessee Forestry Association and County Forestry Associations.

Landowners were exposed to best management practices and water quality issues via the publications and through contacting the professional foresters that are referenced in the mailing material. The cover letter provided to the recipients recognized the Nonpoint Source Program as the funding partner.

*Left: Example of information provided through Welcome Wagon*

GRANTEE: The University of Tennessee—  
Knoxville

PROJECT NAME: Getting the Job Done Right:  
Contractor Training for Small-  
Scale Water Quality Protection  
Solutions

GRANT YEAR: FY2017

WEBSITE: <https://www.utk.edu/>



The goal of this project is to develop and implement educational resources for the landscaping industry focused on water-sensitive residential practices, specifically rain gardens, water gardens (wetlands), and riparian buffers/streambank stabilization. The grant activities include conducting six workshops (three design and three maintenance focuses), building three new projects, and partnering with community partners on three additional projects. In project year one, faculty partnered with the City of Gallatin, Knox County Stormwater, and the University of Tennessee (UT) Facility Services to build four rain garden and conduct associated educational sessions for targeted audiences identified by partners. In this project year two, UT completed two maintenance workshops, completed one new project – a pocket wetland enhancement, and began work on a second new project – a combination rain garden and micro wetland pond. Synergistic activities in project year two included presenting a technical poster at the Annual Meeting of the American Ecological Engineering Society conference in Asheville, North Carolina; conducting a rain garden workshop for homeowners in Blount County, including working with the local Soil Conservation Service to install a demonstration rain garden; building a residential pocket wetland; and building a community rain garden in a mixed income level neighborhood in East Knoxville along with planning for 10 residential micro-rain gardens in the same neighborhood. No Section 319 Grant dollars were used in these synergistic activities, but the experiences and photographs/videos captured during these activities will help populate workshop and educational materials used in future workshops completed for this grant.



*Above: University of Tennessee students assist with two micro-wetland ponds at Dogwood Elementary School*

The maintenance workshops were held at two existing project sites, the first at a Knox County park rain garden in the Lakemoor Hills neighborhood (12 attendees), and the second on the grounds of the Tennessee Aquarium Conservation Institute (22 attendees). Both workshops focused on understanding rain garden design and function in order to inform maintenance activities as well as care and long-term management of native plant communities. The pocket wetland enhancement is located at Bobby Ray Elementary School in McMinnville. Here, UT faculty worked with the City of McMinnville Public Works Department to identify the space, agree on an excavation and planting plan, and revise



*Left: Warren County High School students plant wetland plants.*

maintenance activities to align with native plant establishment. The City provided in-kind support with excavation of a deep pool feature, and Warren County High School students planted native wetland plants. The combination rain garden/micro wetland project is located at Dogwood Elementary School in South Knoxville. Dogwood Elementary School is a Title I school and is committed to experiential learning through outdoor classrooms. The construction is being conducted with volunteers and documented for a future workshop to be held on site in Spring 2020. Additional 2020 plans include building a rain garden in Liberty Park in Jackson, Tennessee, as well as conducting four workshops in order to complete grant deliverables.

**GRANTEE:** WaterWays! (formerly TenneSEA and Caribbean SEA)  
**PROJECT NAME:** Reducing Non-point Source Pollution in Mountain Creek Watershed Phase 2  
**GRANT YEAR:** FY2017  
**WEBSITE:** <https://www.caribbean-sea.org/>



The 2018-2019 fiscal year has been very productive! WaterWays! staff continued outreach and education programs, both with young people at schools in the watershed, as well as community groups. WaterWays! held two “Creek Days” which included do-it-yourself make it, take it rain barrel workshops and education about the homeowner award program, and why the creek is important. The first program was at Mountain Creek Church of Christ. The project now has an initial landscape architect design for a flood plain restoration and stream bank stabilization at their church. The next step is to present the initial design to the church elders for approval. In addition, their church youth group is adopting the creek along the church property!

In addition, much discussion and planning has happened with several big landowners. The first important stream restoration and conservation easement in conjunction with the City of Chattanooga is with the Spring Valley Neighborhood Association and some private landowners. The second community Creek Day was in Spring Valley neighborhood and that provided a relaxed way to discuss possibilities for protecting the creek in their neighborhood. The survey has just been completed and work should begin on this project within the next month. WaterWays! has two additional landowners along the creek who have asked for assistance installing native plant riparian buffers on their property. It is a busy season!



*Far Left: WaterWays! providing instruction for making a rain barrel*



*Left: Examining erosion at Spring Valley Branch*

*Below: Students examining aquatic life in the creek*

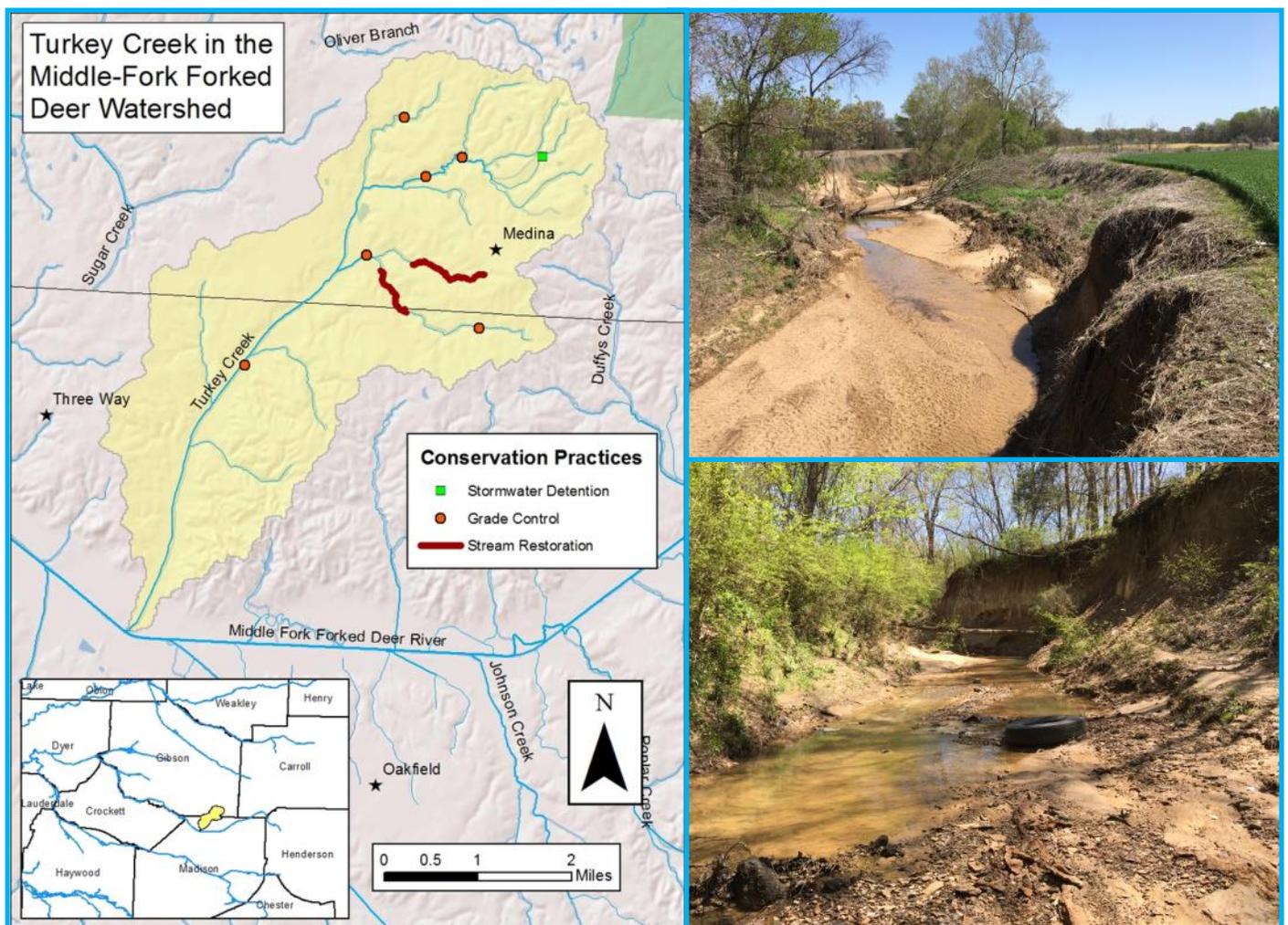


GRANTEE: West Tennessee River Basin Authority  
 PROJECT NAME: Improving biological integrity and physical habitat of Turkey Creek by reducing sediment pollution  
 GRANT YEAR: FY2017  
 WEBSITE: <https://www.tn.gov/environment/about-tdec/boards-and-commissions/board-west-tennessee-river-basin-authority.html>



The first phase of this project was to identify acute threats that are contributing large amounts of sediment to the watershed. After reconnaissance and stream elevation surveys, two sites have been selected to receive grade control structures in 2019. These Grade-control structures will arrest the headcuts and prevent further bank degradation and sedimentation of downstream waterways.

Currently, easements are being obtained from landowners at the proposed site locations. After easements are obtained, final engineering design will be completed and construction will commence, weather pending. Monitoring will commence on these two sites once construction is complete.



Above: Map showing the location of stream restoration activities along Turkey Creek.

Above (both): Examples of streambank erosion near along Turkey Creek near Medina, Tennessee.

# APPENDIX A

## LONG TERM GOALS— CURRENT PROGRESS SUMMARY

## LONG TERM GOALS - CURRENT PROGRESS SUMMARY

### Introduction

The table below summarizes the long term goals set for the Tennessee Nonpoint Source Program (TN-NPS). The table was adapted from the *Tennessee Department of Agriculture Nonpoint Source Program Management Document* as approved by the U.S. Environmental Protection Agency (EPA) in 2014. The intent of the table below is to be evaluated and populated annually during the preparation of the Annual Report, in order to determine if the long term goals set forth in 2014 are on-track to be completed by the end of the 5-year Planning Period. The overall progress of the program, as well as the sector-specific goals, will be monitored; and, management of the program and/or specific sectors will be adapted as needed if adequate progress is not being made. The annual evaluation will assist with making necessary changes to the program as soon as issues are identified, as opposed to only discovering challenges towards the end of the Planning Period (when too little time remains to correct the program's path). The progress for each aggregate and sector-specific goal is provided as:

- **On track to achieve outcomes** - adequate progress has been made towards the long term goal such that there is a high likelihood of being reached by the end of the Planning Period.
- **Exceeded expectations** - exceptional progress has been made towards reaching the long term goal such that there is a high likelihood of being reached prior ahead of schedule.
- **Insufficient progress** - the pace of output achieved must improve in order to ensure that the long term goal can be reached by the end of the 5-year Planning Period.

While many of the annual goals are quantitative in nature, the outcomes are somewhat qualitative. TN-NPS staff used their best judgment while populating the table in order to gauge the overall progress of the program. Additional, detailed information about the Measures of Success used (in part) to determine the annual progress of the long term goals can be found on the Measures of Success Checklists in Appendix B.

LONG TERM GOALS, ANNUAL GOALS, and OUTCOMES								
Long Term Goal (5 year)	Sector	Annual Goals (outputs; Annual Goal x 5 = Long Term Goal measure)	Outcomes	Progress Made in Year 1 (FFY2015)	Progress Made in Year 2 (FFY2016)	Progress Made in Year 3 (FFY2017)	Progress Made in Year 4 (FFY2018)	Progress Made in Year 5 (FFY2019)
Long Term Goal No. 1: Restore impaired water bodies (i.e., those on the 303(d) list) by implementing best management practices (BMPs) that address nonpoint source pollution.	Aggregate	<ul style="list-style-type: none"> <li>• Restore 2 water bodies per year, on average.</li> <li>• Reduce N load by 5,000 lbs/year; P<sub>2</sub>O<sub>5</sub> load by 5,000 lbs/year; and sediment load by 100 ton/year (minimum reductions)</li> </ul>	<ul style="list-style-type: none"> <li>• Improve water quality by reducing water quality impacts from nonpoint sources.</li> </ul>	<b>Exceeded expectations.</b> <i>Modeled load reductions exceeded annual goals.</i>	<b>Exceeded expectations.</b> <i>Load reductions exceeded goals; two Success Stories accepted.</i>	<b>On track to achieve outcomes.</b> <i>Estimated load reductions exceeded the stated goals. One Success Story for FFY2017; however, two draft stories have been submitted for FFY2018.</i>	<b>Exceeded expectations.</b> <i>Load reductions exceeded goals; three Success Stories accepted.</i>	<b>Exceeded expectations.</b> <i>The short term (annual) goals for this long term measure were met or exceeded each year.</i>
	Agriculture	<ul style="list-style-type: none"> <li>• Fund no less than 3 projects each year that address agricultural sources of NPS pollution, depending on the number and quality of proposals received.</li> <li>• Fund the implementation of no less than 65 agricultural BMPs per year.</li> <li>• Staff Watershed Coordinators will perform no less than 200 site visits each year to inspect BMPs pre-, during-, and post-construction.</li> </ul>		<b>Exceeded expectations.</b> <i>All short term goals for this segment were exceeded.</i>	<b>Exceeded expectations.</b> <i>All short term goals for this segment were exceeded.</i>	<b>Exceeded expectations.</b> <i>All short term goals for this segment were exceeded.</i>	<b>Exceeded expectations.</b> <i>All short term goals for this segment were exceeded.</i>	<b>Exceeded expectations.</b> <i>All short term goals for this segment were met or exceeded.</i>

**LONG TERM GOALS, ANNUAL GOALS, and OUTCOMES**

Long Term Goal (5 year)	Sector	Annual Goals (outputs; Annual Goal x 5 = Long Term Goal measure)	Outcomes	Progress Made in Year 1 (FFY2015)	Progress Made in Year 2 (FFY2016)	Progress Made in Year 3 (FFY2017)	Progress Made in Year 4 (FFY2018)	Progress Made in Year 5 (FFY2019)
	Forestry	<ul style="list-style-type: none"> <li>Fund no less than 1 forestry-based project each year, depending on the number and quality of proposals received.</li> <li>Fund the implementation of no less than 5 forestry BMPs each year, depending on the number of active forestry restoration projects.</li> </ul>		<b>Insufficient progress.</b> <i>No BMP-related forestry proposals were received; additional outreach needed.</i>	<b>Insufficient progress.</b> <i>No BMP-related forestry proposals were received; additional outreach needed.</i>	<b>On track to achieve outcomes.</b> <i>No BMP-related forestry proposals were received; however, outreach has been increased, and an adequate number of forestry BMPs were installed.</i>	<b>Insufficient progress.</b> <i>No BMP-related forestry proposals were received and no forestry BMPs were installed; additional outreach needed.</i>	<b>Insufficient progress.</b> <i>One educational forestry proposal was received, but not funded. No forestry BMPs were installed.</i>
	Urban	<ul style="list-style-type: none"> <li>Fund no less than 2 projects focused on stormwater issues in developed areas each year, depending on the number and quality proposals received.</li> <li>Fund no less than 12 stormwater BMPs each year, depending on the number of active urban/suburban restoration projects.</li> <li>Staff Watershed Coordinators will perform no less than 15 site visits each year to inspect various stormwater BMPs pre-, during-, and post-construction.</li> </ul>		<b>Exceeded expectations.</b> <i>All short term goals for this segment were met; a majority of goals were exceeded.</i>	<b>Exceeded expectations.</b> <i>All short term goals for this segment were exceeded.</i>	<b>Exceeded expectations.</b> <i>All short term goals for this segment were exceeded.</i>	<b>Exceeded expectations.</b> <i>All short term goals for this segment were met or exceeded.</i>	<b>Insufficient progress.</b> <i>Year 5 saw a contraction in this sector.</i>
	Failing Septic	<ul style="list-style-type: none"> <li>Fund the repair/replacement of no less than 20 failing septic systems each year, depending on the number of active projects that address failing septic systems.</li> <li>Staff Watershed Coordinators will perform no less than 20 site visits each year to inspect work on repair/replacement of failing septic systems.</li> </ul>		<b>Exceeded expectations.</b> <i>All short term goals for this segment were exceeded.</i>	<b>Exceeded expectations.</b> <i>All short term goals for this segment were exceeded.</i>	<b>On track to achieve outcomes.</b> <i>Strong effort for outreach was made in FFY2018; however, the number of septic repairs fell short of the goal.</i>	<b>Exceeded expectations.</b> <i>All short term goals for this segment were exceeded</i>	<b>Exceeded expectations.</b> <i>All short term goals for this segment were exceeded</i>
	Legacy Mining	<ul style="list-style-type: none"> <li>Fund no less than 1 project addressing legacy mining concerns each year, depending on the number and quality of proposals received.</li> <li>Fund no less than 5 BMPs addressing legacy mining concerns each year, depending on the number of active legacy mining projects.</li> <li>Staff Watershed Coordinators will</li> </ul>		<b>Insufficient progress.</b> <i>No legacy mining-related proposals were received; additional outreach needed.</i>	<b>On track to achieve outcomes.</b> <i>One project addressing legacy mining was funded in FFY2016; site visits for legacy</i>	<b>Insufficient progress.</b> <i>No legacy mining-related proposals were received; additional outreach needed.</i>	<b>Insufficient progress.</b> <i>No legacy mining-related proposals were received, no mining BMPs were installed, and no mining-related site visits</i>	<b>Insufficient progress.</b> <i>No legacy mining BMPs were installed in Year 5, and watershed coordinators only performed four site visits relating</i>

**LONG TERM GOALS, ANNUAL GOALS, and OUTCOMES**

Long Term Goal (5 year)	Sector	Annual Goals (outputs; Annual Goal x 5 = Long Term Goal measure)	Outcomes	Progress Made in Year 1 (FFY2015)	Progress Made in Year 2 (FFY2016)	Progress Made in Year 3 (FFY2017)	Progress Made in Year 4 (FFY2018)	Progress Made in Year 5 (FFY2019)
		perform no less than 5 site visits each year to inspect legacy mining BMPs pre-, during-, and post-construction, depending on the number of active legacy mining projects.			<i>mining were exceeded.</i>		<i>were conducted; additional outreach needed.</i>	<i>to legacy mining issues.</i>
Long Term Goal No. 2: Build citizen awareness of problems and solutions related to nonpoint source pollution through local and statewide education efforts targeting various audiences.	Aggregate	<ul style="list-style-type: none"> <li>• TN-NPS staff will attend/participate in at least 10 educational events each year.</li> <li>• Fund at least 20 educational events each year, depending on the number of active NPS pollution educational projects funded.</li> <li>• Document at least 2,000 citizens presented with messages addressing NPS pollution sources, problems, and solutions each year.</li> <li>• Develop a general evaluation form to be completed by all participants at the conclusion of each educational event.</li> </ul>	<ul style="list-style-type: none"> <li>• Improve relations with stakeholders, potential applicants, and partners.</li> <li>• Increase awareness of nonpoint source impacts.</li> </ul>	<b>On track to achieve outcomes.</b> <i>Most goals exceeded; evaluation form development needed.</i>	<b>On track to achieve outcomes.</b> <i>Most goals exceeded; evaluation form provided to grantees and posted online.</i>	<b>Exceeded expectations.</b> <i>All short term goals for this segment were met or exceeded.</i>	<b>Exceeded expectations.</b> <i>All short term goals for this segment were met or exceeded.</i>	<b>Exceeded expectations.</b> <i>All short term goals for this segment were met or exceeded.</i>
	Agriculture	<ul style="list-style-type: none"> <li>• TN-NPS staff will attend/participate in at least 4 educational events each year targeting an agricultural audience.</li> <li>• Fund at least 5 educational events targeting an agricultural audience.</li> <li>• Document at least 600 citizens presented with messages addressing NPS pollution sources, problems, and solutions.</li> <li>• Respond to 100% of Animal Feeding Operations complaints .</li> <li>• Direct AFO owner/operators to NRCS for mitigation, as necessary.</li> </ul>		<b>Exceeded expectations.</b> <i>All short term goals for this segment were exceeded.</i>	<b>Exceeded expectations.</b> <i>All short term goals for this segment were met or exceeded.</i>	<b>Exceeded expectations.</b> <i>All short term goals for this segment were met or exceeded.</i>	<b>Exceeded expectations.</b> <i>All short term goals for this segment were met or exceeded.</i>	<b>Exceeded expectations.</b> <i>All short term goals for this segment were met or exceeded.</i>
	Forestry	<ul style="list-style-type: none"> <li>• TN-NPS staff will attend/participate in at least 1 educational event each year targeting a forestry audience.</li> <li>• Fund at least 3 educational events each year targeting a forestry audience, depending on the number of active projects aimed at forestry issues.</li> <li>• Document at least 200 citizens presented with messages addressing NPS pollution concerns stemming from forestry-related activities.</li> </ul>		<b>Insufficient progress.</b> <i>No BMP-related forestry proposals were received; additional outreach needed. Education goals on track.</i>	<b>Insufficient progress.</b> <i>No BMP-related forestry proposals were received; additional outreach needed. Education goals on track.</i>	<b>On track to achieve outcomes.</b> <i>No BMP-related forestry proposals were received; however, outreach to the forestry sector was strong in FFY2017</i>	<b>On track to achieve outcomes.</b> <i>While TN-NPS staff participated in several events that addressed forestry-related issues, no educational events were funded.</i>	<b>On track to achieve outcomes.</b> <i>Two of the short term goals were exceeded; however, no solely forestry-related educational events were funded in Year 5.</i>

**LONG TERM GOALS, ANNUAL GOALS, and OUTCOMES**

Long Term Goal (5 year)	Sector	Annual Goals (outputs; Annual Goal x 5 = Long Term Goal measure)	Outcomes	Progress Made in Year 1 (FFY2015)	Progress Made in Year 2 (FFY2016)	Progress Made in Year 3 (FFY2017)	Progress Made in Year 4 (FFY2018)	Progress Made in Year 5 (FFY2019)
	Urban	<ul style="list-style-type: none"> <li>TN-NPS staff will attend/participate in at least 3 educational events each year targeting an urban/suburban audience.</li> <li>Fund at least 10 educational events each year targeting an urban/suburban audience, depending on the number of active projects aimed at urban/suburban issues.</li> <li>Document at least 1,000 citizens presented with messages addressing NPS pollution concerns stemming from stormwater in urban/suburban areas.</li> </ul>		<b>Exceeded expectations.</b> <i>All short term goals for this segment were exceeded.</i>	<b>Exceeded expectations.</b> <i>All short term goals for this segment were met or exceeded.</i>	<b>Exceeded expectations.</b> <i>All short term goals for this segment were met or exceeded.</i>	<b>Exceeded expectations.</b> <i>All short term goals for this segment were exceeded.</i>	<b>Exceeded expectations.</b> <i>All short term goals for this segment were exceeded.</i>
	Failing Septic	<ul style="list-style-type: none"> <li>TN-NPS staff will attend/participate in at least 1 educational event each year targeting an audience with failing septic concerns.</li> <li>Fund at least 1 educational event each year targeting an audience concerned with NPS pollution from failing septic systems.</li> <li>Document at least 100 citizens presented with messages addressing NPS pollution concerns stemming from failing septic systems.</li> </ul>		<b>Exceeded expectations.</b> <i>All short term goals for this segment were exceeded.</i>	<b>Exceeded expectations.</b> <i>All short term goals for this segment were met or exceeded.</i>	<b>Exceeded expectations.</b> <i>All short term goals for this segment were met or exceeded.</i>	<b>On track to achieve outcomes.</b> <i>While grantees presented over 1,000 citizens with septic system information, no educational events were funded.</i>	<b>Exceeded expectations.</b> <i>All short term goals for this segment were exceeded.</i>
	Legacy Mining	<ul style="list-style-type: none"> <li>TN-NPS staff will attend/participate in at least 1 educational event each year targeting an audience dealing with legacy mining concerns.</li> <li>Fund at least 1 educational event each year targeting an audience concerned with NPS pollution from legacy mining activities.</li> <li>Document at least 100 citizens presented with messages addressing NPS pollution concerns stemming from legacy mining activities.</li> </ul>		<b>Insufficient progress.</b> <i>No legacy mining-related proposals were received or are currently funded; additional outreach needed.</i>	<b>Exceeded expectations.</b> <i>All short term goals for this segment were met or exceeded.</i>	<b>Exceeded expectations.</b> <i>All short term goals for this segment were met or exceeded.</i>	<b>On track to achieve outcomes.</b> <i>While grantees presented over 200 citizens with information on legacy mining, no educational events were funded.</i>	<b>Exceeded expectations.</b> <i>All short term goals for this segment were exceeded.</i>
Long Term Goal No. 3: Build capacity for future TN-NPS projects in local watersheds by engaging stakeholders and potential partners through outreach and	Aggregate	<ul style="list-style-type: none"> <li>TN-NPS staff will attend at least 8 stakeholder meetings each year to promote the TN-NPS program and recruit and cultivate new partners for future projects.</li> <li>TN-NPS program will conduct an annual survey of partners, seeking their input for</li> </ul>	<ul style="list-style-type: none"> <li>Improve relations with stakeholders, potential applicants, and partners.</li> <li>Increase awareness of nonpoint source impacts.</li> </ul>	<b>On track to achieve goals.</b> <i>All goals met for this sector.</i>	<b>Exceeded expectations.</b> <i>All short term goals for this segment were met or exceeded.</i>	<b>Exceeded expectations.</b> <i>All short term goals for this segment were met or exceeded.</i>	<b>On track to achieve goals.</b> <i>Most goals met for this sector; however, the partner survey was not</i>	<b>Exceeded expectations.</b> <i>All short term goals for this segment were met or exceeded.</i>

**LONG TERM GOALS, ANNUAL GOALS, and OUTCOMES**

Long Term Goal (5 year)	Sector	Annual Goals (outputs; Annual Goal x 5 = Long Term Goal measure)	Outcomes	Progress Made in Year 1 (FFY2015)	Progress Made in Year 2 (FFY2016)	Progress Made in Year 3 (FFY2017)	Progress Made in Year 4 (FFY2018)	Progress Made in Year 5 (FFY2019)
personal contact.		ways our program can improve and better meet existing needs. <ul style="list-style-type: none"> <li>• TN-NPS staff will provide assistance (as requested) in writing Watershed Based Plans; particularly map-making and load reduction estimates.</li> <li>• TN-NPS program will improve information and tools available on our website to aid in the writing of Watershed Based Plans.</li> <li>• TN-NPS staff will attend at least 3 workshops to promote the 319 program each year.</li> </ul>	<ul style="list-style-type: none"> <li>• Educate citizens regarding management practices to prevent or minimize nonpoint source pollution.</li> </ul>				conducted this year.	
	Agriculture	<ul style="list-style-type: none"> <li>• TN-NPS staff will attend at least 3 stakeholder meetings or workshops to promote the 319 program each year.</li> </ul>		<b>On track to achieve goals.</b> <i>All goals met or exceeded for this sector.</i>	<b>Exceeded expectations.</b> <i>All short term goals for this segment were exceeded.</i>	<b>Exceeded expectations.</b> <i>All short term goals for this segment were exceeded.</i>	<b>Exceeded expectations.</b> <i>All short term goals for this segment were exceeded.</i>	<b>Exceeded expectations.</b> <i>All short term goals for this segment were exceeded.</i>
	Forestry	<ul style="list-style-type: none"> <li>• TN-NPS staff will attend at least 1 stakeholder meeting (e.g., TN Forestry Association or the TN Urban Forestry Council) each year to promote the TN-NPS program.</li> </ul>		<b>On track to achieve goals.</b> <i>All goals met for this sector.</i>	<b>On track to achieve goals.</b> <i>All goals met for this sector.</i>	<b>On track to achieve goals.</b> <i>All goals met for this sector.</i>	<b>Exceeded expectations.</b> <i>All short term goals for this segment were exceeded.</i>	<b>Exceeded expectations.</b> <i>All short term goals for this segment were exceeded.</i>
	Urban	<ul style="list-style-type: none"> <li>• TDA-NPS staff will attend at least 2 stakeholder meetings each year to promote the TN-NPS program.</li> <li>• TN-NPS staff will attend the annual meeting of the Tennessee Stormwater Association (TNSA) each year.</li> </ul>		<b>On track to achieve goals.</b> <i>All goals met for this sector.</i>	<b>Exceeded expectations.</b> <i>All short term goals for this segment were met or exceeded.</i>	<b>Exceeded expectations.</b> <i>All short term goals for this segment were met or exceeded.</i>	<b>Exceeded expectations.</b> <i>All short term goals for this segment were met or exceeded.</i>	<b>Exceeded expectations.</b> <i>All short term goals for this segment were met or exceeded.</i>
	Failing Septic	<ul style="list-style-type: none"> <li>• TN-NPS staff will attend at least 1 stakeholder meeting each year to promote the TN-NPS program.</li> </ul>		<b>Exceeded expectations.</b> <i>All short term goals for this segment were exceeded.</i>	<b>On track to achieve goals.</b> <i>All goals met for this sector.</i>	<b>Exceeded expectations.</b> <i>All short term goals for this segment were exceeded.</i>	<b>Exceeded expectations.</b> <i>All short term goals for this segment were exceeded.</i>	<b>Exceeded expectations.</b> <i>All short term goals for this segment were exceeded.</i>
	Legacy Mining	<ul style="list-style-type: none"> <li>• TN-NPS staff will attend at least 1 stakeholder meeting each year to promote the TN-NPS program.</li> </ul>		<b>Exceeded expectations.</b> <i>All short term goals for this segment were</i>	<b>On track to achieve goals.</b> <i>All goals met for this sector.</i>	<b>Exceeded expectations.</b> <i>All short term goals for this segment were</i>	<b>Exceeded expectations.</b> <i>All short term goals for this segment were</i>	<b>Exceeded expectations.</b> <i>All short term goals for this segment were</i>

LONG TERM GOALS, ANNUAL GOALS, and OUTCOMES

Long Term Goal (5 year)	Sector	Annual Goals (outputs; Annual Goal x 5 = Long Term Goal measure)	Outcomes	Progress Made in Year 1 (FFY2015)	Progress Made in Year 2 (FFY2016)	Progress Made in Year 3 (FFY2017)	Progress Made in Year 4 (FFY2018)	Progress Made in Year 5 (FFY2019)
				<i>exceeded.</i>		<i>exceeded.</i>	<i>exceeded.</i>	<i>exceeded.</i>
Long Term Goal No. 4: Track interim progress towards restoration of impaired water bodies.	Aggregate	<ul style="list-style-type: none"> <li>Develop a sector-based tracking mechanism for BMP implementation, educational activities, pollutant load reductions, and capacity building efforts.</li> <li>Implement a sector-based tracking mechanism for BMP implementation, educational activities, pollutant load reductions, and capacity building efforts.</li> </ul>	<ul style="list-style-type: none"> <li>Increase knowledge of effective and efficient sector-specific BMPs and improve measures of success tracking.</li> </ul>	<b>Insufficient progress.</b> <i>Although the tracking system has been developed, it has not yet been fully implemented. Implementation will occur in FFY2016.</i>	<b>On track to achieve goals.</b> <i>All applicable goals met for this sector. Sector-based tracking was developed and implemented internally; work with grantees is needed.</i>	<b>On track to achieve goals.</b> <i>All applicable goals met for this sector. Sector-based tracking was developed and implemented for BMPs; additional work is needed for education and outreach tracking.</i>	<b>On track to achieve goals.</b> <i>All applicable goals met for this sector.</i>	<b>On track to achieve goals.</b> <i>All applicable goals met for this sector.</i>
	Agriculture	<ul style="list-style-type: none"> <li>Develop a sector-based tracking mechanism for BMP implementation, educational activities, pollutant load reductions, and capacity building efforts.</li> <li>Implement a sector-based tracking mechanism for BMP implementation, educational activities, pollutant load reductions, and capacity building efforts.</li> </ul>		<b>Insufficient progress.</b> <i>Although the tracking system has been developed, it has not yet been fully implemented. Implementation will occur in FFY2016.</i>	<b>On track to achieve goals.</b> <i>All applicable goals met for this sector. Sector-based tracking was developed and implemented internally; work with grantees is needed.</i>	<b>On track to achieve goals.</b> <i>All applicable goals met for this sector. Sector-based tracking was developed and implemented for BMPs; additional work is needed for education and outreach tracking.</i>	<b>On track to achieve goals.</b> <i>All applicable goals met for this sector.</i>	<b>On track to achieve goals.</b> <i>All applicable goals met for this sector.</i>
	Forestry	<ul style="list-style-type: none"> <li>Develop a sector-based tracking mechanism for BMP implementation, educational activities, pollutant load reductions, and capacity building efforts.</li> <li>Implement a sector-based tracking mechanism for BMP implementation, educational activities, pollutant load reductions, and capacity building efforts.</li> </ul>		<b>Insufficient progress.</b> <i>Although the tracking system has been developed, it has not yet been fully implemented. Implementation will occur in FFY2016.</i>	<b>On track to achieve goals.</b> <i>All applicable goals met for this sector. Sector-based tracking was developed and implemented internally; work with grantees is needed.</i>	<b>On track to achieve goals.</b> <i>All applicable goals met for this sector. Sector-based tracking was developed and implemented for BMPs; additional work is needed for education and outreach tracking.</i>	<b>On track to achieve goals.</b> <i>All applicable goals met for this sector.</i>	<b>On track to achieve goals.</b> <i>All applicable goals met for this sector.</i>

LONG TERM GOALS, ANNUAL GOALS, and OUTCOMES

Long Term Goal (5 year)	Sector	Annual Goals (outputs; Annual Goal x 5 = Long Term Goal measure)	Outcomes	Progress Made in Year 1 (FFY2015)	Progress Made in Year 2 (FFY2016)	Progress Made in Year 3 (FFY2017)	Progress Made in Year 4 (FFY2018)	Progress Made in Year 5 (FFY2019)
	Urban	<ul style="list-style-type: none"> <li>Develop a sector-based tracking mechanism for BMP implementation, educational activities, pollutant load reductions, and capacity building efforts.</li> <li>Implement a sector-based tracking mechanism for BMP implementation, educational activities, pollutant load reductions, and capacity building efforts.</li> </ul>		<p><b>Insufficient progress.</b> Although the tracking system has been developed, it has not yet been fully implemented. Implementation will occur in FFY2016.</p>	<p><b>On track to achieve goals.</b> All applicable goals met for this sector. Sector-based tracking was developed and implemented internally; work with grantees is needed.</p>	<p><b>On track to achieve goals.</b> All applicable goals met for this sector. Sector-based tracking was developed and implemented for BMPs; additional work is needed for education and outreach tracking.</p>	<p><b>On track to achieve goals.</b> All applicable goals met for this sector.</p>	<p><b>On track to achieve goals.</b> All applicable goals met for this sector.</p>
	Failing Septic	<ul style="list-style-type: none"> <li>Develop a sector-based tracking mechanism for BMP implementation, educational activities, pollutant load reductions, and capacity building efforts.</li> <li>Implement a sector-based tracking mechanism for BMP implementation, educational activities, pollutant load reductions, and capacity building efforts.</li> </ul>		<p><b>Insufficient progress.</b> Although the tracking system has been developed, it has not yet been fully implemented. Implementation will occur in FFY2016.</p>	<p><b>On track to achieve goals.</b> All applicable goals met for this sector. Sector-based tracking was developed and implemented internally; work with grantees is needed.</p>	<p><b>On track to achieve goals.</b> All applicable goals met for this sector. Sector-based tracking was developed and implemented for BMPs; additional work is needed for education and outreach tracking.</p>	<p><b>On track to achieve goals.</b> All applicable goals met for this sector.</p>	<p><b>On track to achieve goals.</b> All applicable goals met for this sector.</p>
	Legacy Mining	<ul style="list-style-type: none"> <li>Develop a sector-based tracking mechanism for BMP implementation, educational activities, pollutant load reductions, and capacity building efforts.</li> <li>Implement a sector-based tracking mechanism for BMP implementation, educational activities, pollutant load reductions, and capacity building efforts.</li> </ul>		<p><b>Insufficient progress.</b> Although the tracking system has been developed, it has not yet been fully implemented. Implementation will occur in FFY2016.</p>	<p><b>On track to achieve goals.</b> All applicable goals met for this sector. Sector-based tracking was developed and implemented internally; work with grantees is needed.</p>	<p><b>On track to achieve goals.</b> All applicable goals met for this sector. Sector-based tracking was developed and implemented for BMPs; additional work is needed for education and outreach tracking.</p>	<p><b>On track to achieve goals.</b> All applicable goals met for this sector.</p>	<p><b>On track to achieve goals.</b> All applicable goals met for this sector.</p>

**LONG TERM GOALS, ANNUAL GOALS, and OUTCOMES**

Long Term Goal (5 year)	Sector	Annual Goals (outputs; Annual Goal x 5 = Long Term Goal measure)	Outcomes	Progress Made in Year 1 (FFY2015)	Progress Made in Year 2 (FFY2016)	Progress Made in Year 3 (FFY2017)	Progress Made in Year 4 (FFY2018)	Progress Made in Year 5 (FFY2019)
Long Term Goal No. 5: Protect unimpaired/high quality waters (i.e., those not on the 303(d) list) by implementing appropriate BMPs where warranted.	Aggregate	<ul style="list-style-type: none"> <li>Consider funding at least 1 project proposal aimed at protection of unimpaired water body each year, dependent upon nature of proposals received.</li> <li>Consider changes to TN-NPS proposal evaluation scoresheet to impact the likelihood of water body protection projects receiving funding.</li> </ul>	<ul style="list-style-type: none"> <li>Research possible avenues to increase the funding of protective projects.</li> </ul>	On track to achieve goals. All goals met for this sector.	On track to achieve goals. All goals met for this sector. Outreach is on-going with groups interested in protection work.	On track to achieve goals. All goals met for this sector.	On track to achieve goals. All goals met for this sector or not applicable.	On track to achieve goals. All goals met for this sector or not applicable.
	Agriculture	<ul style="list-style-type: none"> <li>Not applicable - projects to protect unimpaired waters by definition will not be assigned to any pollutant source.</li> </ul>		Not applicable. This goal does not apply.	Not applicable. This goal does not apply.	Not applicable. This goal does not apply.	Not applicable. This goal does not apply.	Not applicable. This goal does not apply.
	Forestry	<ul style="list-style-type: none"> <li>Not applicable - projects to protect unimpaired waters by definition will not be assigned to any pollutant source.</li> </ul>		Not applicable. This goal does not apply.	Not applicable. This goal does not apply.	Not applicable. This goal does not apply.	Not applicable. This goal does not apply.	Not applicable. This goal does not apply.
	Urban	<ul style="list-style-type: none"> <li>Not applicable - projects to protect unimpaired waters by definition will not be assigned to any pollutant source.</li> </ul>		Not applicable. This goal does not apply.	Not applicable. This goal does not apply.	Not applicable. This goal does not apply.	Not applicable. This goal does not apply.	Not applicable. This goal does not apply.
	Failing Septic	<ul style="list-style-type: none"> <li>Not applicable - projects to protect unimpaired waters by definition will not be assigned to any pollutant source.</li> </ul>		Not applicable. This goal does not apply.	Not applicable. This goal does not apply.	Not applicable. This goal does not apply.	Not applicable. This goal does not apply.	Not applicable. This goal does not apply.
	Legacy Mining	<ul style="list-style-type: none"> <li>Not applicable - projects to protect unimpaired waters by definition will not be assigned to any pollutant source.</li> </ul>		Not applicable. This goal does not apply.	Not applicable. This goal does not apply.	Not applicable. This goal does not apply.	Not applicable. This goal does not apply.	Not applicable. This goal does not apply.
Long Term Goal No. 6: Fulfill all obligations under grant award agreement with USEPA annually.	Aggregate	<ul style="list-style-type: none"> <li>TN-NPS program will do everything necessary to achieve "Satisfactory Progress" determination by USEPA each year.</li> <li>TN-NPS program will submit an Annual Report by December 31 each year.</li> <li>TN-NPS program will submit a Grant Application by September 30 each year.</li> <li>TN-NPS program will submit an Annual Workplan by May 31 each year.</li> <li>All grant data will be entered in the Grants Reporting and Tracking System (GRTS) by the various deadlines given each year.</li> <li>All grant funds received will be obligated within one year of the date the grant is received.</li> </ul>	<ul style="list-style-type: none"> <li>Continue to receive 319 grant funds for statewide disbursement.</li> </ul>	On track to achieve goals. With the exception of the Annual Workplan submittal, all goals were met or exceeded.	On track to achieve goals. With the exception of the Annual Workplan submittal, all goals were met.	On track to achieve goals. With the exception of the Annual Workplan submittal, all applicable goals were met or exceeded.	On track to achieve goals. With the exception of the obligation of funds within one year of receipt, all applicable goals were met or exceeded.	On track to achieve goals. With the exception of the obligation of funds within one year of receipt, all applicable goals were met or exceeded.

LONG TERM GOALS, ANNUAL GOALS, and OUTCOMES								
Long Term Goal (5 year)	Sector	Annual Goals (outputs; Annual Goal x 5 = Long Term Goal measure)	Outcomes	Progress Made in Year 1 (FFY2015)	Progress Made in Year 2 (FFY2016)	Progress Made in Year 3 (FFY2017)	Progress Made in Year 4 (FFY2018)	Progress Made in Year 5 (FFY2019)
		<ul style="list-style-type: none"> <li>Each grant received from USEPA will be matched my no less than 40% by a combination of state and local funds.</li> <li>TN-NPS staff will attend the annual GRTS users meeting each year.</li> <li>TN-NPS staff will attend the National Nonpoint Source Managers meeting as often as it is held.</li> <li>TN-NPS staff will attend the Regional Nonpoint Source Managers meeting as often as it is held.</li> <li>TN-NPS program will revise the Management Program Document every 5 years, or as required by USEPA.</li> </ul>						
	Agriculture	<ul style="list-style-type: none"> <li>Not Applicable - grant award obligations are not defined by pollutant sector.</li> </ul>		Not applicable. This goal does not apply.				
	Forestry	<ul style="list-style-type: none"> <li>Not Applicable - grant award obligations are not defined by pollutant sector.</li> </ul>		Not applicable. This goal does not apply.				
	Urban	<ul style="list-style-type: none"> <li>Not Applicable - grant award obligations are not defined by pollutant sector.</li> </ul>		Not applicable. This goal does not apply.				
	Failing Septic	<ul style="list-style-type: none"> <li>Not Applicable - grant award obligations are not defined by pollutant sector.</li> </ul>		Not applicable. This goal does not apply.				
	Legacy Mining	<ul style="list-style-type: none"> <li>Not Applicable - grant award obligations are not defined by pollutant sector.</li> </ul>		Not applicable. This goal does not apply.				

Note: The table above will be populated each year as the program is evaluated. Annual tracking will assist with adaptive management measures needed for keeping the TN-NPS program moving in the right direction.

### Conclusion

Year 5 concludes tracking for the current 2015 – 2019 Management Program Document Measures of Success and Long Term Goals. Overall, goals were met or exceeded in all sectors except for forestry and legacy mining. Regarding forestry, the TN-NPS continue to fund a water quality forester through the Division of Forestry, who assists with site visits and troubleshooting for existing BMPs in silviculture operations. Moving forward, it is hoped that this partnership may result in additional proposals to assist landowners with the implementation of appropriate practices for forestry. Legacy mining is the second sector that has proved challenging for TN-NPS staff. One legacy mining project is currently in progress in southeastern Tennessee. It is hoped that the project may build momentum for other groups to engage in acid mine drainage remediation efforts in the future.

The Draft 2020 – 2024 Program Management Document has been submitted to USEPA, and the first round of comments is currently being addressed. The short term measures of success and long term goals put forth in the draft document were informed by the progress made during this five-year period. The 2020 Annual Report will consist of an evaluation of the newly developed measures.

## APPENDIX B

# MEASURES OF SUCCESS CHECKLISTS

# Measures of Success Checklist

## Aggregate/Statewide Goals

Prepared for FFY2019 Annual Report

Measures of Success			
Long Term Goal	Short Term Measure(s) of Success	Status	Comments
<p>Long Term Goal No. 1: Restore impaired water bodies (i.e., those on the 303(d) list) by implementing best management practices (BMPs) that address nonpoint source pollution.</p>	<ul style="list-style-type: none"> <li>• Restore 2 water bodies per year, on average.</li>   <li>• Reduce N load by 5,000 lbs/year; P<sub>2</sub>O<sub>5</sub> load by 5,000 lbs/year; and sediment load by 100 ton/year (minimum reductions)</li> </ul>	<ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> Met</li> <li><input type="checkbox"/> Exceeded</li> <li><input type="checkbox"/> Needs improvement</li>   <li><input type="checkbox"/> Met</li> <li><input checked="" type="checkbox"/> Exceeded</li> <li><input type="checkbox"/> Needs improvement</li> </ul>	<p>Two Success Stories, (update to Lick Creek and East Rock Creek) were accepted by USEPA in FFY19.</p> <p>It is estimated that N was reduced by 10,150 pounds, P was reduced by 9,647 pounds, and sediment was reduced by 725 tons in FFY19.</p>
<p>Long Term Goal No. 2: Build citizen awareness of problems and solutions related to nonpoint source pollution through local and statewide education efforts targeting various audiences.</p>	<ul style="list-style-type: none"> <li>• TN-NPS staff will attend/participate in at least 10 educational events each year.</li>   <li>• Fund at least 20 educational events each year, depending on the number of active NPS pollution educational projects funded.</li>   <li>• Document at least 2,000 citizens presented with messages addressing NPS pollution sources, problems, and solutions each year.</li>   <li>• Develop a general evaluation form to be completed by all participants and the conclusion of each educational event.</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Met</li> <li><input checked="" type="checkbox"/> Exceeded</li> <li><input type="checkbox"/> Needs improvement</li>   <li><input type="checkbox"/> Met</li> <li><input checked="" type="checkbox"/> Exceeded</li> <li><input type="checkbox"/> Needs improvement</li>   <li><input type="checkbox"/> Met</li> <li><input checked="" type="checkbox"/> Exceeded</li> <li><input type="checkbox"/> Needs improvement</li> </ul>	<p>TN-NPS staff attended 104 events, and provided 136 presentations in FFY19.</p> <p>Grantees hosted 26 education and outreach events in FFY19.</p> <p>Nearly 700,000 citizens have been presented with NPS pollution information through field days, and over 1 million citizens have been exposed to NPS concepts through partner exhibits, brochures, mailers, etc.</p> <p>The evaluation form continues to be hosted to the TDA website for use by grantees.</p>

Long Term Goal	Short Term Measure(s) of Success	Status	Comments
<p>Long Term Goal No. 3: Build capacity for future TN-NPS projects in local watersheds by engaging stakeholders and potential partners through outreach and personal contact.</p>	<ul style="list-style-type: none"> <li>• TN-NPS staff will attend at least 8 stakeholder meetings each year to promote the TN-NPS program and recruit and cultivate new partners for future projects.</li> <li>• TN-NPS program will conduct an annual survey of partners, seeking their input for ways our program can improve and better meet existing needs.</li> <li>• TN-NPS staff will provide assistance (as requested) in writing Watershed Based Plans; particularly map-making and load reduction estimates.</li> <li>• TN-NPS program will improve information and tools available on our website to aid in the writing of Watershed Based Plans.</li> <li>• TN-NPS staff will attend at least 3 workshops to promote the 319 program each year.</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Met</li> <li><input checked="" type="checkbox"/> Exceeded</li> <li><input type="checkbox"/> Needs improvement</li>   <li><input checked="" type="checkbox"/> Met</li> <li><input type="checkbox"/> Exceeded</li> <li><input type="checkbox"/> Needs improvement</li>   <li><input type="checkbox"/> Met</li> <li><input checked="" type="checkbox"/> Exceeded</li> <li><input type="checkbox"/> Needs improvement</li>   <li><input checked="" type="checkbox"/> Met</li> <li><input type="checkbox"/> Exceeded</li> <li><input type="checkbox"/> Needs improvement</li>   <li><input type="checkbox"/> Met</li> <li><input checked="" type="checkbox"/> Exceeded</li> <li><input type="checkbox"/> Needs improvement</li> </ul>	<p>TN-NPS staff reported attending 113 stakeholder meetings in FFY19, presenting at 80 of the meetings.</p> <p>The survey was sent to participants on June 21, 2019. The survey results are summarized in Appendix E.</p> <p>In addition to providing assistance whenever it is requested, TN-NPS staff have developed a comprehensive Watershed Based Plan Development Workshop to assist prospective applicants.</p> <p>The TN-NPS staff updates the website information as needed.</p> <p>Staff participated in 29 workshops in FFY19.</p>
<p>Long Term Goal No. 4: Track interim progress towards restoration of impaired water bodies via adaptive management process.</p>	<ul style="list-style-type: none"> <li>• Develop a sector-based tracking mechanism for BMP implementation, educational activities, pollutant load reductions, and capacity building efforts.</li> <li>• Implement a sector-based tracking mechanism for BMP implementation, educational activities, pollutant load reductions, and capacity building efforts.</li> </ul>	<ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> Met</li> <li><input type="checkbox"/> Exceeded</li> <li><input type="checkbox"/> Needs improvement</li>   <li><input checked="" type="checkbox"/> Met</li> <li><input type="checkbox"/> Exceeded</li> <li><input type="checkbox"/> Needs improvement</li> </ul>	<p>The sector-base tracking system has been fully implemented. For education/outreach, presentations, and site visits, an online application has been developed and launched for sector-based tracking. For BMP implementation and pollutant load, an internal (Access-based) approach has been implemented.</p>

Long Term Goal	Short Term Measure(s) of Success	Status	Comments
<p>Long Term Goal No. 5: Protect unimpaired/ high quality waters (i.e., those not on the 303(d) list) by implementing appropriate BMPs where warranted.</p>	<ul style="list-style-type: none"> <li>Consider funding at least 1 project proposal aimed at protection of unimpaired water body each year, dependent upon nature of proposals received.</li> <li>Consider changes to TN-NPS proposal evaluation scoresheet to impact the likelihood of water body protection projects receiving funding.</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Met</li> <li><input type="checkbox"/> Exceeded</li> <li><input type="checkbox"/> Needs improvement</li> </ul> <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> Met</li> <li><input type="checkbox"/> Exceeded</li> <li><input type="checkbox"/> Needs improvement</li> </ul>	<p>N/A; no proposals were received for FFY19 that focused on protecting unimpaired water bodies; however, as of the development of this document, TN-NPS is coordinating with partners interested in pursuing a protection project.</p> <p>Extra points are given for protection project during proposal evaluation.</p>
<p>Long Term Goal No. 6: Fulfill all obligations under grant award agreement with USEPA annually.</p>	<ul style="list-style-type: none"> <li>TN-NPS program will do everything necessary to achieve "Satisfactory Progress" determination by USEPA each year.</li> <li>TN-NPS program will submit an Annual Report by December 31 each year.</li> <li>TN-NPS program will submit a Grant Application by September 30 each year.</li> <li>TN-NPS program will submit an Annual Workplan by May 31 each year.</li> <li>All grant data will be entered in the Grants Reporting and Tracking System (GRTS) by the various deadlines given each year.</li> <li>All grant funds received will be obligated within one year of the date the grant is received.</li> <li>Each grant received from USEPA will be matched by no less than 40% by a combination of state and local funds.</li> </ul>	<ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> Met</li> <li><input type="checkbox"/> Exceeded</li> <li><input type="checkbox"/> Needs improvement</li> </ul> <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> Met</li> <li><input type="checkbox"/> Exceeded</li> <li><input type="checkbox"/> Needs improvement</li> </ul> <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> Met</li> <li><input type="checkbox"/> Exceeded</li> <li><input type="checkbox"/> Needs improvement</li> </ul> <ul style="list-style-type: none"> <li><input type="checkbox"/> Met</li> <li><input checked="" type="checkbox"/> Exceeded</li> <li><input type="checkbox"/> Needs improvement</li> </ul> <ul style="list-style-type: none"> <li><input type="checkbox"/> Met</li> <li><input type="checkbox"/> Exceeded</li> <li><input type="checkbox"/> Needs improvement</li> </ul> <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> Met</li> <li><input type="checkbox"/> Exceeded</li> <li><input type="checkbox"/> Needs improvement</li> </ul>	<p>The "Satisfactory Progress" letter was received by TN-NPS on April 4, 2019.</p> <p>The Annual Report was submitted on December 27, 2018.</p> <p>GRTS data is added/updated continuously upon receipt from grantees.</p> <p>N/A; the grant award was received in July of 2019, so this deadline has not yet been reached.</p>

Long Term Goal	Short Term Measure(s) of Success	Status	Comments
Long Term Goal 6, cont.	<ul style="list-style-type: none"> <li>• TN-NPS staff will attend the annual GRTS users meeting each year</li> <li>• TN-NPS staff will attend the National Nonpoint Source Managers meeting as often as it is held.</li> <li>• TN-NPS staff will attend the Regional Nonpoint Source Managers meeting as often as it is held.</li> <li>• TN-NPS program will revise the Management Program Document every 5 years, or as required by USEPA.</li> </ul>	<input type="checkbox"/> Met <input type="checkbox"/> Exceeded <input type="checkbox"/> Needs improvement  <input checked="" type="checkbox"/> Met <input type="checkbox"/> Exceeded <input type="checkbox"/> Needs improvement  <input type="checkbox"/> Met <input type="checkbox"/> Exceeded <input type="checkbox"/> Needs improvement  <input checked="" type="checkbox"/> Met <input type="checkbox"/> Exceeded <input type="checkbox"/> Needs improvement	<p>N/A; no GRTS user meeting was held.</p> <p>Staff attended the National Nonpoint Source Manager Meeting on November 5 - 8, 2018.</p> <p>N/A; no Regional Nonpoint Source Managers meeting was held in FFY19.</p> <p>A new draft document was submitted to USEPA; currently received comments are being addressed.</p>

If the short term has been met or exceeded, please provide an explanation of how this was determined (i.e. list of objectives completed, activities performed, etc.):

The status of each goal was determined by reviewing Annual Reports/Closeout Reports from grantees and reports from the newly launched Education/Outreach Log and Site Visit Log applications. Most of the Aggregate goals for FFY19 were met or exceeded.

If the short term has not been met, please provide an explanation of the variance:

Not applicable, as all goals were met, exceeded, or not applicable for FFY19.

# Measures of Success Checklist

## Agricultural Sector Short Term Goals

Prepared for FFY 2019 Annual Report

Measures of Success			
Long Term Goal	Short Term Measure(s) of Success	Status	Comments
Long Term Goal No. 1: Restore impaired water bodies (i.e., those on the 303(d) list) by implementing best management practices (BMPs) that address nonpoint source pollution.	<ul style="list-style-type: none"> <li>Fund no less than 3 projects each year that address agricultural sources of NPS pollution, depending on the number and quality of proposals received.</li> <li>Fund the implementation of no less than 65 agricultural BMPs per year.</li> <li>Staff Watershed Coordinators will perform no less than 200 site visits each year to inspect BMPs pre-, during-, and post-construction.</li> </ul>	<ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> Met</li> <li><input type="checkbox"/> Exceeded</li> <li><input type="checkbox"/> Needs improvement</li> </ul> <ul style="list-style-type: none"> <li><input type="checkbox"/> Met</li> <li><input checked="" type="checkbox"/> Exceeded</li> <li><input type="checkbox"/> Needs improvement</li> </ul> <ul style="list-style-type: none"> <li><input type="checkbox"/> Met</li> <li><input checked="" type="checkbox"/> Exceeded</li> <li><input type="checkbox"/> Needs improvement</li> </ul>	<p>In FFY19, two implementation projects, and one education/outreach project that addressed agricultural NPS pollution were funded.</p> <p>126 agricultural BMPs were installed in FFY19.</p> <p>In FFY19, TDA-NPS staff conducted 1,578 agricultural site visits.</p>
Long Term Goal No. 2: Build citizen awareness of problems and solutions related to nonpoint source pollution through local and statewide education efforts targeting various audiences.	<ul style="list-style-type: none"> <li>TN-NPS staff will attend/participate in at least 4 educational events each year targeting an agricultural audience.</li> <li>Fund at least 5 educational events targeting an agricultural audience.</li> <li>Document at least 600 citizens presented with messages addressing NPS pollution sources, problems, and solutions.</li> <li>Respond to 100% of Animal Feeding Operations complaints.</li> <li>Direct AFO owner/operators to NRCS for mitigation, as necessary.</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Met</li> <li><input checked="" type="checkbox"/> Exceeded</li> <li><input type="checkbox"/> Needs improvement</li> </ul> <ul style="list-style-type: none"> <li><input type="checkbox"/> Met</li> <li><input checked="" type="checkbox"/> Exceeded</li> <li><input type="checkbox"/> Needs improvement</li> </ul> <ul style="list-style-type: none"> <li><input type="checkbox"/> Met</li> <li><input checked="" type="checkbox"/> Exceeded</li> <li><input type="checkbox"/> Needs improvement</li> </ul> <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> Met</li> <li><input type="checkbox"/> Exceeded</li> <li><input type="checkbox"/> Needs improvement</li> </ul> <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> Met</li> <li><input type="checkbox"/> Exceeded</li> <li><input type="checkbox"/> Needs improvement</li> </ul>	<p>TDA-NPS staff attended 29 educational and outreach events in FFY19.</p> <p>Grantees conducted 13 agricultural educational events.</p> <p>Partners and grantees reached nearly 7,000 citizens through workshops, farm days, etc., and over 1 million through interactive exhibits, brochures, etc.</p>

Long Term Goal	Short Term Measure(s) of Success	Status	Comments
Long Term Goal No. 3: Build capacity for future TN-NPS projects in local watersheds by engaging stakeholders and potential partners through outreach and personal contact.	<ul style="list-style-type: none"> <li>TN-NPS staff will attend at least 3 stakeholder meetings each year to promote the TN-NPS program and recruit and cultivate new partners for future projects.</li> </ul>	<input type="checkbox"/> Met <input checked="" type="checkbox"/> Exceeded <input type="checkbox"/> Needs improvement	In FFY19, TDA-NPS staff attended over 100 agricultural sector stakeholder meetings.
Long Term Goal No. 4: Track interim progress towards restoration of impaired water bodies via adaptive management process.	<ul style="list-style-type: none"> <li>Develop a sector-based tracking mechanism for BMP implementation, educational activities, pollutant load reductions, and capacity building efforts.</li> <li>Implement a sector-based tracking mechanism for BMP implementation, educational activities, pollutant load reductions, and capacity building efforts.</li> </ul>	<input checked="" type="checkbox"/> Met <input type="checkbox"/> Exceeded <input type="checkbox"/> Needs improvement  <input checked="" type="checkbox"/> Met <input type="checkbox"/> Exceeded <input type="checkbox"/> Needs improvement	The sector-based tracking for BMP implementation has been developed; and, an online education/outreach application has been launched.
Long Term Goal No. 5: Protect unimpaired/high quality waters (i.e., those not on the 303(d) list) by implementing appropriate BMPs where warranted.	<ul style="list-style-type: none"> <li>Not applicable - projects to protect unimpaired waters by definition will not be assigned to any pollutant source.</li> </ul>	N/A	
Long Term Goal No. 6: Fulfill all obligations under grant award agreement with USEPA annually.	<ul style="list-style-type: none"> <li>Not Applicable - grant award obligations are not defined by pollutant sector.</li> </ul>	N/A	

If the short term has been met or exceeded, please provide an explanation of how this was determined (i.e. list of objectives completed, activities performed, etc.):

All of the Agricultural sector goals have been met or exceeded.

---



---



---

If the short term has not been met, please provide an explanation of the variance:

Not applicable, as all goals were met, exceeded, or not applicable for FFY19.

---

---

---

# Measures of Success Checklist

## Forestry Sector Short Term Goals

Prepared for FFY2019 Annual Report

Measures of Success			
Long Term Goal	Short Term Measure(s) of Success	Status	Comments
Long Term Goal No. 1: Restore impaired water bodies (i.e., those on the 303(d) list) by implementing best management practices (BMPs) that address nonpoint source pollution.	<ul style="list-style-type: none"> <li>Fund no less than 1 forestry-based project each year, depending on the number and quality of proposals received.</li> <li>Fund the implementation of no less than 5 forestry BMPs each year, depending on the number of active forestry restoration projects.</li> </ul>	<input type="checkbox"/> Met <input type="checkbox"/> Exceeded <input checked="" type="checkbox"/> Needs improvement  <input type="checkbox"/> Met <input type="checkbox"/> Exceeded <input checked="" type="checkbox"/> Needs improvement	<p>One forestry education project proposal was received, but it was not funded.</p> <p>In FFY19, no forestry BMPs were installed. One forestry-related BMP, a riparian forested buffer in agricultural settings, was installed. While the TN-NPS did not fund BMPs directly, in 2019, the Tennessee Division of Forestry-Water Quality Forester (partially supported by TN-NPS), performed over 1,000 site visits to evaluate BMPs.</p>
Long Term Goal No. 2: Build citizen awareness of problems and solutions related to nonpoint source pollution through local and statewide education efforts targeting various audiences.	<ul style="list-style-type: none"> <li>TN-NPS staff will attend/participate in at least 1 educational event each year targeting a forestry audience.</li> <li>Fund at least 3 educational events each year targeting a forestry audience, depending on the number of active projects aimed at forestry issues.</li> <li>Document at least 200 citizens presented with messages addressing NPS pollution concerns stemming from forestry-related activities.</li> </ul>	<input type="checkbox"/> Met <input checked="" type="checkbox"/> Exceeded <input type="checkbox"/> Needs improvement  <input type="checkbox"/> Met <input type="checkbox"/> Exceeded <input checked="" type="checkbox"/> Needs improvement  <input type="checkbox"/> Met <input checked="" type="checkbox"/> Exceeded <input type="checkbox"/> Needs improvement	<p>TN-NPS staff attended a dozen workshops/ education events that addressed forestry NPS issues.</p> <p>While some educational and outreach events hosted by grantees covered forestry topics, no events were funded that dealt primarily with forestry or silviculture.</p> <p>The Welcome to Your Woods project mailed 676 informational packets to forested property owners in October of 2018.</p>

Long Term Goal	Short Term Measure(s) of Success	Status	Comments
<p>Long Term Goal No. 3: Build capacity for future TN-NPS projects in local watersheds by engaging stakeholders and potential partners through outreach and personal contact.</p>	<ul style="list-style-type: none"> <li>• TN-NPS staff will attend at least 1 stakeholder meeting (e.g., TN Forestry Association or the TN Urban Forestry Council) each year to promote the TN-NPS.</li> </ul>	<input type="checkbox"/> Met <input checked="" type="checkbox"/> Exceeded <input type="checkbox"/> Needs improvement	<p>Staff attended 44 state-holder meetings were forestry-related issues were discussed in FFY19.</p> <p>In addition, Tennessee Division of Forestry staff were invited to the fall TN-NPS All-Hands Meeting to explore additional opportunities for collaboration.</p>
<p>Long Term Goal No. 4: Track interim progress towards restoration of impaired water bodies via adaptive management process.</p>	<ul style="list-style-type: none"> <li>• Develop a sector-based tracking mechanism for BMP implementation, educational activities, pollutant load reductions, and capacity building efforts.</li> <li>• Implement a sector-based tracking mechanism for BMP implementation, educational activities, pollutant load reductions, and capacity building efforts.</li> </ul>	<input checked="" type="checkbox"/> Met <input type="checkbox"/> Exceeded <input type="checkbox"/> Needs improvement  <input checked="" type="checkbox"/> Met <input type="checkbox"/> Exceeded <input type="checkbox"/> Needs improvement	<p>The sector-based tracking for BMP implementation has been developed; and, an online education/ outreach application has been launched.</p>
<p>Long Term Goal No. 5: Protect unimpaired/ high quality waters (i.e., those not on the 303(d) list) by implementing appropriate BMPs where warranted.</p>	<ul style="list-style-type: none"> <li>• Not applicable - projects to protect unimpaired waters by definition will not be assigned to any pollutant source.</li> </ul>	<p>N/A</p>	
<p>Long Term Goal No. 6: Fulfill all obligations under grant award agreement with USEPA annually.</p>	<ul style="list-style-type: none"> <li>• Not Applicable - grant award obligations are not defined by pollutant sector.</li> </ul>	<p>N/A</p>	

If the short term has been met or exceeded, please provide an explanation of how this was determined (i.e. list of objectives completed, activities performed, etc.):

Outreach and education continues to be the strongest aspect of the TN-NPS forestry sector. This year saw increased coordination between TN-NPS and the Tennessee Division of Forestry.

If the short term has not been met, please provide an explanation of the variance:

Staff need to continue attempts to recruit forestry BMP implementation projects.

# Measures of Success Checklist

## Urban Sector Short Term Goals

Prepared for FFY 2019 Annual Report

Measures of Success			
Long Term Goal	Short Term Measure(s) of Success	Status	Comments
<p>Long Term Goal No. 1: Restore impaired water bodies (i.e., those on the 303(d) list) by implementing best management practices (BMPs) that address nonpoint source pollution.</p>	<ul style="list-style-type: none"> <li>• Fund no less than 2 projects focused on stormwater issues in developed areas each year, depending on the number and quality proposals received.</li> <li>• Fund no less than 12 stormwater BMPs each year, depending on the number of active urban/suburban restoration projects.</li> <li>• Staff Watershed Coordinators will perform no less than 15 site visits each year to inspect various stormwater BMPs pre-, during-, and post-construction.</li> </ul>	<ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> Met</li> <li><input type="checkbox"/> Exceeded</li> <li><input type="checkbox"/> Needs improvement</li> </ul> <ul style="list-style-type: none"> <li><input type="checkbox"/> Met</li> <li><input type="checkbox"/> Exceeded</li> <li><input checked="" type="checkbox"/> Needs improvement</li> </ul> <ul style="list-style-type: none"> <li><input type="checkbox"/> Met</li> <li><input type="checkbox"/> Exceeded</li> <li><input checked="" type="checkbox"/> Needs improvement</li> </ul>	<p>One implementation project funded in FFY19 addresses urban stormwater as well as agricultural sources of pollution. No additional urban sector proposals were received.</p> <p>In FFY2019, only one urban BMP was installed.</p> <p>The TN-NPS staff conducted three urban-related site visits in FFY19.</p>
<p>Long Term Goal No. 2: Build citizen awareness of problems and solutions related to nonpoint source pollution through local and statewide education efforts targeting various audiences.</p>	<ul style="list-style-type: none"> <li>• TN-NPS staff will attend/participate in at least 3 educational events each year targeting an urban/suburban audience.</li> <li>• Fund at least 10 educational events each year targeting an urban/suburban audience, depending on the number of active projects aimed at urban/suburban.</li> <li>• Document at least 1,000 citizens presented with messages addressing NPS pollution concerns stemming from stormwater in urban/suburban areas.</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Met</li> <li><input checked="" type="checkbox"/> Exceeded</li> <li><input type="checkbox"/> Needs improvement</li> </ul> <ul style="list-style-type: none"> <li><input type="checkbox"/> Met</li> <li><input checked="" type="checkbox"/> Exceeded</li> <li><input type="checkbox"/> Needs improvement</li> </ul> <ul style="list-style-type: none"> <li><input type="checkbox"/> Met</li> <li><input checked="" type="checkbox"/> Exceeded</li> <li><input type="checkbox"/> Needs improvement</li> </ul>	<p>TN-NPS staff recorded attending 11 urban education/outreach events.</p> <p>Grantees conducted 19 urban nonpoint source-related events.</p> <p>Over 1 million individuals were presented with information about urban runoff issues through a mix of exhibits, brochures, etc.</p>

Long Term Goal	Short Term Measure(s) of Success	Status	Comments
<p>Long Term Goal No. 3: Build capacity for future TN-NPS projects in local watersheds by engaging stakeholders and potential partners through outreach and personal contact.</p>	<ul style="list-style-type: none"> <li>• TN-NPS staff will attend at least 2 stakeholder meetings each year to promote the TN-NPS program.</li> <li>• TN-NPS staff will attend the annual meeting of the Tennessee Stormwater Association (TNSA) each year.</li> </ul>	<p><input type="checkbox"/> Met  <input checked="" type="checkbox"/> Exceeded  <input type="checkbox"/> Needs improvement</p> <p><input checked="" type="checkbox"/> Met  <input type="checkbox"/> Exceeded  <input type="checkbox"/> Needs improvement</p>	<p>The TN-NPS staff recorded attending 14 urban/suburban-based stakeholder meetings in FFY19.</p> <p>In lieu of attending TNSA, staff attended the Tennessee Chapter of the American Water Resources Association Symposium in April of 2019.</p>
<p>Long Term Goal No. 4: Track interim progress towards restoration of impaired water bodies via adaptive management process.</p>	<ul style="list-style-type: none"> <li>• Develop a sector-based tracking mechanism for BMP implementation, educational activities, pollutant load reductions, and capacity building efforts.</li> <li>• Implement a sector-based tracking mechanism for BMP implementation, educational activities, pollutant load reductions, and capacity building efforts.</li> </ul>	<p><input checked="" type="checkbox"/> Met  <input type="checkbox"/> Exceeded  <input type="checkbox"/> Needs improvement</p> <p><input checked="" type="checkbox"/> Met  <input type="checkbox"/> Exceeded  <input type="checkbox"/> Needs improvement</p>	<p>The sector-based tracking for BMP implementation has been developed; and, an online education/outreach application has been launched.</p>
<p>Long Term Goal No. 5: Protect unimpaired/high quality waters (i.e., those not on the 303(d) list) by implementing appropriate BMPs where warranted.</p>	<ul style="list-style-type: none"> <li>• Not applicable - projects to protect unimpaired waters by definition will not be assigned to any pollutant source.</li> </ul>	<p>N/A</p>	
<p>Long Term Goal No. 6: Fulfill all obligations under grant award agreement with USEPA annually.</p>	<ul style="list-style-type: none"> <li>• Not Applicable - grant award obligations are not defined by pollutant sector.</li> </ul>	<p>N/A</p>	

If the short term has been met or exceeded, please provide an explanation of how this was determined (i.e. list of objectives completed, activities performed, etc.):

Education and outreach for the urban sector was strong. Many of the outreach goals were exceeded.

---

---

---

If the short term has not been met, please provide an explanation of the variance:

The urban sector was unusually slow in FFY19. This may be, in part, to the February floods and the recovery efforts that delayed BMP installations. Several urban projects have received needed permits, it seems likely that activity in this sector will rebound in FFY20.

---

---

---

# Measures of Success Checklist

## Failing Septic Sector Short Term Goals

Prepared for FFY 2019 Annual Report

Measures of Success			
Long Term Goal	Short Term Measure(s) of Success	Status	Comments
<p>Long Term Goal No. 1: Restore impaired water bodies (i.e., those on the 303(d) list) by implementing best management practices (BMPs) that address nonpoint source pollution.</p>	<ul style="list-style-type: none"> <li>Fund the repair/replacement of no less than 20 failing septic systems each year, depending on the number of active projects that address failing septic systems.</li> </ul>	<input type="checkbox"/> Met <input checked="" type="checkbox"/> Exceeded <input type="checkbox"/> Needs improvement	<p>A total of 50 septic system repairs/replacements were completed by grantees in FFY19.</p>
	<ul style="list-style-type: none"> <li>Staff Watershed Coordinators will perform no less than 20 site visits each year to inspect work on repair/replacement of failing septic systems.</li> </ul>	<input type="checkbox"/> Met <input checked="" type="checkbox"/> Exceeded <input type="checkbox"/> Needs improvement	<p>The TN-NPS staff reported conducting a total of 36 septic system site visits.</p>
<p>Long Term Goal No. 2: Build citizen awareness of problems and solutions related to nonpoint source pollution through local and statewide education efforts targeting various audiences.</p>	<ul style="list-style-type: none"> <li>TN-NPS staff will attend/participate in at least 1 educational event each year targeting an audience with failing septic concerns.</li> </ul>	<input type="checkbox"/> Met <input checked="" type="checkbox"/> Exceeded <input type="checkbox"/> Needs improvement	<p>Staff attended three outreach events targeting failing septic systems.</p>
	<ul style="list-style-type: none"> <li>Fund at least 1 educational event each year targeting an audience concerned with NPS pollution from failing septic systems.</li> </ul>	<input type="checkbox"/> Met <input checked="" type="checkbox"/> Exceeded <input type="checkbox"/> Needs improvement	<p>Grantees addressed failing septic systems at 18 educational events in FFY19.</p>
	<ul style="list-style-type: none"> <li>Document at least 100 citizens presented with messages addressing NPS pollution concerns stemming from failing septic systems.</li> </ul>	<input type="checkbox"/> Met <input checked="" type="checkbox"/> Exceeded <input type="checkbox"/> Needs improvement	<p>Over 2,800 citizens were presented with information about failing septic systems.</p>

Long Term Goal	Short Term Measure(s) of Success	Status	Comments
<p>Long Term Goal No. 3: Build capacity for future TN-NPS projects in local watersheds by engaging stakeholders and potential partners through outreach and personal contact.</p>	<ul style="list-style-type: none"> <li>TN-NPS staff will attend at least 1 stakeholder meeting each year to promote the TN-NPS program.</li> </ul>	<input type="checkbox"/> Met <input checked="" type="checkbox"/> Exceeded <input type="checkbox"/> Needs improvement	<p>TN-NPS staff attended seven stakeholder meetings that addressed topics related to failing septic systems.</p>
<p>Long Term Goal No. 4: Track interim progress towards restoration of impaired water bodies via adaptive management process.</p>	<ul style="list-style-type: none"> <li>Develop a sector-based tracking mechanism for BMP implementation, educational activities, pollutant load reductions, and capacity building efforts.</li> <li>Implement a sector-based tracking mechanism for BMP implementation, educational activities, pollutant load reductions, and capacity building efforts.</li> </ul>	<input checked="" type="checkbox"/> Met <input type="checkbox"/> Exceeded <input type="checkbox"/> Needs improvement  <input checked="" type="checkbox"/> Met <input type="checkbox"/> Exceeded <input type="checkbox"/> Needs improvement	<p>The sector-based tracking for BMP implementation has been developed; and, an online education/outreach application has been launched.</p>
<p>Long Term Goal No. 5: Protect unimpaired/high quality waters (i.e., those not on the 303(d) list) by implementing appropriate BMPs where warranted.</p>	<ul style="list-style-type: none"> <li>Not applicable - projects to protect unimpaired waters by definition will not be assigned to any pollutant source.</li> </ul>	<p>N/A</p>	
<p>Long Term Goal No. 6: Fulfill all obligations under grant award agreement with USEPA annually.</p>	<ul style="list-style-type: none"> <li>Not Applicable - grant award obligations are not defined by pollutant sector.</li> </ul>	<p>N/A</p>	

If the short term has been met or exceeded, please provide an explanation of how this was determined (i.e. list of objectives completed, activities performed, etc.):

After the agricultural sector, the septic sector was the most active area for TN-NPS this year. The short installation time meant that septic repairs/replacements were less impacted than other sectors by inclement weather.

If the short term has not been met, please provide an explanation of the variance:

Not applicable, as all goals were met, exceeded, or not applicable for FFY19.

# Measures of Success Checklist

## Legacy Mining Sector Short Term Goals

Prepared for FFY 2019 Annual Report

Measures of Success			
Long Term Goal	Short Term Measure(s) of Success	Status	Comments
<p>Long Term Goal No. 1: Restore impaired water bodies (i.e., those on the 303(d) list) by implementing best management practices (BMPs) that address nonpoint source pollution.</p>	<ul style="list-style-type: none"> <li>• Fund no less than 1 project addressing legacy mining concerns each year, depending on the number and quality of proposals received.</li> <li>• Fund no less than 5 BMPs addressing legacy mining concerns each year, depending on the number of active legacy mining projects.</li> <li>• Staff Watershed Coordinators will perform no less than 5 site visits each year to inspect legacy mining BMPs pre-, during-, and post-construction, depending on the number of active legacy mining projects</li> </ul>	<ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> Met</li> <li><input type="checkbox"/> Exceeded</li> <li><input type="checkbox"/> Needs improvement</li>   <li><input type="checkbox"/> Met</li> <li><input type="checkbox"/> Exceeded</li> <li><input checked="" type="checkbox"/> Needs improvement</li>   <li><input type="checkbox"/> Met</li> <li><input type="checkbox"/> Exceeded</li> <li><input checked="" type="checkbox"/> Needs improvement</li> </ul>	<p>One project addressing abandoned mine lands issues was submitted and funded in FFY19.</p> <p>No legacy mining BMPs were installed in FFY19.</p> <p>Four site visits relating to legacy mining issues were conducted in FFY19 - an improvement over previous years, but still below the target.</p>
<p>Long Term Goal No. 2: Build citizen awareness of problems and solutions related to nonpoint source pollution through local and statewide education efforts targeting various audiences.</p>	<ul style="list-style-type: none"> <li>• TN-NPS staff will attend/participate in at least 1 educational event each year targeting an audience dealing with legacy mining concerns.</li> <li>• Fund at least 1 educational event each year targeting an audience concerned with NPS pollution from legacy mining activities.</li> <li>• Document at least 100 citizens presented with messages addressing NPS pollution concerns stemming from legacy mining activities.</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Met</li> <li><input checked="" type="checkbox"/> Exceeded</li> <li><input type="checkbox"/> Needs improvement</li>   <li><input type="checkbox"/> Met</li> <li><input checked="" type="checkbox"/> Exceeded</li> <li><input type="checkbox"/> Needs improvement</li>   <li><input type="checkbox"/> Met</li> <li><input checked="" type="checkbox"/> Exceeded</li> <li><input type="checkbox"/> Needs improvement</li> </ul>	<p>The TN-NPS staff reported attending three events in which legacy mining issues were addressed.</p> <p>Two educational and outreach events hosted by grantees addressed legacy mining as an aspect of their event.</p> <p>Over 300 individuals were presented with information about legacy mining by TN-NPS staff at workshops and stakeholder meetings.</p>

Long Term Goal	Short Term Measure(s) of Success	Status	Comments
<p>Long Term Goal No. 3: Build capacity for future TN-NPS projects in local watersheds by engaging stakeholders and potential partners through outreach and personal contact.</p>	<ul style="list-style-type: none"> <li>TN-NPS staff will attend at least 1 stakeholder meeting each year to promote the TN-NPS.</li> </ul>	<input type="checkbox"/> Met <input checked="" type="checkbox"/> Exceeded <input type="checkbox"/> Needs improvement	<p>TN-NPS staff attended four stakeholder meetings in FFY19.</p>
<p>Long Term Goal No. 4: Track interim progress towards restoration of impaired water bodies via adaptive management process.</p>	<ul style="list-style-type: none"> <li>Develop a sector-based tracking mechanism for BMP implementation, educational activities, pollutant load reductions, and capacity building efforts.</li> <li>Implement a sector-based tracking mechanism for BMP implementation, educational activities, pollutant load reductions, and capacity building efforts.</li> </ul>	<input checked="" type="checkbox"/> Met <input type="checkbox"/> Exceeded <input type="checkbox"/> Needs improvement  <input checked="" type="checkbox"/> Met <input type="checkbox"/> Exceeded <input type="checkbox"/> Needs improvement	<p>The sector-based tracking for BMP implementation has been developed; and, an online education/outreach application has been launched.</p>
<p>Long Term Goal No. 5: Protect unimpaired/high quality waters (i.e., those not on the 303(d) list) by implementing appropriate BMPs where warranted.</p>	<ul style="list-style-type: none"> <li>Not applicable - projects to protect unimpaired waters by definition will not be assigned to any pollutant source.</li> </ul>	<p>N/A</p>	
<p>Long Term Goal No. 6: Fulfill all obligations under grant award agreement with USEPA annually.</p>	<ul style="list-style-type: none"> <li>Not Applicable - grant award obligations are not defined by pollutant sector.</li> </ul>	<p>N/A</p>	

If the short term has been met or exceeded, please provide an explanation of how this was determined (i.e. list of objectives completed, activities performed, etc.):

Progress is being made in Tennessee within the legacy mining sector. Increased interest has lead to the  

---

funding of new implementation project working with property owners impacted by acid mine drainage.  

---

If the short term has not been met, please provide an explanation of the variance:

While capacity is being built in this sector, additional recruitment is necessary to meet all the stated goals.  

---

---

**APPENDIX C**

**SUCCESS STORIES**



# NONPOINT SOURCE SUCCESS STORY Update

## Tennessee

### Agricultural BMPs Reduce the Impact of Cattle Grazing in Lick Creek

#### Update Overview

This Nonpoint Source Success Story Update highlights the removal of a second impairment (pathogens) from Lick Creek, a tributary of Spring Creek. In 1998 Spring Creek and its tributaries were added to the Clean Water Act (CWA) section 303(d) list for impairment by organic enrichment/dissolved oxygen and siltation. In 2002 Lick Creek was listed individually as impaired by pathogens and other habitat alterations due to livestock. Lick Creek's habitat impairment was removed in 2006 (for more details, see the September 2007 Success Story, *Agricultural BMPs Reduce the Impact of Cattle Grazing and Improve Quality of Creek's Habitat*). Landowners have installed multiple best management practices (BMPs) since 2012. Because data show that *Escherichia coli* (*E. coli*) bacteria levels now comply with water quality standards (WQS), Tennessee removed the pathogen impairment from Lick Creek in 2018.

#### Problem

Livestock accessing the stream led to impairment of aquatic habitat and contributed pathogens to Lick Creek in Marshall and Rutherford counties. Although the habitat impairment was removed from Lick Creek in 2006, bacteria levels remained high. Analysis of individual *E. coli* samples in 2011 showed amounts up to 1,414 colony forming units (CFUs) per 100 milliliters (mL), which exceeded the instantaneous WQS of 941 CFUs/100 mL.

#### Story Highlights

In 2012 the Marshall County Soil Conservation District (SCD) received a CWA section 319 grant to install BMPs in the Spring Creek watershed. Using these funds, the SCD helped landowners install a total of 42 BMPs within the Lick Creek sub-basin, including fences, pipelines and alternative watering systems, heavy use areas, and a stream crossing. The Tennessee Department of Agriculture's Agricultural Resources Conservation Fund (ARCF) program supported installation of an additional 16 BMPs, including fencing, heavy use areas, and forage planting (Figure 1).

#### Results

In 2014–2015, all 10 samples collected from Lick Creek met the instantaneous WQS. State WQS for *E. coli* also require that the geometric mean of at least five samples not exceed 126 CFUs/100 mL. In 2014–2015, the geometric means of two sets of five samples each (10 total samples) met the WQS (111 CFUs/100 mL and 90 CFUs/100 mL, respectively). As a result, Lick Creek was removed from Tennessee's impaired waters list in 2018 for pathogens. Lick Creek now fully supports all designated uses.

#### Partners and Funding

Marshall County SCD received a 2012 CWA section 319 grant totaling \$370,000 for work in the Spring Creek watershed; approximately \$80,740 was provided as cost share for projects within the Lick Creek sub-basin. To date, Tennessee's ARCF has contributed \$26,546 in incentive payments for BMPs in the sub-basin. Marshall County SCD key partners included the Natural Resources Conservation Service and the Marshall County government.

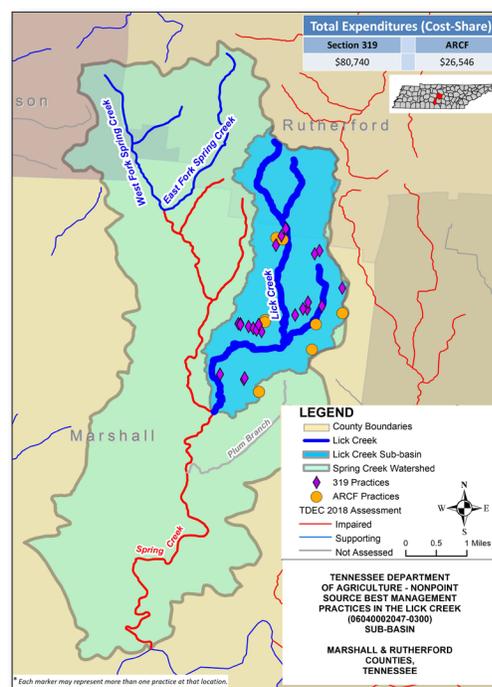


Figure 1. BMPs in the Lick Creek sub-basin.

#### Update: July 2019

EPA 841-F-19-001S

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

#### For additional information contact:

Sam Marshall

Tennessee Department of Agriculture  
615-837-5306 • Sam.Marshall@tn.gov



# NONPOINT SOURCE SUCCESS STORY

## Tennessee

### Improvements to Agricultural Management Help in the Recovery of East Rock Creek (Marshall County)

#### Waterbody Improved

East Rock Creek, located in Marshall County, was added to Tennessee's 2002 Clean Water Act (CWA) section 303(d) list for impairments from siltation and habitat alterations from pasture grazing. By 2012, the causes of pollution had been expanded to include nitrate and *Escherichia coli* (*E. coli*). The Nature Conservancy (TNC), with support from two Clean Water Act (CWA) section 319 grants, helped producers install agricultural best management practices (BMPs). Tennessee's Agricultural Resources Conservation Fund (ARCF) also supported implementation of BMPs along East Rock Creek and its tributaries. In 2018, 14.17 miles of East Rock Creek had been improved significantly, and the segment was no longer listed as impaired by nitrate, siltation, or habitat alterations on the State of Tennessee's List of Impaired Waters.

#### Problem

East Rock Creek (TN06040002012 – 0100) is within the Rock Creek watershed (060400020501), in Marshall County, Tennessee (Figure 1). The designated uses for East Rock Creek are fish and aquatic life, recreation, livestock watering and wildlife, and irrigation. This portion of Marshall County is predominately rural, and the primary land use in the Rock Creek watershed is pasture grazing and hay production, with some row crop farming and forested areas.

In Tennessee's 1992 CWA section 303(d) list of impaired waters, Big Rock Creek (including East Rock Creek) was identified as impacted by ammonia, nutrients, and organic enrichment/dissolved oxygen. In 2002, East Rock Creek was listed individually on Tennessee's CWA section 303(d) list for siltation and other habitat alterations from pasture grazing. In 2006, nutrients (nitrates) were added as a cause of pollution; in 2008, *E. coli* was identified as an impairment.

In 2011, the Tennessee Department of Environment and Conservation (TDEC) conducted a Tennessee Macroinvertebrate Index (TMI) to measure biological function, which yielded a score of 24. (To meet biocriteria guidelines, a score of 32 or higher is required.)

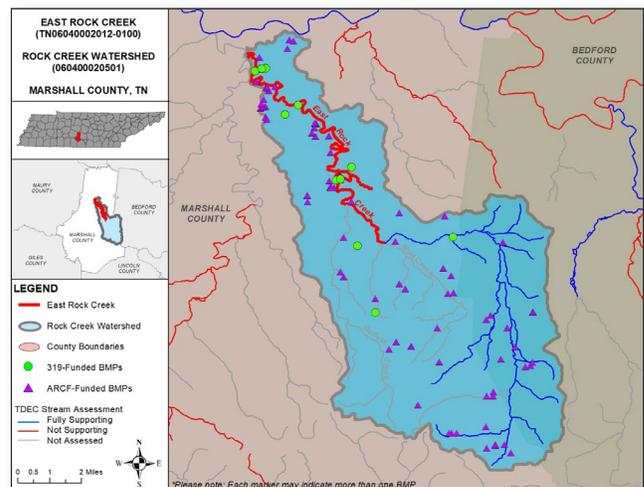


Figure 1. East Rock Creek is in central Tennessee.

A total maximum daily load (TMDL) for low dissolved oxygen and nutrients for the Upper Duck River watershed (060300001), which includes East Rock Creek, was developed by TDEC and approved by the U.S. Environmental Protection Agency (USEPA) in 2005. No target load reductions for East Rock Creek were identified. A TMDL for the Upper Duck River watershed for siltation and habitat alteration was also developed by TDEC and approved by USEPA in 2006. The TMDL recommended a decrease of 39.6 percent of the siltation load.

## Story Highlights

In fiscal year (FY) 2001, TNC was awarded a CWA section 319 grant to develop a watershed management plan for Big Rock Creek (to which East Rock Creek flows). In FY 2006, TNC received a second CWA section 319 grant to implement the watershed management plan and assist with the installation of agricultural BMPs within the watershed. A total of 31 agricultural BMPs were installed in the Rock Creek watershed, including fencing, livestock pipelines, heavy use areas, watering facilities and riparian forest buffers (Table 1).

**Table 1. BMPs installed in the Rock Creek watershed.**

Practice name	Units installed		Total units installed
	CWA 319 funds	ARCF funds	
Cover crop	-	66 (2,547 ac)	66 (2,547 ac)
Fence	2 (5,100 ft)	2 (10,902 ft)	4 (16,002 ft)
Riparian forest buffer	1 (600 ft)	-	1 (600 ft)
Forage and bio-mass planting	-	8 (252 ac)	8 (252 ac)
Cropland conversion	-	10 (452 ac)	10 (452 ac)
Pipeline	7 (5,995 ft)	2 (4,520 ft)	9 (10,515 ft)
Heavy use area	9	6	15
Watering facility	12	7	19

Notes: ft = linear feet; ac = acres

The Tennessee Department of Agriculture's (TDA) ARCF program has assisted with the implementation of 101 agricultural BMPs along East Rock Creek and its tributaries within the Rock Creek watershed, including fencing, heavy use areas, cover crops, and forage and biomass plantings (Figure 2).

## Results

The biological function of East Rock Creek was reevaluated by TDEC in 2015. Macroinvertebrate sampling of East Rock Creek provided an improved TMI of 34 (passing score is 32), with an increase in intolerant species (indicating improved water quality). As a result of the 2015 TMI, East Rock Creek was removed from the Tennessee's 2018 list of impaired waters for nitrate, siltation, and habitat alterations. (Tennessee has narrative nutrient and



**Figure 2. Cross fencing installed near East Rock Creek in Marshall County.**

siltation criteria; since nitrates and siltation are no longer causing measurable harm, TDEC delisted East Rock Creek for these parameters based on the improved habitat scores.) As of 2018, East Rock Creek remains impaired by *E. coli* from pasture grazing.

## Partners and Funding

The TNC was awarded a CWA section 319 grant in 2001 totaling \$986,238 to support restoration efforts along Big Rock Creek and its tributaries (including East Rock Creek). During the FY 2001 grant period, a watershed management plan was developed for Big Rock Creek. In 2006, a second CWA section 319 grant (for \$492,987) was awarded to TNC for implementing BMPs along Big Rock Creek and its tributaries. Within the Rock Creek watershed specifically, in which East Rock Creek is located, a total of \$32,501 was invested in agricultural BMPs. Key partners with TNC included the Center for Watershed Protection, U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS), Austin Peay University, Marshall County School District and the City of Lewisburg.

In addition to the CWA section 319 grant funding, Tennessee's ARCF program has contributed \$118,355 for installing agricultural BMPs in the Rock Creek watershed. Partners with TDA for installation of BMPs through ARCF include USDA NRCS and the Marshall and Bedford county soil conservation districts.



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

EPA 841-F-19-001JJ  
November 2019

## For additional information contact:

**Sam Marshall**  
Tennessee Department of Agriculture  
615-837-5306 • Sam.Marshall@tn.gov

## APPENDIX D

# WATERSHED BASED PLAN DEVELOPMENT WORKSHOP



# Developing a Nonpoint Source Watershed Based Plan

Tennessee Department of Agriculture  
Land & Water Stewardship



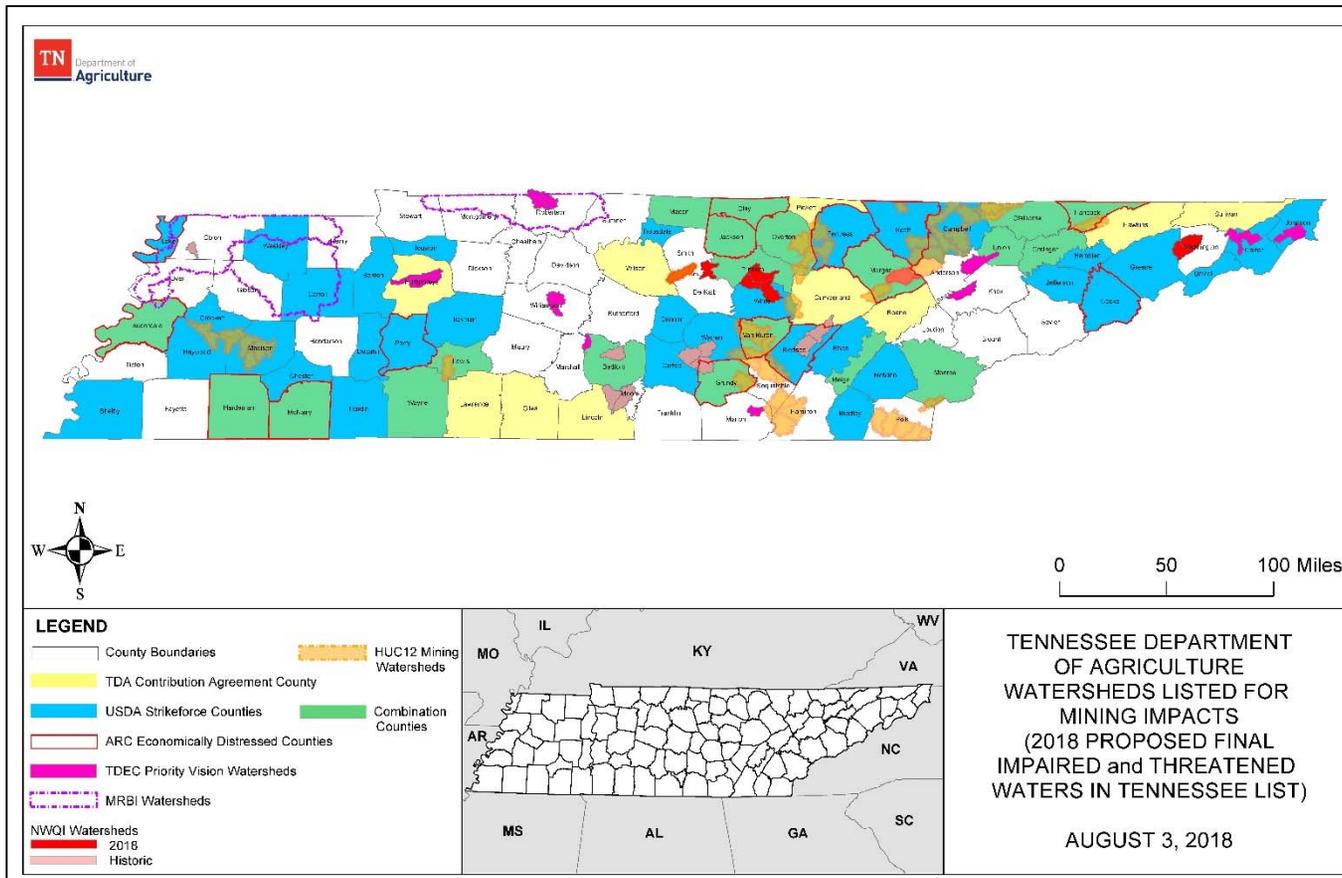
# When is a Watershed Based Plan Required?

- A watershed based plan (or equivalent) is required when a local municipality, non-governmental agency, or other qualifying organization is applying for Section 319 Grant for watershed funds.
  - Grant funds are broken into two categories: program funds and watershed funds. Watershed funds have more monies available to access – quite a bit more. For example, in 2019, the program funds (which includes education and outreach projects) had approximately \$58,000 in its pool. In contrast, the watershed funds pool had approximately \$1,178,000.
  - Applying for watershed funds provides the applicant with the opportunity to access more money, oftentimes with less competition (fewer proposals received).

# Locating Potential Project Areas

- Most often, organizations thinking about applying for a Section 319 Grant already have a pretty solid idea of where they want to work.
- In rare cases, an organization might be interested in a general area (say, a specific county or region), but they don't know how to further pinpoint an exact area. Factors to consider include:
  - Are the streams impaired or designated as a high quality waterbody?
  - Is this the area of greatest need?
  - Is there currently local buy-in, local volunteers, nearby technical support (e.g. a university), or previous projects in the area?
  - Does the area have other designations (e.g. economically distressed, USDA Strikeforce County) that may increase the amount of funds that can be leveraged?

# Locating Potential Project Areas, cont.



- Setting specific goals can help narrow down potential areas of interest.

# Locating Potential Project Areas, cont.

- If your organization is still not sure which area may be best, review TDA's *Grant Proposal Evaluation Criteria*.
- In addition, working in typically under-represented sectors (e.g. mining, forestry) can also benefit a proposal's score.

Total Score \_\_\_\_\_ Rank \_\_\_\_\_  
Funded \_\_\_\_\_

**TN** Department of  
**Agriculture**

**TENNESSEE NONPOINT SOURCE PROGRAM**

**Grant Proposal Evaluation Criteria – WATERSHED PROJECT FUNDS**

**PROJECT NAME:** \_\_\_\_\_

**Section I** – All proposed projects must provide sufficient information to answer the following questions regarding each project. If the answer to any of the following questions is "NO" then the project is not eligible for further consideration in Section II, and will not be formally ranked for funding allocation.

A. Is the project eligible for 319 funding?  
\_\_\_\_ Yes \_\_\_\_ No \_\_\_\_\_

B. State Nonpoint Guidelines - the project addresses one or more of the long term goals identified in the Tennessee Nonpoint Source "Management Program Document"?  
\_\_\_\_ Yes \_\_\_\_ No

C. Project Target – the project is precisely aimed at preventing or mitigating pollutant loadings from nonpoint sources within a specific watershed(s) with the ultimate goal of removing a 303(d)-listed waterbody or preventing one from becoming listed? (i.e., this should not be a "demonstration project")  
\_\_\_\_ Yes \_\_\_\_ No

D. Project Work Plan – the work plan provides sufficient, detailed documentation of the proposed project, including: list of cooperating organizations, description of project, overall objectives, specific milestones, measures of success, anticipated schedule for accomplishing milestones, and a budget?  
\_\_\_\_ Yes \_\_\_\_ No

E. Financial Commitment – matching funds (normally 40%) are provided, and the budget includes the source(s) of all matching funds?  
\_\_\_\_ Yes \_\_\_\_ No

F. Watershed Plan Status – a plan has already been approved or is currently under review?  
\_\_\_\_ Yes \_\_\_\_ No

**Forward Proposal to Section II for Final Project Scoring**      \_\_\_\_ Yes      \_\_\_\_ No

**Section II** – Only projects that have satisfactorily met Section I requirements may continue for ranking consideration under this section. Total points earned in this section will determine a project's overall ranking, and ranking will be the primary basis for funding allocation. No project is guaranteed to receive 100% of requested funds, regardless of score or rank.

\_\_\_\_\_ 1. Percent of 319 budget for personnel costs [defined as total amount of money allocated for salaries and benefits of employees of the grantee and the total amount allocated for payment through subcontracts for technical assistance(i.e., not to include cost of labor for BMP implementation)]:

> >75% ---- 0 points  
> 50-74% -- 2 points  
> 25-49% -- 5 points

# Project Areas with Watershed Based Plans

- Upon identification of an area in which your organization wants to work, check to see if a watershed based plan has previously been developed.
  - Approved nine-element watershed based plans for Tennessee can be found online at:  
[https://www.tn.gov/agriculture/farms/conservation/nonpoint-source-program\\_rd.html](https://www.tn.gov/agriculture/farms/conservation/nonpoint-source-program_rd.html)
  - In addition, many seven-element plans were previously developed and approved. Although they cannot be used “as-is,” they may require only minor additions/revisions. Call TDA at 615-837-5492 to determine if a historical seven-element plan exists for your area of interest.

## Project Areas with Watershed Based Plans, cont.

- If an approved nine-element watershed based plan exists for your area of interest, you may not need to develop a new plan.
  - Review the existing plan:
    - Does your organization agree with the causes and sources of pollution?
    - Is your organization interesting in performing the mitigation/remediation tasks outlined in the plan?
    - Is there a partnering opportunity with the plan originator?
- Some plans may require revision; however, even if your organization determines that a new plan is needed, the previous plan can provide a useful starting point/historical context.

# Project Scope/Size

- Once your organization determines that a viable nine-element watershed based plan does not exist for the area of interest, it is important to determine the appropriate scope and size of the plan you are about to develop.
- Scope and size depends on multiple factors including:
  - Number of contributing pollution sources (i.e. one or two severely cut-back areas versus several dozen failing septic systems)
  - Organizational capacity (technical expertise, additional funding sources, staffing, etc.)
  - Access
  - Community support

# Project Scope/Size, cont.

- With regards to size, our cooperators typically use the 12-digit hydrologic unit code (HUC-12); however, this is not required. Watersheds can be larger or smaller, as best suits the applying organization.

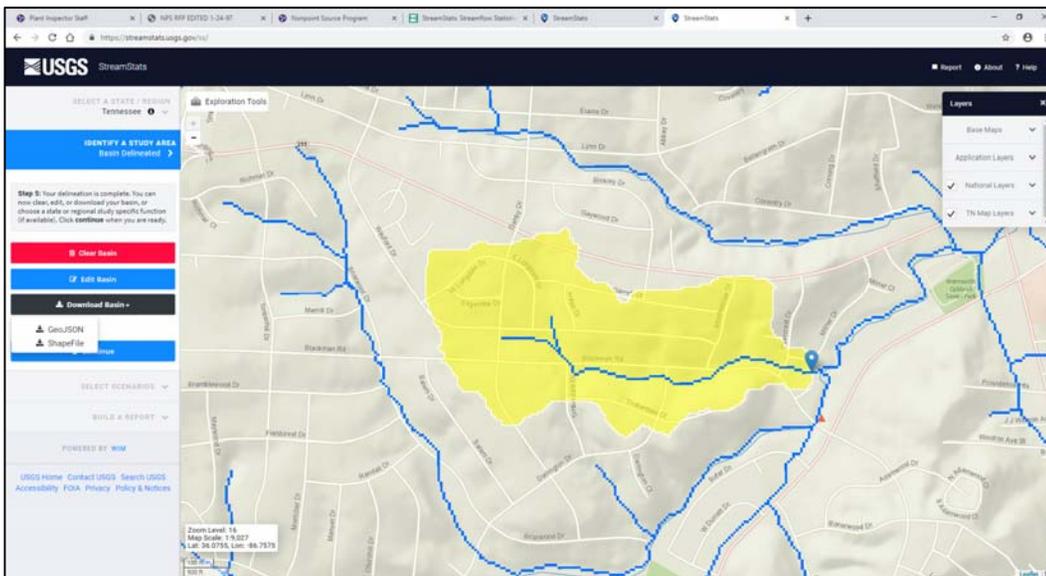
## How Large is a Watershed?

Level	HUC <sup>1</sup> Digits	Name	Unit Size (Average or Range)	
			Square Miles	Acres
1	2	Region	177,560	113,638,400
2	4	Subregion	16,800	10,752,000
3	6	Basin	10,596	6,781,440
4	8	Subbasin	703	449,920
5	10	Watershed	63-391	40,000-250,000
6	12	Subwatershed	16-63	10,000-40,000

<sup>1</sup>Hydrologic unit code (e.g., HUC10 is a 10-digit HUC)  
Source: Virginia DCR (2017a)

# Project Scope/Size, cont.

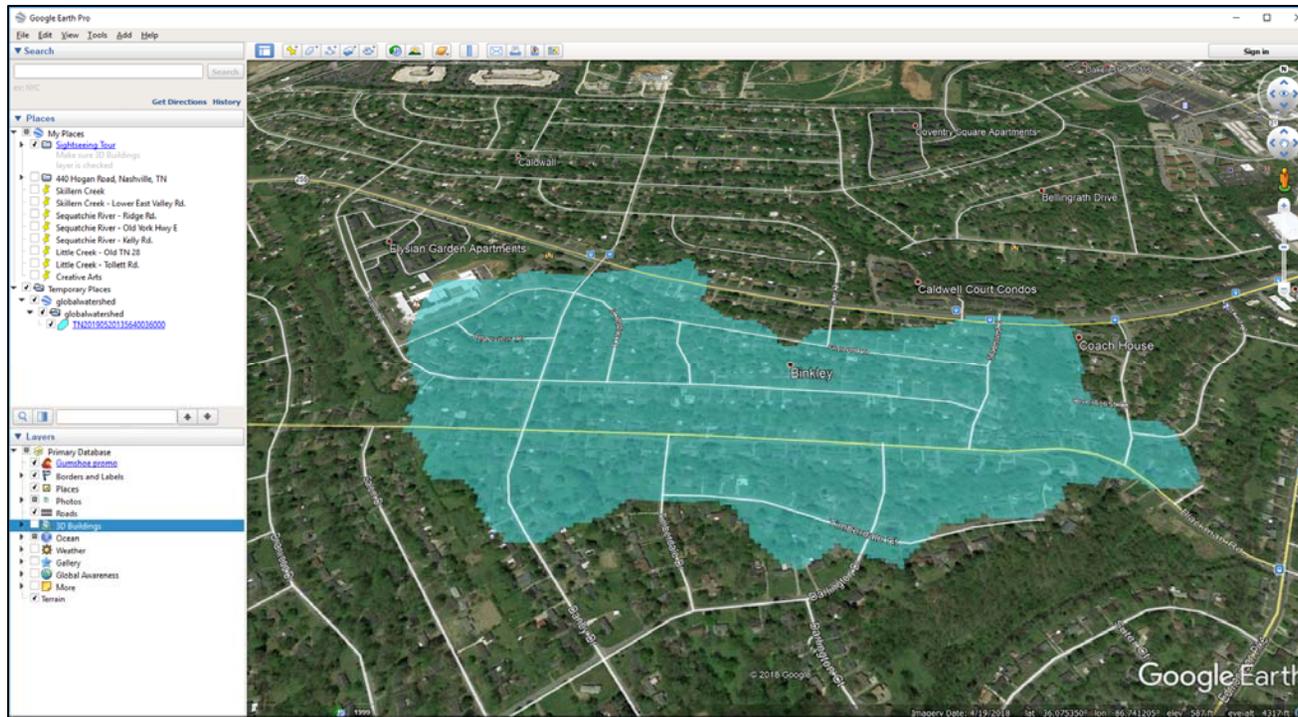
- Smaller organizations, or applicants wishing to target a very specific pollution cause and source, may want to consider a smaller basin within a HUC-12.



- StreamStats is an online tool that can be useful in defining smaller basins within a HUC-12. The tool, administered by the U.S. Geological Survey, can be found at: <https://streamstats.usgs.gov/ss/>

# Project Scope/Size, cont.

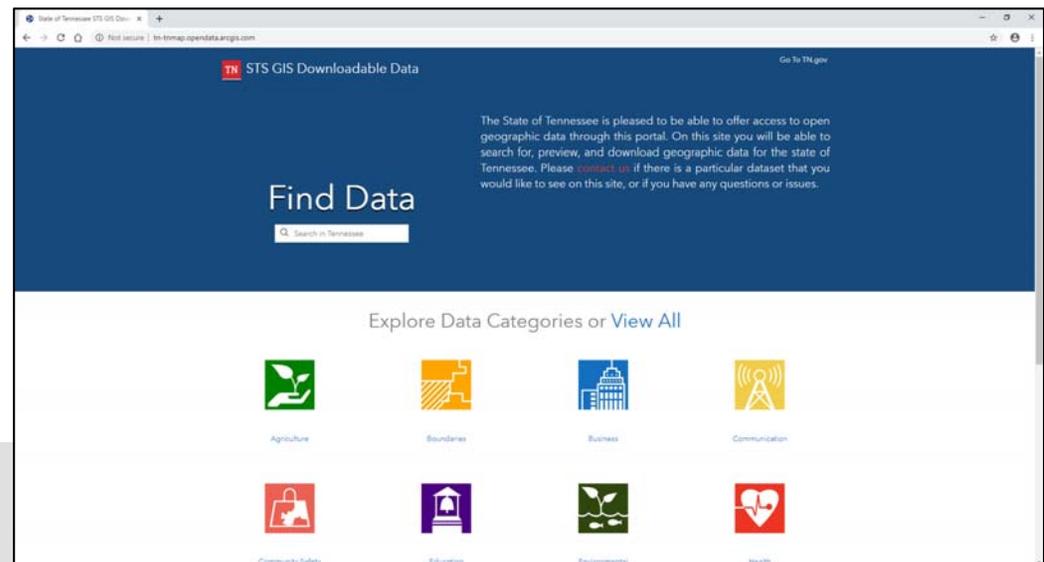
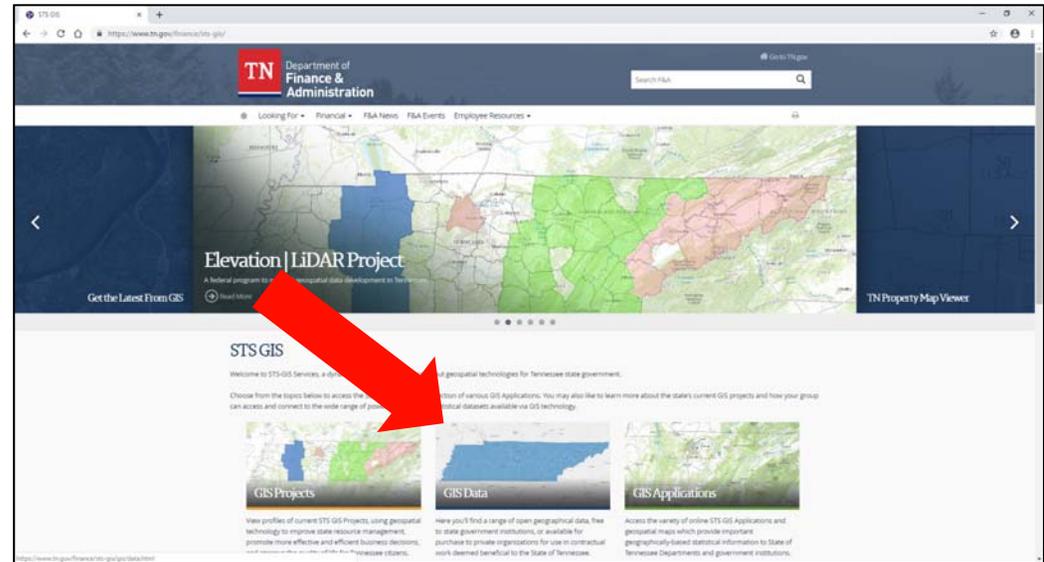
- If your organization does not use ESRI products (e.g. ArcMap), the shapefile can be converted to a KML file and used with Google Earth Pro.



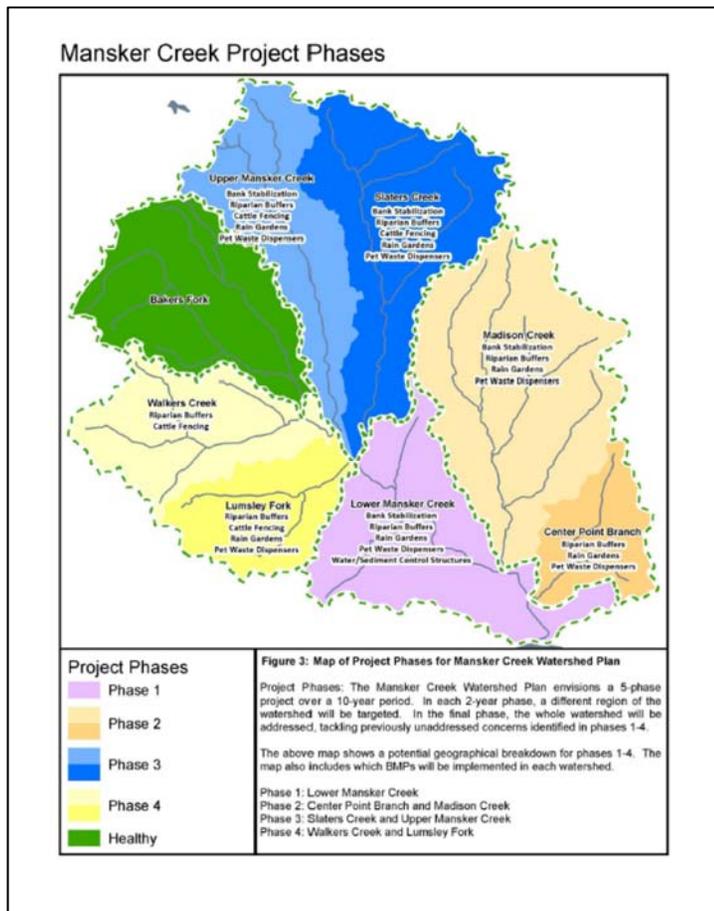
# Project Scope/Size, cont.

- The State of Tennessee offers downloadable GIS data at their Open Data Portal found at:

<https://www.tn.gov/finance/sts-gis.html>



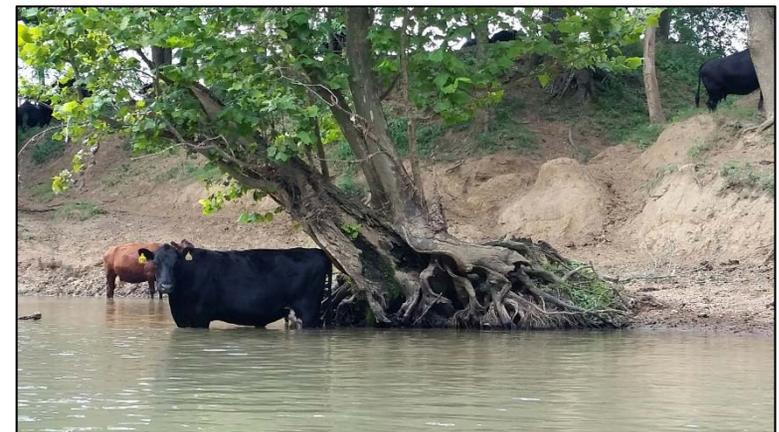
# Project Scope/Size, cont.



- Remember when determining the scope and size of your watershed based plan:
  - A watershed based plan can be phased. For example, if your group only plans to work on one or two large projects, focused on a single cause/source, that can be Phase I. Subsequent phases identify other areas for improvement that your organization, or a partner, may want to tackle at a later date.
  - Watershed based plans should be “pie-in-the-sky” plans – that is, if funding, access, man-power, etc. weren’t issues, what activities need to be completed to restore (or protect) the basin or watershed.

# Element 1: Identification of Causes of Impairment and Pollutant Sources

- Cause versus Source
  - Cause – the pollutant negatively impacting the waterbody, including:
    - Nutrients such as total phosphorus or nitrate/nitrite
    - *Escherichia coli* (pathogens)
    - Sedimentation/siltation
  - Source – the place or activity from which the pollutant originates, such as:
    - Municipal (urbanized high density area)
    - Grazing in riparian or shoreline zones
    - Channelization



# Element 1: Identification of Causes of Impairment and Pollutant Sources, cont.

- Information provided by the Tennessee Department of Environment and Conservation (TDEC) is your starting point for identifying causes and sources.
  - Total maximum daily loads (TMDL)
    - Found online at: <https://tdec.tn.gov/document-viewer/#/search/tmdl>
  - Alternative Restoration Approach Documents (5-alt Reports)
    - Found online at: <https://www.tn.gov/environment/program-areas/wr-water-resources/watershed-stewardship/tennessee-s-total-maximum-daily-load--tmdl--program/tmdl-new-vision.html>
  - Division of Water Resources – Public Data Viewer
    - Found online at: <https://tdeconline.tn.gov/dwr/>
  - List of Impaired Waters
    - Found online at: [https://www.tn.gov/content/dam/tn/environment/water/planning-and-standards/wr\\_wq\\_303d\\_2018-final.xlsx](https://www.tn.gov/content/dam/tn/environment/water/planning-and-standards/wr_wq_303d_2018-final.xlsx)

# Element 1: Identification of Causes of Impairment and Pollutant Sources, cont.

- Field reconnaissance is an invaluable tool for verifying pollutant sources.

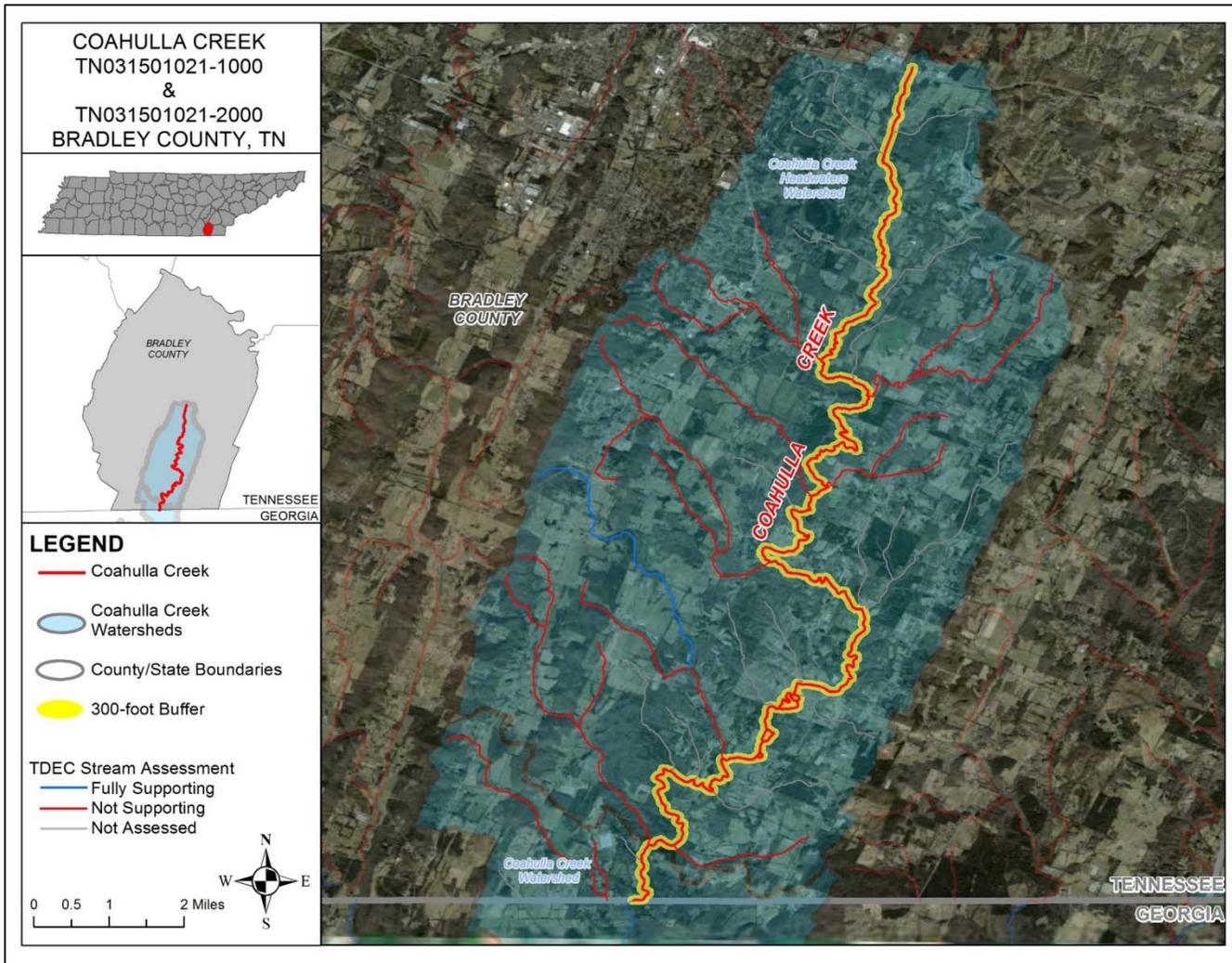


- Leveraging educational and outreach efforts (such as creek clean-ups) can assist in minimizing the recon labor required.



- Photographs from your organization or volunteers can be a powerful addition to your watershed based plan.

# Element 1: Identification of Causes of Impairment and Pollutant Sources, cont.



- Include a map
  - If possible, indicate major contributors of pollutant load.
  - Many online mapping programs can assist with map development, and assistance is available from TDA, if needed.

# Element 2: Estimate of Pollutant Load Reductions Expected from Management Measures

- The pollutant load reduction estimate is typically one of the most challenging elements.
- Previously, through an agreement with U.S. EPA, Tennessee applicants were exempted from this element; however, all nine elements are now required.
- The Request for Proposals (RFP) provides a rough estimation tool for use with common best management practices.

Tennessee NPS Program - Pollutant Load Reduction Estimation Tool

BMP Name	NRCS Code	N Reduction Factor	Unit	P Reduction Factor	Unit	Sediment Reduction Factor	Unit
Watering System	614	70.23	lbs N/unit/year	5.88	lbs P/unit/year	0.004	tons/unit/year
Heavy Use Area	561	0.09	lbs N/sq ft/year	0.01	lbs P/sq ft/year	0.002	tons/sq ft/year
Pipeline	516	0.13	lbs N/foot/year	0.02	lbs P/foot/year	0.006	tons/foot/year
Fence	382	0.25	lbs N/foot/year	0.02	lbs P/foot/year	0.006	tons/foot/year
Forage and Biomass Planting	512	6.78	lbs N/acre/year	0.66	lbs P/acre/year	0.175	tons/acre/year
Grass Stabilization Structure	410	246.82	lbs N/structure/year	25.79	lbs P/structure/year	4.224	tons/structure/year
Water and Sediment Control Basin	638	199.41	lbs N/basin/year	33.92	lbs P/basin/year	6.109	tons/basin/year
Critical Area Planting	342	100.04	lbs N/acre/year	13.56	lbs P/acre/year	0.055	tons/acre/year
Streambank/Shoreline Protection	580	1.75	lbs N/foot/year	0.17	lbs P/foot/year	0.047	tons/foot/year
Access Control (Livestock Exclusion)	472	0.11	lbs N/foot/year	0.01	lbs P/foot/year	0.001	tons/foot/year
Septic improvements	006	119.28	lbs N/unit/year	12.58	lbs P/unit/year	3.564	tons/unit/year
Access Road	560	0.37	lbs N/foot/year	0.03	lbs P/foot/year	0.004	tons/foot/year
Nutrient Management	590	6.31	lbs N/acre/year	1.02	lbs P/acre/year	0.282	tons/acre/year
Riparian Forest Buffer	391	308.4	lbs N/acre/year	22.6	lbs P/acre/year	3	tons/acre/year
Rain Garden	007	0.158	lbs N/sq ft/year	0.06	lbs P/sq ft/year	0.006	tons/sq ft/year
Winter Cover Crop	340	11.4	lbs N/acre/year	2.4	lbs P/acre/year	0.84	tons/acre/year
Terrace	600	0.12	lbs N/foot/year	0.04	lbs P/foot/year	0.01	tons/foot/year
Stream Crossing	578	50.3	lbs N/unit/year	7.5	lbs P/unit/year	2.8	tons/unit/year
Diversion	362	0.11	lbs N/foot/year	0.03	lbs P/foot/year	0.01	tons/foot/year
Spring Development	574	78.9	lbs N/unit/year	7.2	lbs P/unit/year	1.8	tons/unit/year
Grassed Waterway	412	913.2	lbs N/acre/year	220	lbs P/acre/year	89.4	tons/acre/year
Filter Strip	393	375.8	lbs N/acre/year	83	lbs P/acre/year	32.9	tons/acre/year

**Example:** You have a project where you intend to install 4,650 linear feet of access control fencing; 2 watering systems; 2,400 square feet of heavy use area; 3,800 linear feet of pipeline; and 1,200 feet of streambank protection.

Estimate the TOTAL expected reduction in loading of N, P, and sediment to the receiving stream as follows:

PRACTICE	AMOUNT		N Reduction Factor	= lbs N/year
Access Control	4,650 feet	x	0.11	511.5
Watering System	2 units	x	70.23	140.5
Heavy Use Area	2,400 square feet	x	0.09	216
Pipeline	3,800 feet	x	0.13	494
Streambank Protection	1,400 feet	x	1.75	2450
Expected reduction in N load =				<b>3812</b>

PRACTICE	AMOUNT		P Reduction Factor	= lbs P/year
Access Control	4,650 feet	x	0.01	46.5
Watering System	2 units	x	5.88	11.76
Heavy Use Area	2,400 square feet	x	0.01	24
Pipeline	3,800 feet	x	0.02	76
Streambank Protection	1,400 feet	x	0.17	238
Expected reduction in P load =				<b>396.26</b>

PRACTICE	AMOUNT		Sediment Reduction Factor	= tons sediment/year
Access Control	4,650 feet	x	0.001	4.65
Watering System	2 units	x	0.43	0.86
Heavy Use Area	2,400 square feet	x	0.002	4.8
Pipeline	3,800 feet	x	0.006	22.8
Streambank Protection	1,400 feet	x	0.047	65.8
Expected reduction in sediment load =				<b>98.91</b>

## Element 2: Estimate of Pollutant Load Reductions Expected from Management Measures, cont.

- A wide variety models are available for estimating pollutant load reduction. A list and description of nutrient and sediment estimation tools can be found online at:  
<https://www.epa.gov/sites/production/files/2018-08/documents/loadreductionmodels2018.pdf>
- TDA utilizes the Spreadsheet Tool for Estimating Pollutant Load (STEPL) model for reporting estimated load reduction to the U.S. EPA. The model and accompanying data server can be accessed at: <http://it.tetratech-ffx.com/steplweb/>
- In addition, if you have specific practices planned in a specific watershed, TDA can assist with running a STEPL model.

## Element 3: Management Measures Needed to Achieve Load Reductions

- Element 3 goes hand-in-hand with Element 2. This section should provide a description of the practices proposed, as well as any critical/priority areas.
- Practices supported by NRCS, found online at: [https://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/national/technical/cp/ncps/?cid=nrcs143\\_026849](https://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/national/technical/cp/ncps/?cid=nrcs143_026849), as well as septic system repairs, rain gardens, abandoned minelands remediation (typically in coordination with TDEC), and forestry practices can be proposed.



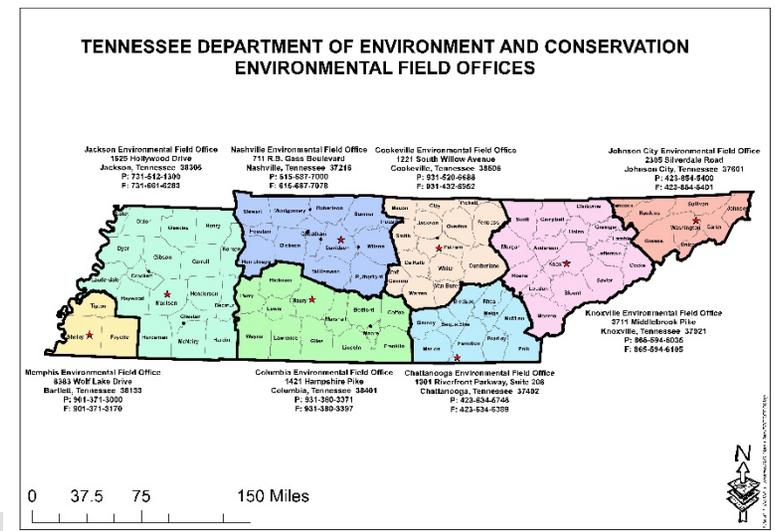
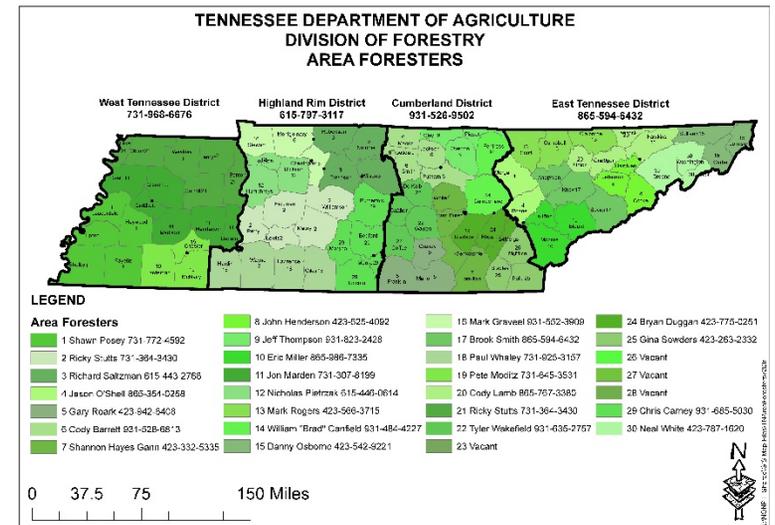
- Unique/novel practices can also be proposed; however, additional information may be requested regarding new technologies.
- PLEASE NOTE: practices intended to comply with permit terms and conditions, environmental enforcement actions, etc. are not eligible for Section 319 funds.

# Element 4: Estimate the Amounts of Technical and Financial Assistance Needed

- As before, the watershed based plan is intended to illustrate the **full cost**, in both funds and labor, to:
  - Implement all the needed practices to restore the watershed to fully supporting of all designated uses ~OR~ protect a high quality waterbody from degradation
  - Maintain the implemented practices
  - Long-term monitoring of water quality
  - Education and outreach activities
  - Technical assistance
- Element 4 provides an opportunity to address partnerships, alternative funding sources, donated time and materials, volunteer work.
- Cost estimates for agricultural practices may be determined used the Tennessee Environmental Quality Incentives Program (EQIP) General Payment Schedule found online at:  
[https://www.nrcs.usda.gov/wps/portal/nrcs/detail/tn/programs/financial/eqip/?cid=nrcs141p2\\_016426](https://www.nrcs.usda.gov/wps/portal/nrcs/detail/tn/programs/financial/eqip/?cid=nrcs141p2_016426)
- Other practice costs may require additional research, requesting estimates from vendors, etc.

# Element 4: Estimate the Amounts of Technical and Financial Assistance Needed, Cont.

- Engaging potential partners early is key. Letters of support from committed partners can also strengthen your proposal.
- TDA can assist with providing contacts to State field staff that may be useful partners.
- When working in rural areas, NRCS and county Soil Conservation Districts (SCDs) can be helpful in identifying cooperating landowners. Contacts for the SCDs can be found online at: <https://www.tn.gov/agriculture/farms/conservation/ag-farms-sscc.html>



# Element 5: Information and Education Component

- Education and outreach is required for all Section 319 Grants.
- Activities can run the gambit from:
  - Minor – outreach performed while engaging participating landowners
  - Major – construction of an outdoor classroom in conjunction with a wetland restoration project
- With watershed fund projects, the education and outreach is often a public meeting, farm day/farmer's breakfast, or information mailers.



## Element 6: Schedule for Implementation

- Element 6 is an estimate on the amount of time to fully implement the watershed based plan – it is strongly linked with Element 7: Interim Measurable Milestones.
- The schedule should be reflective of the schedule laid out in your proposal. If you are using a phased approach, whichever phase you are proposing should coincide with the schedule in the watershed based plan.
- Be as specific as you can, while allowing flexibility for unforeseen circumstances (such as inclement weather) that may delay practice implementation.

# Element 7: Interim Measureable Milestones

- Closely linked with Element 6, Element 7 is basically a measure of the work that being is done.
- Measurable milestones may include:
  - Number of potential cooperators contacted
  - Number of practices installed
  - Number of education and outreach events attended
  - Other important benchmarks such as obtaining permits, completing practice design, etc.

## **Timeline & Tasks**

### 1<sup>st</sup> year – 2010

- Within one month of the contract start date, a public meeting will be held. In addition, there will be a mail-out specifically to landowners and residents within the watershed.
- Within two months of the contract start date, a brochure for landowners will be designed and mailed to landowners and residents within the watershed with information concerning BMPs.
- The Lauderdale County Soil Conservation Office will utilize the local newspapers, The Lauderdale Voice and The Lauderdale County Enterprise, to feature the introduction, present efforts, and information concerning BMP incentive programs along with contact information for interested parties.
- Within the first six months, a field day involving local public schools, with special attention given to stream restoration and ways to prevent stream pollution, will be conducted.
- Within the first year of the contract, 10 BMPs will be installed.
- Funding for BMPs in contract year one will be installed by September 30<sup>th</sup>.
- Submit Progress and Close-Out Reports per contract specifications.
- Submit an Annual Report by Sept. 15<sup>th</sup> in lieu of the standard progress report on September 30<sup>th</sup>, on activities and accomplishments throughout the past year (photos included).

### 2<sup>nd</sup> year – 2011

- Within one month of the start of the 2<sup>nd</sup> contract year, a public meeting will be held. In addition, there will be a mail-out specifically to landowners and residents within the watershed.
- Within six months, a Tour of Installed BMPs in the watershed will be conducted to evaluate the effectiveness, and continue education to landowners, residents and the community.
- The Lauderdale County Soil Conservation Office will utilize the local newspapers, The Lauderdale Voice and The Lauderdale County Enterprise, to feature the present efforts and information concerning BMP incentive programs along with contact information for interested parties.
- Within this year of the contract, 20 BMPs will be installed. \*This number is subject to change as watershed support for the BMPs increases. This will be reevaluated yearly and may drive the need for change in promotion of the project.
- Funding for BMPs in contract year two will be installed by September 30<sup>th</sup>.
- Submit Progress and Close-Out Reports per contract specifications.

# Element 7: Interim Measureable Milestones, cont.

- Permitting and inclement weather has historically had the greatest negative impact on meeting milestones.
  - If you have applied for a permit, you can check the status on the Division of Water Resources Data Viewer found online at: <https://www.tn.gov/environment/about-tdec/tdec-dataviewers.html>

Tennessee Division of Water Resources (DWR)

Permits Documents Permit Appeals Moratoriums Complaints Inspections Eng. Plans Hydrologic Det. Exceptional Waters Ambient Monitoring QLP Data Oil & Gas Wells

Search Guidance and Help Link

DWR Permits in Tennessee

Q Go Rows 50 Actions

- Row text contains 'Cumberland River'
- Status = 'Complete'
- Status not in 'Inactive/Withdrawn'

1 - 1 of 1

Permit No	Site Name	Permittee Name ↑	Project Name	Permit Type	Status	Rating	Location	City	County	EEO Name	Issuance	Effective	Expiration
NRS15 350	Cumberland City Navigation By-Pass Channel - Maintenance Dredging at Cumberland River Miles 102.0 and 104-5 at Barkley Reservoir	US Army Corps of Engineers - Nashville District (USCOE)	Cumberland City Navigation By-Pass Channel - Maintenance Dredging at Cumberland River Miles 102.0 and 104-5 at Barkley Reservoir	ARAP	Complete	Minor	Cumberland River Miles 102.0 and 104-5 at Barkley Reservoir	Cumberland City	Stewart	Nashville	-	-	-

1 - 1 of 1

## Element 8: Criteria to Determine if Load Reductions are Being Achieved

- Element 8 is meant to be used to determine if the practices being installed are positively impacting water quality.
- The criteria can be:
  - Direct (i.e. quantitative, analytical data)
  - Indirect (i.e. beach closings or the presence/absence of a sensitive species)
- Element 8 can be tricky, as TDEC typically samples waterbodies in 5-year cycles, and TDA does not pay for grantees to conduct sampling. Leverage your partnerships, if possible.

# Element 8: Criteria to Determine if Load Reductions are Being Achieved, cont.

TOTAL PROPOSED PRACTICES									
Practice	Number Proposed	Average Sq. Ft.	Total Sq. Ft.	Estimated Load Reduction Per Unit			Estimated Load Reduction - Total		
				N (lbs/yr)	P (lbs/yr)	Sed (tons/yr)	N (lbs/yr)	P (lbs/yr)	Sed (tons/yr)
Heavy Use Areas	10	676	6760	0.09	0.01	0.002	608.4	67.6	13.52
YEAR 1 PRACTICES INSTALLED									
Practice	Number Installed	Average Sq. Ft.	Total Sq. Ft.	Estimated Load Reduction Per Unit			Estimated Load Reduction - Total		
				N (lbs/yr)	P (lbs/yr)	Sed (tons/yr)	N (lbs/yr)	P (lbs/yr)	Sed (tons/yr)
Heavy Use Areas	5	676	3380	0.09	0.01	0.002	304.2	33.8	6.76
YEAR 2 PRACTICES INSTALLED									
Practice	Number Installed	Average Sq. Ft.	Total Sq. Ft.	Estimated Load Reduction Per Unit			Estimated Load Reduction - Total		
				N (lbs/yr)	P (lbs/yr)	Sed (tons/yr)	N (lbs/yr)	P (lbs/yr)	Sed (tons/yr)
Heavy Use Areas	3	676	2028	0.09	0.01	0.002	182.52	20.28	4.056
YEAR 3 PRACTICES INSTALLED									
Practice	Number Installed	Average Sq. Ft.	Total Sq. Ft.	Estimated Load Reduction Per Unit			Estimated Load Reduction - Total		
				N (lbs/yr)	P (lbs/yr)	Sed (tons/yr)	N (lbs/yr)	P (lbs/yr)	Sed (tons/yr)
Heavy Use Areas	2	676	1352	0.09	0.01	0.002	121.68	13.52	2.704
TOTAL INSTALLED/FINAL ESTIMATED LOAD REDUCTION									
Practice	Number Installed	Average Sq. Ft.	Total Sq. Ft.	Estimated Load Reduction Per Unit			Estimated Load Reduction - Total		
				N (lbs/yr)	P (lbs/yr)	Sed (tons/yr)	N (lbs/yr)	P (lbs/yr)	Sed (tons/yr)
Heavy Use Areas	10	676	6760	0.09	0.01	0.002	608.4	67.6	13.52

- Another option is to utilize the tools from Element 2, to estimate the load reduction potentially achieved to date, based on the number of practices installed.

# Element 9: Monitoring Component

- The most common method of fulfilling the requirement in Element 9 is to use TDEC's water quality monitoring data.
  - Most applicants indicate that they will rely on TDEC's assessments to determine if their restoration or protection efforts have been successful
  - Many organizations lack the technical expertise and/or funding to conduct water quality assessments.
  - TDA does not provide funding for monitoring, outside those monies allocated to TDEC
- This is not to say that your organization *~must~* rely on TDEC's monitoring data to meet the requirement. If your organization has the technical knowledge and alternative funding, monitoring/water quality assessments by individual organizations and agencies is encouraged.
- Leverage partnerships with entities that are already engaged in monitoring activities to determine if their data is available to the public, and possibly useful to evaluate your success.

## Element 9: Monitoring Component, cont.

- If your organization opts to perform water quality monitoring, please share your data with your partners and TDEC.
- Be aware that data you collect may not be useable for TDEC's purposes; however, it may help inform their decisions regarding additional monitoring locations.



# Request for Proposals – Watershed Based Plan Format

TN-NPS Request for Proposals  
Page 12 of 31

## ATTACHMENT B

### **Watershed Based Plan Format**

(Please use the following sections and instructions to guide you as you write your Watershed Based Plan. These are the only sections that you need to include in your plan. Please use these headings. Follow the directions for each section, but do not provide information beyond what is requested. We anticipate that each plan should be less than ten pages, not including supporting documents such as maps. Keep in mind that many times the scale, scope, and budget of a watershed-based plan will be greater than that of the proposal you submit.)

(Please put page number on each page)

#### **Name of Project:**

#### **Lead Organization:**

#### **Watershed Identification** (name, location, 12-digit HUC, etc.):

#### **Causes and Sources of Nonpoint Source Pollution in the Watershed**

Discuss all that is known about the water quality problems in the watershed. Use all local knowledge of the current land usages in the watershed, and how these contribute to the problems affecting water quality. These resources from TDEC may be helpful.

- Recent list of TDEC's assessment publications, including the latest List of Impaired Waters and 305(b) Report - <http://www.tn.gov/environment/article/wr-wq-water-quality-reports-publications>
- Assessment Database/Dataviewer – <http://tdeconline.tn.gov/dwr/>
- TMDLs - <https://www.tn.gov/environment/program-areas/wr-water-resources/watershed-stewardship/tennessee-s-total-maximum-daily-load--tmdl--program.html>
- Watershed Management Plans - <https://www.tn.gov/environment/program-areas/wr-water-resources/watershed-stewardship/watersheds-by-basin.html>

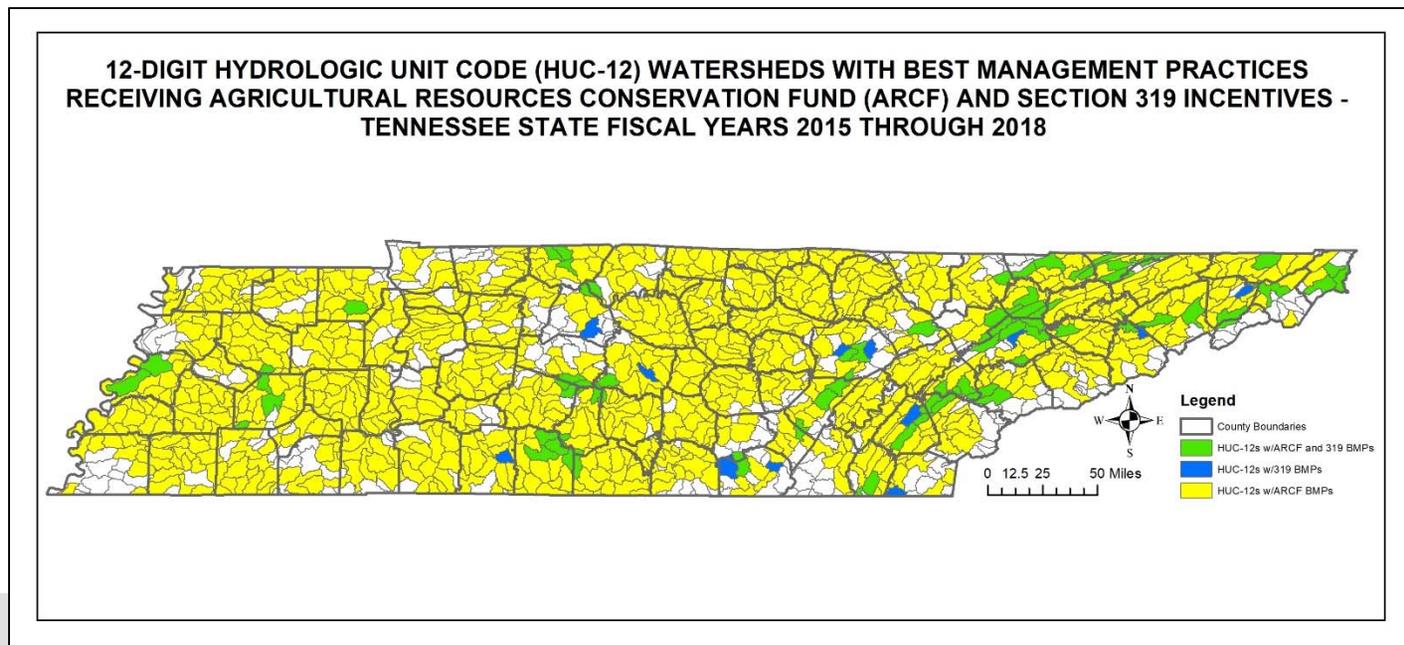
#### **Estimate of Load Reductions**

Provide an estimate of load reductions to be achieved by implementing the planned BMPs. One EPA-approved way to do this is to use the TN NPS Program's Pollutant Load Reduction Estimation Tool, located on page 8.

- Attachment B of the TN-NPS Request for Proposals provides a basic Watershed Based Plan Format that can simplify plan development.
- You are not required to use this format; however, be sure to include all the information listed in the Watershed Based Plan Format.

# Available Assistance

- TDA is able to provide some assistance to plan writers such as:
  - Map development
  - Possible data resources
  - Contacts for partners
  - Eligibility requirements
  - Information on previous projects and local engagement





# ANY QUESTIONS?

Heidi McIntyre-Wilkinson | Environmental Specialist  
Tennessee Department of Agriculture | Land & Water Stewardship Section  
[heidi.mcintyre-wilkinson@tn.gov](mailto:heidi.mcintyre-wilkinson@tn.gov)  
615.837.5492

# APPENDIX E

## SECTION 319(h) GRANT PARTICIPANT ANNUAL SURVEY

# Appendix E

## Section 319(h) Grant Participant Annual Survey

2019

**TENNESSEE DEPARTMENT OF AGRICULTURE**

2019

Authored by: Land & Water Stewardship Section Staff

# Section 319 Applicant Survey

[Soliciting feedback and managing needs]

## Introduction to the Section 319 Applicant Survey

The annual 319 Applicant Survey was initiated in the Summer of 2015 in order to assess what grant recipients perceived as the strengths and weaknesses of the current TN-NPS Program. The intent of the survey was to determine if specific needs of the grantees were being met. The survey provides an opportunity for TDA to learn from grantees and applicants, and to gather input regarding grantee satisfaction. Based upon the results of the survey, TDA staff will evaluate potential changes to the project selection process, communication, and grant administration (adaptive management). The questions chosen for the 319 Grantee Survey will be reviewed and refined annually.

*The survey provides an opportunity for TDA to learn from grantees and applicants, and to gauge grantee satisfaction.*

## Survey Methodology

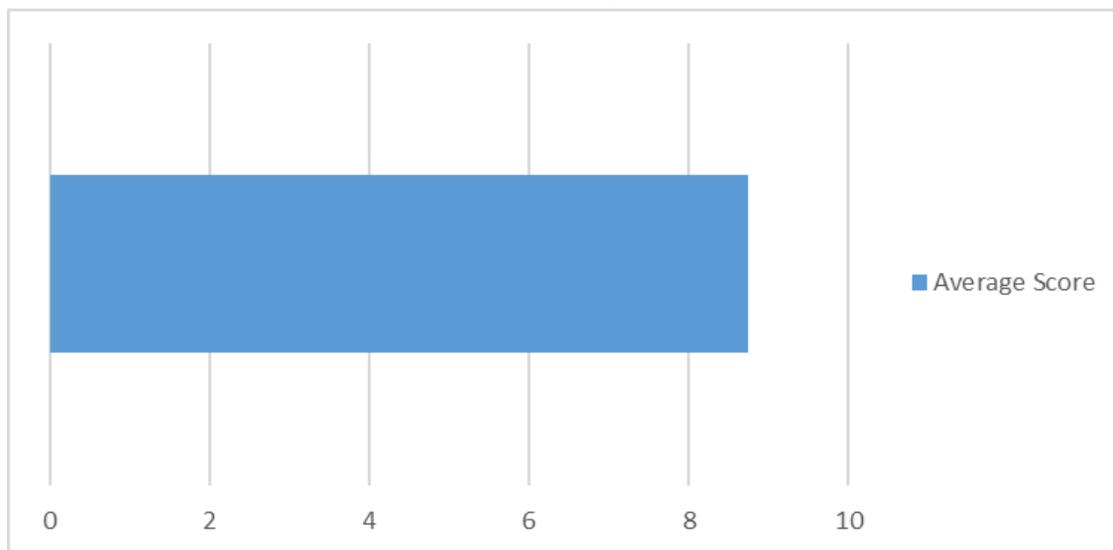
Questions for the Section 319 Applicant Survey were developed in the Spring of 2019. A total of ten questions were chosen in order to get an adequate idea of the level of satisfaction of the grantees with the current process, while not making the survey overly long or onerous. An email list was developed by compiling the contact information for organizations and agencies that had applied for a 319 grant within the previous five years. The email list included both past recipients, and those parties that applied for a 319 grant, but were not chosen to receive funding. The survey questions were developed into a questionnaire using SurveyMonkey, Inc. ([www.surveymonkey.com](http://www.surveymonkey.com)). A link to the survey was sent to the email list on June 21, 2019. A follow-up reminder was sent to the survey recipients on August 1, 2019. The survey was ended on August 6, 2019. A total of 50 individuals received the survey, and 13 individuals completed all or part of the questionnaire.

## Results

The following is a list of the questions utilized for the survey, as well as the responses received from the survey participants. Please note: none of the questions on the survey were mandatory; that is, participants were able to skip any questions they did not wish to answer. Therefore, although there was a total of 13 participants, 13 responses were not received for each question. Also, any comments such as “not applicable,” “n/a,” etc. were omitted from this document to maintain conciseness.

**Question 1: Does the current Request for Proposals (RFP) do a good job of communicating the requirements and expectations for grant proposal applications? Please rate the current RFP on the sliding scale of 1 to 10 below, with 1 representing "does not communicate the requirements at all," and 10 representing "the RFP fully communicates all requirements and expectations."** *Question Format: Sliding bar to indicate ranking.*

**FIGURE 1: RANKING OF REQUEST FOR PROPOSALS**



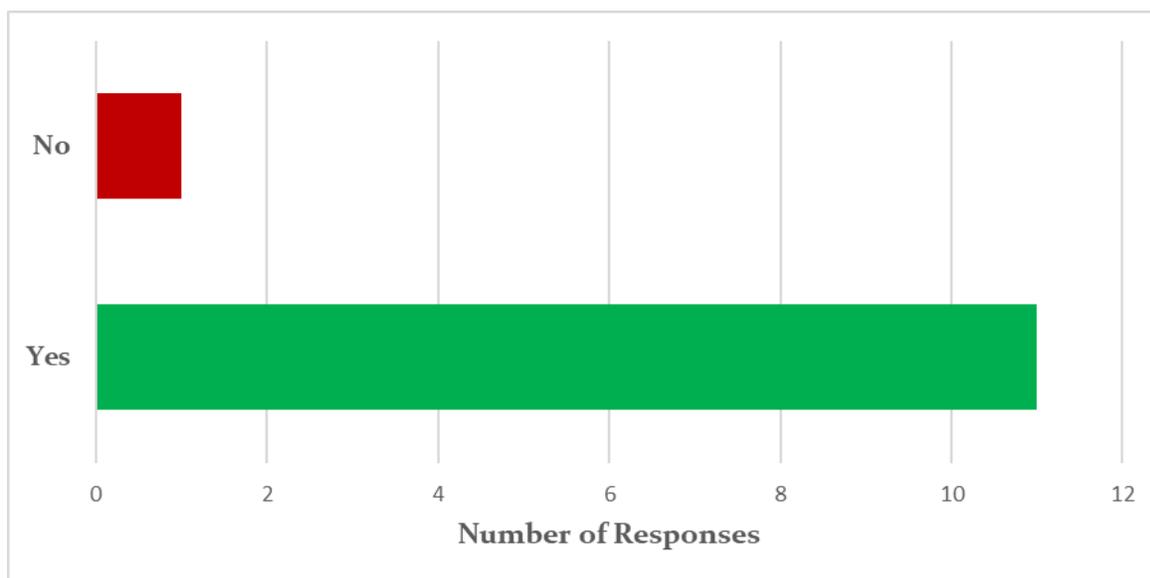
**Question 2: How could the RFP be improved? What information do you feel should be added, or more fully explained?** *Question Format: Comment/short answer. Comments are summarized below.*

Seven participants responded to Question 2. One out of the seven respondents indicated that no improvements were necessary. Three individuals requested clarification or reduction of documentation required for applying. One respondent requested additional information on data usage. One individual noted a desire to apply for grant funds in watersheds without impaired streams. One participant requested a better explanation of the watershed based plan requirements. (Please note: the Land and Water Stewardship Section now offers a comprehensive short course to interested parties on the development of watershed based plan.)

**Question 3: Are you satisfied with the current 319 Grant proposal submittal and review process?** *Question Format: Yes or no, with optional comment/short answer field.*

A majority (approximately 92 percent, or 11 out of 12) of the respondents are satisfied with the proposal review process. One comment was provided, which stated that the review and reward process takes too long.

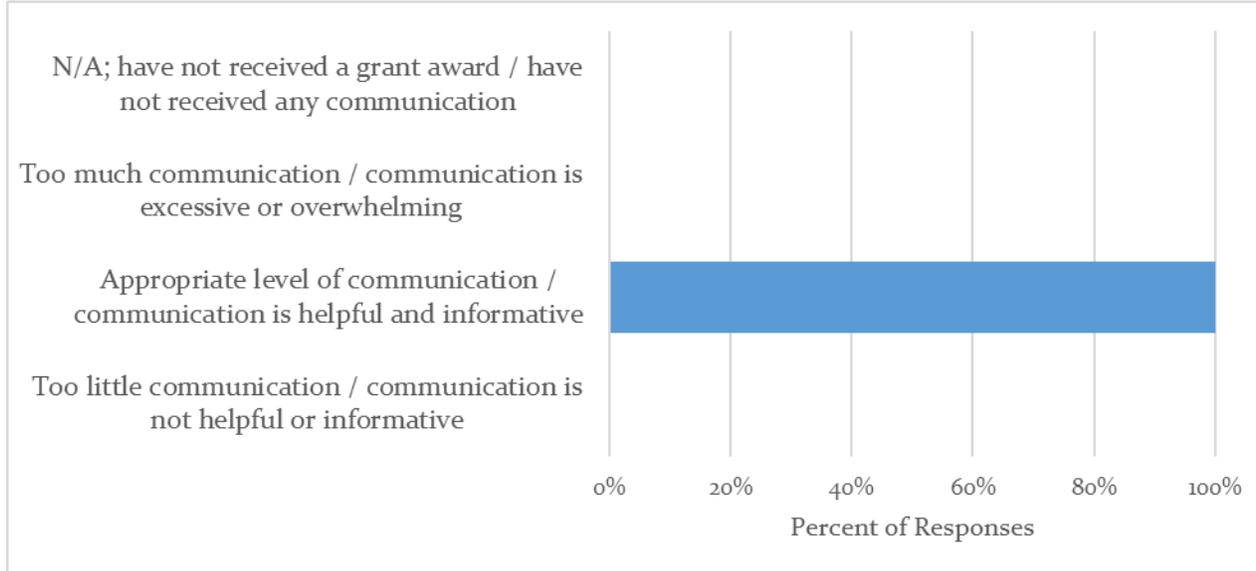
**FIGURE 2: SATISFIED WITH CURRENT 319 GRANT PROPOSAL REVIEW PROCESS**



**Question 4: If you are a past or present grant recipient, are you satisfied with the quantity and quality of communication and contact you receive from the TDA-Nonpoint Source Program? Please rate the current quality of communication.)** *Question Format: Multiple choice, with optional comment/short answer field.*

All of the respondents (12) indicated that they were satisfied with the current quantity and quality of communication. No optional comments were received for Question 4.

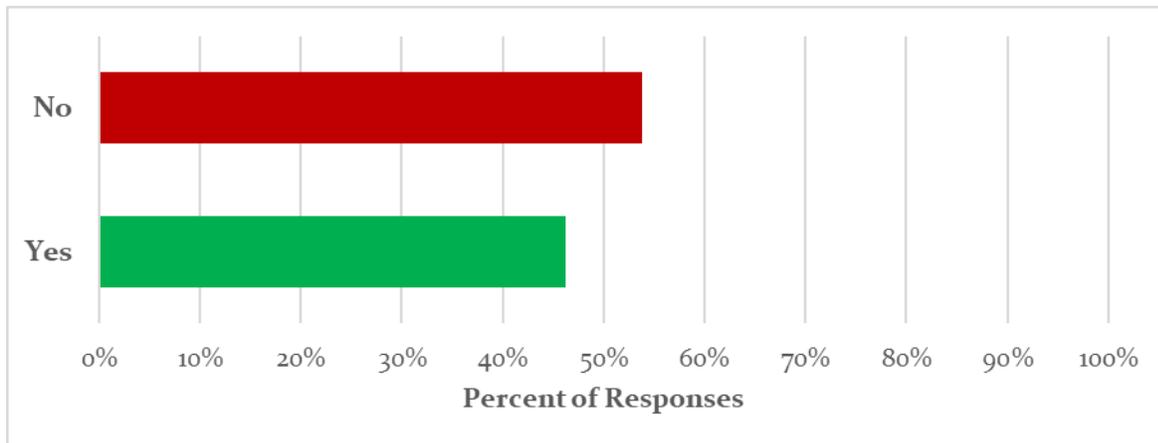
**FIGURE 3: SATISFIED WITH THE QUANTITY AND QUALITY OF COMMUNICATION**



**Question 5: Would a greater TDA-Nonpoint Source Program social media presence, where information could be posted about upcoming events, successes, and/or funding opportunities be helpful to you or your organization?** *Question Format: Yes or no, with an optional follow-up comment/short answer field to indicate which platform would be preferred.*

The respondents were slightly less in favor of having a greater social media presence. Four participants provided their platform preference, with three indicating Facebook ©, and one indicating both Twitter © and Instagram ©.

**FIGURE 4: BENEFIT TO A GREATER SOCIAL MEDIA PRESENCE**



**Question 6: Which of the following characterizations best describes your feelings regarding the amount of paperwork and reporting required for a 319 Grant in Tennessee?** *Question Format:*

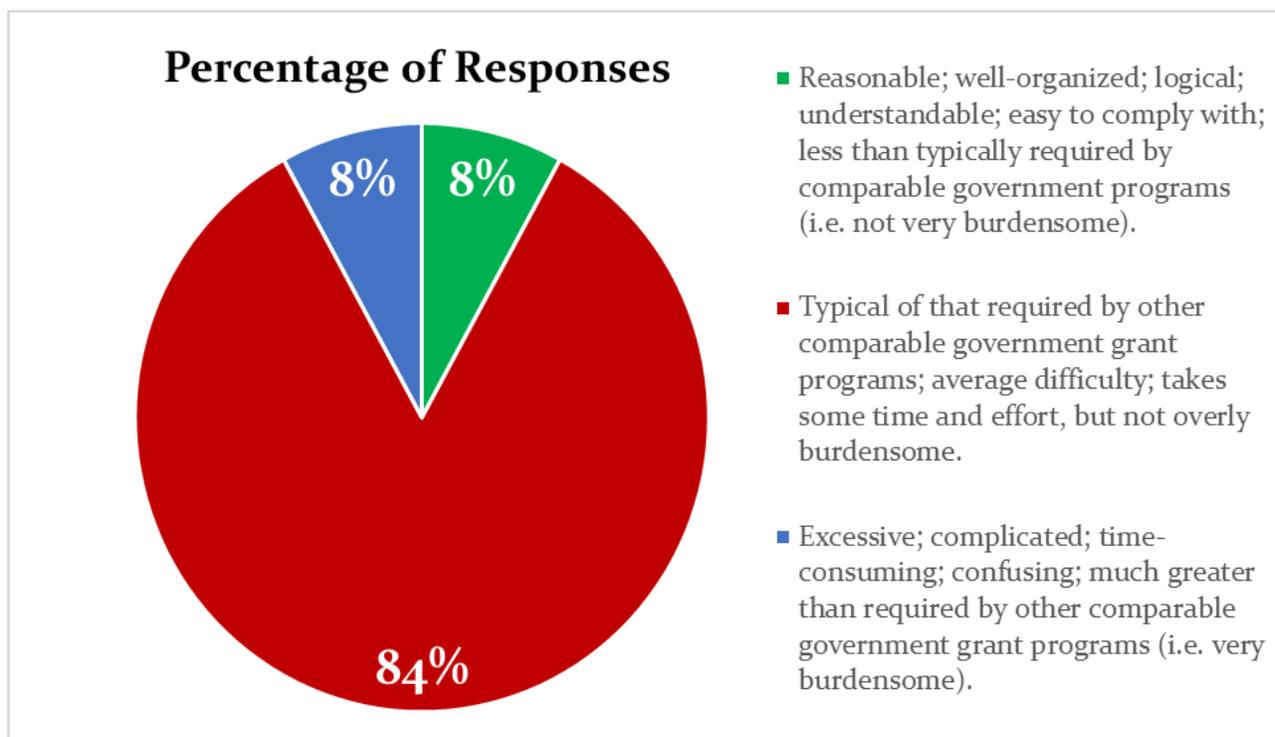
*Multiple choice, with an optional comment/short answer field.*

Approximately 59 percent of the respondents indicated that they felt that the amount of paperwork required for the Section 319 Grant Program is typical of similar grant programs.

Three respondents provided comments:

- Streamlining the paperwork would be helpful for reimbursements.
- Paperwork on the front end is comparable to other grant entities. Paperwork required upon completion is excessive.
- The massive work plan. Also, planning is made onerous when you don't receive a contract until roughly a year after application.

**FIGURE 5: FEELINGS REGARDING AMOUNT OF PAPERWORK AND REPORTING REQUIRED**

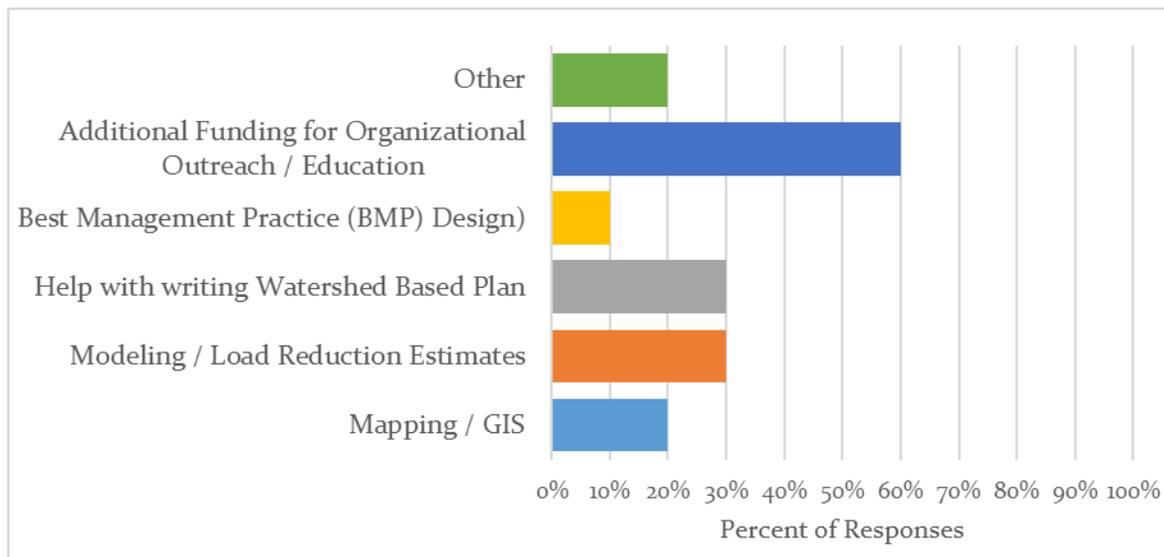


**Question 7: Which of the following technical services would be most useful to your organization, if offered by the TDA-Nonpoint Source Program? (Choose all that apply.)** *Question Format: Multiple choice – choose all that apply.*

- **Mapping/GIS**
- **Modeling/Load Reduction Estimates**
- **Help with Writing Watershed-based Plan**
- **Best Management Practice (BMP) Design**
- **Additional Funding for Organizations Outreach/Education Support**
- **Other (please specify):**

The most requested service in this year’s survey was additional funding for organizational outreach/education. Two respondents indicated “other,” and requested assistance with monitoring and measuring success.

**FIGURE 6: MOST USEFUL TECHNICAL SERVICES**



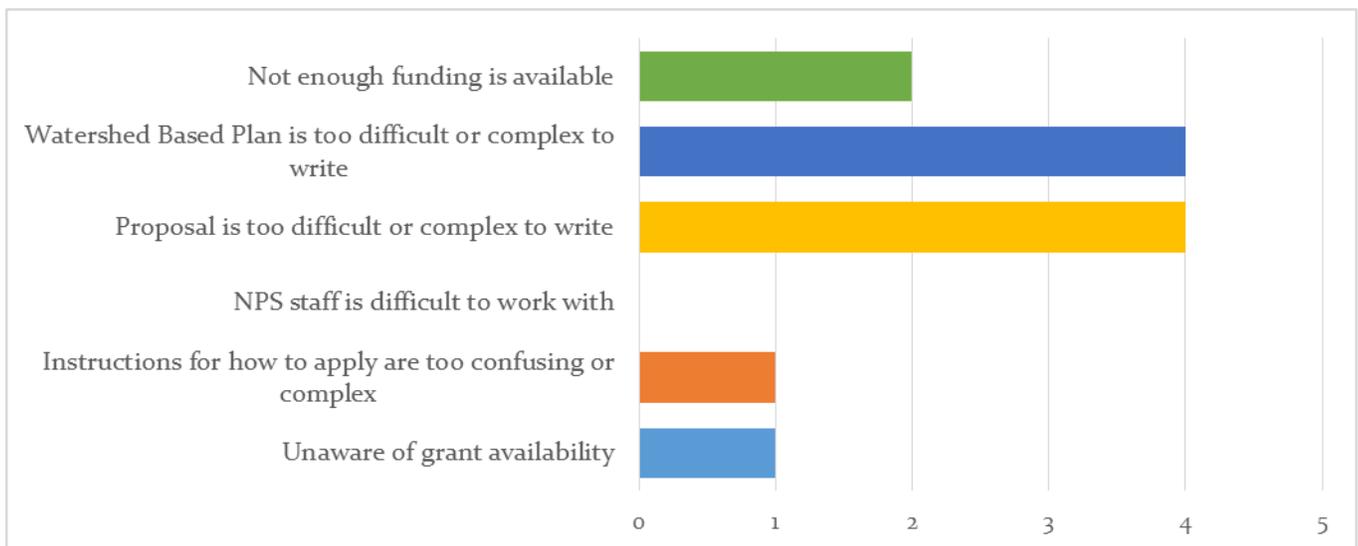
**Question 8: What would be your recommendation(s) as to how the TDA-Nonpoint Source Program could recruit new applicants for 319 Grants?** *Question Format: Short answer/comment field. Comments are summarized below.*

Seven participants answered Question 8. Three of the respondents indicated that additional assistance with the development of Watershed Based Plans would help recruit new applicants. Two participants suggested that additional funding for personnel/lessening of restrictions on the portion of the grant that can be used for salary would improve participation. One comment recommended sharing information with community foundations, and one comment requested an updated program mailing list.

**Question 9: What do you think is the primary deterrent when eligible organizations/entities decide NOT to apply for a 319 Grant?** *Question Format: Multiple choice, with an optional comment/short answer field.*

The two most prevalent deterrent indicated by survey takers were the difficulty/complexity of the proposal development (approximately one third of respondents) and the difficulty/complexity of the watershed based plan development (approximately one third of respondents, as well). Two optional comments were received; one participant stated that proposals should be funded in full, and one state that they could not speculate on reasons why other organizations do not choose to apply.

**FIGURE 7: PRIMARY DETERRENT TO APPLYING FOR 319 GRANT**

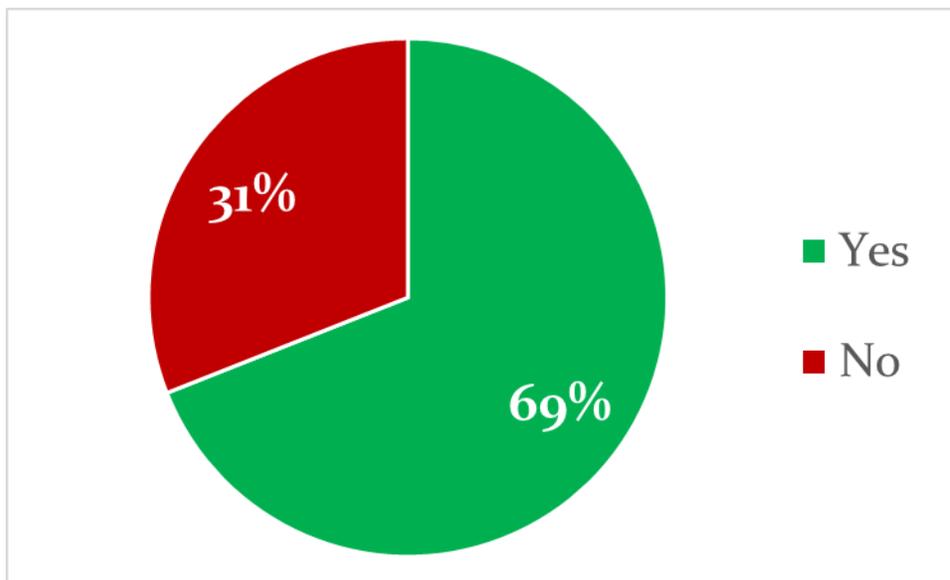


**Question 10: Would it be beneficial to you or your organization if annual regional or state-wide nonpoint source meetings were held to assist with training, present new/innovative ideas, and allow grant participants to network with other partners across the region/state?**

*Question Format: Either/or, with optional comment/short answer field. Comments are summarized below.*

Almost 70 percent of the respondents felt that an annual regional or state-wide nonpoint source meeting would benefit their organization. The comments provided included the importance of collaboration with other organizations (i.e. see what other groups are doing), as well as providing training opportunities.

**FIGURE 8: BENEFIT TO HOLDING ANNUAL MEETING**



**Conclusion**

The survey had a participation of approximately 26 percent of grantees and applicants. The response rate was lower (8 percent) than the previous survey, held in 2017. This may be due to TN-NPS not sending a survey to participants in 2018. The results of the survey will inform decisions regarding additional services that may be offered by TDA in the future, as well as alert TDA staff to areas of concern within the program. The survey results will also be used to identify new directions for TN-NPS grant initiatives, or to decide if previous initiatives should be reinstated.

A recurring theme in the input received in this year’s survey was the need for assistance in the development of watershed based plans for applying for watershed funds. Prior to the survey’s distribution, TN-NPS staff had developed a comprehensive short-course on watershed based plan writing. The short-course reviews the information required for a watershed based plan, as well as free resources available online to collect needed information. As of the date of this document, TN-

NPS staff have provided the training two cooperating non-governmental organizations, and the training is being promoted at public events, meetings, etc.

Participation in the annual survey continues to decrease. Moving forward, modifications of the survey are being considered. Participants often skip questions requiring a comment to be entered; in the future, it may be beneficial to only ask yes/no or multiple choice questions for ease of completion. Also, the timing of the survey may be adjusted to late fall/early winter when many projects are halted because of weather concerns. Participants may have more time to devote to completing the survey at that time. Other options for soliciting feedback will also be explored if participation continues to decline.

## APPENDIX F

# NATIONAL WATER QUALITY INITIATIVE (NWQI) STATUS UPDATE

# NATIONAL WATER QUALITY INITIATIVE (NWQI) STATUS UPDATE

## Introduction

### *Initiative Overview*

The National Water Quality Initiative (NWQI), launched in 2012, is a collaborative effort between the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS), the Environmental Protection Agency (EPA), and state agencies to reduce nonpoint source pollution to high-priority watersheds identified in each state. The high-priority watersheds are chosen by NRCS with input from state water quality agencies. The program is designed to focus efforts and funding to provide maximum impacts on the chosen watersheds.

The NWQI requires in-stream water quality monitoring of at least one priority watershed per year. The monitoring assesses water quality and biological conditions related to nutrients, sediments, or livestock-related pathogens. The objective is to determine if any of the parameters have changes throughout the monitoring period, and whether these changes (positive or negative) can be attributed to agriculture-based best management practices (BMPs) that have been installed in the watershed.

In the State of Tennessee, NRCS prioritizes watersheds for nomination that are located in counties included in the USDA StrikeForce Initiative. The USDA StrikeForce Initiative was established in 2010 with the objective of combatting the specific challenges associated with rural poverty, as well as growing rural communities and improving opportunities. In addition, NRCS utilizes EPA's Recovery Potential Screening Tool to further pare down the number of watersheds nominated for NWQI inclusion.

### *Tennessee Nonpoint Source (TN-NPS) Program Roles Assisting NWQI*

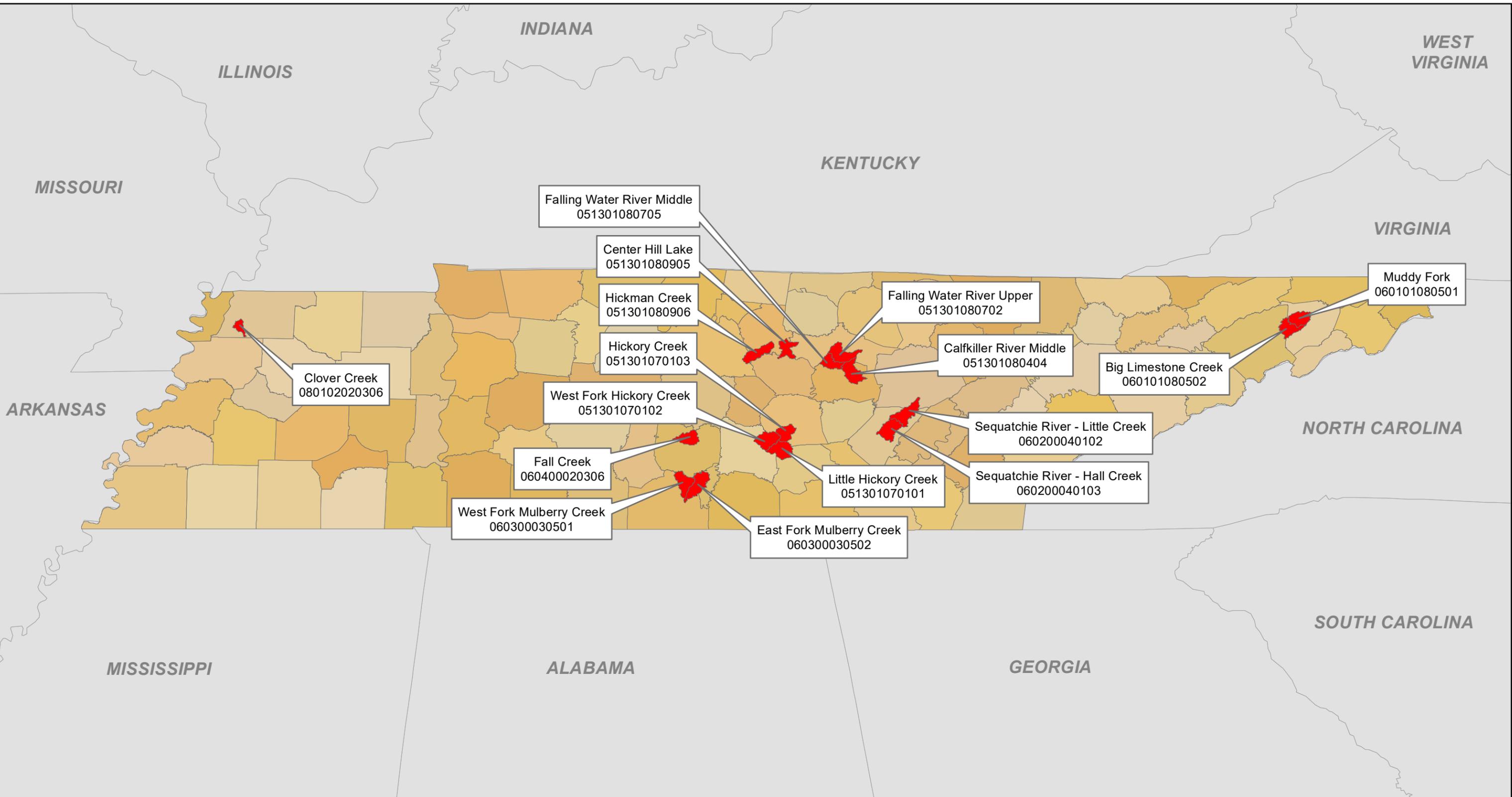
The TN-NPS has several minor roles with regards to the NWQI. When asked, TN-NPS provides input on eligible watersheds through knowledge obtained by the Watershed Coordinators, who are in various watersheds every year. TN-NPS also provides funding, in the form of 319 Grant monies, to the Tennessee Department of Environment and Conservation (TDEC) for in-stream water quality monitoring.

## Annual Updates

### *FFY2019*

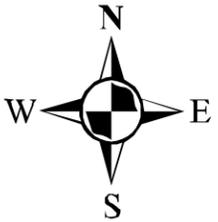
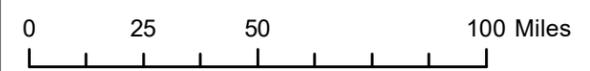
In FFY2019, no new NWQI watersheds were chosen by NRCS and their partners. Instead, it was decided that the program would focus on previously identified watersheds; and, capacity-building would be continued in those areas. Please see Figure 1 for a map of legacy priority watersheds.

No Section 319 BMPs were installed in NWQI watersheds in FFY2018. The State of Tennessee's Agricultural Resources Conservation Fund (ARCF) program provided incentives for the installation of 47 BMPs in NWQI watersheds, including fencing, cover crops, critical area plantings, heavy use areas, and watering facilities. TDA staff visited the following watersheds in FFY2019: Clover Creek, Center Hill Lake, Hickman Creek, Falling Water River Middle, Falling Water River Upper, Calkiller River Middle, Fall Creek, West Fork Hickory Creek, Little Hickory Creek, Sequatchie River-Hall Creek, and Big Limestone Creek.



**LEGEND**

- Tennessee Counties
- High-priority Watersheds FFY2019 (Previously Identified Watersheds)



**FIGURE 1: NATIONAL WATER QUALITY INITIATIVE WATERSHEDS FOR THE STATE OF TENNESSEE IN FEDERAL FISCAL (FFY) YEAR 2019**

### *FFY2018*

In FFY2018, NRCS, in cooperation with state and federal partners, identified a new set of seven NWQI watersheds (please see the new watershed summaries below). The watersheds are located in north Middle (Wilson, Smith, Putnam, DeKalb, and White Counties) and East (Washington and Greene Counties) Tennessee.

No Section 319 BMPs were installed in NWQI watersheds in FFY2018. The State of Tennessee's Agricultural Resources Conservation Fund (ARCF) program provided incentives for the installation of 32 BMPs in NWQI watersheds, including fencing, cover crops, heavy use areas, and watering facilities (among others). Staff members from TDA visited all the NWQI watersheds with the exception of Muddy Fork. In FFY2018, TDEC performed water quality monitoring in Big Limestone Creek, Calfkiller River Middle, Falling Water River Middle, Falling Water River Upper, Hickman Creek, and Muddy Fork watersheds.

### *FFY2017*

Just as in FFY2016, NRCS chose to continue their focus on the same NWQI priority watersheds as the previous year. The demographic information summarized in Table 1 has been updated to include the latest 2017 data available. As of the development of this document (November, 2017), the proposed final 2016 Section 303(d) list for the State of Tennessee has not been approved by USEPA. Therefore, the final 2014 Section 303(d) list was used for the purposes of indicating impaired waterbodies within each watershed.

In FFY2017, the 319 Grant program did not cost-share on any BMPs in an NWQI priority watershed. The State of Tennessee's Agricultural Resources Conservation Fund (ARCF) supported the installation of 69 practices in NWQI priority watersheds. During FFY2017, TN-NPS staff performed site visits in all the NWQI priority watersheds with the exception of Hickory Creek. Water quality monitoring (chemical parameters) was conducted in one priority watershed, Fall Creek, along Fall Creek and Hurricane Creek, was performed in this fiscal year.

### *FFY2016*

In FFY2016, NRCS did not change the NWQI priority watersheds. Demographic information for each of the watersheds was updated based on the latest 2016 data available. The statuses of streams within the watersheds have also been updated to reflect the 2014 Clean Water Act (CWA) Section 303(d) for the State of Tennessee, which was approved in May of 2016.

No BMPs were supported in NWQI watersheds in FFY2016 using 319 Grant funds; however, 28 BMPs installed in the selected watersheds were supported by the State of Tennessee's Agricultural Resources Conservation Fund (ARCF). While assisting with the implementation of ARCF BMPs, TN-NPS visited Clover Creek, East Fork Mulberry Creek, Fall Creek, Little Hickory Creek, Sequatchie River – Hall Creek, Sequatchie River – Little Creek, West Fork Hickory Creek, and West Fork Mulberry Creek watersheds. Water quality monitoring was performed in three NWQI priority watersheds in FFY2016, which included Hickory Creek, Little Hickory Creek, and West Fork Hickory Creek.

### *FFY2015*

In FFY2015, NRCS chose 174 small watersheds nationwide to provide an estimated \$25 million in financial assistance through the Environmental Quality Incentives Program (EQIP) for the implementation of the NWQI. In Tennessee, nine watersheds were chosen as high-priority watersheds eligible for the NWQI. Figure 1 provides the location of the NWQI watersheds for the State of Tennessee for FFY2015.

In FFY2015, a total of 13 BMPs were installed in NWQI watersheds through cost-share with 319 Grant funds. The BMPs ranged from septic system repairs to exclusion fencing for livestock. Also in FFY2015, the State of Tennessee's Agricultural Resources Conservation Fund (ARCF) assisted with funding an additional 16 BMPs in NWQI watersheds. Watershed Coordinators (TN-NPS) visited two of the NWQI high-priority watersheds (Sequatchie River – Hall Creek and Sequatchie River – Little Creek), and TDEC performed water quality monitoring in one of the watersheds (Fall Creek).

#### *Watershed Summaries*

This section is not applicable, as no new watersheds were chosen for the NWQI program in FFY2019. Summaries for previously selected high-priority watersheds can be found in prior Annual Reports.

#### *Environmental Justice Considerations*

Environmental justice is defined by EPA as “the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies.”

Six demographic indicators are utilized by EPA to determine environmental justice areas. The indicators include:

- Percent low income (based on an income twice that of the national poverty level or less);
- Percent minority;
- Less than a high school education;
- Linguistic isolation;
- Less than 5 years of age; and
- Greater than 64 years of age.

Using the average of the percent low-income and the percent minority, EPA arrives at a Demographic Index. The Demographic Index can be used as an indicator to the “overall potential susceptibility of the population in a block group;” i.e., the potential that the population in a specific area will be negatively affected by environmental impacts.

A summary of the Demographic Index and the demographic indicators for the prior NWQI high-priority watersheds, can be found in previous TN-NPS Section 319 Annual Reports. As no new areas were chosen for FFY2019, the analysis typically performed using the EPA's online EJ SCREEN mapping tool (available at: <http://www.epa.gov/ejscreen>) was not completed for this year.

#### **Moving Forward**

In the future, it is hoped that additional watersheds will be identified in traditionally under-served areas of the State. A secondary goal would be to encourage closer coordination between partners to optimize the leveraging of funds among multiple agencies and groups.