

# FY 2016 *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 29, 2016

---

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

Contact: Dr. Sam Marshall  
Phone: (615) 837-5306  
Sam.Marshall@tn.gov  
Fax: (615) 837-5025

---

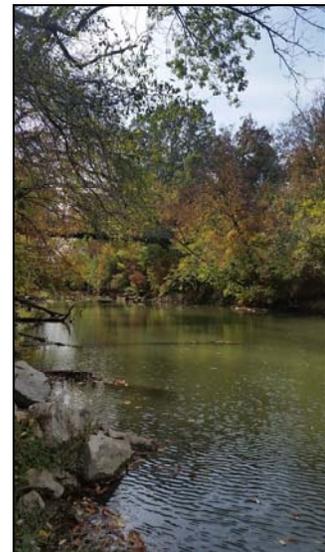
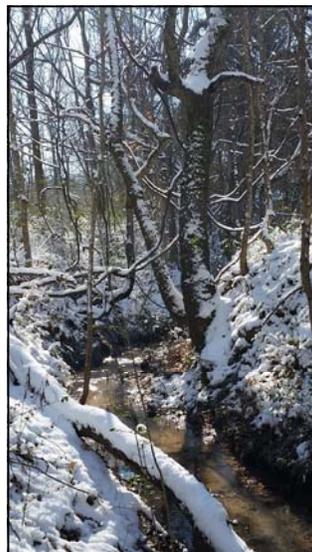
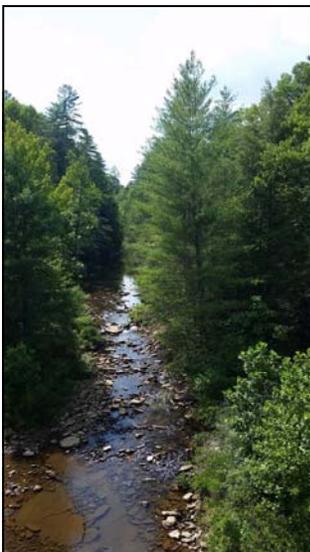


## Table of Contents

<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	14-16
Individual Active Projects (In alphabetical order by grantee)	17-56

### List of Appendices

- Appendix A: Long Term Goals—Current Progress Summary
- Appendix B: Measures of Success Checklists
- Appendix C: Section 319(h) Grant Participant Annual Survey
- Appendix D: Draft Nonpoint Source Newsletter Template
- Appendix E: FFY2016 Success Stories
- Appendix F: National Water Quality Initiative (NWQI) Status Update



# Acronyms

BMP	Best Management Practice
<i>E. coli</i>	Escherichia coli
HUAP	Heavy use area protection
LID	Low Impact Development
NPS	Nonpoint Source
NRCS	Natural Resources Conservation Service
RC & D	Resource Conservation and Development Council
SCD	Soil Conservation District
SWCD	Soil and Water Conservation District
TDA	Tennessee Department of Agriculture
TDEC	Tennessee Department of Environment and Conservation
TN	Tennessee
TN-NPS	Tennessee Nonpoint Source Program
TVA	Tennessee Valley Authority
TWRA	Tennessee Wildlife Resources Agency
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
UT	University of Tennessee

# 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 FFY2016, the TN-NPS continued implementation of the Program Management Document. The tracking of BMPs by sector, as proposed under the Program Management Document, was fully implemented for FFY2016. Measures of Success within the program continue to be evaluated annually, and can be found in Appendices A and B.

The TN-NPS continues to improve communication with grantees and cooperators in accordance with the adaptive management strategy laid-out in the Program Management Document. The second annual participant survey was released on October 20, 2016. A list of survey questions, key findings, and survey results, can be found in Appendix C.

Based on the 2014 CWA 303(d) list, two Success Stories were developed and submitted to EPA. King Branch (Sevier County) and Crab Orchard Creek/Laurel Creek (Morgan County) were approved by USEPA during FFY2016 (please see Appendix D).

In FFY2016, Crab Orchard Creek Watershed in Morgan County, Tennessee was featured in USEPA’s **National Nonpoint Source Program - a catalyst for water quality improvements**; a special report highlighting the 319 Program nationwide. As part of that process, the work in that watershed was also chosen as one of seven watersheds nationwide to be the focus of an interactive story map developed by USEPA. The TN-NPS provided additional information and interviews to assist with the Story Map development.

In FFY2016, \$1,238,000 was awarded to watershed projects, and \$118,983 was awarded to statewide/education/outreach projects. Approximately 283 best management practices were implemented in FFY2016, including septic repairs, exclusion fencing, heavy use areas, and bank stabilizations.

## Areas for Improvement

The TN-NPS continues to face challenges engaging applicants from non-agricultural sectors. Sectors such as mining and forestry were not represented in the proposals received in FFY2016. During FFY2017, additional outreach and engagement for non-agricultural stakeholders will be pursued.

Delayed funding for the TN-NPS also posed a challenge in FFY2016. Unfortunately, this resulted in contracts not being executed in time for the fall work season, and some groups opted-out of awards (as they secured additional/alternative funding).

## Conclusion

In FFY2016, the TN-NPS was successful in promoting water quality issues and assisting with the implementation of BMPs to improve water quality throughout Tennessee. In the future, the program will build upon it’s successes and look for new ways to improve water quality in Tennessee.

## FFY2016 Program Highlights

- ◆ *Continued Program Management Document implementation*
- ◆ *Two Success Stories—King Branch and Crab Orchard Creek/Laurel Creek were submitted and approved by USEPA.*
- ◆ *Crab Orchard Creek Watershed in Morgan County was chosen to be showcased in a USEPA special report, including the development of a story map.*
- ◆ *Funded \$1,238,000 in watershed projects and \$118,983 in statewide/education/outreach projects for FFY2016.*
- ◆ *283 BMPs were implemented in FFY2016.*

# 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 2016 (i.e., October 1, 2015– September 30, 2016).

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:

1. **BMP Implementation Projects** improve an impaired waterbody, or prevent a non-impaired water from becoming placed on 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 FY2016

The Tennessee Department of Agriculture (TDA) relies on the cooperation of stakeholders, partnerships, and local landowner 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 FFY2016.

## **SIGNIFICANT GRANT MILESTONES IN FISCAL YEAR 2016:**

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

In FFY2016, the TN-NPS continued the implementation of the Management Program Document. Measures of Success are tracked and evaluated annually. 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 has been fully implemented. Per the adaptive management principles outlined in the Management Program Document, changes to the program administration have been made to assist grant applicants. For example, the criteria by which projects are ranked and evaluated has been made available to the applicants in the Request for Proposals (RFP).

### **319 Applicant Survey**

The TN-NPS again surveyed Section 319(h) Grant applicants from the previous five years to obtain input on the program. Approximately, 65 individuals and institutions were sent a request to complete the survey, with a total of 24 responses received. A summary of the survey methodology, questions, and responses is included in Appendix C.

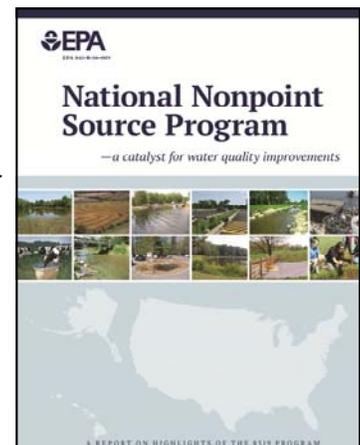
Two trends were identified in the survey results. First, applicants indicated a strong support for the development of a periodic Nonpoint Source Newsletter. Approximately 90 percent of respondents indicated that it would be beneficial to their organization to be provided with information about changes to the 319 Program, other sources of funding, upcoming partner events, etc. A draft copy of a Nonpoint Source Newsletter template can be found in Appendix D. Second, respondents again stated that the assistance with outreach and education from the TN-NPS would be helpful to their organization. Over 60 percent of the individuals that answered the survey requested support in this area. It appears that additional study, to determine what type of direct support (e.g. list-serve from the TN-NPS, direct promotion of 319 partners of the TDA website, etc.) would yield the best results.

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

In May of 2016, the United States Environmental Protection Agency (USEPA) approved the State of Tennessee's 2014 Clean Water Act (CWA) Section 303(d) list of impaired waters. During FFY2016, the TN-NPS identified several watersheds in which CWA Section 319 grant funds had been expended, and impaired waters had been delisted for the pollutants addressed by the implemented BMPs. The identification of possible successes is on-going; however, in FFY2016, the TN-NPS developed two Success Stories. The Success Stories for King Branch in Sevier County and Crab Orchard Creek/Laurel Creek in Morgan County were accepted and published on the USEPA website. Together, King Branch and Crab Orchard Creek/Laurel Creek account for 14.1 miles of streams that were restored to unimpaired status. To read these two newest Success Stories and see a complete list of all Tennessee Success Stories, turn to Appendix E.

### **Crab Orchard Creek Success Included in National Report and Story Map**

The Crab Orchard Creek watershed in Morgan County was featured in the recent national report from USEPA entitled *National Nonpoint Source Program - a Catalyst for Water Quality Improvements* ([https://www.epa.gov/sites/production/files/2016-10/documents/nps\\_program\\_highlights\\_report-508.pdf](https://www.epa.gov/sites/production/files/2016-10/documents/nps_program_highlights_report-508.pdf)). The watershed was one of seven watersheds chosen nationally for showcasing as an interactive story map. Crab Orchard Creek was listed due to pH and metals from legacy mines. Through partnerships with TDEC and local stakeholders, acid mine drainage treatment systems were constructed on tributaries of Crab Orchard Creek.



The first segment of Crab Orchard Creek (TN06010208020-2000) was delisted in 2010. The treatment systems, along with additional agricultural and septic BMPs, succeeded in helping an additional segment of Crab Orchard Creek (TN06010208020-3000) and another tributary, Laurel Creek (TN06010208020-0700) being removed from the 2014 CWA Section 303(d) list. When complete, the story map (which is slated to launch in late 2016/early 2017) will allow the public to navigate around the watershed to see the various BMPs that have been installed and cooperator interviews discussing the benefits they've experienced.

### **Grant Awards Recipients for FFY2016**

In FFY2016, the TN-NPS received a total of 19 proposals. Of the proposals received, 11 were wholly or partially funded with 319 grant dollars. The total amount awarded was \$1,238,000 for watershed projects, and \$118,983 in statewide education and outreach projects.

### **Best Management Practices Installation for FFY2016**

Grant recipients used grant funds (from all open grants) to install 283 BMPs in FFY2016. The top five BMPs installed in FFY2015 were (in descending order of frequency): heavy use area protection, alternative watering facilities, winter cover crops, livestock pipeline, and fencing (exclusion and otherwise).

### **Other Program Highlights for FFY2016:**

#### ***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 Tennessee Stormwater Association Annual Meeting in at Fall Creek Falls State Park, Spencer, TN—October 20 - 22, 2015.
- ◆ John McClurkan attended the Hypoxia Task Force meeting in St. Louis, MO — April, 2016
- ◆ Sam Marshall attended the Region 4 Nonpoint Source Meeting in Atlanta, GA — April 18 - 20, 2016.
- ◆ Sam Marshall attended the National Nonpoint Source Managers Meeting in Boston, MA — October 31 through November 3, 2016

#### ***Providing Technical Assistance for the Revised Tennessee Phosphorus Index***

The TN-NPS program staff have served as Committee Members and provided technical assistance to USDA-NRCS during the development and revision of the Tennessee Phosphorus Index (P Index). The P Index is a tool used by farmers to determine agronomic fertilizer and manure application rates to minimize the transport of phosphorus from farm fields to surface waters. The use of this tool can save producers money by avoiding over-application of nutrients, while protecting water quality.

*Below: Members of the Tennessee Phosphorus Index Committee meeting in Murfreesboro, TN on July 6, 2016.*



#### ***FFY10 and FFY2012 Grant Closeouts***

The FFY2010 and FFY2012 grants expired on 9/30/2016. The Closeout Report for FFY2010 was submitted to USEPA on December 14, 2016, and the Closeout Report for FFY2012 was submitted on December 15, 2016.

**FFY2016 Grant Awarded**

The TN-NPS released a Request for Proposals on September 14, 2015 in anticipation of the 319 grant award expected for FFY2016. Proposals were due by December 1, 2015 and a total of 19 proposals were received. All together, these proposals requested a total of \$3,337,665 in grant funding. NPS funding for Tennessee in FY2016 was \$2,476,000 with \$1,356,983 available for projects. The TN-NPS strives to fund as many eligible projects as possible; however, sufficient funding was available to provide a grant to only 11 of the 19 project proposals submitted in FFY2016. Furthermore, many of the projects that received funding were not awarded the requested amount, due to budget limitations.

The FFY2016 grant of \$2,476,000 was awarded on September 21, 2016. All funds have been obligated and contracts are currently being written and signed. The following table provides a list of projects funded from the FY2015 grant and how much grant funding each received.

**Table 1: FFY2016 Grant Awards**

<b>Name of Applicant</b>	<b>Name of Project</b>	<b>319 Grant Money Allocated</b>	<b>Funding Type</b>
City of Athens	Denso Eco Park / North Mouse Creek Restoration Project	\$145,000	Watershed
Clinch-Powell RC&D Council	Clinch-Powell Watershed Restoration Project	\$190,00	Watershed
Cumberland River Compact	Bank Stabilization at Moss Wright Park and Mansker Creek Watershed Restoration—Phase I	\$174,000	Watershed
Hamblen County SCD	Nolichucky Sediment Reduction Project	\$165,000	Watershed
Knox County Stormwater Management Department	Roseberry Creek Watershed Restoration Initiative	\$144,000	Watershed
Morgan County SCD	Crooked Fork Restoration Project	\$224,000	Watershed
Obed Watershed Community Association	Obed Watershed Headwaters—Phase IV	\$56,000	Watershed
Tennessee Aquarium Conservation Institute	Watershed Wisdom: A Stormwater Mitigation and Best Practice Demonstration Site at the Tennessee Aquarium Conservation Institute	\$75,483	Program
Tennessee RC&D Council	Tennessee ENVIROTHON	\$18,000	Program
TDEC	Water Quality Monitoring of NPS-Impaired Streams	\$150,000	Program and Watershed
Urban Green Lab	Mobile Lab: Sustainable Practices Education	\$15,500	Program
<b>TOTAL</b>		<b>\$1,356,983</b>	

## Total NPS Spending in FFY2016

In FFY2016, the TN-NPS again demonstrated the ability to put federal 319 grant money on the ground in an effective way. During FFY2016, 319 money was spent from federal grants received in every year from FFY2010 through FFY2015 with the exception of FFY2011, which closed out last year. From across all of the open grant years, a total of approximately \$3,209,190.22 was spent in FFY2016. The following table breaks down how the money was spent.

**Table 2: 319 Program Spending in Tennessee – FFY2016**

Nature of Expense	Amount of 319 Dollars Spent
NPS Program Management	\$1,047,183.74
Watershed Restoration Projects	\$1,645,703.30
Educational Projects	\$516,303.18
<b>TOTAL:</b>	<b>\$3,209,190.22</b>

The total spent in FFY2016 is slightly more than the amount spent in FFY2015 (\$3,308,047.58). Program Management costs consist of salaries and benefits for 13 FTEs, travel, supplies, and indirect costs; all stemming from the TN-NPS.

The following two figures illustrate the spending from FFY2016. Figure 1 is a geographical representation of where 319 money was spent in FFY2016 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.

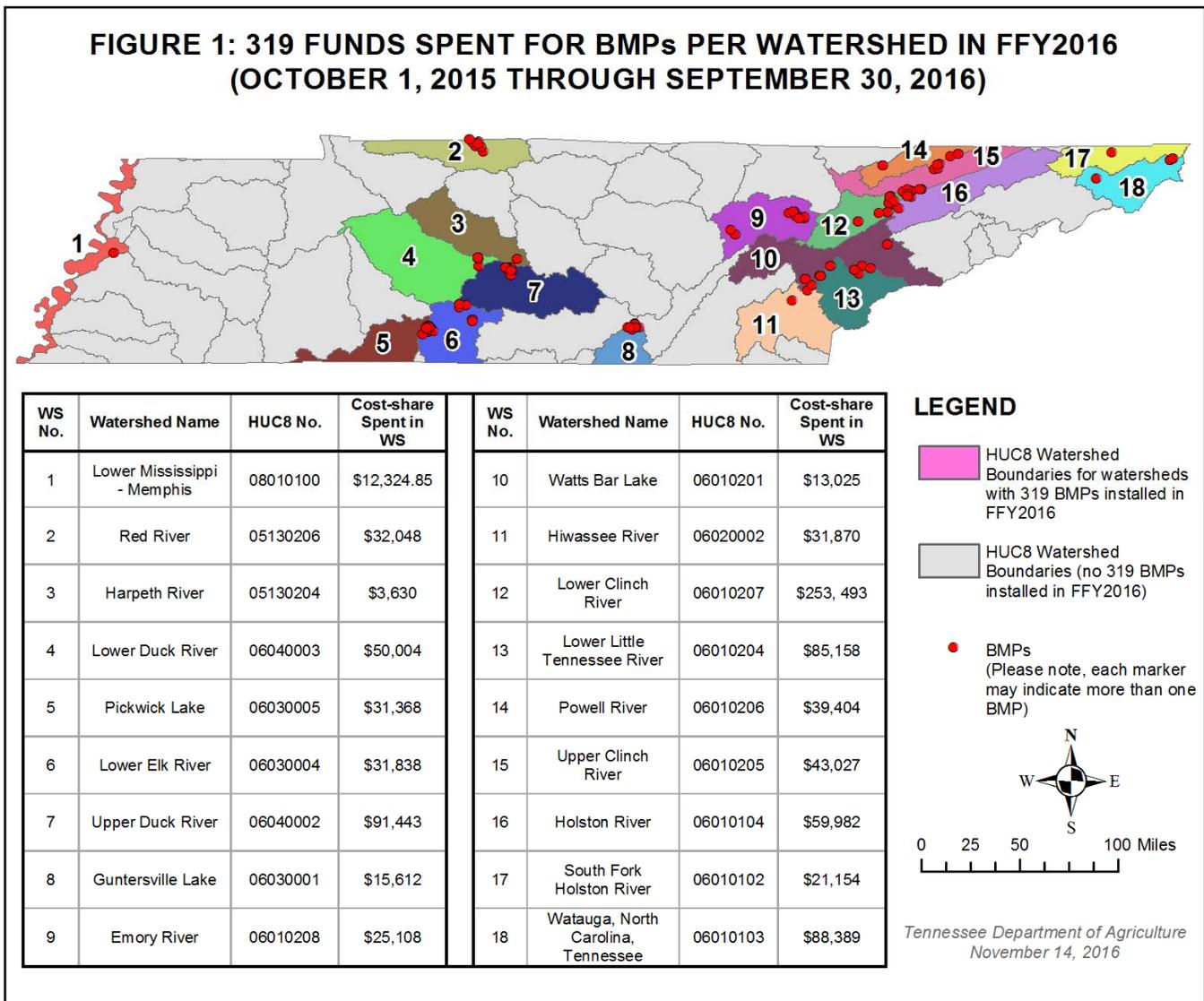


Figure 2 shows a number of things related to 319 spending. The brown bars show the amount of grant money spent in FFY2016 from each of our active grants. The green bars show the cumulative amount spent or drawn-down from each of our active grants. We have recently closed out the FFY2010 and FFY2012 grants, each with a \$0 balance. The FFY2011 grant was closed out last year (December 2015). Each subsequent grant year has less and less money spent as each year is more and more recent, but the Tennessee NPS program has a strong history of spending all of the money from each grant before it is closed out.

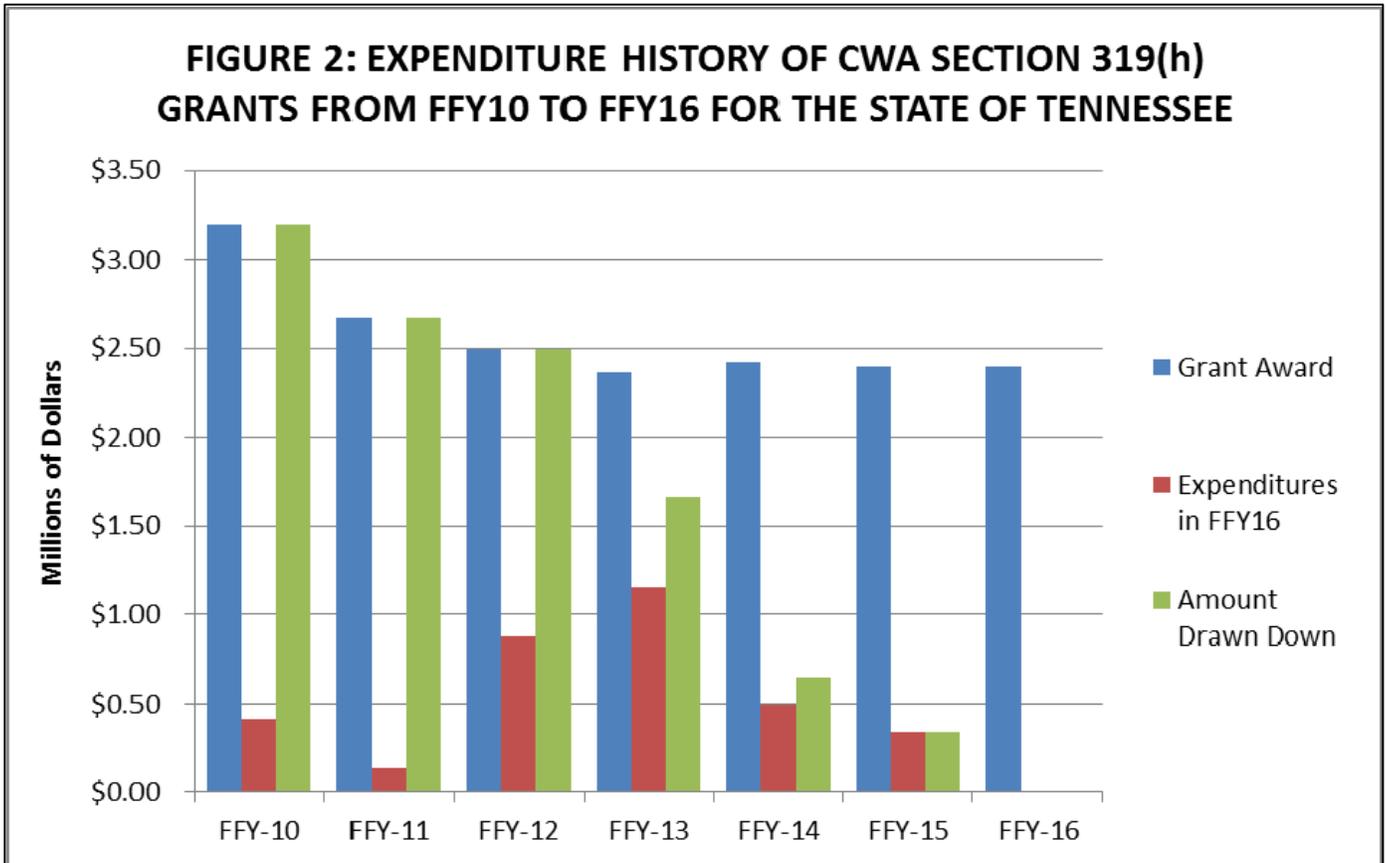
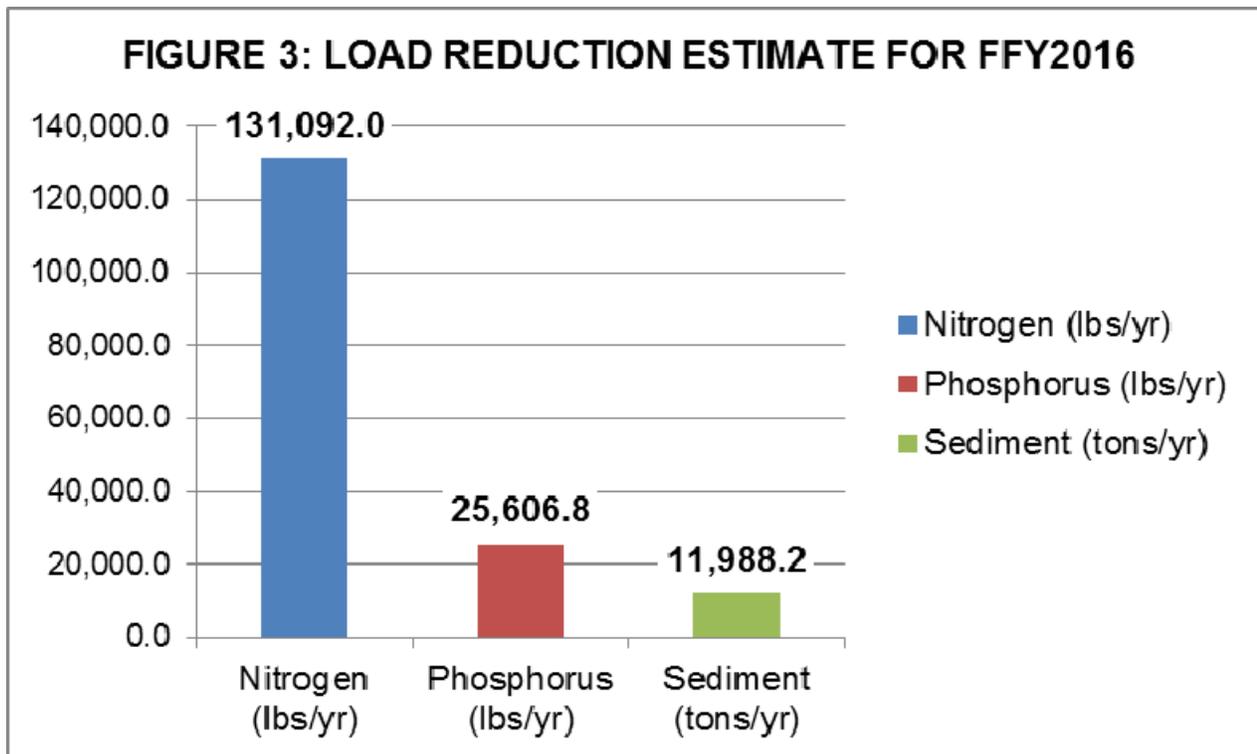


Figure 3 shows our estimated load reductions for N, P, and sediment from all projects with BMPs for FFY16. Estimates were derived using the STEPL Model.

Approximately 283 BMPs were installed throughout the state in FFY16. Load reduction estimates are indicated in the chart below. Pollutant load reductions are key to removing stream reaches and bodies of water from the 303(d) List. Since delisting streams from the 303(d) list 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.

Data derived from GRTS entries and database query dating from October 1, 2015 to September 30, 2016.

**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.

## Status of All Projects Active in FY2016—as of 11/21/16 (balance)

Grantee Name—Project Name	Amount Awarded (\$)	Balance (\$)	Expiration Date
Anderson County SCD— <i>Bullrun Creek Restoration Initiative Phase III</i>	\$300,000	\$0.00	1/31/2017
Anderson County SCD— <i>Hinds Creek</i>	\$75,000.00	\$75,000.00	1/31/2019
Appalachian RC&D— <i>Roan Creek Restoration</i>	\$230,000.00	\$198,799.97	1/15/2019
Austin Peay State University— <i>Project WET TN 2.0</i>	\$120,000.00	\$98,913.32	12/31/2017
Blount County SCD— <i>Baker &amp; Centenary Creeks Restoration</i>	\$120,000.00	\$74,210.86	12/31/2018
Boone Watershed Partnership— <i>Beaver Creek Restoration</i>	\$130,000.00	\$0.00	2/28/2016
Boone Watershed Partnership— <i>Gap Branch Restoration Project</i>	\$55,000.00	\$35,820.50	4/30/2017
Boone Watershed Partnership— <i>Sinking Creek Educational Park</i>	\$20,600.00	\$5,917.50	12/15/2017
Caribbean SEA— <i>Reducing NPS &amp; Education</i>	\$90,000.00	\$0.00	7/31/2016
Claiborne County SCD— <i>Little Sycamore Creek</i>	\$92,000.00	\$35,301.00	1/30/2019
Clinch-Powell RC&D— <i>Expanded East TN Grazing Lands</i>	\$99,524.00	\$74,517.49	12/31/2017
Clinch-Powell RC&D— <i>Mulberry/Little Mulberry Restoration Phase II</i>	\$130,000.00	\$0.00	3/15/2016
Cumberland River Compact— <i>Cathy Jo Subwatershed</i>	\$250,000.00	\$0.00	2/15/2016
Cumberland River Compact— <i>Cathy Jo Subwatershed Extended</i>	\$56,588.28	\$0.00	7/31/2016
Cumberland River Compact— <i>Sustainable Farming Education</i>	\$34,371.00	\$24,666.46	12/15/2018
First TN Development District— <i>Cash Hollow Creek Restoration</i>	\$90,000.00	\$0.00	1/31/2016
Giles County SCD— <i>Richland Creek/Blue Creek</i>	\$235,000.00	\$218,047.65	2/28/2019
Giles County SCD— <i>Robertson Fork Creek Phase II</i>	\$125,000.00	\$0.00	12/31/2015
Harpeth River Watershed Association— <i>Harpeth River Headwaters Restoration-Phase III</i>	\$55,000.00	\$38,504.00	1/31/2018
Knox County— <i>Beaver Creek Phase II</i>	\$167,160.00	70,992.52	2/28/2018
Knox County SCD— <i>Flat Creek Restoration</i>	\$195,000.00	\$126,317.62	2/28/2019
Knox County SCD— <i>Stock Creek Restoration</i>	\$100,000.00	\$0.00	4/15/2016
Lawrence County SCD - <i>Tripp Town Watershed Improvement</i>	\$60,000.00	\$0.00	3/15/2016
Marshall County SCD - <i>Spring Creek Watershed Restoration</i>	\$370,000.00	\$0.00	1/31/2016
Middle Nolichucky WS Alliance - <i>College Creek Restoration</i>	\$180,000.00	\$0.00	1/15/2016
Middle Nolichucky WS Alliance— <i>Holley Creek Restoration</i>	\$122,500.00	\$86,610.50	2/14/2018
Morgan County SCD— <i>Crooked Fork Restoration Project</i>	\$260,000.00	\$87,047.36	7/31/2017
Obed WS Community Assoc. - <i>Crossville Headwaters Restoration-Phase II</i>	\$62,000.00	\$0.00	10/15/2015
Robertson County SCD— <i>Valley Branch Restoration Project</i>	\$175,000.00	\$137,594.45	7/31/2017

## Continuation of Status of All Projects Active in FYY2016

Grantee Name—Project Name—Grant Year	Amount Awarded (\$)	Balance (\$)	Expiration Date
Southeast TN RC&D - <i>Fork Creek Watershed</i>	\$120,000.00	\$0.00	4/15/2016
Southeast TN RC&D - <i>Guntersville Lake Tributaries</i>	\$122,814.00	\$0.00	8/31/2016
TN Dept of Environment & Conservation/Water Resources - <i>Water Quality Monitoring of NPS Impaired Streams 2010</i>	\$207,050.00	\$0.00	4/30/2016
TN Dept of Environment & Conservation/Water Resources - <i>Water Quality Monitoring of NPS Impaired Streams 2012</i>	\$37,673.00	\$0.00	7/15/2016
TN Dept of Environment & Conservation/Water Resources - <i>Water Quality Monitoring of NPS Impaired Streams 2013</i>	\$150,000.00	\$0.00	12/31/2016
TN Dept of Environment & Conservation/Water Resources— <i>Water Quality Monitoring of NPS Impaired Streams 2014</i>	\$234,000.00	\$0.00	3/15/2018
TN Dept of Environment & Conservation/Water Resources— <i>Water Quality Monitoring of NPS Impaired Streams 2015</i>	\$150,000.00	\$0.00	3/15/2019
Tennessee Environmental Council— <i>Lytle Creek Phase I</i>	\$115,000.00	\$108,331.88	7/31/2019
Tennessee Environmental Council - <i>Rutherford Creek Restoration—Phase III</i>	\$105,000.00	\$0.00	10/31/2016
Tennessee Valley Authority - <i>TN Growth Readiness</i>	\$74,000.00	\$0.00	4/15/2016
Town of Mountain City— <i>Furnace Creek 2014 Watershed Implementation Project</i>	\$335,000	\$141,959.60	1/15/2018
The University of Tennessee Agricultural Extension Service— <i>BMP's Row Crop Production—Obion River WS</i>	\$96,480.00	\$57,684.53	12/15/2016
The University of Tennessee Agricultural Extension Service— <i>Horse Farm Management &amp; WQ Project: On Farm BMPs</i>	\$50,000.00	\$0.00	7/1/2016
The University of Tennessee Agricultural Extension Service— <i>Welcome Wagon</i>	\$23,000.00	\$23,000.00	1/31/2019
The University of Tennessee, Institute of Agriculture - <i>TYN: Roots for Long-Term Viability</i>	\$50,000.00	\$0.00	7/1/2016
West TN River Basin Authority— <i>Reducing NPS Pollution in the Forked Deer River 2013</i>	\$195,000.00	\$195,000.00	5/15/2017
West TN River Basin Authority— <i>Moize Creek</i>	\$193,675.00	\$193,675.00	2/28/2018

## Project Summaries for FY2016

(In alphabetical order, by grantee)

**GRANTEE:** Anderson County Soil Conservation District

**PROJECT NAME:** Bull Run Creek Restoration—Phase III

**GRANT YEAR:** FY2013

**WEBSITE:** <https://www.tn.gov/agriculture/article/ag-scd-anderson>



The Bull Run Creek Restoration Phase III has been successful and all \$300,000 has been spent improving farmland and implementing best management practices in Anderson and Union counties. During this time phrase, four landowners benefited and improved their farms. In Union County, twelve acres have been seeded, two watering facilities installed, and a sixty by forty heavy use area installed. In Anderson County, ninety feet of animal trail & walkway, one hundred feet of underground outlet, and two roof runoff structures have been installed.

These improvements will help the landowners manage their farming operations more efficiently with less time involved. All landowners have sincerely expressed their gratefulness and many thanks for the help.

*Below, top left: Installation of heavy use area protection in Union County.*

*Below, top right: Heavy use area protection, animal trail, and underground outlet installed in Anderson County.*

*Below, bottom: Pasture seeding in Union County.*



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



The Roan Creek project began with a public outreach Watershed Meeting on March 1, 2016. Appalachian Resource Conservation and Development (RC&D) Council and Brushy Fork Environmental Consulting, Inc. (BFEC) publicized and hosted the event at the Central Baptist Church in Mountain City, Tennessee. Over a dozen landowners attended and discussed their streambank issues. BFEC is working off of this sign-up list currently and meeting landowners as the project progresses. The watershed project furthermore required an Individual Permit (IP) from the Tennessee Department of Environment and Conservation (TDEC) to implement restoration activities. BFEC began in January of 2016 and the IP was received on June 13, 2016. The Council submitted a site plan for the Jay Jackson project, as a template (and the first project) with this grant. The understanding is that in the future BFEC will submit a geographic information system (GIS) based site plan to TDEC and they have a week to respond with questions and comments. If no comments are received, the Council has the authorization to construct instream measures.

The Jay Jackson project included the restoration of Wallace Branch, a tributary to Roan Creek. Approximately 500 linear feet of work was performed including the installation of multiple J-hooks, floodplain benching, and planting of unique riparian vegetation. Mr. Jackson donated multiple genotype specific Azalea species to the project as part of his in-kind match. Since completing the Wallace Branch project, Johnson County contacted BFEC and has now entered into a cost-share agreement for a Goose Creek stabilization project, just upstream of a past 319 success site—Ralph Stout Park. Goose Creek is actively cutting toward a commercial building; implementation is scheduled for the winter—spring of 2017.



*Above: Jay Jackson site prior to streambank stabilization.*



*Right: Jay Jackson site after completion of streambank stabilization.*

GRANTEE: Austin Peay State University  
PROJECT NAME: Project WET TN 2.0  
GRANT YEAR: FY2014  
WEBSITE: <http://www.apsu.edu/wet>



During the last year, 26 Project WET teacher training events were held, for a total of 40 since the beginning of the grant term. An additional 719 K-12 teachers and preservice teachers participated in the workshops (for a total of 1,010), learning about nonpoint source water quality issues in Tennessee. The teachers leave the workshops with classroom-ready activities to teach their students how they can impact water quality.

The Project WET State Coordinator presented educational sessions at the Tennessee Environmental Education Association's Annual Conference in 2015, and attended the National Project WET Coordinator's Conference in 2016, allowing her to participate in the Publications and Products WET Team that helps direct the activities of the national organization related to publications, including a new early childhood education Guide that will be available soon.



*Upper left: Children made beaded bracelets that show their "Incredible Journeys" through the water cycle in a Project WET activity.*

*Upper right: Students using Project WET's publication, "Discover the Waters of Tennessee."*

*Bottom: Teachers at a workshop learn Project WET activities.*

GRANTEE: Boone Watershed Partnership, Inc. (BWP)  
PROJECT NAME: Beaver Creek Restoration  
GRANT YEAR: FY2013  
WEBSITE: <http://boonewatershed.com/>



The Beaver Creek Stream Restoration Project began on March 1, 2013, to assist landowners along Beaver Creek in Bristol and Sullivan County, Tennessee with solutions to bank erosion and other problems affecting their property and the quality of water in the creek. These problems may include steep or "cut" banks where the creek is washing away property and storm water run-off.

A Cost Share Agreement was signed by landowners, Melinda and Frank Whitaker, 3184 Avoca Road, Bristol, Tennessee. Approximately 1,000 linear feet of the Whitaker's property borders Beaver Creek. A 200 foot section of stream bank at a bend in the creek was eroding and creating a 15 foot vertical drop off next to a mobile home. Brushy Fork Environmental Consulting provided the engineering and construction/installation of boulder j-hook and toe wall structures. The project included eight loads of boulders, five loads of fill, three loads of topsoil, Geotextile cloth, coconut matting, seed, and straw. Shrubs and trees were planted within two weeks of the completed installation. Despite dry conditions, the landowners have diligently watered the plantings to contribute to the successful project. The following pictures are before and after photos of the Whitaker project.



*Left: Before photograph taken prior to bank stabilization.*

*Below: After photograph post-construction and bank stabilization.*



GRANTEE: Boone Watershed Partnership, Inc. (BWP)  
PROJECT NAME: Gap Branch Restoration Project  
GRANT YEAR: FY2013  
WEBSITE: <http://boonewatershed.com/>



The Gap Branch (Gap Creek, as it is known to residents) Restoration Project, was implemented to address *Escherichia coli* (*E. coli*) in the creek. Tennessee's 2010 303(d) list identified Gap Branch (TN06010103008-0800) as a water quality limited stream impaired by *E. coli*. There are 15.93 miles of impaired stream/tributary that affect Gap Creek, a number of which are located outside of the city limit. The portion of Gap Creek that is being addressed by the Gap Branch Restoration Project is the 1 mile located within the City of Elizabethton corporate limits. Within this project area the creek flows through agricultural, residential and commercial land uses before it reaches the Watauga River, (HUC 8 = 06010103) at approximate river mile 22.

A team composed of the BWP project manager and City of Elizabethton Stormwater Department personnel has conducted field trips to further identify potential projects. As a result, it was determined that by disconnecting homes at Clark Homestead, L.L.C. (a mobile home park) in a flood plain adjacent to Gap Branch from septic tanks and providing sewer connections there will be reduction of *E. coli* and pathogens in the creek. This property lies at Lat.: N36.33113, Long.: W82.26372. The team met with the landowner, Jimmy Hayes, and an engineer he employs and developed a plan to carry out the project. Mr. Hayes, who is a contractor, will do the construction work using a design developed by his engineer and approved by the City of Elizabethton. A Cost Share Agreement has been signed and the design is completed, which will include a 1000 foot outfall line, and 22 sewer hook-ups.

The project was scheduled to be completed in 2015; however, Jimmy Hayes informed the BWP that he would be unable to complete the project because of a cost increase due to necessary project modifications. Representatives of BWP, City of Elizabethton Water Resources, and Tennessee Department of Agriculture met with Mr. Hayes on July 16, 2016. He reported that the original design was based on the existing residential sewer connections coming out of the mobile homes in the front yards, which are on the side of the homes the road is on. However, during the construction progress it was found that all the sewer lines connect to the mobile homes in the back yards. This caused the following complications: (1) A considerably longer pipe run with additional fittings were needed to connect each home on the south side of the street to the main sewer line on the north side of the street. (2) The code required minimum fall for the longer lateral connections had the effect of causing the 4" main sewer line to be deeper than expected. (3) The (now) deeper main line will have to be installed at a less efficient flatter grade since the existing city manhole elevation is a constraint. (4) The cuts for road crossings of the lateral sewer connections became deeper thereby causing more disturbance of the asphalt road.

Mr. Hayes proposed to solve the above issues by laying a second 4" diameter line on the south side of the road parallel to the line on the north side of the road. There was agreement that the proposed solution was reasonable from engineering standpoint. Mr. Hayes agreed to go forward with the project with additional funding from the state. After the addition of the extra materials, the estimate is that the total dollar cost of removing the pollution source of 23 septic tanks and drain fields will come to less than \$3,000 per unit.

*Right (both): Examples of mobile homes in Clark Homestead, LLC located close to Gap Branch.*



GRANTEE: Boone Watershed Partnership, Inc. (BWP)  
PROJECT NAME: Sinking Creek Wetlands Educational Park  
GRANT YEAR: FY2014  
WEBSITE: <http://boonewatershed.com/>



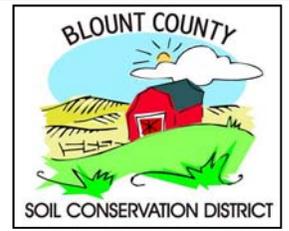
In April, 2016, an educational sign was placed at the entrance to Jacob's Nature Park at Sinking Creek. The sign was designed and manufactured by Essyx Design & Fabrication, which is a company located just over the ridge from Jacob's Nature Park in Johnson City. The metal silhouette of a boy in a tree reaching for dragonflies immediately demonstrates one of the park's intentions: for children to explore nature. Although unknown to the visitor, the font of "Jacob" in the park's name on the sign is a copy of the signature of the six year-old Johnson City boy who died of an unknown source of *E. coli* bacteria and who inspired the community to develop the environmental education park. There are two large panels below the park name: one of them contains a biography of Jacob Francisco and photos of him exploring nature. The biography explains how Jacob loved to learn, explore, and cared about who and what was around him. It also includes the symptoms that Jacob experienced with his illness, the potential sources of *E. coli* bacteria contamination through either food or water, and the treatment that Jacob endured; in this manner, the public is informed about how to prevent contamination, how to recognize symptoms of a contamination, and the importance of immediate medical treatment. The biography explains Jacob's declaration that he would one day be famous, and explains the significance of the park to inspire children to explore, learn, and care about their environment as Jacob did. The other panel written largely by the Nature Program Coordinator of the Johnson City Department of Parks & Recreation explains some history of the acreage, a description of the Sinking Creek Restoration Project, and explains the importance of the Sinking Creek wetlands to water quality within the Boone watershed. The sign also includes children's artwork that warns of potential sources of *E. coli* bacteria. The sign states that its creation was funded by the Tennessee Department of Agriculture, Nonpoint Source Program. The sign provides an impactful entrance to the region's only urban environmental education park. Further designs for interpretive signs are being developed with the Nature Program Coordinator for Johnson City Department of Parks & Recreation and students and faculty from East Tennessee State University.

Another big event toward development of Jacob's Nature Park at Sinking Creek is the current construction of an ADA-compliant bridge/overlook of Sinking Creek. It links a wetlands hiking trail to the woodlands hiking trail in the park. The eight-foot wide bridge spans thirty feet and is accessed with a 100 foot ramp/wetlands boardwalk between Sinking Creek and a vernal pool extending toward the parking lot. This infrastructure has been a true community-collaborative venture: funding for engineering and materials has been paid by community fundraisers over the past five years; construction supervision and heavy machinery has been provided by the Johnson City Dept. of Parks & Recreation; and, the manual labor has been performed by inmates of the Tennessee Dept. of Corrections, NECX, Roan Mountain Work Camp. Volunteers from the community and East Tennessee State University continue to develop hiking trails, plant native species, and remove invasive plants from the acreage. Students from East Tennessee State University continue studying water quality of 303(d)-listed Sinking Creek. The infrastructure of bridges, boardwalks and outdoor classroom slowly being developed with private funds and sought-after grants will enable and facilitate educational access to Sinking Creek, its wetlands, and surrounding 28 acres. Progress with park development and how to get involved, along with news of different projects related to Jacob's Nature Park at Sinking Creek can be found through [www.jacobfrancisco.com](http://www.jacobfrancisco.com).



Above: Signage installed at Jacob's Nature Park at Sinking Creek

**GRANTEE:** Blount County Soil Conservation District  
**PROJECT NAME:** Baker and Centenary Creek Restoration Initiative—Phase II  
**GRANT YEAR:** FY2015  
**WEBSITE:** <https://www.blountn.org/soil/>



Eight individual cooperators, representing nine contracts, have completed their planned practices during the FFY2016. The implemented practices include:

- ◆ One watering facility;
- ◆ Two alternative watering systems;
- ◆ 940 feet of pipeline;
- ◆ 1,252 square feet of heavy use area protection;
- ◆ 5,561 feet of cross fencing;
- ◆ 2,000 square feet of animal trails and walkways;
- ◆ 2,496 square feet of feeding pads;
- ◆ Two grade stabilization structures (French drain and rock seep); and,
- ◆ 77 linear feet of underground outlet.

Additional operators have been approved for cost-share assistance and these clients have been encouraged to complete their practices in a timely manner. The Blount County Environmental Health Department is marketing the septic system repair and restoration aspect of grant programming through approved contractors that install septic-related systems. In addition, a proposal to be submitted to the Tennessee Department of Transportation is being developed to address steep bank erosion along State Highway 411 South. No CWA Section 319(h) funding to be utilized in the development of the proposal. Grant partners have discussed the parameters of an agricultural conservation tour which may occur spring 2017. A venue has been secured for planned homeowner outreach workshops to be conducted spring 2017 in Loudon County. Project partners are preparing the marketing campaign for these events. Survey work for the planned water quality environmental features at Carpenters Elementary Schools's "Outdoor Environmental Learning Area" is currently being completed. Monitoring efforts shall be conducted via the Watershed Association of the Tellico Reservoir and the Tennessee Department of Environments and Conservation (TDEC). No CWA Section 319(h) funding to be utilized for this aspect of grant programming. All aspects of grant programming are reviewed on a monthly basis by the Board of Supervisors of the Blount County Soil Conservations District as part of an adaptive management policy to ensure project integrity.



*Above: Alternative watering system installed to support prescribed grazing.*

*Below: Cross-fencing installed for prescribed grazing.*



*Below: Heavy use area protection installed with animal trails.*



GRANTEE: Caribbean Student Environmental Alliance (SEA)

PROJECT NAME: Reducing NPS & Education in  
Chattanooga Area Watersheds

GRANT YEAR: FY2010

WEBSITE: <http://www.caribbean-sea.org/>



This project aimed to provide education and install model BMP's at three schools in the Chattanooga area: Red Bank High School, Thrasher Elementary School and Scenic Land School (now called Skyuka Hall). All three BMP's are now installed and during this extension, the students and volunteers worked to improve the BMP's and education workshops for their teachers were held.

The Rain Garden designed and constructed by Red Bank High School students is thriving, but had gotten overgrown with invasives. A follow-up project involved weeding, mulching and planting to improve the garden. At Skyuka, the wetland life has improving with every season. The students at Skyuka Hall added lots of native plants to the wetland borders. Their goal was to attract more butterflies and they really succeeded. They had so many monarch and fritillary caterpillars this fall, too! They were very excited to find a stonefly larva in the creek this spring! They are sure THEIR wetland is helping the creek become healthier!



*Above: Installation and maintenance of rain gardens at area schools.*



Above: Project WILD and AQUATIC WILD workshop held for teach-

This year one of our partners in the Mountain Creek watershed, Komatsu, volunteered to help, and the gardens at both Red Bank High School and at Skyuka Hall were weeded. Lots of native plants were added to both Mountain Creek BMPs. They even constructed a nature trail and bird blind for the students at Skyuka Hall! The students at Thrasher managed to dig up and replace a tree which had died and replaced it with a beautiful birch tree. They added diversity to their garden with lots of plants and mulching.

Teachers from all three schools were invited to a Project WILD and AQUATIC WILD workshop held at Red Bank Elementary School in May. The workshop was led by Pandy English from TWRA and was the highlight of the year for several teachers, particularly when they found the snake in the creek! Many teachers have requested that Caribbean SEA host this workshop again, so dates are now being looked at for the best time to offer it.



Left: Signage installed at a rain garden.

**GRANTEE:** Claiborne County Soil Conservation District  
**PROJECT NAME:** Little Sycamore Creek Watershed Initiative  
**GRANT YEAR:** FY2015  
**WEBSITE:** <http://tnacd.org/>



The Little Sycamore Creek Watershed Initiative held one planning meeting on how to implement this grant, met with landowners and took applications on 2/16/16. Claiborne County Soil Conservation District (SCD) and Natural Resources Conservation Service (NRCS) personnel did field evaluations and planning for 16 applications in the Little Sycamore Creek Watershed. Brochures were made that included the cost share, best management practices (BMPs), contact information, and legal statements. A flyer was also made to announce the grant and the open house community meeting which was also sent to the local paper and radio.

There are 16 cost share applications for Little Sycamore Creek so far with estimates totaling \$211,425.00. A breakdown of approvals and implementation of these applications is below.

Completed BMPs totaling \$56,699.00 consists of the following:

- ◆ 5 watering facilities;
- ◆ 3,180 feet of Livestock pipeline;
- ◆ 700 feet of cross fencing;
- ◆ 600 feet of access control fencing;
- ◆ 1 pumping plant;
- ◆ 5,980 square feet of heavy use area protection; and,
- ◆ 5,600 square feet animal trails.

Currently under construction at an estimated \$35,301.00 are the following BMPs:

- ◆ 1,050 square feet animal trail;
- ◆ 4,453 square feet heavy use area protection;
- ◆ 3 watering facilities;
- ◆ 2,895 feet of cross fencing; and,
- ◆ 3,225 feet of access control fencing.

In addition, there is currently approximately \$199,425.00 in remaining application requests, which will need additional funding to complete.



*Left: Alternative livestock watering facility installed in the Little Sycamore Creek Watershed.*



*Right: Heavy use area protection installed in FFY2016.*

GRANTEE: Clinch-Powell Resource Conservation and Development Council

PROJECT NAME: Expanded East Tennessee Grazing Lands Conservation

GRANT YEAR: FY2014

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



From October 1, 2015 through May, 2016 there was no activity on this project since the Grazing Specialist, Webb Flowers had resigned. The new Grazing specialist, James T. Green, Jr, started working June 1, 2016. After a review of the project proposal and previous activity reports, it was determined that the priority activities for the remainder of the project would be directed at making farm visits and helping United States Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS) and Soil and Water Conservation District (SWCD) workers develop grazing plans. There will be some emphasis on training of agency workers at the same time as farm visits are conducted.

From June 1—September 30, 2016 there were 10 producer farm visits with NRCS/SWCD workers to develop grazing plans for beef cattle, sheep and horses. Most of these farms have perennial streams that have been or will be fenced or the animals will be provided pressurized water tanks as a way to reduce the impact on surface water quality. A significant amount of time has been spent with each owner/manager to teach the importance of understanding how plants grow and how this understanding will aid in the survival and sustainability of the vegetation on the landscape. The success of any grazing operation is the performance of the vegetation that is vital to cost effective livestock production as well as the protection of the soil and water resource. A philosophy that the Clinch-Powell RC&D is trying to share is that managing the vegetation is the key to good resource protection and successful livestock production.

*Below: Clinch-Powell RC&D staff work with landowners on grazing plans.*



GRANTEE: Clinch-Powell Resource Conservation and Development Council

PROJECT NAME: Mulberry/Little Mulberry Creek Restoration Project (Phase II)

GRANT YEAR: FY2012

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



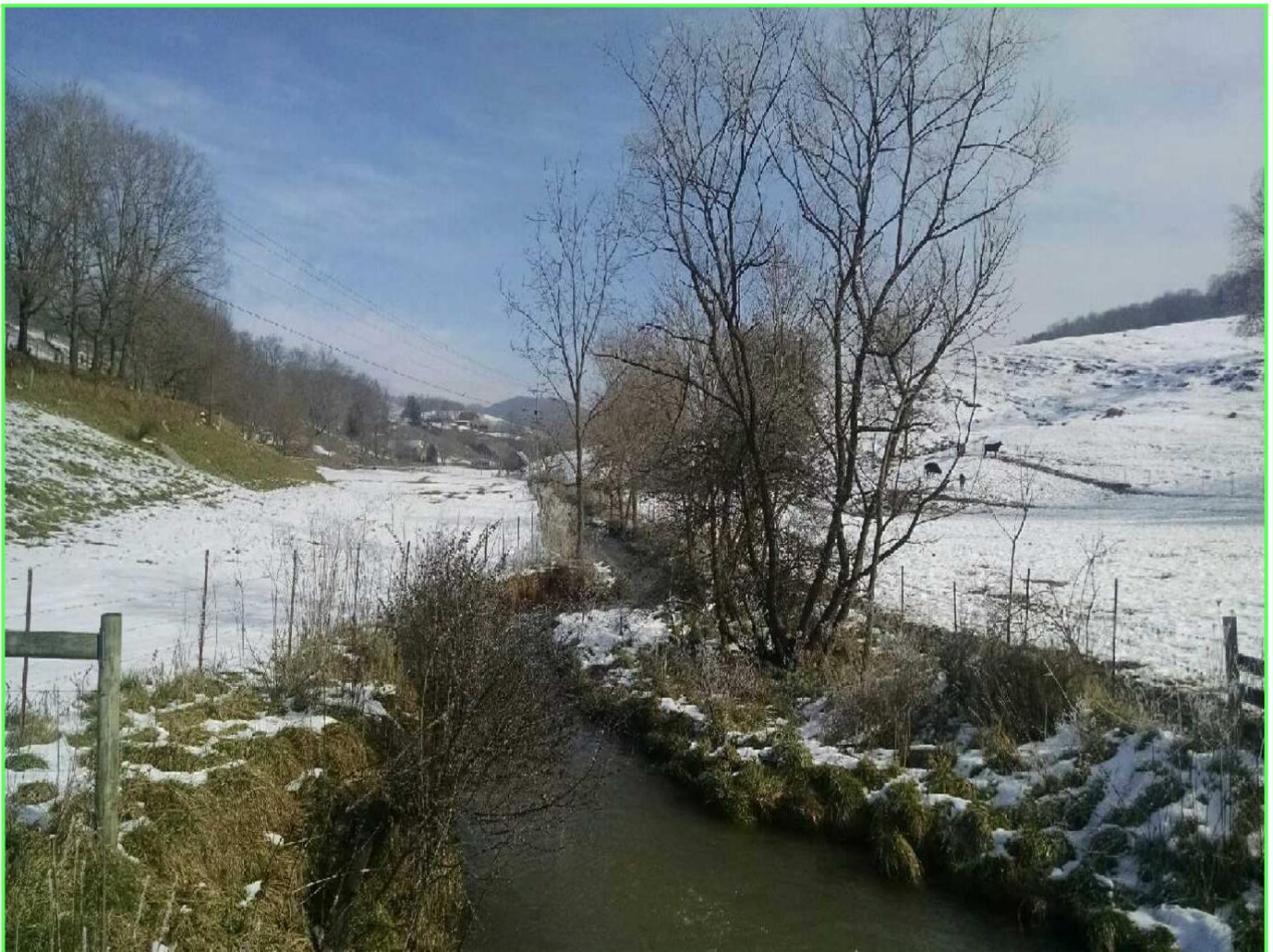
The Clinch-Powell Resource Conservation and Development District (C-P RC&D) learned that there is a lot of factors that contribute to the degradation of a watershed and that each watershed and tributary are different. Traditionally, the C-P RC&D looked only at the problems associated with the mainstream stream, but often the hidden problems lie in the headwater and feeder streams. An eroding bank on a stream may look bad, but it may not be contributing as much nonpoint source pollution as runoff from a feed area during wet weather. When assessing and working on a watershed, you not only need to look at the obvious nonpoint source inputs, but also the indirect that only show up during certain weather or time periods.

Farmers are often aware of their NPS problems but their time and financial limitations are tied to their ability to pay the bills not keep the water clean. In negotiating projects, it is important to show the benefits to their operations not just the environment. Landowners might not care about the threatened or endangered mussels in the stream, but do care about the fact that clean water results in better livestock health and production. Landowners do not need another lecture from an agency, but rather a program offering assistance in making their operation more productive. If it benefits the environment, then that is good, too. Without programs such as this one, landowners would not have the financial means or technical ability to implement agricultural best management practices. The TDA cost-share programs are benefitting more than just the environment they are helping farmers become better stewards of the land.



*Above: Exclusion fencing of a small tributary of Mulberry Creek to allow for the establishment of riparian habitat.*

It is not always the largest streams which contribute the most nonpoint source pollution. Due to the steep terrain in the Mulberry Creek Watershed, there are numerous feeder streams which developed into major watershed degradation problems. The goal through this program is to address as many nonpoint source pollution contributors as possible including mainstem, feeder streams and wet weather conveyances.

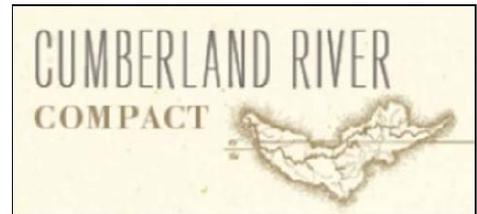


*Above: Exclusion fencing of Little Mulberry Creek to prevent livestock from entering the stream.*

Accomplishments to the Mulberry/Little Mulberry Phase II Grant thus far include:

- 15 - Livestock Watering Facilities
- 17,998 - Feet of Pipeline
- 25,762 - Feet of Access Control Fencing
- 3 - Water Wells
- 2 - Heavy Use Area Protections
- 3 - Stream Crossings
- 2,989 - Feet of Farm Access Road
- Held 1 farm field day attended by over 75 landowners

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



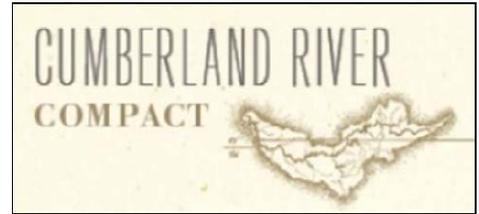
Drawing from the Natural Resources Conservation Service (NRCS), Tennessee Department of Agriculture (TDA), and other resources, the Cumberland River Compact (the Compact) developed educational documents by researching best management practices (BMPs) related specifically to water quality issues, which funding sources and grants could be used to fund these BMPs, useful contacts for Tennessee farmers, as well certification options for those farmers who want to explore organic/sustainable farming. In advance of production of a final educational pamphlet, the Compact has released an initial online version of their educational document, which provides a quick overview of some of the BMPs, funding sources, and contacts that will be specific to water quality related issues. This document can be found at <http://cumberlandrivercompact.org/resources/river-friendly-agriculture/>. This will be an evolving document, and future versions will be amended to contain additional graphics, imagery, etc. The Compact will incorporate continued feedback from the agricultural community to inform the later versions of both our online document and any hard copy versions that are produced. The initial impression, based on feedback from farmers, soil conservation districts, and outreach, suggests that promotable activities vary widely; but, that exclusion fencing, precision agriculture and nutrient management, and no-till/reduced till for new crops such as tobacco may be among the most fruitful areas for future outreach.

With input from the farming community, the Compact developed a pair of surveys, one general and one specifically targeted at the poultry farming community, with whom they have been developing a workable relationship. Based on their experiences contacting farmers by phone in past projects, the Compact have been exploring alternative options for survey distribution and data collection. Additionally, they have been working to promote educational outreach on agricultural issues to the local Nashville community as well through the River Talks program. On February 9, 2016, Kathleen Wolff, the Beaman Park to Bells Bend Conservation Corridor Treasurer, and Sarah Nathan, reporter and photographer, presented a history of the Bells Bend land and inhabitants followed by a photo essay chronicling current sustainable agricultural projects at Bells Bend. The Compact has additional - in November they hosted a talk discussing the Farm to Table movement from the farmer's perspective, and in February they will be hosting noted environmentalist and rancher John Cain Carter for a talk on his efforts to incentivize farmers and ranchers to limit deforestation in the Amazon, and what lessons his work might hold for Tennessee agriculture.

*Below: Guests attend a River Talk in the Cumberland River Compact's RiverCenter.*



**GRANTEE:** Cumberland River Compact  
**PROJECT NAME:** Cathy Jo Subwatershed-Stormwater-  
Shared Consequences, Shared Responsibility  
**GRANT YEAR:** FY2010  
**WEBSITE:** <http://cumberlandrivercompact.org/>



The goal of the project was to improve the health of Cathy Jo Creek as it flows through Nashville Zoo property by enhancing stormwater treatment by the Zoo's stormwater detention basin and runoff management from adjacent office park, which flows into the Zoo's detention basin. Achieving the project objectives will reduce the problems of polluted runoff reaching the Cathy Jo stream segment (trash, sediment, nutrients), increase groundwater recharge and support stable flows during dry months, reduce maintenance and trash problems for zoo staff, and mitigate peak flows to assist with flood prevention. Educational events will round out the project with a one-day stormwater training workshop for designers and contractors plus a series of 2-3 seminars on stormwater for general public audiences.

**Status and Recent Activity:**

In the past year, the project was completed and the final closeout report was submitted. The final year involved completion of three key project elements: 1) on-site stormwater treatment practices on the Zoo property; 2) engagement with landowners and tenants of adjacent Grassmere business park to explore reducing stormwater runoff volume and pollution; and 3) educational programs to share information on practices and benefits of stormwater retrofits. As the project wrapped up, the visual assessment of the health of Cathy Jo Branch continued to improve with visible improvement in the rock substrate and clarity of water quality. In fact, given the improvement in the stream conditions, Metro Nashville added the stream segment to its sites for benthic macroinvertebrate monitoring and a baseline sampling was taken to begin the long term monitoring.

The following summarizes project activities this year for the Zoo site, educational offerings, and office park analysis:

**1) Zoo Site Project Construction:**

- Zoo site stormwater modifications and Zoo exhibit installations were completed as follows:  
1) final design modifications and construction of two stormwater inlet structures leading from the office park drainage into the Zoo's stormwater pond; 2) completed construction of water quality control berms to treat both detention pond outflow and runoff from Croft farm area; 3) clearing of invasive plant species in the 5 acre riparian zone and landscape plantings of native prairie grass, plants, and trees; 4) installation of exclusion fencing and shelter to become elk and bison native habitat exhibit.

*Below (both): The Second Annual Weed Wrangle were volunteers removed invasive plants, and assisted with landscape work.*



## 2) Educational Offerings

A series of educational offerings on stormwater retrofits and this project were completed, including the following activities:

- A full-day professional training workshop was held at the Nashville Zoo on Nov 20, 2015. Over 30 water professionals attended, including engineers, landscape architects, stormwater managers and others. The project was highlighted as an example of design and construction of stormwater retrofits and the benefits they bring to water quality and habitat health, with presentations by project principals plus Metro Stormwater and EPA Region 4.
- The third of a three part series of one-hour Cumberland River Compact River Talk seminars was held in February 2016, with a presentation by Dale McGinnity, the Nashville Zoo Ectotherm Curator. Dale presented on the biodiversity of the stream and conservation research by the Zoo that is complementing the restoration of this and other watershed stewardship measures.
- Several state and national level presentations were made to share success and lessons of this project. Steve Casey, PE, project engineer, spoke on the project at the Tennessee Water Resources Symposium in April, 2016 and the EPA Regional 4 Municipal Separate Storm Sewer (MS4) Conference in May 2016. Gwen Griffith, Cumberland River Compact, led a symposium on this project as an example of stormwater retrofits at the River Network's River Rally national conference in Mobile, Alabama in May 2016. Steve Casey, Dale McGinnity, and Gwen Griffith co-authored a project article for the Tennessee Stormwater Association newsletter in September 2016.
- Plans were completed and a Memorandum of Agreement put in place with the Nashville Zoo to place interpretive signage for Zoo visitors in association with the elk and bison exhibit as the site goes into use as a native habitat exhibit. The signage will focus information on headwater streams, riparian zones, native habitat and stormwater management.

## 3) Office Park Analysis and Runoff Management:

Steve Casey's analysis of the office park stormwater drainage and potential BMPs was utilized to conduct outreach to several building owners and tenants of the office park. As result, Asurion engaged with the project to explore replacing a portion of their asphalt parking lot with pervious pavers during their next planned parking lot maintenance. Asurion funded over one-half the cost of a full analysis and design process by CEC necessary to replace 5% of the parking area with pervious pavers. CEC produced a bid-ready project package for Asurion to use next year if their business model supports that decision. Asurion also signed an agreement with the Cumberland River Compact to allow full use of the design, construction, and cost documents as an educational tool on pervious surface conversions. All of the CEC documents will become educational tools for future training programs and conference presentations.

### Next Steps:

Beyond project completion, the Cumberland River Compact will continue to engage with Nashville Zoo and project partners to build upon the project outcomes and seek ongoing opportunities for stormwater retrofits. Elk and bison will be added to the exhibit in 2017 as the landscape matures and signage will be installed. It is hoped that installation of pervious pavers at the office park will be possible in 2017, at which time a field training workshop will be held. Educational value of the project will be folded into other Compact project activities, including a current de-paving project and other retrofit sites. Funding will also be sought to go forward with potential BMPs identified in the office park setting.



Above: Small headwaters of Cathy Jo Branch appear clearer after rain events following installation of berms.

GRANTEE: First Tennessee Development District  
PROJECT NAME: Cash Hollow Creek Watershed Restoration  
Project  
GRANT YEAR: FY2012  
WEBSITE: <http://www.ftdd.org/>



The Cash Hollow Creek Restoration project began in February 2013. Since the start of the project, the First Tennessee Development District (FTDD) staff have updated the list of property owners in the watershed, hosted a public meeting to inform property owners about the grant, and have attended the local Boone Watershed Partnership meetings to update on progress within the watershed, and developed a mailing list of potential project participants. During this reporting period, the project to connect four apartments to the Johnson City Sanitary Sewer System was completed. Development District staff has also made field visits to the Cash Hollow watershed area on several occasions, and went to several houses in the area to distributed business cards project contact information. Development District staff discussed the project with homeowners in an effort to gain more participation in the project, and attended the by-monthly Boone Watershed Partnership meetings. Staff sent multiple mailings letters to property owners over the course of the project in an effort to gain more interest from the public. There are approximately 86 property owners that reside in the Cash Hollow Creek Watershed area.

Staff met individually with at two homeowners and the local Tennessee Department of Agriculture (TDA) representative. These property owners were interested in potential best management practices (BMP) projects on their property. However, due to the lack of matching funds or other issues, neither property owner was able to commit to the project. Unfortunately, the apartment complex project was the only BMP installed in the watershed. However, this project will have significant impact on the watershed for years to come. This project eliminated leaking septic tanks that were directly impacting the watershed and replaced them with environmentally friendly sanitary sewer connections.

*Below: Location of new connections from apartments to the sanitary sewer.*



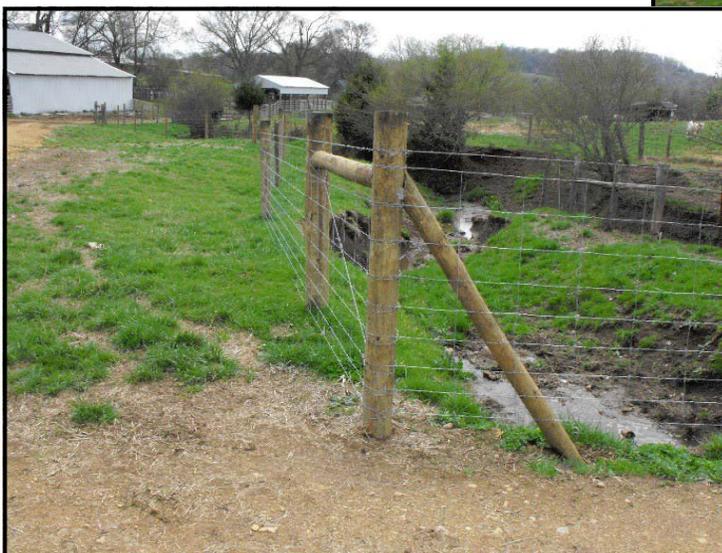
GRANTEE: Giles County Soil Conservation District  
PROJECT NAME: Robertson Fork Creek  
Restoration, Phase II  
GRANT YEAR: FY2012  
WEBSITE: <http://www.gcscd.com/>



The initial objective of the Robertson Fork Creek (RFC) Watershed project was to have the creek removed from the Clean Water Act (CWA) Section 303(d) impaired list by educating landowners regarding water quality and its environmental effects in their watershed. Employees from the Giles Soil Conservation District (SCD) met with clients in the RFC Watershed area promoting Best Management Practices (BMPs) that were to be funded through the RFC Watershed 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, and waste storage facilities. It was explained that upon contract approval these practices would be cost shared at 75%. In February 2013, the RFC Watershed Project – Phase I was completed eighteen months prior to contract end date. A total of 22 (twenty-two) landowners participated in the projects completing best management practices (BMPs) and receiving cost share. The Giles County SCD was awarded Phase II of the RFC Watershed Project which began in January 2013. Phase II of this grant continued to follow the same practices and guidelines as were established in Phase I. Total funds granted for Phase II is \$125,000.00.

Completed in July of 2016, the RFC Phase II Project had a total of thirteen (13) landowners participate. Completed BMPs include 47,945 feet of fence, 11,454 square feet of Heavy Use Area, 12,233 feet of pipeline, 1,511 cubic yards of Clearing and Snagging, and 15 watering facility. The Giles County SCD and NRCS will continue to work with farmers in this watershed utilizing other projects and technical assistance to address animal agriculture concerns.

*Below: Exclusion fencing installed in Giles County.*



*Above: Alternative livestock watering facility installed in Giles County.*

GRANTEE: Giles County Soil Conservation District

PROJECT NAME: Richland Creek—Blue Creek  
Watershed Project

GRANT YEAR: FY2016

WEBSITE: <http://www.gcscd.com/>



In Fiscal Year 2016 the Giles County Soil Conservation District (SCD) was awarded a 319 Grant for the Richland Creek-Blue Creek Watershed in the amount of \$235,000.00. Water quality assessments for the stream list *E.coli* bacteria at elevated levels. With Giles County being one of the top cattle counties in Tennessee it is assumed livestock contributes to higher bacteria counts. This project is currently not targeting other potential sources of *E. coli* from urban sources but does have that potential through the Clean Water Act (CWA) Section 319 grant policy. Farmers who are partnering with the SCD are doing their part to improve the streams by limiting livestock access. The installation of one alternative water source (trough) and cross fence can reduce access by 50%. In most cases the impact is much greater with several clients requesting 100% exclusion on their streams. The practices installed can also lead to significantly increased forage management capabilities for the grazers, improved animal health and more importantly greater economic returns to the farming operation. Livestock producers who understand multiple paddock grazing systems know they can greatly reduce costs for labor, equipment, fertilizers, herbicides and feed by transitioning to planned grazing systems. Grant funds will be used to assist landowners in Northern Giles County with Best Management Practices (BMPs). Practices approved by the Giles County SCD Board includes cross fencing, exclusion fencing, filter strips, field borders, forested riparian buffer, pipeline, watering facilities, heavy use area, stream crossing, clearing and snagging, pumping plant, and spring development. Each of these practice can be cost-shared at 75%. All practices are to be installed according to the guidelines used by the USDA Natural Resources Conservation Service (NRCS). Upon completion of each project, Tori McWilliams, Watershed Coordinator and Rusty Walker, NRCS District Conservationist will inspect the practice before Carla Potts, Watershed Financial Coordinator submits request for the client's reimbursement.

Since its beginning 7,215 feet of fencing has been installed and another 10,047 feet has been committed with signed and approved contracts. Other completed BMPs are: 2 Heavy Use Areas (HUA), 1,290 feet of pipeline and 2 watering facilities. Six clients have signed contracts to install practices such as watering facilities, pipelines, spring development, and heavy use areas. In July, the District sent out letters to more than 260 clients in the Richland Creek-Blue Creek Watershed informing them of the availability of the grant. The district also attracted attention with their display at the Giles County Fair held in August. The display highlighted information that was announced in the Richland Creek-Blue Creek Watershed Letter and the many benefits of improving agricultural production through implementation of Best Management Practices. The Giles County SCD will continually promote this grant through advertisement on it's website at [www.gcscd.com](http://www.gcscd.com). The continued objective of the Richland Creek-Blue Creek Project is to improve water quality, educate landowners, and remove the impaired stream from the CWA Section 303(d) list.

*Below: Outreach at the Giles County Fair.*



*Below: Exclusion fencing in Giles County.*



**GRANTEE:** Harpeth River Watershed Association  
**PROJECT NAME:** Harpeth River Headwaters Restoration Project—Phase III  
**GRANT YEAR:** FY2014  
**WEBSITE:** <http://www.harpethriver.org/>



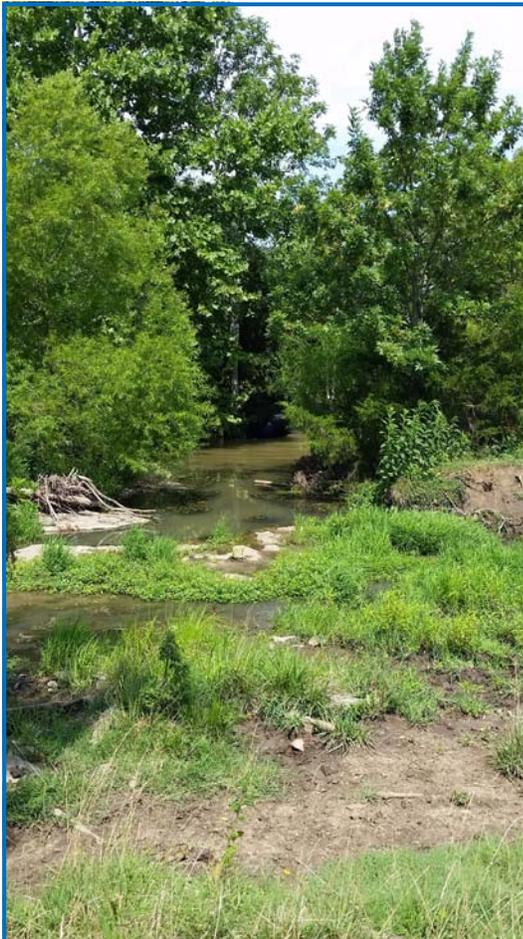
The purpose of the current Phase III grant is to address sediment and nutrient reduction from agricultural lands in Eagleville, as well as other properties such as private residences and commercial or public properties. The Harpeth River Watershed Association (HRWA) completed one agricultural best management practice (BMP) design and installation project in the fall of 2015 and anticipate completing a second project by the end of 2016. Furthermore, HRWA plans to inform and educate the community in and around Eagleville in terms of project successes and riparian property BMPs.

HRWA collaborated with Chris Hancock from Natural Resources Conservation Service (NRCS) to engage and work with producer John Taylor to develop a plan to extend two heavy use area feeding pads in two separate pastures. Following approval by Wayne Pressler from NRCS regarding eligibility, the pad extensions were installed by Middle Tennessee Dairy Service, Inc. in the fall of 2015. In 2016, HRWA again collaborated with NRCS to work with producer Horace Jackson in terms of conservation planning and BMP installation. NRCS developed a conservation plan, cost estimates, and performed engineering studies for installation of a watering system, exclusion fencing, and livestock stream crossing. Wayne Pressler has approved of the project and a cost-sharing agreement form has been signed by all required parties. Mr. Jackson is currently bidding the project out and installation is expected to occur in the near future.

*Top Right: Current location of livestock crossing in Concord Creek.*

*Below: Concord Creek as it passes through Jackson Farm.*

*Bottom Right: Proposed location of hardened livestock crossing.*

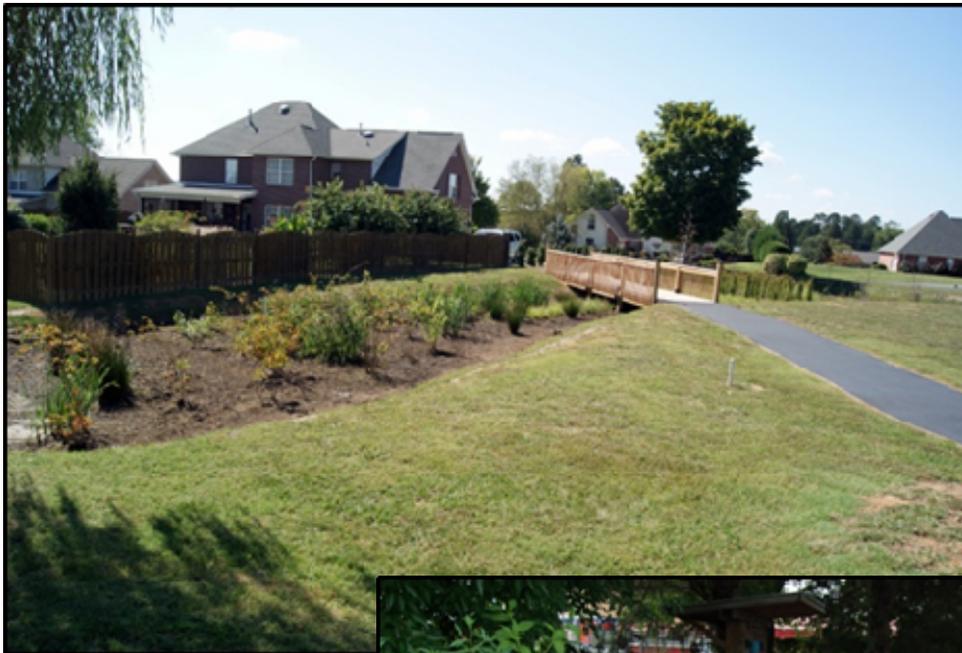


GRANTEE: Knox County  
PROJECT NAME: Beaver Creek Restoration Phase II  
GRANT YEAR: FY2014  
WEBSITE: <http://www.knoxcounty.org/>



The past year has been busy with multiple projects completed including a 5,100-foot bio-retention cell that captures stormwater, filters pollutants, and infiltrates eight acres of runoff in the Cedar Crossing subdivision. The Cedar Crossing Home Owners Association (HOA) used the bio-retention basin as the main feature in building a mini-park for residents in the subdivision's common space. Agricultural projects are picking up with one project complete and three more in various stages of implementation. Focus is on the headwaters of Beaver Creek, the location of all agriculture projects to date. Approximately 300 feet of pervious concrete sidewalk was installed at a Beaver Creek high school (Halls High School) to treat a muddy path that was inputting sediment to the North Fork of Beaver Creek.

Educational events the past year included 350 attendees at the 9<sup>th</sup> Annual Halls Outdoor Classroom Celebration in April, a workshop on pervious concrete installation in conjunction with the installation of the sidewalk in May, and a Famer's breakfast in July with more than 25 people in attendance.



*Left: Bio-retention basin at the Cedar Crossing Subdivision.*



*Right: Pervious sidewalks installed at Halls High School.*

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



Knox County Soil Conservation District (SCD) held a meeting in March with the grant partners, Union County SCD, Grainger County SCD, and Knox County Stormwater Management Department, where the grant goals, requirements and future projects were discussed. Logistics of working with the three soil conservation districts were discussed. Outreach needs and goals as part of the grant were discussed. In addition to working with the soil conservation districts and Knox County Stormwater Management Department on agricultural best management practices (BMP) projects, the grant is funding septic system repairs. The grant was therefore discussed with the Knox County Health Department and the Tennessee Department of Environment and Conservation (TDEC)—Division of Water Resources who permit drain fields in Knox, Union and Grainger Counties.



*Above: Exclusion fencing installed along Little Flat Creek to exclude cattle.*



*Above: Installation of a livestock pipeline and watering system.*

In FFY2016, Knox County SCD obligated funding to three agricultural BMP projects in Knox County with a projected cost share of about \$77,650.00; two projects in Union County with a cost share of \$31,303.00; and, three projects in Grainger County with a projected cost share of \$26,741.00. For many of these projects, additional funds were leveraged from the Farm Service Agency (FSA), the Natural Resource Conservation Service (NRCS) and the Agricultural Resource Conservation Fund (ARCF) thereby increasing the impact of the grant funding. Collectively, Knox County SCD has worked with private land owners on agricultural conservation on 658 acres, and protected approximately 1.1 miles of creek as part of the Flat Creek CWA Section 319 (h) Grant. Additionally the grant has funded one septic system repair so far in the Flat Creek watershed in Knox County. The project funding has allowed the opportunity to work with agricultural producers and landowners that the District otherwise would not have had the opportunity to work with. This has resulted in improved land management and ultimately improved water quality.



*Above: Installation of a new drain field for a septic system repair.*

GRANTEE: Knox County Soil Conservation District  
PROJECT NAME: Stock Creek Restoration  
GRANT YEAR: FY2012  
WEBSITE: <http://www.knoxcounty.org/epw/soilconservation.php>



Federal fiscal year 2016 wrapped up this Section 319 grant with one big agricultural project and a number of educational activities. Agricultural practices completed on a 129 acre farm included 2,102 feet of paddock fencing, a heavy use area with a 40 feet X 71 feet feeding pad, and a 15.5 feet X 600 feet access road with 10 water bars.

Five education/outreach meetings were held during this period to plan 2016 post grant activities including the Stock Creek Task Force annual presence at the Bonny Kate Spring Fling with 1,000 attendees, John Sevier Days at the Marble Springs State Historic Site, and a final public meeting to showcase accomplishment under this grant. The end date for this grant was April 15, 2016.



*Left: Before photograph of the heavy use area prior to construction.*

*Bottom left: After photograph post-construction of the heavy use area protection.*

*Bottom right: Access road installed on the farm.*



GRANTEE: Lawrence County Soil Conservation District  
PROJECT NAME: Tripp Town Watershed  
GRANT YEAR: FY2012  
WEBSITE: <https://www.tn.gov/agriculture/article/ag-scd-lawrence>



In the past year, the Lawrence County Soil Conservation District (SCD) has worked with landowners to plan BMP's that will yield measureable water quality improvements. The District worked with one cattle producer to install watering facilities that will allow him to rotationally graze his cattle, improving soil and water quality. They also worked with a landowner to convert his 58 acre row-crop field to a field of permanent grass. Permanent grass will hold the soil in place much better and improve water infiltration- resulting in less runoff. Cover crops are an important component of long-term row-crop production. The District assisted another row-crop producer with planting 823 acres of cover crops. These cover crops played an important part in keeping the soil in the fields and out of the streams over the winter of 2015/2016, and also improved the soil so that more water will be absorbed during a rain event and less will run off into streams.

The Lawrence County SCD is grateful for the financial assistance provided by the EPA 319 program. Although the Tripp Town Watershed Restoration Project is now over, the Tripp Town Watershed is in much better shape that when the project began and much of that can be attributed to the financial assistance they were able to offer the producers inside this watershed to help them improve water quality around their homes and farms.

*Top left: Cropland converted to permanent grass*

*Top right: Winter cover crop*



*Bottom left: Alternative livestock waterer*

*Bottom right: Cropland converted to permanent grass*

GRANTEE: Marshall County Soil Conservation District  
PROJECT NAME: Spring Creek Watershed Restoration Project  
GRANT YEAR: FY2012  
WEBSITE: <http://marshallscd.wordpress.com/>



The Marshall County Soil Conservation District (SCD) finished the grant in February of 2016. \$292,375.07 of the granted \$370,000.00 was spent. During the last 4 to 5 months, projects were completed with 10 participants. BMPs included exclusion fence, cross fence, water facilities, a well, heavy use areas, a stream crossing, critical area seeding and mulching, tree establishment, pumping plants, pipelines, and forage and biomass planting.

*Above: Alternative livestock watering facility and heavy use area protection installed in Marshall County.*

*Below: Field Day held at Westview Farms in October, 2015.*

Marshall County SCD held a field day to showcase their work on October 7, 2015 at Westview Farms. There were over 50 people in attendance. Work on Westview Farm was showcased as well discussions on other topics such as grazing and soil health, and land preservation. A fence and water facility demonstration was performed by the Marshall County Farmers Cooperative. The Marshall County 2015 Farmer of the Year was presented. The award went to Shannon Cook, a CWA Section 319 grant cooperator.



GRANTEE: Middle Nolichucky Watershed Alliance  
 PROJECT NAME: Holley Creek Restoration Project  
 GRANT YEAR: FY2014  
 WEBSITE: <http://www.mnwa-tn.org/>



During the second contract year on the Holley Creek Restoration Project, the following activities have been completed as part of the overall streambank restoration and stormwater treatment wetland project:

- **Property Owner Coordination.** Continued coordination was conducted with the property owner, Mr. Scott Niswonger and Niswonger Foundation staff to discuss project details and permitting
- **Hydrologic and Hydraulic Evaluation.** Conducted detailed hydrologic and hydraulic modeling and evaluated storm flows and hydrology and hydraulics for wetland sizing and inlet and outlet structures.
- **Engineering and Design.** Developed detailed design of stormwater treatment wetland and stream restoration measures. Prepared design plans and details for permitting and construction.
- **Vegetation Plan.** Prepared planting plans, details and specifications for streambank stabilization and stormwater treatment wetland, incorporating native vegetation.
- **Erosion and Sediment Control Plan.** Prepared erosion and sediment control plans for streambank stabilization and stormwater treatment wetland project elements.
- **Permitting.** Prepared and submitted permit applications and supporting documentation for TDEC and USACE/TVA joint permit and conducted follow-up agency coordination. TDEC Aquatic Resource Alteration Permit for the project was received on August 2, 2016. Project permit approval for USACE/TVA joint permit was received on August 17, 2016.
- **Construction Contractor Coordination.** Conducted preliminary coordination with contractor on project design, erosion control measures and construction sequencing. The project is ready for construction and is currently waiting on availability of Mr. Niswonger's construction manager and construction crew as well as the favorable season for construction and establishment of vegetation. The project is anticipated to be constructed during the late fall of 2016.

The Middle Nolichucky Watershed Alliance has continued to keep its membership and the larger community informed about the Holley Creek Restoration Project through regular meetings and through an article written about the project for the MNWA newsletter.



Left: Aerial photography of the proposed project area.

**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<sup>st</sup> 2015 to September 30<sup>th</sup> 2016 there were five septic BMP's completed impacting 5 acres; the total cost share for the five septic repairs was \$16,001. In addition, two seeding BMP's were completed that impacted 22 acres with a total cost share of \$2,592.00. A total of \$10,080.18 was requested for the administrative work for the grant completed by the District Secretary. A wrap for the outside of the Educational Soil Tunnel Trailer was purchased along with a TV and sound bar. The total spent for these items totaled \$2,519.96. This leaves the amount requested to date as \$172,952.64 and a remaining balance of \$87,047.36 of the original \$260,000 grant ending 7/31/2017. Presently the Morgan County SCD has 11 applications for septic repair/replacement and an additional application for pasture/hay land seeding.

The Morgan County SCD has been committed to reaching out as much as possible to the communities within the Crooked Fork Creek Watershed. Education on water resource conservation and information on the CWA Section 319(h) Grant has been made available through posters, flyers, news articles and advertisements, an Outdoor Show. Over 6,000 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 Morgan County SCD 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 that TDA has provided.

*Below: Soil Train Trailer educating Kindergartners.*

*Below: Morgan County SCD Education Soil Train Trailer used for outreach and education.*



*Above: Soil Train Trailer at Farm Day.*

GRANTEE: Robertson County Soil Conservation District  
PROJECT NAME: Valley Branch Restoration Project  
GRANT YEAR: FY2013  
WEBSITE: <http://robertsonscd.wordpress.com/>



The 2016 fiscal year (FY) has been a busy one in Robertson County for the 319 Project! In FY2016 Robertson County Soil Conservation District (SCD) and the Natural Resources Conservation Service (NRCS) cooperated with seven participants to install conservation practices for a total of \$32,047.69 being granted to landowners. To date the local program has reimbursed twelve landowners for completed conservation projects and there are currently seven approved applications for new projects. Preliminary cost estimates indicate that the seven approved applications will enable the SCD to obligate the remaining balance of our 319 funds. This achieved the District's milestone of obligating the remaining fund balance by August 2016. Although this is great news, the SCD is challenged with being able to finish construction before the grant period expires on December 31, 2016. Therefore, the SCD has requested an extension of the current grant until July 31, 2017.

During the reporting period seven projects have been completed and include:

- Repair of a failed septic systems on the Michael James, Pat Leding, and Jeb Lax properties.
- Live-stock watering facilities and critical area treatment was in-stalled on the Johnie Baldwin farm.
- Gary Keay installed two heavy use area treatments in his pasture where livestock are fed.
- David Gunn used exclusion fencing to better protect his stream crossing and waterway.
- Lastly, Jack Nixon performed some critical area planting and installing fencing on his farm.



*Above: Stream crossing and exclusion fence.*



*Above: Critical area planting.*



*Above: Livestock Exclusion fence.*



*Above: Septic system replacement site.*

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

**PROJECT NAME:** Fork Creek Watershed Project

**GRANT YEAR:** FY2012

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

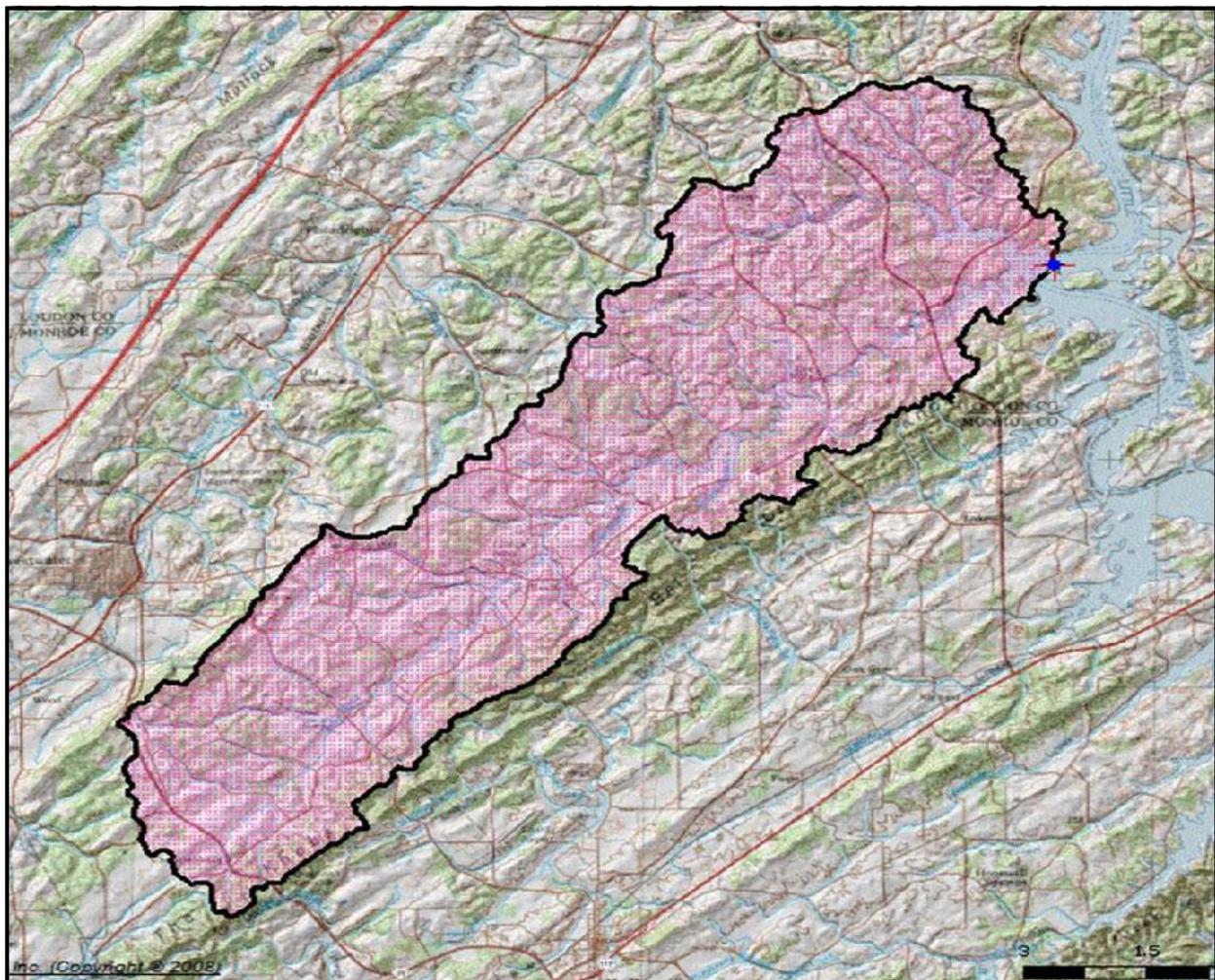


The last 12 months of the Southeast Resource Conservation and Development (RC&D) Council's Fork Creek CWA Section 319(h) project have been a resounding success. Not only did all the allocated grant monies get spent, but several major projects were completed that will likely make major impacts in the environment – especially with the agricultural side.

The largest agriculture project completed this period was work on a stockyard putting in lanes, fencing, and heavy use protection. Before, many of the heavily trafficked areas were essentially mud pits where cattle would be shin deep in mud, especially in the rainy season. With the lanes and heavy use areas, the field is green and runoff pollutants are reduced.

The Council did not complete as many septic jobs as originally anticipated during this period, but the septic repairs completed not only helped the environment, but also provided an opportunity to make contact with contractors who were willing to work on other projects including on the agriculture side.

*Below: Map of the Fork Creek Watershed.*



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

**PROJECT NAME:** Gunterville Lake Watershed Tributaries Project

**GRANT YEAR:** FY2010

**WEBSITE:** <http://setnrcd.org/index.php/about-us/9-projects/5-water-quality-improvement>



During the final 12 months of the Gunterville Lake Project, the Southeast Tennessee Resource Conservation and Development (SETN RC&D) Council was finally able to connect with the community, and completed a number of projects that will truly impact the environment and the community surrounding the Little Fiery Gizzard in an extremely positive way.

On the agriculture side there was not as much progress. There are not as many farms in Tracy City, and those that are were either not interested in the grant or, in the case of Concentrated Animal Feeding Operations (CAFOs), unresponsive. With that being said the SETN RC&D did work closely with a new farmer in the area who raises alpaca. The Council connected with her, and introduced her to the local leaders and agriculture specialists. She currently does workshops and plans to do farm field trips and highlight conservation efforts.

For septic system repairs, the SETN RC&D worked extensively with county environmentalist Skip Scott to get projects on the ground and moving. As a result, more septic jobs were finished in the last two quarters of the grant than were completed during preceding portion of the grant. The majority of failed septic systems were what would be considered "severe," and in desperate need of repair. A number of repairs had visible holes in the ground where sewage was visible just beneath the surface. Another system had sewage directly on the ground surface.



*Upper and lower left: Installation of a pipeline before and during construction*

*Below: Example of cross fencing installed in Van Buren County.*



GRANTEE: Tennessee Environmental Council  
PROJECT NAME: Rutherford Creek Restoration—Phase III  
GRANT YEAR: 2013  
WEBSITE: <http://tectn.org/>



During this time the Tennessee Environmental Council stabilized 230 feet of creek bank. The Council used 12 logs that were 18 inches in diameter and 11 logs that were 12 inches in diameter. They also went back to all previously treated areas and planted approximately 800 live-stake trees. The Council also worked on two rain gardens. Invasive/unwanted species were removed and 55 bushes were planted. The Council had 4 council staff members and 2 interns, as well as 30+ volunteers aiding on this project.

*Below (all): Planting bushes near Grassy Branch*



**GRANTEE:** Tennessee Environmental Council  
**PROJECT NAME:** Lytle Creek Phase I Restoration Plan Implementation  
**GRANT YEAR:** 2015  
**WEBSITE:** <http://tectn.org/>



The Council is undergoing the initial stages of the Lytle Creek Restoration Plan. Sites are currently being assessed for participation in implementing tasks, identifying key restoration opportunities, and to establish relationships with private and public owners. The site for the first rain garden installation along East Overall Street and the public greenway in Murfreesboro has been determined and excavation scheduled. A proposal has been submitted to the City of Murfreesboro for stream bank restoration of approximately 900 linear feet along the Town Creek and Lytle Creek confluence near S Front Street. The proposed project includes riparian restoration, live staking, and rain garden installation.

The Council is developing project partners, educating volunteers, and refining plans to carry out BMPs. Partnerships include the Council staff in cooperation with Storm Water Departments of Murfreesboro, Rutherford County, as well as Murfreesboro Parks and Recreation and USDA. Volunteer participation began with a river cleanup and assessment near Overall Street and local greenways in October in cooperation with McFadden Community Center and the Middle Tennessee State University (MTSU) Student Government Association (SGA).



*Left: Volunteers assess the creek for pollutants, trash, and discuss habitat concerns along Lytle Creek.*



*Right: Volunteers from the McFadden Community Center and MTSU SGA at a river clean-up in Lytle Creek.*

GRANTEE: Town of Mountain City  
PROJECT NAME: Furnace Creek Watershed, Phase II  
GRANT YEAR: FY2014  
WEBSITE: <http://mountaincityonline.com/>



Phase 2 of the Furnace Creek Watershed project began in late 2015 & 2016 with the Individual Permitting (IP) of the entire watershed project. Brushy Fork Environmental Consulting, Inc. (BFEC) began contacting all of the foreseeable landowners on multiple sections of Furnace Creek: Furnace Creek Road, Lower Furnace Creek, and Buster Brown. Furnace Creek Road is the upstream extent of the watershed, near the all-terrain vehicle (ATV) park (that is CWA Section 303(d) listed), where the channel flows through a low-income area of town. Lower Furnace Creek is the section that flows through the downtown section of the Town of Mountain City and has many urban impacts. Buster Brown is a stand alone landowner that didn't sign up with the Phase 1 work and decided to participate later. The IP application was submitted, and after approximately three months of review, moved into the public notice phase, ultimately receiving the permit in the spring.



**BEFORE**

With the watershed work now permitted the BFEC construction crew, working with the Town of Mountain City Public Works staff moved into the Buster Brown section, stabilizing the approximately 170 linear foot section in the late fall/winter of 2015. In the spring of 2016, the Public Works crew moved into the headwaters section of Furnace Creek Road. Stream enhancement occurred along 5 tracts of land; 4 private landowners and Johnson County Highway Department for approximately 1,600 linear feet of enhancement work. Multiple natural channel features were installed including: J-hooks, vegetated boulder walls, floodplain connectivity, sloping, trash removal, invasive removal, and native riparian planting. This work occurred in the spring of 2016. In late August 2016 crews began working on the Lower Furnace Creek section. This construction will be on-going through 2017 with about 2,000 linear feet of work proposed on an estimated 9 properties.

*Left: Furnace Creek below a culvert crossing before construction.*

*Below: Furnace Creek below a culvert crossing after construction.*



**AFTER**

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



Above: New logo designed for the Welcome Wagon program.

The contract began in earnest in February of this year. A team consisting of representatives from the Tennessee Division of Forestry and the Tennessee Forestry Association was assembled. University of Tennessee members included the Principle Investigator and the Head of the Department of Forestry, Wildlife and Fisheries. Over the course of eight months, three planning sessions were held, whereby the content of the mailing packets was developed and the details of the first mailing were finalized.

Below: Helpful websites for new forest landowners.

To be included in the mail packets are the following:

- ◆ 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;
- ◆ Forest health business cards; and,
- ◆ An invitation to join both the Tennessee Forestry Association and County Forestry Associations.

The names of new forest landowners are being procured from the State Tax Assessor and the first scheduled mass mailing - to an estimated 500 landowners - will occur in late 2016.

<p>Tennessee Division of Forestry</p>  <p><a href="http://go.gl/hE7i7U">http://go.gl/hE7i7U</a></p> <hr/> <p>PLANT IN TREES.org</p>  <p><a href="http://PlantTNTrees.org">http://PlantTNTrees.org</a> (tree seedlings)</p>	<p>Tennessee Forestry Association  <i>"The voice of forestry in Tennessee"</i></p>  <p><a href="http://www.tnforestry.com/">http://www.tnforestry.com/</a></p>
<p>University of Tennessee Extension        Forestry Publications</p>  <p><a href="http://tinyurl.com/ie2k7nu">http://tinyurl.com/ie2k7nu</a></p>	<p>American Tree Farm System</p>  <p><a href="https://www.treefarmssystem.org/">https://www.treefarmssystem.org/</a></p>
<p>Log-on before you Log</p>  <p><a href="http://www.tnforestry.com/Log-on_before_You_Log/">www.tnforestry.com/Log-on_before_You_Log/</a></p> <p><a href="http://www.tnforestry.com/Log-On Before You Log/">http://www.tnforestry.com/Log-On Before You Log/</a></p>	 <p><a href="http://ProtectTNForests.org">http://ProtectTNForests.org</a></p>
 <p><a href="http://BurnSafeTN.org">http://BurnSafeTN.org</a></p>	

GRANTEE: The University of Tennessee Extension  
PROJECT NAME: BMPs Row Crop Obion River  
GRANT YEAR: FY2014  
WEBSITE: <https://extension.tennessee.edu/Pages/default.aspx>



There are 392 stream miles and 15,500 lake acres within the Obion River Watershed that are listed as either only partially supporting, or not supporting, their designated uses, according to the 2010 Tennessee 303(d) list of impaired waterways, with crop production as the leading source of impairment. The overall objective of this project is to utilize on-farm demonstrations and county, multi-county and regional meetings to increase the awareness and adoption of agricultural Best Management Practices (BMPs) that will ultimately improve water quality and remove stream sections within the Obion River Watershed from the Tennessee 303(d) list of impaired streams. The two targeted BMPs in this project include site-specific fertility management and the adoption of cover crops. This year, 19 presentations were made at county and multi-county meetings; field days; and trade association meetings to over 1,100 producers, crop consultants, cover crop seed dealers, NRCS personnel, and UT Extension agents. A cover crop field day will be held in late March 2017 at the Research and Education Center at Milan. The program will include topics on cover crop establishment and termination, biomass production and nitrogen concentration of different cover crop species/mixes, weed suppression benefits, soil health benefits and yield response.

This year, 13 demonstration fields totaling approximately 700 acres in Lake, Obion, Dyer, and Weakley counties received variable rate application (VRA) of P and K fertilizers in the spring prior to planting. Cover crop demonstrations were planted on approximately 1,200 acres in Gibson, Lake, Weakley, Henry and Dyer counties last fall for the 2016 growing season. The participating producers planted either soil health building, nitrogen fixing or soil protection mixes. Over 1,600 acres of cover crop demonstrations in the Obion River Watershed are planned for this fall. Based on NRCS and county Extension agent estimates, more than 72,000 acres of various crop species/mixtures will be planted this fall in the Obion River Watershed. Also, a partnership has been formed with the Tennessee Soybean Promotion Board and the Cotton Incorporated Tennessee State Support Committee to fund cover crop research to further investigate cover crop establishment and management, as well as barriers to adoption.



*Far left: Five-species mix planted for soil health.*

*Top right: Cereal rye cover crop.*

*Bottom right: Cotton planted into cover crop residue*

GRANTEE: The University of Tennessee  
PROJECT NAME: Tennessee Yards and Neighborhoods:  
Roots for Long-Term Viability  
GRANT YEAR: FY2012  
WEBSITE: <https://ag.tennessee.edu/tnyards/Pages/default.aspx>



The focus of the last year of this contract centered on Task 3, which was to expand the geographic spatial scale of program delivery into new Tennessee communities, as well as collect the materials developed through this program in one location.

Through the efforts of the Principle Investigators, the University of Tennessee Extension has identified the Tennessee Smart Yards program as their premier platform from which to deliver education on sustainable residential landscaping to urban clientele. In 2014, UT Extension created a new framework in which State Specialists and County Agents work to identify community needs and match resources to provide science-based solutions. In this framework, a “Workgroup” was formed to focus on Sustainable Residential Landscapes, comprising of 10 professionals (including both Andrea Ludwig and Ruth Anne Hanahan). Through this workgroup, funding was secured (~\$18,000) to bring in 15 new participating county programs and conduct Agent inservice trainings in 2016-2017. Metrics were also added to the statewide reporting mechanism for UT Extension county staff, which aggregates activity reports based on topic areas across the state. In summary, this funding as well as improved internal infrastructure that links directly to the Tennessee Smart Yards program will help ensure its viability into the future.

The efforts towards Task 2, expanding the scope of the materials available for Extension Agents and municipal separate storm sewer (MS4) professionals focused on finalizing powerpoints and scripts as well as creating a common space to house these materials so that Agents and MS4 personnel may access them. The foundational nine principle 1-hour modules may be found here: [https://www.dropbox.com/sh/iaj5k8firubohoz/AAADcR\\_LzougYBFQgEPsixEza?dl=0](https://www.dropbox.com/sh/iaj5k8firubohoz/AAADcR_LzougYBFQgEPsixEza?dl=0) The additional 5 new topic modules may be found here: <https://www.dropbox.com/sh/zsqxpqbtsefpeui/AADmxoZoiqhc0VS4RYvQChuxa?dl=0> An Agent Resource webpage was created to house all the materials for the rain garden workshops and lunch and learn models. That site can be accessed here: <https://ag.tennessee.edu/watersheds/Pages/Agent-Resources.aspx>

A rain garden workshop was also conducted as a train-the-trainer at Lane AgriPark, where 28 Master Gardeners and County Extension Agents learned about how to design, construct and maintain a home rain garden.

*Below: New workshop materials for 2017.*

*Below: Building a demonstration rain garden.*



**GRANTEE:** West Tennessee River Basin Authority (WTRBA)  
**PROJECT NAME:** Moize Creek: Erosion Mitigation to Reduce Nonpoint Source Pollution in the Forked Deer River  
**GRANT YEAR:** FY2014  
**WEBSITE:** [tn.gov/environment/article/board-west-tennessee-river-](http://tn.gov/environment/article/board-west-tennessee-river-)



The project is underway with completion of the first erosion control structure in place near Old Humboldt Road in Jackson, Tennessee. This site consisted of a drop riser pipe and earthen berm to prevent waters from continuing to erode stream banks along the tributary to Moize Creek.



*Left: Before photograph of the project area near Old Humboldt Road.*

*Below: After photograph of the project area after erosion control devices were installed to prevent continued erosion along a tributary of Moize Creek.*



The second project under development has completed concept design phase, and the WTRBA is awaiting engineering designs. This site will consist of a grade control structure and stream bank stabilization downstream of an urban development where flash flows have caused instability in the system. The permitting process is underway now and construction should begin spring of 2017.

GRANTEE: West Tennessee River Basin Authority (WTRBA)  
PROJECT NAME: Reducing Nonpoint Source Pollution in the  
Forked Deer River

GRANT YEAR: FY2013

WEBSITE: [tn.gov/environment/article/board-west-tennessee-river-basin-authority](http://tn.gov/environment/article/board-west-tennessee-river-basin-authority)



The objective of the Madison County Erosion Mitigation and Hydrologic Improvements project was to reduce non-point source pollution to the Forked Deer River. The projects focused on the Sandy Creek watershed and had the primary objective of reducing gully erosion, sediment loading, and infrastructure threats.

The final project of this grant was completed in 2016. This final phase consisted of a grouted rock chute, restored stream channel in an area that was previously a deeply incised and erosive gully, and a rock stream crossing for utility access.

*Below, top left: Aerial photograph of the project area. Below, top right: Construction of the grouted rock chute.*

*Below, bottom: Completed rock chute.*



# 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>			
	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>			
	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>			

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>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>		Exceeded expectations. All short term goals for this segment were met; a majority of goals were exceeded.	Exceeded expectations. All short term goals for this segment were exceeded.			
	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>		Exceeded expectations. All short term goals for this segment were exceeded.	Exceeded expectations. All short term goals for this segment were exceeded.			
	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 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>		Insufficient progress. No legacy mining-related proposals were received; additional outreach needed.	On track to achieve outcomes. One project addressing legacy mining was funded in FFY2016; site visits for legacy mining were exceeded.			
Long Term Goal No. 2: Build citizen awareness of problems and solutions related to nonpoint source pollution through local and statewide education efforts	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</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>	On track to achieve outcomes. Most goals exceeded; evaluation form development	On track to achieve outcomes. Most goals exceeded; evaluation form provided to			

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)
targeting various audiences.		<p>presented with messages addressing NPS pollution sources, problems, and solutions each year.</p> <ul style="list-style-type: none"> <li>Develop a general evaluation form to be completed by all participants at the conclusion of each educational event.</li> </ul>		<i>needed.</i>	<i>grantees and posted online.</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>			
	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>			
	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>			
	Failing Septic	<ul style="list-style-type: none"> <li>TN-NPS staff will attend/participate in at</li> </ul>		<b>Exceeded expectations.</b>	<b>Exceeded expectations.</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)
		<ul style="list-style-type: none"> <li>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>		<i>All short term goals for this segment were exceeded.</i>	<i>All short term goals for this segment were met or 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>			
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.	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 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 stakeholder meetings or workshops to promote the 319 program each year.</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> <li>Educate citizens regarding management practices to prevent or minimize nonpoint source pollution.</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>			

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)
	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>			
	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>			
	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>			
	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>			
	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 exceeded.</i>	<b>On track to achieve goals.</b> <i>All goals met for this sector.</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>			
	Agriculture	<ul style="list-style-type: none"> <li>Develop a sector-based tracking mechanism for BMP implementation,</li> </ul>		<b>Insufficient progress.</b>	<b>On track to achieve goals.</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)
		educational activities, pollutant load reductions, and capacity building efforts. <ul style="list-style-type: none"> <li>Implement a sector-based tracking mechanism for BMP implementation, educational activities, pollutant load reductions, and capacity building efforts.</li> </ul>		<i>Although the tracking system has been developed, it has not yet been fully implemented. Implementation will occur in FFY2016.</i>	<i>All applicable goals met for this sector. Sector-based tracking was developed and implemented internally; work with grantees is needed.</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>			
	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>		<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>			
	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>		<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>			
	Legacy	<ul style="list-style-type: none"> <li>Develop a sector-based tracking</li> </ul>		<b>Insufficient</b>	<b>On track to</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)
	Mining	mechanism for BMP implementation, educational activities, pollutant load reductions, and capacity building efforts. <ul style="list-style-type: none"> <li>Implement a sector-based tracking mechanism for BMP implementation, educational activities, pollutant load reductions, and capacity building efforts.</li> </ul>		<b>progress.</b> <i>Although the tracking system has been developed, it has not yet been fully implemented. Implementation will occur in FFY2016.</i>	<b>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>			
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>	<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. Outreach is on-going with groups interested in protection work.</i>			
	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>		<b>Not applicable.</b> <i>This goal does not apply.</i>	<b>Not applicable.</b> <i>This goal does not apply.</i>			
	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>		<b>Not applicable.</b> <i>This goal does not apply.</i>	<b>Not applicable.</b> <i>This goal does not apply.</i>			
	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>		<b>Not applicable.</b> <i>This goal does not apply.</i>	<b>Not applicable.</b> <i>This goal does not apply.</i>			
	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>		<b>Not applicable.</b> <i>This goal does not apply.</i>	<b>Not applicable.</b> <i>This goal does not apply.</i>			
	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>		<b>Not applicable.</b> <i>This goal does not apply.</i>	<b>Not applicable.</b> <i>This goal does not apply.</i>			
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> </ul>	<ul style="list-style-type: none"> <li>Continue to receive 319 grant funds for statewide disbursement.</li> </ul>	<b>On track to achieve goals.</b> <i>With the exception of the Annual Workplan submittal, all goals were met or</i>	<b>On track to achieve goals.</b> <i>With the exception of the Annual Workplan submittal, all goals were met.</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)
		<ul style="list-style-type: none"> <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 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>		<i>exceeded.</i>				
	Agriculture	<ul style="list-style-type: none"> <li>• Not Applicable - grant award obligations are not defined by pollutant sector.</li> </ul>		<b>Not applicable.</b> <i>This goal does not apply.</i>	<b>Not applicable.</b> <i>This goal does not apply.</i>			
	Forestry	<ul style="list-style-type: none"> <li>• Not Applicable - grant award obligations are not defined by pollutant sector.</li> </ul>		<b>Not applicable.</b> <i>This goal does not apply.</i>	<b>Not applicable.</b> <i>This goal does not apply.</i>			
	Urban	<ul style="list-style-type: none"> <li>• Not Applicable - grant award obligations are not defined by pollutant sector.</li> </ul>		<b>Not applicable.</b> <i>This goal does not apply.</i>	<b>Not applicable.</b> <i>This goal does not apply.</i>			
	Failing Septic	<ul style="list-style-type: none"> <li>• Not Applicable - grant award obligations are not defined by pollutant sector.</li> </ul>		<b>Not applicable.</b> <i>This goal does not apply.</i>	<b>Not applicable.</b> <i>This goal does not apply.</i>			
	Legacy Mining	<ul style="list-style-type: none"> <li>• Not Applicable - grant award obligations are not defined by pollutant sector.</li> </ul>		<b>Not applicable.</b> <i>This goal does not apply.</i>	<b>Not applicable.</b> <i>This goal does not apply.</i>			

## Conclusion

Overall, the TN-NPS program made very good progress in Year 1 of the Program Management Document implementation. An area identified as needing improvement to support achieving the program's Long Term Goals is outreach in the forestry sector. No forestry-related proposals were received in FFY2016; however, late year coordination with TDA's Forestry Division indicated some interest in possibly developing a proposal for consideration in FFY2018.

The TN-NPS Program also experienced many successes in FFY2016. Many goals were exceeded greatly, indicating that in some sectors, Tennessee is well on-track to accomplish the desired water quality outcomes. Some notable exceedances include:

- The number of agricultural BMPs funded;
- The number of urban sector projects funded;
- Two Success Stories were submitted and accepted;
- Improved engagement in the legacy mining sector; and,
- Pollutant load reductions.

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.

## APPENDIX B

# MEASURES OF SUCCESS CHECKLISTS

# Measures of Success Checklist

## Aggregate/Statewide Goals

Prepared for FFY2016 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, for King Branch and Crab Orchard Creek/ Laurel Creek have been accepted by USEPA in FFY2016.</p> <p>Per estimates, N was reduced by 131,092 pounds, P was reduced by 25,607 pounds, and sediment decreased by 11,988 tons in FFY2016.</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 approximately 300 education and outreach events across all sectors in FFY2016!</p> <p>Partners reported hosting 87 events in FFY2016.</p> <p>Partners reported reaching at least 9,224 individuals at public events (farm tours, outdoor classrooms, etc.) and through brochures, websites, etc.</p> <p>The evaluation form is being distributed to FFY2016 grantees, and has been posted to the TDA website.</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 stakeholder meetings or 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 checked="" type="checkbox"/> Met</li> <li><input type="checkbox"/> Exceeded</li> <li><input type="checkbox"/> Needs improvement</li> </ul>	<p>TN-NPS staff attended over 20 stakeholder meetings across all sectors.</p> <p>See Appendix C for details regarding the 2nd annual survey of partners.</p> <p>In FFY2016, TDA assisted with the development of over a dozen maps for Watershed Based Plans, as well as several maps requested by potential applicants.</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-based tracking, developed in FFY2015, was implemented internally (TN-NPS staff) in FFY2016. Additional coordination with grantees is needed to implement sector-based tracking of education and outreach events.</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 protection proposals were received in FFY2016; however, coordination efforts are underway with two not-for-profit groups interested in developing proposals for protection work.</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 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>The Annual Workplan was not submitted until September due to delays in receiving final workplans from the grantees, and subsequent approval from USEPA Region 4.</p> <p>GRTS data is added/updated continuously upon receipt from grantees.</p> <p>All grant funds from FFY2015 were obligated within one year of receiving the grant. The FFY2016 grant funds are currently being placed under contract.</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 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	<p>N/A; no GRTS meeting was held in FFY2016.</p> <p>N/A; the Management Program Document is in Year 2 of implementation.</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, site visit reports from Watershed Coordinators, and a review attendance records and document submissions. Except for the Annual Workplan submittal, all applicable state/aggregate goals were met.

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

The Annual Workplan was not submitted by May 31st primarily due to delays in receiving the final workplans back from the selected grantees. In FFY2017, the process will be streamlined in order to promote a more timely response from the grantees.

# Measures of Success Checklist

## Agricultural Sector Short Term Goals

Prepared for FFY 2016 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 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>TN-NPS has funded three projects that include the implementation of agricultural BMPs in FFY2016.</p> <p>240 agricultural BMPs were installed with 319 funds in FFY2016.</p> <p>Watershed Coordinators and TN-NPS staff conducting approximately 2,940 site visits in FFY2016!</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 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>Staff attended over 250 agricultural education and outreach events.</p> <p>Over 60 educational events were hosted by grantees in FFY2016 that addressed agricultural topics.</p> <p>Through workshops, posters, brochures, and presentations, over 9,000 citizens were presented with information about agricultural runoff.</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 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	TN-NPS staff attended over 10 stakeholder meetings such as Soil Conservation District meetings, meetings with non-governmental organizations, etc.
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 type="checkbox"/> Met <input type="checkbox"/> Exceeded <input checked="" type="checkbox"/> Needs improvement	In FFY2015, the sector-based tracking was developed; in FFY2016, this tracking has been fully implemented for BMPs and pollutant load reductions. Tracking of educational activities and capacity building is performed by watershed coordinators at this time. Additional outreach with our grantees is needed to implement their tracking effectively.
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.):

Overall, most of the agriculture-sector goals were met or exceeded. Please refer to the comments column above for details.

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

While tracking of education and outreach is being performed by TN-NPS staff, tracking by grantees

---

has been less consistent (e.g. some grantees provide very detailed information, some provide little to no

---

information). Additional coordination with grantees in FFY2017 will attempt to address this issue.

---

# Measures of Success Checklist

## Forestry Sector Short Term Goals

Prepared for FFY2016 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 type="checkbox"/> Needs improvement  <input type="checkbox"/> Met <input type="checkbox"/> Exceeded <input type="checkbox"/> Needs improvement	<p>N/A; no forestry-specific proposals were submitted in FFY2016.</p> <p>N/A; please see above. The previously funded, active forestry project (Welcome Wagon) deals primarily with education and outreach (not BMP implementation).</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 checked="" type="checkbox"/> Exceeded <input type="checkbox"/> Needs improvement  <input type="checkbox"/> Met <input checked="" type="checkbox"/> Exceeded <input type="checkbox"/> Needs improvement	<p>Staff attended 13 forestry-related events/trainings.</p> <p>In combination with multi-sector educational events, TDA-NPS funded trainings/workshops that overlap the forestry sector (such as the Tennessee ENVIROTHON and Project WET).</p> <p>When taking into account multi-sector outreach, over 1,500 citizens, students, and teachers were presented with forestry-related topics (such as forest health and invasive species) which can impact runoff.</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 checked="" type="checkbox"/> Met <input type="checkbox"/> Exceeded <input type="checkbox"/> Needs improvement	<p>TN-NPS staff attended the Tennessee Watershed Association Meeting, hosted by the Tennessee Wildlife Resources Agency, on May 12, 2016. The meeting covered all sources of watershed impairment, with several presentations pertaining to revegetation/ reforestation of riparian areas.</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 type="checkbox"/> Met <input type="checkbox"/> Exceeded <input checked="" type="checkbox"/> Needs improvement	<p>Full implementation of sector-based tracking has been implemented for TN-NPS staff; however, additional work is needed to assist grantees with their tracking.</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.):

No forestry-related proposals were submitted for review in FFY2016, making evaluation of this sector difficult.

---

---

---

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

In FFY2016, as in FFY2015, there appeared to be limited interest in forest-related projects/BMPs. More work needs to be done to engage the forestry and silviculture industries. Likely additional interest will be generated during the recovery from the extreme forest fire season experienced in Tennessee in 2016.

---

---

---

# Measures of Success Checklist

## Urban Sector Short Term Goals

Prepared for FFY 2016 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>	<p> <input type="checkbox"/> Met  <input checked="" type="checkbox"/> Exceeded  <input type="checkbox"/> Needs improvement                 </p> <p> <input type="checkbox"/> Met  <input checked="" type="checkbox"/> Exceeded  <input type="checkbox"/> Needs improvement                 </p> <p> <input type="checkbox"/> Met  <input checked="" type="checkbox"/> Exceeded  <input type="checkbox"/> Needs improvement                 </p>	<p>Five projects funded in FFY2016 involve the implementation of urban BMPs.</p> <p>In FFY2016, 21 urban BMPs were installed.</p> <p>Watershed Coordinators conducted 242 urban-based site visits in FFY2016.</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>	<p> <input type="checkbox"/> Met  <input checked="" type="checkbox"/> Exceeded  <input type="checkbox"/> Needs improvement                 </p> <p> <input type="checkbox"/> Met  <input checked="" type="checkbox"/> Exceeded  <input type="checkbox"/> Needs improvement                 </p> <p> <input type="checkbox"/> Met  <input checked="" type="checkbox"/> Exceeded  <input type="checkbox"/> Needs improvement                 </p>	<p>TN-NPS staff attended over 28 educational/outreach events addressing to urban stormwater concerns.</p> <p>In FFY2016, an outstanding 52 educational events were hosted by grantees that pertained to urban runoff. These included seminars, training sessions, and invasive species removal/site preparation workshops.</p> <p>Over 2,000 citizens were presented with urban stormwater information through websites, training seminars, Tennessee ENVIROTHON, 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>TN-NPS staff attended at least seven stakeholder meetings that addressed urban source of pollution.</p> <p>Staff attended TNSA at Fall Creek Falls State Park.</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 type="checkbox"/> Met <input type="checkbox"/> Exceeded <input checked="" type="checkbox"/> Needs improvement</p>	<p>Full implementation of sector-based tracking has been implemented for TN-NPS staff; however, additional work is needed to assist grantees with their tracking.</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.):

TN-NPS has been successful in building capacity for urban projects, as indicated by the number of urban projects funded in FFY2016. As these projects progress, the number of urban BMPs installed per year is expected to rise quickly.

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

As with other sectors, more detailed tracking of education and outreach efforts by the grantees is needed.

# Measures of Success Checklist

## Failing Septic Sector Short Term Goals

Prepared for FFY 2016 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>   <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>	<p> <input type="checkbox"/> Met  <input checked="" type="checkbox"/> Exceeded  <input type="checkbox"/> Needs improvement                 </p> <p> <input type="checkbox"/> Met  <input checked="" type="checkbox"/> Exceeded  <input type="checkbox"/> Needs improvement                 </p>	<p>Repairs/replacements or connections to a sanitary sewer system were completed on 22 sites in FFY2016.</p> <p>Watershed Coordinators reported visiting a total of 69 septic repair/ replacement sites in FFY2016.</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>   <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>	<p> <input type="checkbox"/> Met  <input checked="" type="checkbox"/> Exceeded  <input type="checkbox"/> Needs improvement                 </p> <p> <input type="checkbox"/> Met  <input checked="" type="checkbox"/> Exceeded  <input type="checkbox"/> Needs improvement                 </p> <p> <input type="checkbox"/> Met  <input checked="" type="checkbox"/> Exceeded  <input type="checkbox"/> Needs improvement                 </p>	<p>Five education and outreach events that addressed septic systems were attended by TN-NPS staff.</p> <p>TN-NPSP supported four educational events that addressed failing septic systems.</p> <p>In FFY2016, Morgan County Soil Conservation District engaged more than 6,000 citizens on septic and agricultural topics.</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 checked="" type="checkbox"/> Met <input type="checkbox"/> Exceeded <input type="checkbox"/> Needs improvement	<p>TN-NPS staff attended Soil Conservation District meetings that addressed septic issues.</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 type="checkbox"/> Met <input type="checkbox"/> Exceeded <input checked="" type="checkbox"/> Needs improvement	<p>Full implementation of sector-based tracking has been implemented for TN-NPS staff; however, additional work is needed to assist grantees with their tracking.</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.):

Most of the goals for the septic-sector were met or exceeded in FFY2016. Almost 70 site visits were performed by TN-NPS staff.

---

---

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

Although 69 site visits were performed in FFY2016, only 22 projects were completed. In FFY2017, TN-NPS staff will attempt to determine why only about one-in-three potential cooperators move forward with repairs/replacements.

---

---

# Measures of Success Checklist

## Legacy Mining Sector Short Term Goals

Prepared for FFY 2016 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> </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>	<p>In FFY2016, Morgan County Soil Conservation District was funded for legacy mining work along Crooked Fork.</p> <p>In FFY2016, there were several overlapping projects installed that were agriculture-based, but installed on legacy mining areas (to deal with legacy mining issues such as erosion, poor stand establishment due to low pH, etc.). TN-NPS performed 16 site visits to legacy mining sites previously funded (e.g. Crab Orchard Creek) and potential BMP sites.</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 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>TDA-NPS staff attended events that addressed all forms of nonpoint source pollution, including legacy mining.</p> <p>Project WET hosted 26 teacher education sessions, which addressed all forms/sectors of nonpoint source pollution.</p> <p>Between Project WET and Tennessee ENVIROTHON (which both address all sectors of NPS pollution), over 1,500 citizens were provided information on legacy mining impacts.</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 checked="" type="checkbox"/> Met <input type="checkbox"/> Exceeded <input type="checkbox"/> Needs improvement	<p>TN-NPS staff attended Soil Conservation District meetings in which projects on abandoned mines to improve agriculture were discussed.</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 type="checkbox"/> Met <input type="checkbox"/> Exceeded <input checked="" type="checkbox"/> Needs improvement	<p>Full implementation of sector-based tracking has been implemented for TN-NPS staff; however, additional work is needed to assist grantees with their tracking.</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.):

In addition to the successes mentioned above, a large legacy mining project funded in part by CWA

---

Section 319 funds along Crab Orchard Creek and its tributaries, was chosen by USEPA as the subject of  
an interactive Story Map.

---

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

As with the other sectors, additional assistance needs to be provided to grantees in the legacy mining  
sector to implement a more precise tracking mechanism for education and outreach.

---

---

## APPENDIX C

# SECTION 319(h) GRANT PARTICIPANT ANNUAL SURVEY

# 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

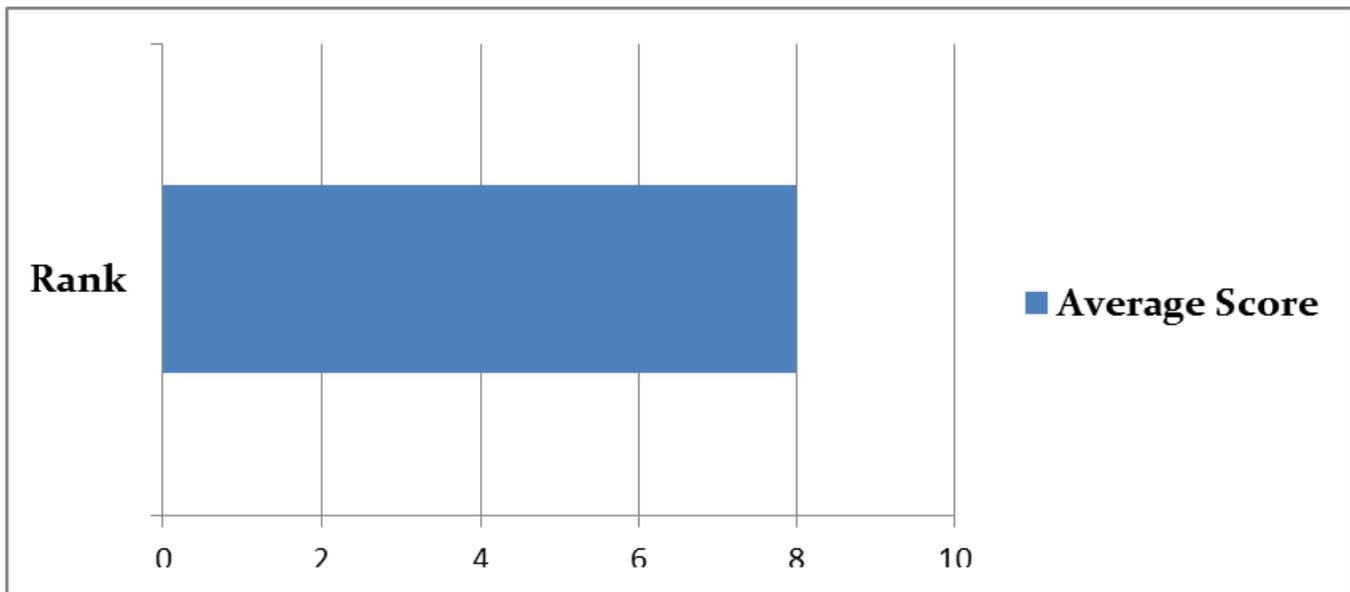
Questions for the Section 319 Applicant Survey were developed in the Summer of 2016, with revisions to the survey in the Fall of 2016. A total of ten questions were chosen in order to get an adequate idea of the level of satisfaction of the grantees with the current process, while not making the survey 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 October 20, 2016. A follow-up reminder was sent to the survey recipients on November 3, 2016. The survey was ended on November 17, 2016. Approximately 65 individuals received the survey, and 24 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 24 participants, 24 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:*

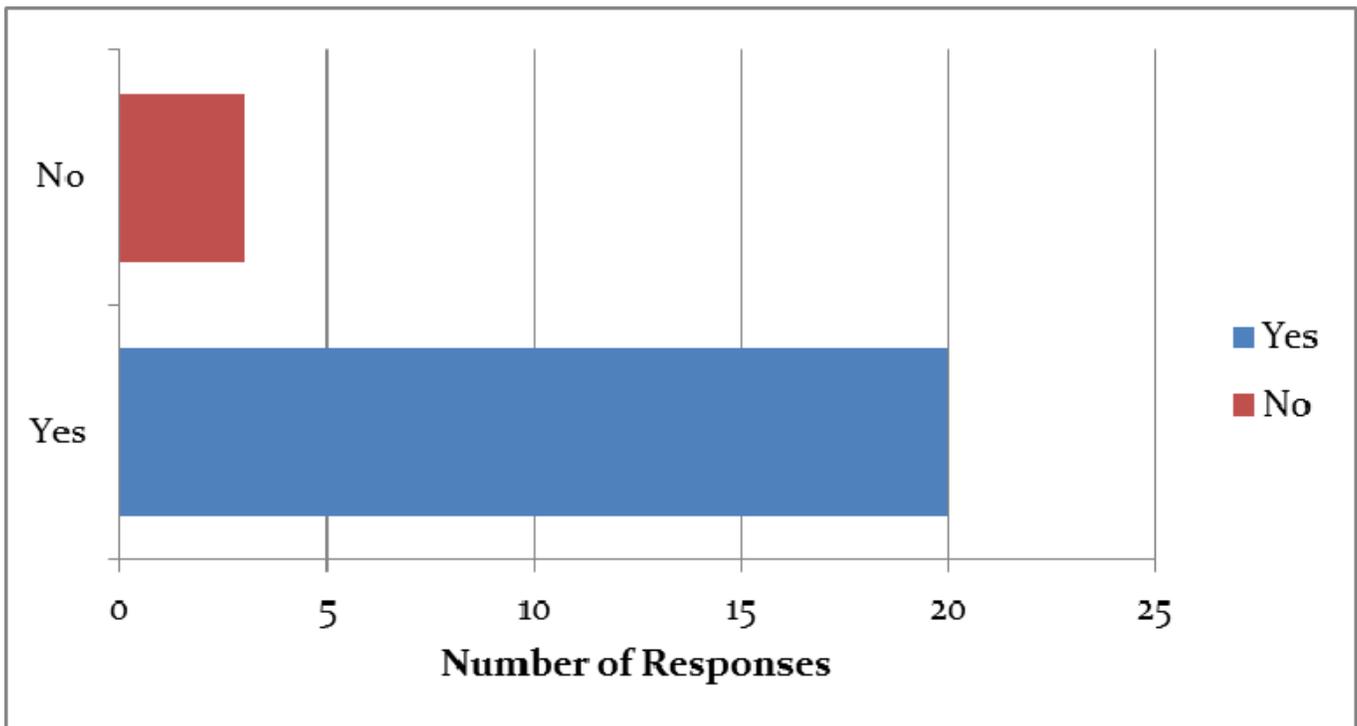
*Comment/short answer. Comments are summarized below.*

A majority of the respondents (11 out of 16) stated that the RFP was confusing, or that additional details/examples would be helpful. The additional information requested varied greatly among respondents, including monitoring examples, more detail on Watershed-based Plans, and a list of currently approved Watershed-based Plans. Five out of the 16 respondents were happy with the current RFP.

**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 87 percent, or 20 out of 23) of the respondents are satisfied with the proposal review process. Comments received included that the review process is too lengthy (two respondents), and that too many calculations are required (one respondent).

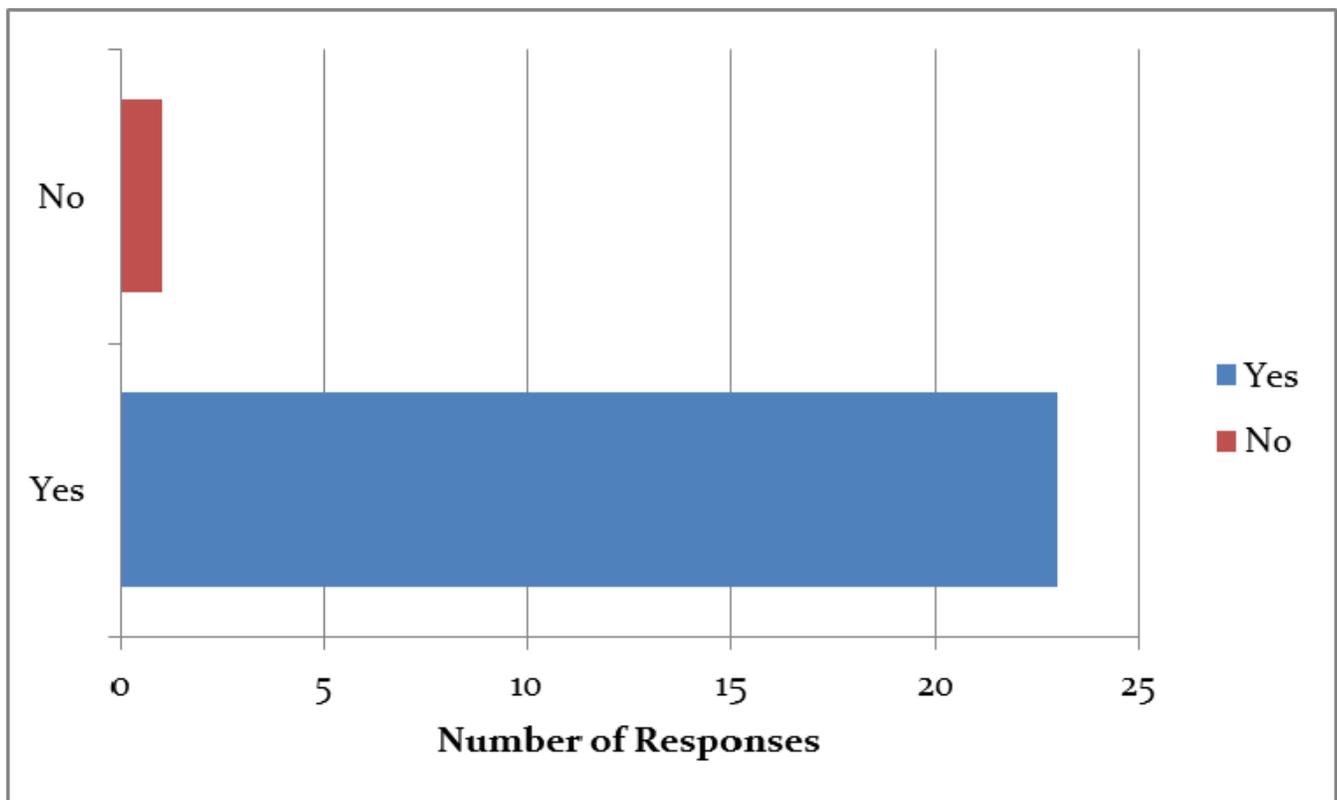
**FIGURE 2: SATISFIED WITH CURRENT 319 GRANT PROPOSAL REVIEW PROCESS**



**Question 4: Is the current proposal submittal schedule convenient? (Typically, the RFP is posted in September, and the deadline to apply is December 1st.)** *Question Format: Yes or no, with optional comment/short answer field.*

A large majority of respondents (approximately 96 percent) are satisfied with the proposal submittal schedule. One respondent indicated in the comments that it would be helpful to have more time between the release of the RFP, and the submittal due date.

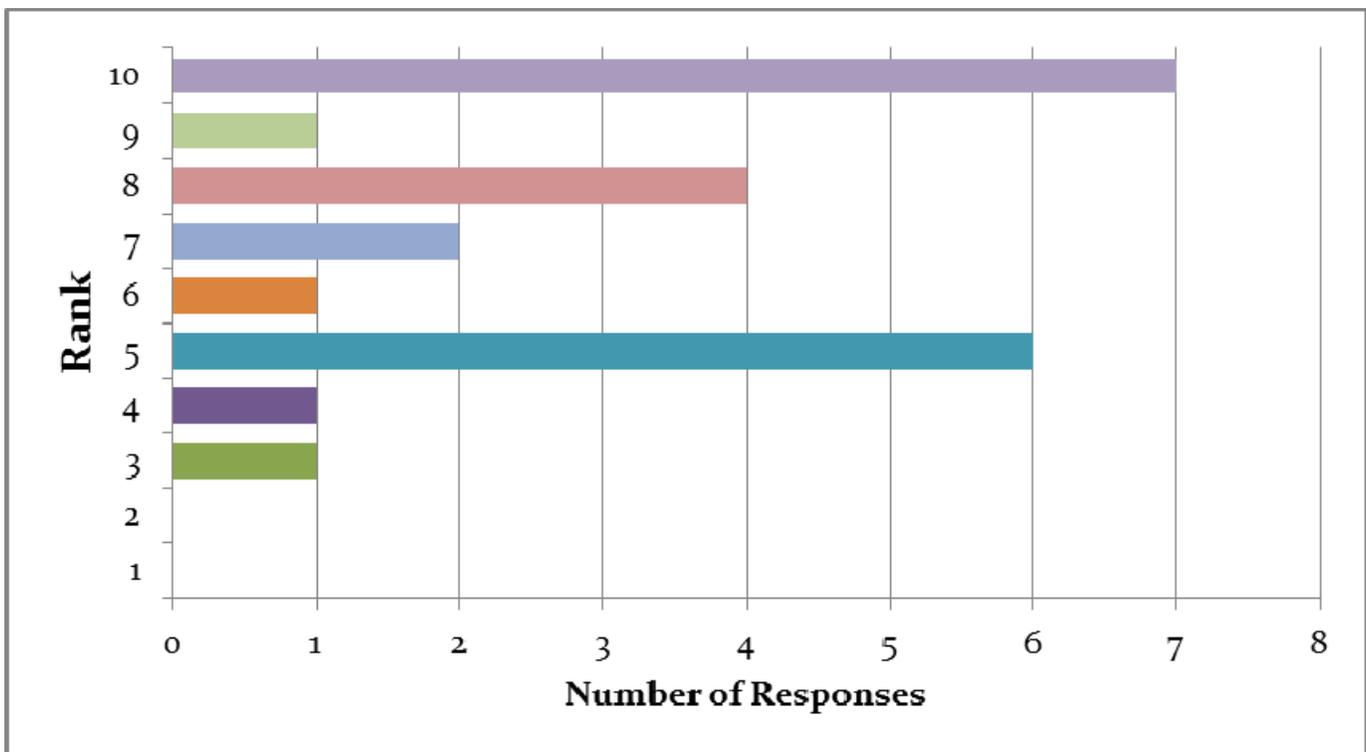
**FIGURE 3: SATISFIED WITH CURRENT 319 GRANT PROPOSAL SUBMITTAL SCHEDULE**



**Question 5: 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 and quantity of communication on the sliding scale of 1 to 10 below, with 1 representing "little to no communication is provided," 5 representing "the quantity and quality of communication is appropriate and helpful," and 10 representing "too much information is provided (overwhelming amount)." Respondents that have not received a grant award may omit this question. Question Format: Sliding bar to indicate quality and quantity of information received.**

A ranking of "10," representing an overwhelming amount of information, received the most responses (7 out of 23). Overall, the respondents appeared to indicate that currently the TN-NPS is sending too much information, or the information is not overly helpful to the execution of their projects.

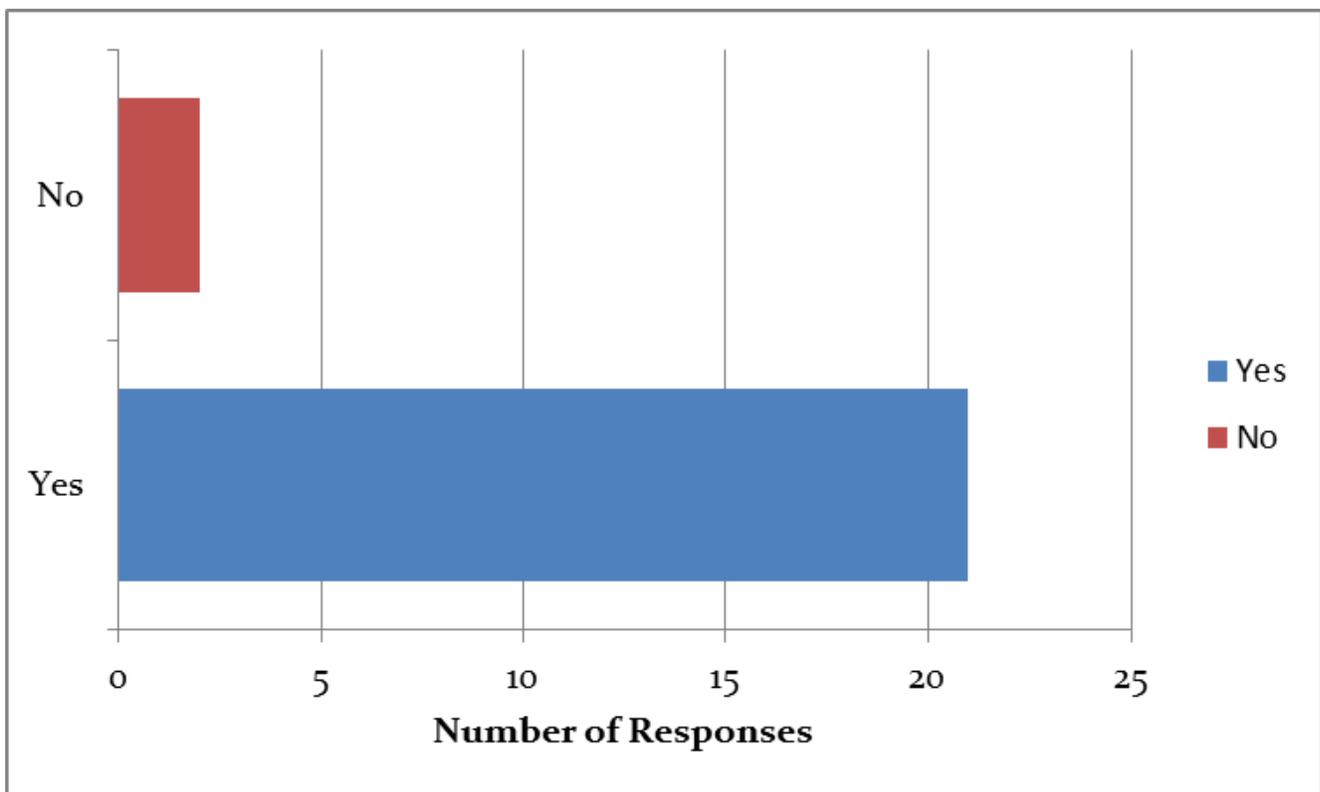
**FIGURE 4: QUALITY AND QUANTITY OF COMMUNICATION**



**Question 6: Would a periodic Nonpoint Source Newsletter, containing pertinent information about policy/regulations, examples of successful public outreach strategies, and showcasing innovative projects statewide be helpful to you or your organization?** *Question Format: Yes or no, with an optional comment/short answer field.*

A large number of respondents (21 out of 23) felt that the development of a periodic newsletter for nonpoint source topics would be beneficial. Based on the responses from Question 5 (regarding the volume and quality of communication), it may be worthwhile to investigate whether general communications can be compiled for a newsletter, thereby reducing the number of e-mails sent to grantees and applicants. Several commenters mentioned that a portion of the newsletter focusing on successful projects would be helpful to their organization.

**FIGURE 5: BENEFIT TO DEVELOPING A NONPOINT SOURCE NEWSLETTER**

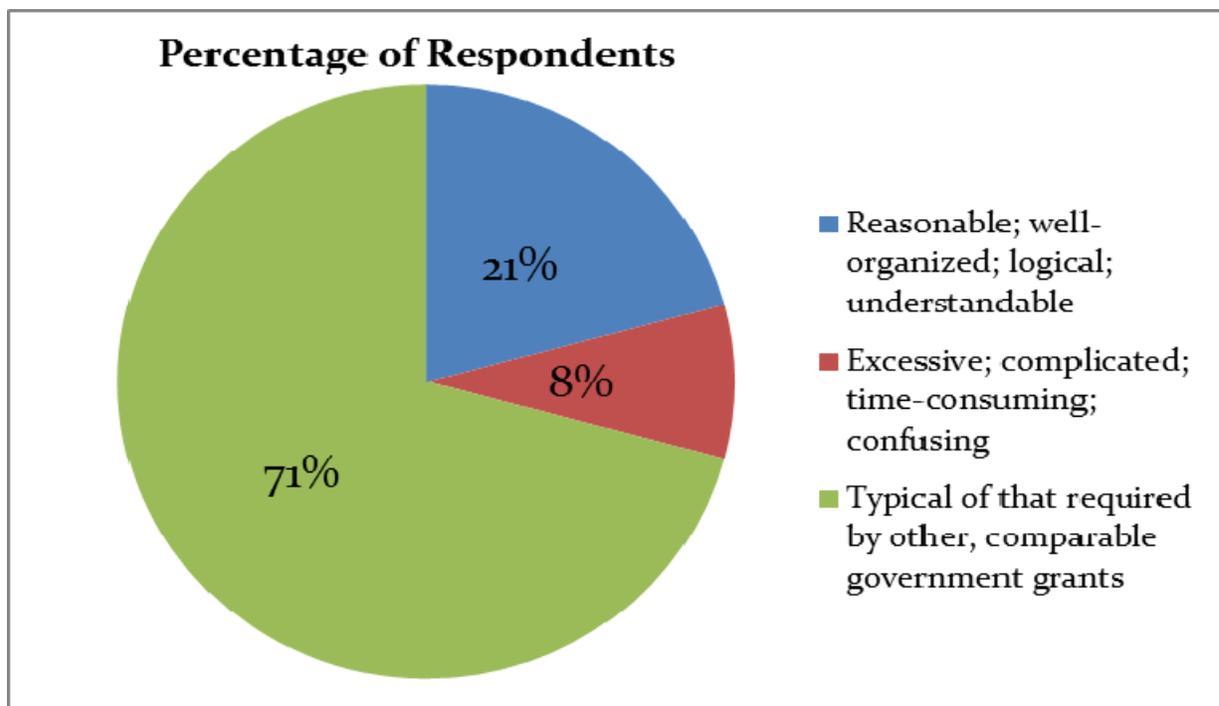


**Question 7: Which of the following characterizations best describes your feelings regarding the amount of paperwork and reporting required for a 319 Grant in Tennessee?** *Question Format:*

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

Most respondents (approximately 71 percent) feel that the amount of paperwork required for the Section 319 Grant Program is typical of similar grant programs. Two comments were received: one respondent mentioned that the grant accounting categories did not match their organization, and one respondent felt that some paperwork currently required for all reimbursements should only be required quarterly.

**FIGURE 6: FEELINGS REGARDING AMOUNT OF PAPERWORK AND REPORTING REQUIRED**

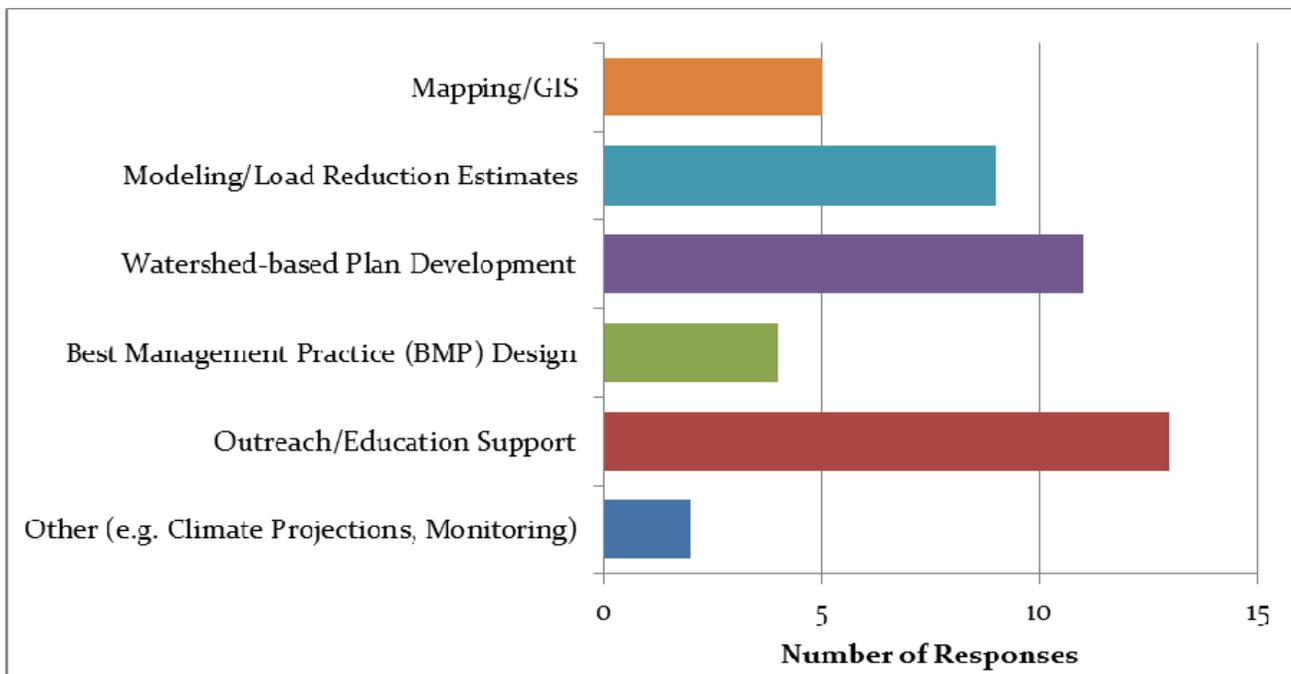


**Question 8: Which of the following technical services would be most useful to your organization, if offered by the TDA-Nonpoint Source Program? (Choose all that apply.)** *Question Format: Multiple choice – choose all that apply with optional comment/short answer field.*

- **Mapping/GIS**
- **Modeling/Load Reduction Estimates**
- **Watershed-based Plan Development**
- **Best Management Practice (BMP) Design**
- **Outreach/Education Support**
- **Other (please specify):**

This question was included on the previous year’s survey. Similar to last year’s results, respondents again considered outreach and education support to be the most useful technical service TN-NPS could offer to grantees. Of the two respondents that requested other services, one asked for monitoring services to be provided, and the other requested information on growth scenarios and climate projections.

**FIGURE 7: MOST USEFUL TECHNICAL SERVICES**



**Question 9: 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.*

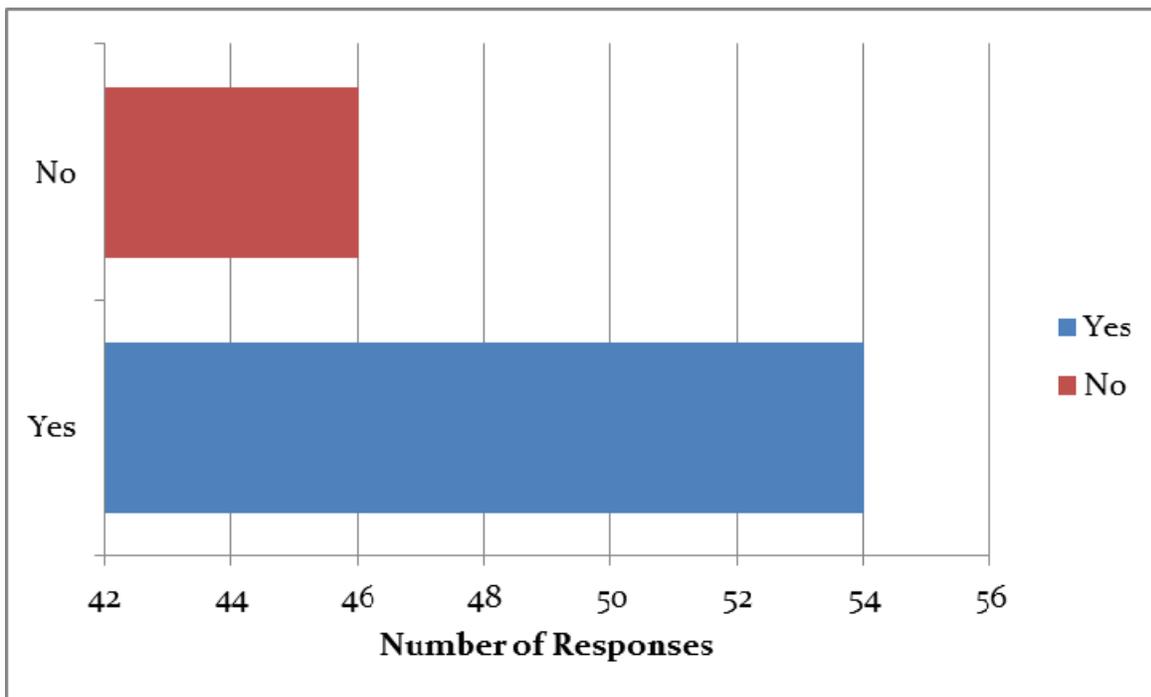
Several respondents again stressed the need for additional outreach by the TN-NPS, especially targeting specific/non-traditional audiences. Many also requested additional information about project priorities and assistance with writing grant proposals.

**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.*

Results for this survey question were mixed. About 54 percent felt an annual meeting would be beneficial, while 46 percent felt it would not. Some commenters felt that if the proposed newsletter was developed, it would take the place of an annual meeting.

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



## Conclusion

The survey had a participation of approximately 37 percent of grantees and applicants. Unfortunately, the response rate decreased by over 15 percent this year from the preceding year. 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.

One trend identified in this year's survey, as identified in last year's survey, is the need for additional education and outreach. A clarification needs to be made for next year's survey between monetary support for education and outreach, and TN-NPS undertaking educational activities. Due to the partitioning of funding, and limited budget for education and outreach funds from the Program Funds category of the Section 319 grant, it is difficult for TN-NPS to assist grantees with additional outreach dollars. If this is what the respondents are intending, there is little the Section 319 grant program can do to meet this expectation. Instead, if the respondents are intending for TN-NPS staff to tackle education and outreach, opportunity exists to increase public engagement. Staff members attended dozens of meetings, field days, and convention in FFY2016; in FFY2017, an effort can be made for staff to present information about nonpoint source pollution more frequently. In addition, TN-NPS staff attended the EPA-sponsored training "Working with Schools for Waterways Education" in July of 2015 in hopes of engaging more schools in nonpoint source pollution prevention learning.

Another trend identified in the FFY2016 survey was the need for communication from TN-NPS to be less frequent, and more meaningful. Several of those surveyed responded positively to the idea of developing a Nonpoint Source Newsletter. It is hoped that general information and items of interest can be compiled in the newsletter and sent as a single e-mail (as opposed to sending it "piece-meal" in several mail-outs).

Although participation was lower for the FFY16 survey than the FFY15, the feedback received is valuable in determining where adaptive management practices have been successful, and where additional improvement can be made. Additional efforts will be made to support education and outreach, when possible, to assist grantees with getting their messages to the public.

## APPENDIX D

# DRAFT NONPOINT SOURCE NEWS- LETTER TEMPLATE



# NONPOINT SOURCE NEWS

## Inaugural Issue of the Nonpoint Source News!

Welcome to the inaugural issue of the Tennessee Department of Agriculture's (TDA) NonPoint Source News periodic e-newsletter. Developed by TDA's Land & Water Stewardship Section, the e-newsletter is designed to keep Section 319 Grant participants and Agricultural Resources Conservation Fund (ARCF) partners informed of recent developments in nonpoint source pollution control in Tennessee and around the country.

Topics covered in the newsletter include:

- ◇ showcasing innovative projects designed to protect water quality and minimize nonpoint source pollution;
- ◇ important changes in Federal and State rules and regulations that may impact best management practices (BMP) installation; and,
- ◇ upcoming events such as training, field days, workshops, etc.

Please take a few minutes to browse our first issue. If you would like to recommend a topic, submit a successful project implemented in conjunction with a Section 319 Grant or ARCF cost-share, or add an upcoming event to our newsletter, please see the contact information on Page 2. Happy reading, and thanks to all our partners engaged in protecting Tennessee waters!

### Calendar

#### **Nov. 29—30**

Middle TNGIC Forum  
Montgomery Bell State Park

#### **Dec. 1**

Deadline for 319 Grant Proposals

## Permitting Streamlined

Over the past few months, two important changes were made to that will simplify the permitting process for some nonpoint source BMPs. On February 29, 2016, a permit streamlining agreement between the U. S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS), the Tennessee Department of Environment and Con-

servation (TDEC), the Tennessee Association of Conservation Districts (TACD), and TDA was signed, which clarified which activities associated with the prevention or reduction of soil erosion are exempt from needing a State Construction General Permit (CGP) and/or an Aquatic Resources Alteration Permit (ARAP).

*Continued on page 2*



Acid mine treatment pond in Morgan Co.

## Permitting Streamlined, cont.

Continued from page 1

Projects such as stream habitat improvement and wetland creation, when installed per NRCS Practice Standards, may be exempt from permitting. Check with your local NRCS or SCD office for additional information about your specific projects.

In addition, the Tennessee Valley Authority (TVA) recently placed an Interpretive Rule in the Federal Register to clarify which construction activities on the Tennessee River, its impound-

ments, and tributaries are exempt from 26a permitting (also referred to as a Shoreline Permit or a Shoreline Construction Permit). Stream crossings and stream restoration projects may be exempt from 26a permitting under the current Interpretive Rule. Additional information can be obtained in the Federal Registry, Volume 81, No. 169 (published August 31, 2016), or at your nearest TVA Watershed Team Office.



Stream crossing for livestock in Johnson Co.



## Calling All Partners—We Want to Showcase Your Work!

We're looking for stories from you, our partners, about successes you've had with outreach/education, engaging shareholders, implementing new strategies, or utilizing innovative technology to protect Tennessee's streams and lakes from nonpoint source pollution. If you would like to see your

organization's hard work recognized, please email a brief description and two photographs to:

**Sam Marshall**  
[Sam.marshall@tn.gov](mailto:Sam.marshall@tn.gov)

*\*Please provide a telephone number in the event we need to follow-up with you.*

## Success Showcase—King Branch, Sevier Co.

King Branch, in the West Prong Little Pigeon Watershed, has been posted for water contact due to high *Escherichia coli* (*E. Coli*) since 1993. In 1998, the entire West Prong Little Pigeon River was added to the State of Tennessee's Clean Water Act (CWA) 303(d) list of impaired waters. Sevier

County was the recipient of two Section 319 Grants totaling \$334,425 in 2001 and 2005 to install a septic tank effluent pump (STEP) sewer system. The STEP system began treating effluent from over 30 homes and businesses along King Branch that had previously been malfunctioning. In April of 2014, the contact advisory was lifted, and King Branch was re-

*King Branch in Sevier Co. is now fully supporting of all designated uses thanks in part to sewer improvements through a 319 grant.*

County was the recipient of two Section 319 Grants totaling \$334,425 in

moved from Section 303(d) list.



STEP sewer system installation in Sevier Co.

APPENDIX E  
SUCCESS STORIES

# List of Tennessee Success Stories\*

\* New Success Stories are included in the appendix.

<u>Waterbody Name</u>	<u>Year</u>
Crab Orchard Creek Watershed 	2016
King Branch 	2016
Blue Springs Creek	2005
Cane Creek	2005
Hinds Creek	2007
Big Sandy Creek	2007
Arrington Creek	2008
Cripple Creek	2008
Fall Creek	2008
Lick Creek (Marshall County)	2008
Lick Creek (McNairy County)	2008
Rock Springs Branch	2008
Wades Branch	2008
West Sandy Creek	2008
Dry Creek	2008
Cherokee Creek	2009
Austin Branch	2009
Brush Creek	2009
Cove Creek	2009
Kyker Branch	2010
Nolichucky River	2010
Slop Creek	2010
Turkey Creek	2010
Obion River	2010
Thompson Creek	2010
Crooked Creek	2011
McKnight Branch	2013
Crab Orchard Creek	2013
Goose Creek	2013
Cloyd Creek	2013
Gallagher Creek	2013
Stock Creek	2014



# NONPOINT SOURCE SUCCESS STORY

## Tennessee

### Septic Tank Effluent Pumping Project Improves King Branch

#### Waterbody Improved

Since 1993 King Branch has been posted with signs for water contact avoidance due to high *Escherichia coli* (*E. coli*) levels from failing septic systems. In 1998 the Tennessee Department of Environment and Conservation (TDEC) added the entire West Prong Little Pigeon River watershed to the Clean Water Act (CWA) section 303(d) list; King Branch was added to the 303(d) list as an individual segment in 2002. The Tennessee Nonpoint Source Program, in conjunction with the Sevier County Environmental Health Department and using partial funding support through CWA section 319 grant funding, installed a septic tank effluent pump (STEP) sewer system to treat sewage that had been impacting both surface and groundwater. In April 2014 the water contact advisory was lifted due to improved water quality and decreased *E. coli*. TDEC removed the 2.5-mile segment of King Branch from Tennessee's CWA section 303(d) list in 2014.

#### Problem

King Branch is within the West Prong Little Pigeon River–Upper watershed (060101070206) near Pigeon Forge in central Sevier County, Tennessee (Figure 1). King Branch flows generally east/northeast into the West Prong Little Pigeon River, which is part of the Lower French Broad River watershed.

In the early 1990s TDEC conducted an intensive bacteriological study of the West Prong Little Pigeon River to determine if the river met bacteriological standards for body contact recreation during recreational seasons. The sampling results showed that King Branch exceeded regulatory bacterial limits, and the stream was deemed unsafe for contact recreation. The primary cause of impairment was identified as failing septic systems (chiefly for homes and businesses along King Branch Road). In 1993 a public advisory was issued and warning signs were posted. In 1998 and 1999 TDEC tested samples from King Branch for *E. coli*; the sample concentrations ranged from 1,553 counts (cts) per 100 milliliter (mL) to over 2,419 cts/100 mL (i.e., above the test method's detection limit). In 1998 TDEC added the entire West Prong Little Pigeon River watershed to the Clean CWA section 303(d) list; King Branch was added to the 303(d) list as an individual segment (TN06010107010\_0200) in 2002.

A total maximum daily load (TMDL) for pathogens in the Lower French Broad River was developed by TDEC and approved by the U.S. Environmental Protection Agency in December 2005. The goal of the TMDL was

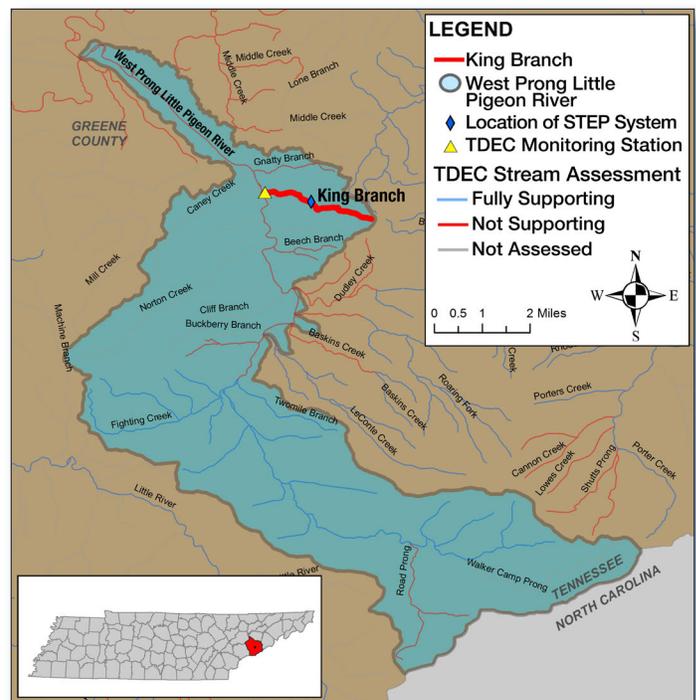


Figure 1. The King Branch Road STEP project was implemented in the West Prong Little Pigeon River watershed in Sevier County, Tennessee. The locations of King Branch, the STEP system, and the nearest TDEC monitoring station are shown in the lower watershed.

to have King Branch meet the Tennessee criteria/standard for *E. coli*, which states that the concentration of a fecal coliform group shall not exceed 200 colony forming units (cfu) per 100 mL nor shall the concentration of the *E. coli* group exceed 126 cfu/100 mL as a



Figure 2. Maneuvering the new STEP system equipment into place was challenging because of tight working conditions along King Branch Road.

geometric mean based on a minimum of 10 samples collected from a given sampling site over a period of not more than 30 consecutive days, with individual samples being collected at intervals of not less than 12 hours; and, the concentration of the fecal coliform group in any individual sample shall not exceed 1,000 cfu/100 mL.

## Project Highlights

Planning and design for restoring King Branch began in 2001. In 2006 the Sevier County Environmental Health Department approved the construction of a STEP sewer system in this area because of an immediate threat to public health from failing septic systems. STEP systems collect sewage from the customers on the system and route it to a recirculating sand filter with drip irrigation lines for disposal. Previously existing septic leach lines are removed from service, which prevents sewage from reaching the soil surface and contaminating runoff. In 2007 a STEP system capable of treating up to 11,000 gallons of effluent per day was constructed to service over 30 homes and businesses along King Branch Road (Figure 2).

## Results

Removing septic-related pollution sources reduced bacteria levels in King Branch. Sampling conducted by TDEC in 2013 showed that the *E. coli* levels within the stream had improved and met water quality standards for all designated uses. Observations from June to August 2013 indicated *E. coli* had decreased to a

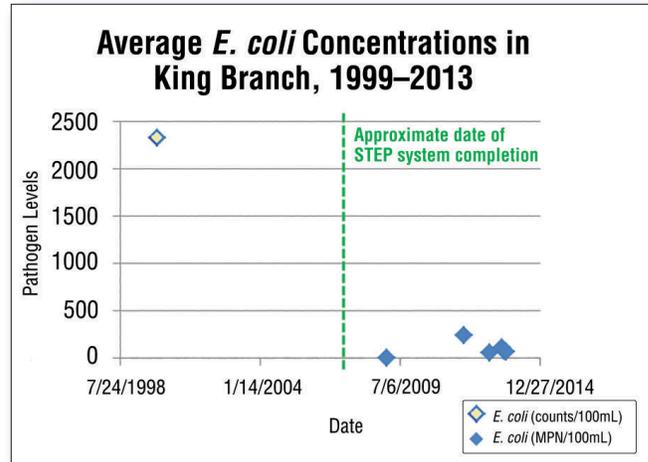


Figure 3. *E. coli* levels consistently met standards after the STEP system was installed.

range of 62.2 most probable number (MPN) per 100 mL to 112.4 MPN/100 mL (this is approximately equal to a range of 62.2–112.4 cfu/100 mL), which is well below the 126 cfu/100 mL required by state standards (Figure 3). In 2014 TDEC lifted the contact advisory and removed King Branch from the impaired waters list for bacteria.

## Partners and Funding

The Sevier County Environmental Health Department served as the lead organization for the STEP project. Other cooperating organizations included the Sevier County Soil Conservation District, Smokey Mountain Resource Conservation and Development Council, Tennessee Department of Agriculture, TDEC, Tennessee Department of Health – Division of Lab Services, and the U.S. Department of Agriculture – Natural Resources Conservation Service.

Sevier County was the recipient of two CWA section 319 grants (2001 and 2005) for a total of \$334,425. Partial funding through the CWA section 319 program assisted in the purchase of the STEP system itself, along with the accompanying packed bed trickling filter/drip effluent dispersal system. Matching funds for the project were supplied by Sevier County. The system is owned and operated by Tennessee Wastewater Systems and is inspected twice a month. The system serves approximately 35 homes under Permit No. SOP-05043; the permit must be renewed every 5 years (the current permit expires August 31, 2017).



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

EPA 841-F-16-001R  
August 2016

## For additional information contact:

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



# NONPOINT SOURCE SUCCESS STORY

## Tennessee

### Acid Mine Drainage Abatement Projects Continue to Improve Water Quality in the Crab Orchard Creek Watershed

#### Waterbodies Improved

In 1998 Crab Orchard Creek and Laurel Creek were listed as impaired due to acid mine drainage (AMD). Between 2006 and 2011, the Tennessee Department of Environment and Conservation (TDEC) and the Tennessee Department of Agriculture (TDA), with support from a Clean Water Act (CWA) section 319 grant, restored portions of the watershed adversely impacted by legacy mining. In 2010, a 2.3-mile segment of Crab Orchard Creek had improved and was delisted by TDEC. The reclamation activities are still paying dividends, as an additional 7.9 miles portion of Crab Orchard Creek and 3.7 miles of Laurel Creek were delisted by TDEC in 2014. Through the state of Tennessee's Agricultural Resources Conservation Fund (ARCF) support, additional best management practices (BMPs) are being installed throughout the watershed to protect newly restored segments of Crab Orchard Creek and Laurel Creek, and to benefit segments still in need of restoration.

#### Problem

Crab Orchard Creek (TN06010208020-3000) and Laurel Creek (TN06010208020-0700) are within the Crab Orchard Creek watershed (060102080406) in Morgan County, Tennessee (Figure 1). Laurel Creek flows into Crab Orchard Creek, which flows into the Emory River.

In 1982, 22 miles of Crab Orchard Creek were included on the Nationwide Rivers Inventory for exceptional scenery, recreation, geology, fish and wildlife values. Crab Orchard Creek watershed (including Laurel Creek) was included on Tennessee's 1998 CWA section 303(d) for impairments for pH and siltation due to abandoned mines. Field data collected by TDEC in 1999–2000 indicated that Crab Orchard Creek (TN06010208020-3000) was impaired for pH, metals and manganese, while Laurel Creek was impaired for pH alone. A pH total maximum daily load (TMDL) was developed for the Crab Orchard Creek watershed in 2001, which indicated that resource extraction (i.e., mining activities) were the cause of impairment to both Crab Orchard Creek and Laurel Creek. Tennessee's Fish and Aquatic Life criteria pH range of 6.5 to 9.0 (the most stringent) was chosen as the criteria for the Crab Orchard Creek watershed in the TMDL. Samples tested between October 1999 and June 2000 indicated pH values for Crab Orchard Creek ranged from 4.0 to 6.5; the pH in Laurel Creek ranged from 4.5 to 5.7.

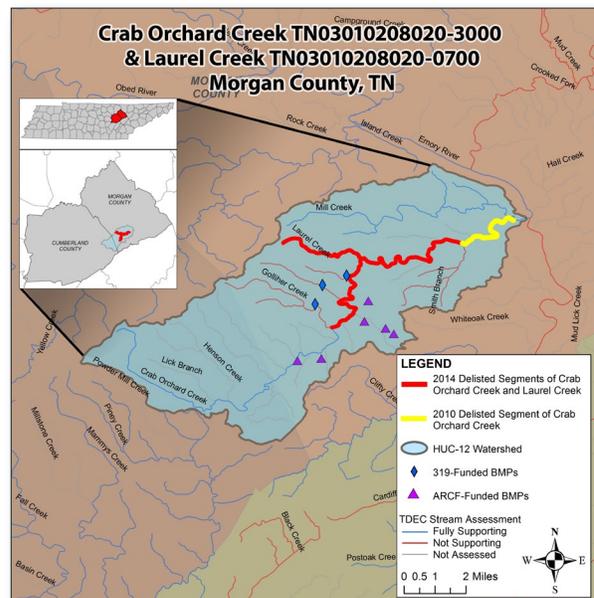


Figure 1. Crab Orchard Creek and Laurel Creek are in central Tennessee.

#### Project Highlights

Mine reclamation and AMD treatment efforts were initiated by TDEC using a 2005 CWA section 319 grant. Between 2006 and 2010, TDEC installed eight AMD treatment systems/ponds and reclaimed 57 acres of previously mined lands (Figure 2). These restoration efforts contributed to the removal of

Photograph courtesy of TDA and TDEC.

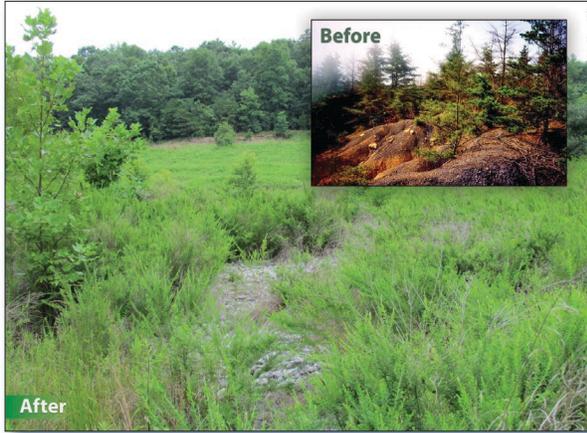


Figure 2. Mining land area before and ten years after reclamation activities were performed.

a downstream segment of Crab Orchard Creek (TN06010208020-2000) from Tennessee's 2010 list of impaired waters.

In addition to addressing pollution from mining lands, partners have been working to control agricultural sources of pollution for many years. As early as 2002, partners began installing agricultural BMPs in the watershed. In total, through the support of ARCF, 37 BMPs to reduce agricultural pollutants were installed in the Crab Orchard Creek watershed in 2002–2016. The practices included exclusion fencing, alternative watering facilities, livestock heavy use areas and cropland conversion.

## Results

The pH of Crab Orchard Creek was analyzed in April–June of 2014. The pH levels ranged from 6.10 to 7.24 during the sampling period (meeting the applicable criteria), indicating a considerable improvement from previous observations.

Manganese concentrations varied from 48 micrograms per liter ( $\mu\text{g}/\text{L}$ ) to 600  $\mu\text{g}/\text{L}$ ; four of the six observations showed concentrations less than 200  $\mu\text{g}/\text{L}$ . Previous concentrations of manganese in Crab Orchard Creek, observed in 1999 and 2000 during the development of the Crab Orchard Creek TMDL, were as high as 7,480  $\mu\text{g}/\text{L}$ . During the 1999–2000 sampling period, only one manganese sample in Crab Orchard Creek had concentrations under 200  $\mu\text{g}/\text{L}$ .

In addition, benthic invertebrates were sampled in 2012 by TDEC, and a Tennessee Macroinvertebrate Index (TMI) was calculated to determine if the remaining manganese was causing a condition of pollution. The TMI yielded scores of 36 and 32; a score of 32 or higher is considered passing for biocriteria guidelines.

As a result of these data, an additional 7.9 miles of Crab Orchard Creek (TN06010208020-3000; immediately upstream from the segment delisted in 2010) and 3.7 miles of Laurel Creek (TN06010208020-0700) were removed from Tennessee's 2014 impaired waters list. The delisting of these two additional watershed segments illustrates that the installation of the AMD treatment systems and mine reclamation continues to provide water quality benefits.

## Partners and Funding

The lead organization on the project was the Land Reclamation Section of TDEC's Division of Water Resources, which was awarded a CWA section 319 grant totaling \$409,200. TDEC provided \$209,800 in matching funds to assist with the construction of the mine reclamation and treatment systems. Additional support was provided by the Crab Orchard Creek Restoration Partnership (COCRP), which consisted of organizations and nongovernmental agencies dedicated to removing Crab Orchard Creek and its tributaries from the impaired waters list. Partners within COCRP included TDEC, Tennessee Valley Authority, Emory River Watershed Association, Morgan County, Oakdale School, U.S. Department of Agriculture–Natural Resources Conservation Service (NRCS), Tennessee Wildlife Resources Agency, University of Tennessee, Tennessee Scenic Rivers Association, and Chota Canoe Club. Members of the COCRP provided technical assistance, community outreach/education, and monitoring.

In addition to the AMD remediation supported by the section 319 grant, Tennessee's ARCF provided \$80,878 to help implement 37 agricultural BMPs. The U.S. Fish and Wildlife Service and NRCS are also currently active in the watershed, supplying cost-share opportunities and technical assistance for additional BMPs protective of water quality. Installing agricultural BMPs is critical in the Crab Orchard Creek watershed to prevent newly restored segments from being overburdened by other pollutant sources.



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

EPA 841-F-16-001II  
December 2016

## For additional information contact:

**Sam Marshall**  
Tennessee Department of Agriculture  
Land and Water Stewardship Section  
615-837-5306 • [Sam.Marshall@tn.gov](mailto:Sam.Marshall@tn.gov)

## 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

### *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*

##### Clover Creek (080102020306)

The Clover Creek watershed is located in northwestern Tennessee in Obion County. The watershed covers approximately 10,616 acres, and ultimately drains into the Obion River. Obion County is a predominately rural county, and the principle land cover within the drainage area is cultivated crops, with some hay/pastureland and deciduous forest. Clover Creek (TN08010202028\_1000) is listed as “Not Supporting” in the 2014 State of Tennessee's 303(d) list due to physical substrate habitat alterations and sedimentation/siltation from nonirrigated crop production and channelization. An unnamed tributary to Clover Creek (TN08010202028\_0100) is also listed as “Not Supporting” for habitat alteration, alterations to stream-side vegetative cover, low dissolved oxygen, siltation, nitrogen, and phosphorus.

##### Fall Creek (060400020306)

The Fall Creek watershed is found in Middle Tennessee, primarily in Bedford County, with a small portion in Rutherford County. The Fall Creek watershed drains approximately 25,057 acres, and drains into the Duck River. Land cover within the watershed is mostly pasture and hayland, with some cultivated crops and deciduous forests present. Fall Creek (TN06040002038\_1000) is listed as “Not Supporting” in the 2014 State of Tennessee's CWA Section 303(d) list due to *Escherichia coli* (*E. coli*) due to pasture grazing. Hurricane Creek (TN06040002038\_0300), which also drains a significant portion of the watershed, is not supporting due to *E. coli*, loss of biological integrity due to siltation, and physical substrate habitat alterations, primarily from pasture grazing.

##### West Fork Mulberry Creek (060300030501)

The West Fork Mulberry Creek watershed spans portions of Lincoln and Moore Counties in southern Middle Tennessee. It drains approximately 28,492 acres from West Fork Mulberry Creek to the Elk River. Land cover within the watershed is mixed, with pasture/hay production and deciduous forest being the primary classes. West Fork Mulberry Creek

(TN06030003056\_0100) is listed as “Not Supporting” in the 2014 State of Tennessee’s CWA Section 303(d) list due to *E. coli* from pasture grazing and animal feeding operations. The West Fork Mulberry Creek watershed abuts the East Fork Mulberry Creek watershed (described below).

#### East Fork Mulberry Creek (060300030502)

The East Fork Mulberry Creek watershed is located in Lincoln and Moore Counties, with a small portion of the drainage area in southern Bedford County. It encompasses approximately 35,267 acres, and eventually drains to the Elk River. Land cover in the watershed is a combination of pasture/hay production, deciduous forest, and evergreen forest. A portion of East Fork Mulberry Creek (TN06030003056\_0250) was listed in as “Not Supporting” in the 2014 State of Tennessee’s CWA Section 303(d) list due to *E. coli* from pasture grazing.

#### West Fork Hickory Creek (051301070102)

The West Fork Hickory Creek watershed is located in Warren and Coffee Counties. The watershed is approximately 30,854 acres in size, and eventually drains to Hickory Creek. Predominant land cover types include pasture/hay production and row crop farming. West Fork Hickory Creek (TN05130107012\_0400) is listed as “Not Supporting” in the 2014 State of Tennessee’s CWA Section 303(d) list due to *E. coli* from pasture grazing. Meadow Branch (TN05130107012\_0410) is also listed as “Not Supporting” due to *E. coli* from pasture grazing. Meadow Branch is an Exceptional Tennessee Water due to the presence of the federally endangered barrens topminnow. The West Fork Hickory Creek watershed abuts the Hickory Creek and Little Hickory Creek watersheds (described below).

#### Hickory Creek (051301070103)

The Hickory Creek watershed is located in rural Warren County. It covers approximately 22,437 acres. Land cover is mixed, with pasture/hayland the predominant type, followed by deciduous forest and row crops. A major tributary of Hickory Creek, Locke Branch (TN05130107012\_0100) is listed as “Not Supporting” in the 2014 State of Tennessee’s CWA Section 303(d) list due to alteration in stream-side or littoral vegetative cover, and loss of biological integrity due to siltation from pasture grazing.

#### Little Hickory Creek (051301070101)

The Little Hickory Creek watershed is found in Coffee, Warren, and Grundy Counties. It spans approximately 31,992 acres of deciduous forest, row crops, and pasture/hay. A major tributary of Little Hickory Creek, Fultz Creek (TN05130107012\_0200) is listed as “Not Supporting” in the 2014 State of Tennessee’s 303(d) list due to alteration in stream-side or littoral vegetative cover, and loss of biological integrity due to siltation from silviculture activities.

#### Sequatchie River – Hall Creek (060200040103)

The Sequatchie River – Hall Creek watershed covers approximately 32,253 acres in eastern Tennessee (Bledsoe County). Land cover in the watershed includes deciduous forest, pasture/hay, row crops, and developed land of varying intensities. The Sequatchie River (TN06020004007\_1000) and Hall Creek (TN06020004007\_0400) are both listed as “Not Supporting” in the 2014 State of Tennessee’s CWA Section 303(d) list due to *E. coli* from pasture

grazing. Skillern Creek (TNo6020004007\_2200) is listed due to *E. coli* due to pasture grazing; however, it was removed from the 2014 list for unknown toxicity. This watershed abuts the Sequatchie River – Little Creek watershed described below.

### Sequatchie River – Little Creek (060200040102)

The Sequatchie River – Little Creek watershed is located in Bledsoe and Cumberland Counties. It is approximately 34,104 acres in size. Land cover within the watershed is primarily deciduous forest and pasture grazing, with minor areas of row crops. The Sequatchie River (TNo6020004007\_1000), as mentioned above, is listed due to *E. coli* from pasture grazing. Stephens Branch (TNo6020004007\_0900), Swafford Branch (TNo6020004007\_0800), Little Creek (TNo6020004007\_0600), Manning Spring (TNo6020004007\_1200), and an unnamed tributary to the Sequatchie River (TNo6020004007\_1400) are also listed as “Not Supporting” in the 2014 State of Tennessee’s CWA Section 303(d) list due to *E. coli* from pasture grazing.

### *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 FFY2015 NWQI high-priority watersheds can be found in Table 1. The U.S. Census Block Groups were identified using Geographic Information System (GIS) software, by isolating those block groups within (or partially within) each of the high-priority watersheds. Using the EPA’s online EJ SCREEN mapping tool (available at: <http://www.epa.gov/ejscreen>), TN-NPS generated Standard Reports for each block group identified. The data from the Standard Reports is summarized below, along with data for the State of Tennessee, EPA Region 4, and the U.S. (national level).

**TABLE 1: DEMOGRAPHIC INDICATORS IN NWQI HIGH-PRIORITY WATERSHEDS**

Watershed	County	Census Block Group Identification Number	Demographic Indicators (Raw Data, Reported as Percent <sup>1</sup> )						
			Demographic Index	Minority Population	Low Income Population	Linguistically Isolated Population	Population With Less Than High School Education	Population Under 5 Years of Age	Population Over 64 Years of Age
Clover Creek	Obion	471319653002	26	4	47	0	26	7	25
		471319653003	34	10	58	6	32	6	10
		471319654002	17	3	32	0	19	6	18
	<b>Watershed Average</b>		<b>26</b>	<b>6</b>	<b>46</b>	<b>2</b>	<b>26</b>	<b>6</b>	<b>18</b>
Fall Creek*	Bedford	470039501002	25	14	36	0	15	2	15
		470039502001	26	6	47	0	17	12	11
		470039502002	22	10	33	0	17	7	11
		470039504021	28	12	45	0	15	7	14
		470039505002	21	20	23	15	19	4	25
		470039505003	46	26	67	12	19	10	18
	Rutherford	471490407022	14	2	26	2	8	1	12
	<b>Watershed Average</b>		<b>26</b>	<b>13</b>	<b>29</b>	<b>4</b>	<b>15</b>	<b>6</b>	<b>15</b>
West Fork Mulberry Creek	Lincoln	471039750001	20	11	29	0	20	4	26
		471039750002	22	4	39	0	5	1	11
	Moore	471279302001	17	9	25	0	18	4	25
		471279302002	41	14	68	0	25	7	22
	<b>Watershed Average</b>		<b>25</b>	<b>10</b>	<b>40</b>	<b>0</b>	<b>17</b>	<b>4</b>	<b>21</b>
East Fork Mulberry Creek	Bedford	470039508001	10	1	19	0	16	6	12
	Lincoln	471039750001	20	11	29	0	20	4	26
		471039750002	22	4	39	0	5	1	11
	Moore	471279301001	16	3	28	0	15	3	8
		471279301002	19	3	34	0	12	3	30
		471279302001	17	9	25	0	18	4	25
		471279302002	41	14	68	0	25	7	22
<b>Watershed Average</b>		<b>21</b>	<b>6</b>	<b>35</b>	<b>0</b>	<b>16</b>	<b>4</b>	<b>19</b>	

**TABLE 1: DEMOGRAPHIC INDICATORS IN NWQI HIGH-PRIORITY WATERSHEDS**

Watershed	County	Census Block Group Identification Number	Demographic Indicators (Raw Data, Reported as Percent <sup>1</sup> )						
			Demographic Index	Minority Population	Low Income Population	Linguistically Isolated Population	Population With Less Than High School Education	Population Under 5 Years of Age	Population Over 64 Years of Age
West Fork Hickory Creek*	Coffee	470319701001	23	3	44	0	15	7	11
		470319701002	22	1	44	0	14	8	16
	Warren	471779308001	27	14	40	1	27	9	12
		471779308002	21	8	33	2	9	11	9
		471779308003	18	4	32	0	13	6	19
	<b>Watershed Average</b>			<b>22</b>	<b>6</b>	<b>39</b>	<b>1</b>	<b>16</b>	<b>8</b>
Hickory Creek*	Warren	471779306003	29	13	44	2	26	6	12
		471779307001	51	14	88	0	26	29	14
		471779308001	27	14	40	1	27	9	12
		471779308002	21	8	33	2	9	11	9
		471779308003	18	4	32	0	13	6	19
		471779309001	31	9	54	4	27	4	20
	<b>Watershed Average</b>			<b>30</b>	<b>10</b>	<b>49</b>	<b>2</b>	<b>21</b>	<b>11</b>
Little Hickory Creek*	Coffee	470319701001	23	3	44	0	15	7	11
		470319707001	25	3	46	0	23	3	16
	Grundy	470619550002	39	21	58	0	31	4	16
	Warren	471779308003	18	4	32	0	13	6	19
		471779309001	31	9	54	4	27	4	20
	<b>Watershed Average</b>			<b>27</b>	<b>8</b>	<b>47</b>	<b>1</b>	<b>22</b>	<b>5</b>
Sequatchie River - Hall Creek*	Bledsoe	470079530001	27	10	44	0	17	12	17
		470079530002	23	0	46	0	16	5	20
		470079531001	25	0	50	0	25	4	15
		470079531002	50	33	66	1	23	6	15
		470079531003	31	3	59	0	23	7	19
		470079531004	25	3	47	0	19	0	22
		470079532001	36	18	55	0	24	5	10
		470079532002	30	1	60	0	30	2	18
	<b>Watershed Average</b>			<b>31</b>	<b>9</b>	<b>53</b>	<b>0</b>	<b>22</b>	<b>5</b>

**TABLE 1: DEMOGRAPHIC INDICATORS IN NWQI HIGH-PRIORITY WATERSHEDS**

Watershed	County	Census Block Group Identification Number	Demographic Indicators (Raw Data, Reported as Percent <sup>1</sup> )						
			Demographic Index	Minority Population	Low Income Population	Linguistically Isolated Population	Population With Less Than High School Education	Population Under 5 Years of Age	Population Over 64 Years of Age
Sequatchie River – Little Creek*	Bledsoe	470079530001	27	10	44	0	17	12	17
		470079531002	50	33	66	1	23	6	15
		470079532001	36	18	55	0	24	5	10
	Cumberland	470359707021	24	0	48	0	26	3	27
		470359708002	24	3	45	0	25	3	19
	<b>Watershed Average</b>			<b>32</b>	<b>13</b>	<b>52</b>	<b>0</b>	<b>23</b>	<b>6</b>
<b>FFY2016 NWQI Watersheds Average</b>			<b>27</b>	<b>9</b>	<b>44</b>	<b>1</b>	<b>19</b>	<b>6</b>	<b>17</b>
<b>State of Tennessee Average</b>			<b>32</b>	<b>25</b>	<b>39</b>	<b>2</b>	<b>15</b>	<b>6</b>	<b>14</b>
<b>EPA Region 4 Average</b>			<b>38</b>	<b>37</b>	<b>39</b>	<b>3</b>	<b>15</b>	<b>6</b>	<b>15</b>
<b>National Average</b>			<b>36</b>	<b>37</b>	<b>35</b>	<b>5</b>	<b>14</b>	<b>6</b>	<b>14</b>

<sup>1</sup> Values have been rounded to the nearest whole percent.

\* Denotes a watershed located wholly or partly within a USDA StrikeForce Initiative county.

Overall, the average Demographic Index for the NWQI high-priority watersheds (27) is lower than the State of Tennessee (32), EPA Region 4 (38), and National (36) average. Several watersheds were higher than the State and National average for low income populations (see Warren and Bledsoe Counties). Similar to FFY2015, the NWQI watersheds appeared to be less representative in terms of minority populations than the State and National average. It may be helpful for STAC to consider adding criterion to the NWQI watershed selection process to target the engagement of minority populations going forward.

## Moving Forward

Currently, TN-NPS is attempting to identify “over-lapping” priorities with other agencies, groups, and initiatives. For example, the Mississippi River Basin Healthy Watersheds Initiative, Gulf of Mexico Hypoxia Task Force, and state/local areas of concern are being analyzed to identify where interests and goals intersect, in order to maximize benefits to these watersheds. Moving forward, these areas may be targeted for additional education and outreach to enact greater change.