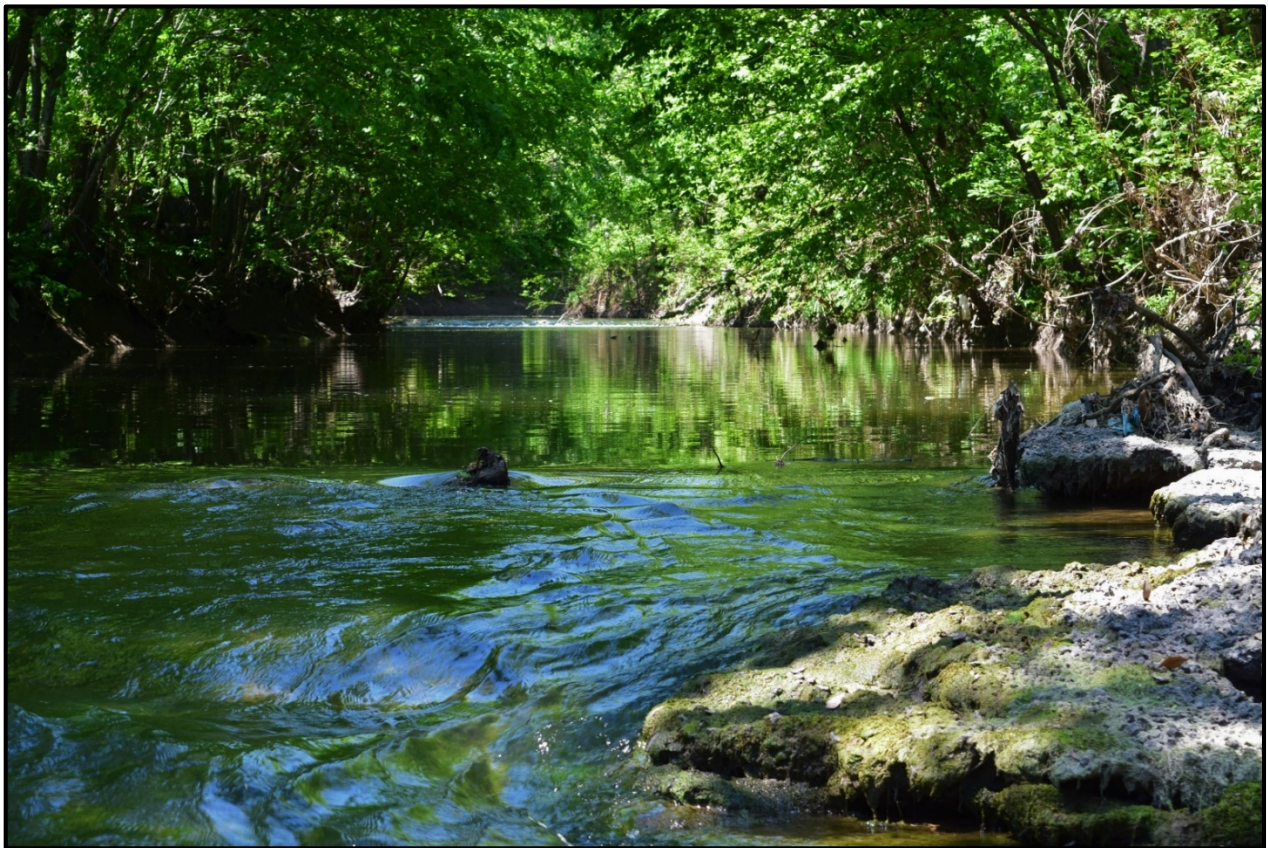


COORDINATING FACILITATION AND IMPLEMENTATION OF THE LAVON LAKE WATERSHED PROTECTION PLAN

Final Report

TSSWCB Project #18-10



North Texas Municipal Water District

Funding for this effort was provided through a Clean Water Act Nonpoint Source Grant administered by the Texas State Soil and Water Conservation Board from the U.S. Environmental Protection Agency.

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List of Abbreviations

EPA	Environmental Protection Agency
MPN	Most Probable Number
NRCS	Natural Resources Conservation Service
NTMWD	North Texas Municipal Water District
SWCD	Soil and Water Conservation District
TSSWCB	Texas State Soil and Water Conservation Board
TWON	Texas Well Owner Network
TWS	Texas Watershed Steward
WPP	Watershed Protection Plan
WQMP	Water Quality Management Plan

Introduction

Lavon Lake is the primary source of water for over 2 million residents in North Texas. Its watershed is a 492,095-acre area in the Trinity River Basin and includes parts of Collin, Fannin, Grayson, and Hunt Counties.

The majority of the Lavon Lake watershed is undeveloped or agricultural land, but urban centers such as McKinney, Frisco, Allen and Prosper are expanding in the western portion of the watershed. Lavon Lake is supplied by five major tributaries, Wilson Creek, the East Fork of the Trinity River, Sister Grove Creek, Pilot Grove Creek and Indian Creek (Figure 1). Wilson Creek and the East Fork of the Trinity River were identified as impaired on the Texas Commission on Environmental Quality 2014 Integrated Report for Surface Water Quality due to elevated levels of *E. coli* bacteria. Data used for the 2014 Integrated Report were 17 and 22 samples collected on The East Fork of the Trinity River and Wilson Creek, respectively, during the 7-year period between 2005 and 2012. The geometric mean of these data were 151 cfu/100mL in the East Fork of the Trinity River and 164 cfu/100mL in Wilson Creek, which exceed the state standard of 126 cfu/100 mL for water bodies designated for primary contact recreation. These segments have remained on the 303(d) List in subsequent integrated reports through 2022.

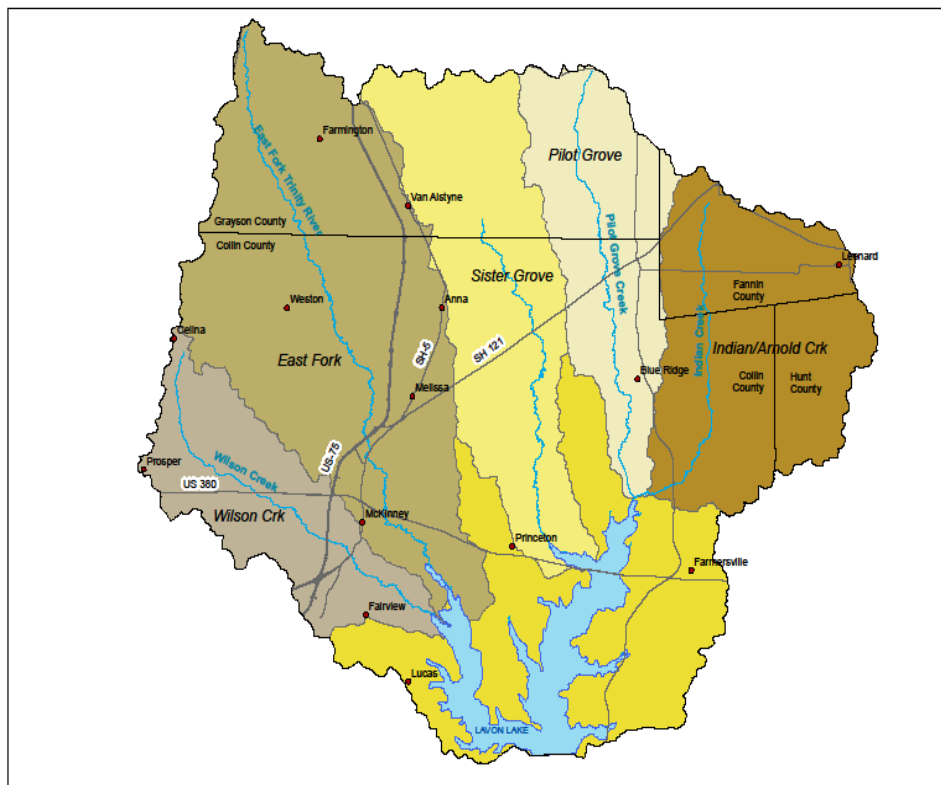


Figure 1. Lavon Lake Watershed

In order to address these impairments and other pollutants of concern, NTMWD began a collaborative dialogue with Texas State Soil and Water Conservation Board (TSSWCB) and Texas A&M AgriLife to develop of a Watershed Protection Plan (WPP) for Lavon Lake. The WPP development was a stakeholder-driven process facilitated by NTMWD with support from TSSWCB. A diverse group of stakeholders - known as the Lavon Lake Watershed Partnership - was assembled to review information and provide direction and a local perspective on development of the plan.

Between November 2016 and June 2017 the Partnership met eight times. Meetings were open to the public. Attendees consisted of land and business owners, public officials, and local, state and federal agencies. Potential pollutant sources were identified. Based on an evaluation of existing water quality data, watershed characteristics, SELECT analysis and load duration curves, load reductions necessary to meet water quality standards were estimated. The Partnership recommended management measures to reduce bacteria loading and to prevent nutrients, sediment, and hazardous substances from reaching harmful levels.

Management measures were established under four general categories: Urban Nonpoint Source, Wastewater, Agricultural Nonpoint Source, and Wildlife and Nondomestic Animals. A 10-year timeline was established to implement management measures identified in the WPP. The WPP was approved and signed by the Partnership Steering Committee. It was accepted by the Environmental Protection Agency (EPA) in December 2017.

Project Overview

The TSSWCB executed Cooperative Agreement 18-10 with NTMWD in November 2018. The project - *Coordinating Facilitation and Implementation of the Lavon Lake Watershed Protection Plan* – included the following goals:

- Facilitate implementation of management measures identified in the Lavon Lake Watershed Protection Plan.
- Conduct regularly scheduled stakeholder meetings to provide the Partnership with updates on progress and seek stakeholder input and recommendations on needed activities.
- Assist the Partnership in identifying and developing proposals to acquire funding for implementation projects, and in managing and tracking implementation efforts.
- Coordinate and conduct water resources-related environmental outreach and education efforts across the watershed.
- Communicate water quality conditions to the public and the Partnership in order to support adaptive management and expand public knowledge and participation in the project.

The following management measures were instituted to achieve identified goals:

- Water quality monitoring
- Watershed Partnership meetings
- Educational workshops and outreach
- Facilitation of public/private partnerships to develop watershed protection projects.

In April 2019, NTMWD received an EPA-approved Quality Assurance Project Plan. Routine monitoring began at fourteen stations on tributaries of Lavon Lake; ten stations were monitored quarterly and four were monitored monthly. A partnership meeting and multiple workshops were held at various locations throughout the watershed in support of the project. NTMWD staff coordinated with local governments and organizations to host public education programs including stream trailer demonstrations and conservation programs.

The implementation efforts were conducted largely within constraints and uncertainties imposed by the Covid-19 pandemic. Many scheduled in-person events were postponed during the pandemic in order to maintain compliance with the safety guidelines from the Center for Disease Control and NTMWD Policy. Despite the circumstances, one Partnership meeting and eight educational programs were conducted. Other outreach activities included maintenance of the project web site, creation of a new watershed flyer, design and installation of Protect Lavon Lake Watershed road signs, purchase and multiple demonstrations of a stream hydrology trailer and the production of Lavon Lake-centric videos about nonpoint source pollution.

Project Highlights

Project Administration

In summer 2019, a new Watershed Manager was hired to facilitate project activities. The new manager spent a significant amount of time establishing relationships with partners and stakeholders leading up to pandemic and shutdown in April 2020. Throughout the remainder of 2020 and 2021, NTMWD remained in contact with project partners through virtual meetings, phone calls and emails, planning educational workshops, submitting grant proposals and other project-related activities. Project partners included TSSWCB, Collin County Soil & Water Conservation District (SWCD), Collin County AgriLife Extension, Texas A&M AgriLife Extension local municipalities, Collin County and Texas A&M Forest Service.

Technical Assistance

NTMWD coordinated efforts with the project's District Technician from Collin County SWCD. NTMWD and the technician regularly communicated and coordinated regarding Partnership events and workshops. In July 2020, the District Technician resigned. NTMWD participated in the Collin County SWCD interview process of a new technician,

who was hired December 2020. NTMWD continued to work with the Collin County SWCD and the new technician to promote awareness of the Water Quality Management Plan (WQMP) Program and Natural Resources Conservation Service (NRCS) programs.

Water Quality Management Plans

Over the course of this project, 10 WQMPs were certified covering a total of 2,893.5 acres. Predominant land use was cattle grazing on pasture (57%) and range (22%) management principles. Crop production, including hay accounted for about 13% of the certified acreage. About 5% of the land was managed for wildlife, primarily in forested floodplains.

The status of planned/funded/certified complete practices include:

- Brush Management (Ac): 98.5 planned, 59.9 funded and work is in progress
- Critical Area Planting (Ac): 18.8 planned, 12.1 funded, and 3.9 certified for reimbursement
- Fence (Ft): 4890 planned, 4425 funded and work is in progress
- Grade Stabilization Structure: 1 planned and funded
- Pasture and Hay Planting (Ac): 227.9 planned, 199.4 funded, 150.6 certified for reimbursement
- Range Planting (Ac): 103.7 planned, 65.4 funded
- Terrace (Ft): 18,291 planned, 10,179 funded and 8,793 certified for reimbursement

Lavon Lake Watershed Received Priority Designation

Texas NRCS selected the Lavon Lake watershed as one of two priority watersheds in the state. The designation resulted in the allocation of about \$2.28M in funding for watershed protection projects in the Lavon and Lampasas River watersheds. The funding was made available through the National Water Quality Initiative as part of the Agriculture Improvement Act of 2018.

The NTMWD participated in the prioritization process and made recommendations to the NRCS State Technical Advisory Committee. The Lavon watershed was selected as a priority because it is a source of drinking water, an EPA-accepted watershed protection plan is in place and because of the strong commitment of local stakeholders in the Lavon Watershed Partnership. Appendix C contains the NRCS Lavon Lake flyer.

Water Quality Monitoring

Routine water quality monitoring was conducted at fourteen stations on tributaries of Lavon Lake (Figure 2). Ten stations were sampled quarterly and four were sampled monthly (Figure 3). Throughout the project period, water quality in the watershed was monitored for the following chemical and physical parameters: *E. coli*, total suspended solids, ammonia, nitrate, nitrite, orthophosphate, phosphorous, dissolved oxygen, specific conductance, pH, stream flow, and temperature. Data are depicted in the charts in Appendix A.



Figure 2. Water Quality Monitoring



Figure 3. Project 18-10 Water Monitoring Locations

Water Quality Data

E. coli trends varied throughout the Lavon Lake watershed with concentrations ranging between 1 MPN/100mL and 2,419 MPN/100mL. Data were grouped by the following subwatersheds to determine localized trends: Wilson Creek, East Fork Trinity River, Sister Grove Creek, Pilot Grove Creek, Indian Creek and Elm Creek. Data were analyzed using a rolling 5-sample geomean and compared to the *Texas Surface Water Quality Standards* criteria for primary contact recreation, a geometric mean of 126 MPN per 100mL.

In the Wilson Creek watershed, the majority of samples collected from Site 21764 contained E.coli levels above the state criteria (Figure 4). E.coli fluctuated seasonally with bacteria levels increasing in the spring and peaking in late summer.

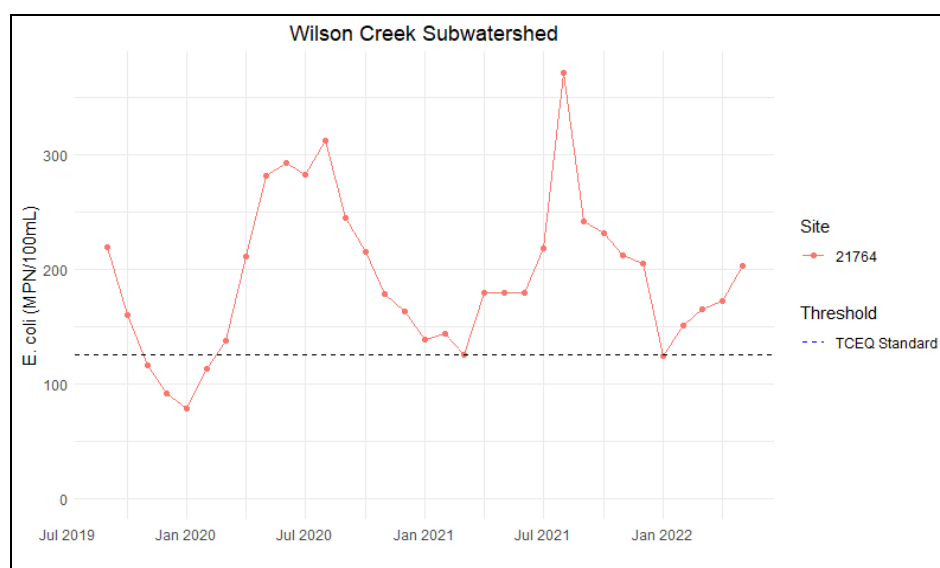


Figure 4. E.coli trends in the Wilson Creek Subwatershed, Sep 2020 – May 2022

The East Fork Trinity River subwatershed was represented by six monitoring sites. Samples collected from the main stem sites (21778, 21779 and 22130) were mostly below the state criteria (Figure 5). Tributary sites remained above the state criteria for the sampling period with Throckmorton Creek (21777) showing an increasing trend and both Honey Grove Creek sites (20932 and 21776) indicating a decreasing trend.

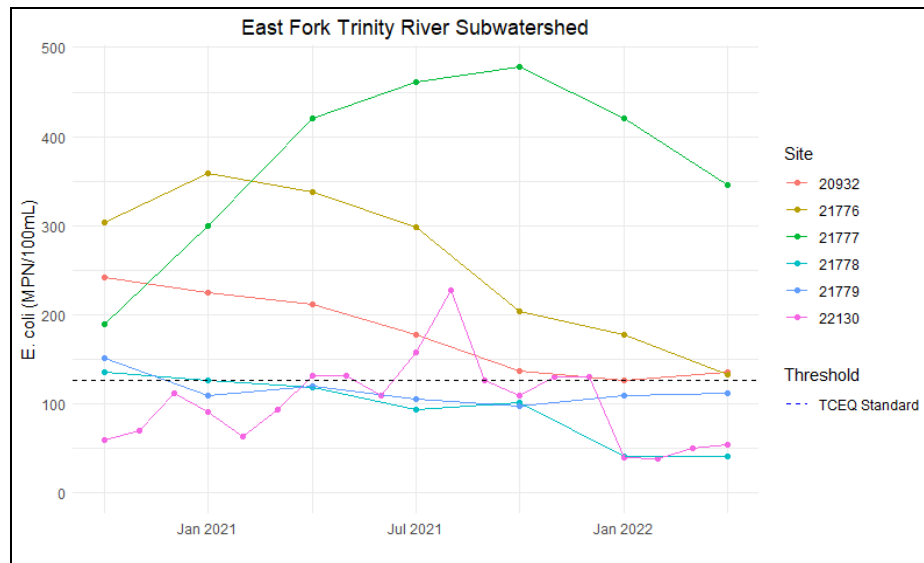


Figure 5. E.coli trends in the East Fork Trinity River subwatershed, Oct 2020 – May 2022

The Sister Grove Creek subwatershed was represented by two monitoring sites; one at the headwaters and the other near its confluence with Lavon Lake. Most samples collected from both sites were consistently above the state criteria (Figure 6). The headwaters site (21767) showed a slight increasing trend during the spring. The downstream site (21396) showed a more dramatic increase in the spring before decreasing to below the state criteria by late summer. Increases in E.coli levels in both streams is likely due to rainfall and spring weather patterns.

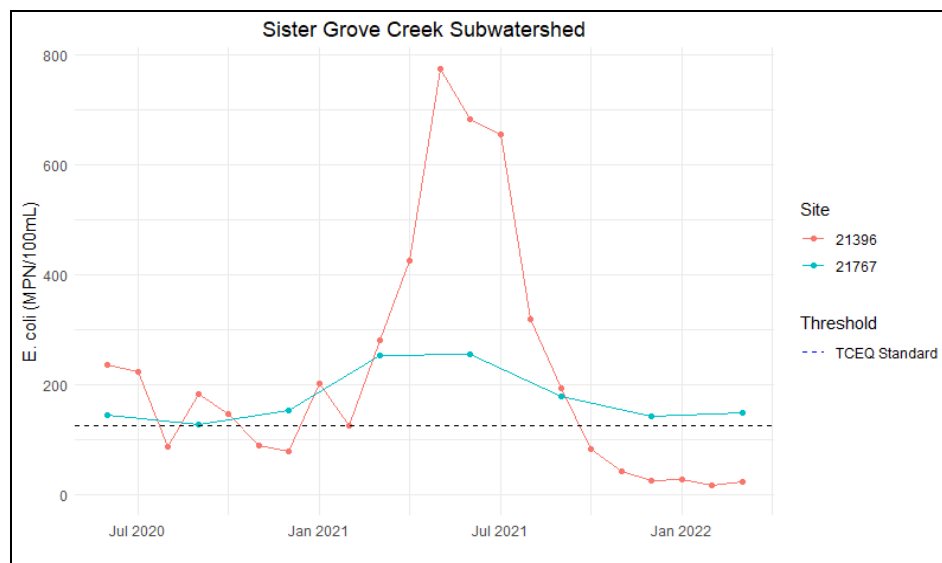


Figure 6. E.coli trends in the Sister Grove Creek subwatershed, Jun 2020 – Mar 2022

The Pilot Grove Creek subwatershed was represented by two monitoring sites; one at the headwaters and the other upstream of its confluence with Lavon Lake. All but one sample collected from both sites were above the state criteria (Figure 7). Both sites showed similar and decreasing trends throughout the monitoring period.

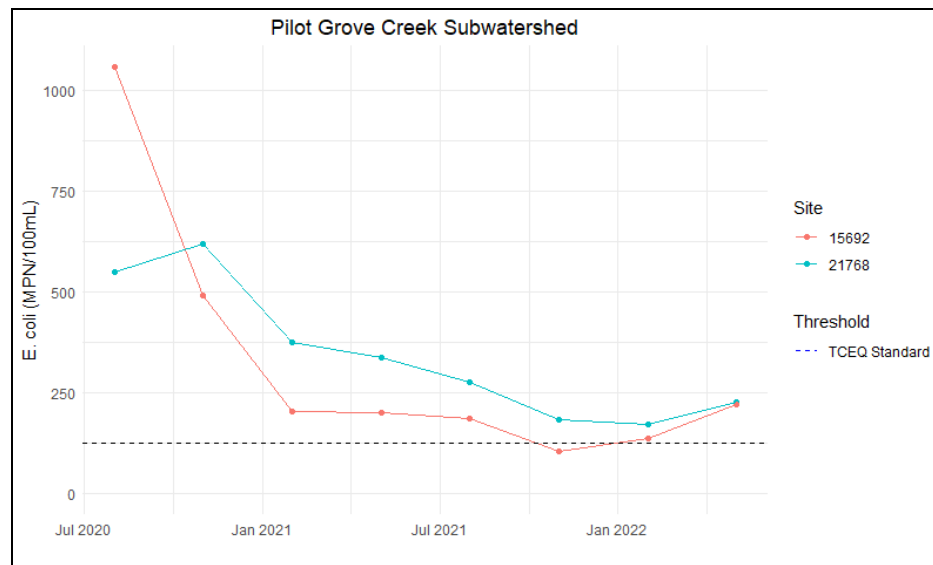


Figure 7. E.coli trends in the Pilot Grove Creek subwatershed, Aug 2020 – May 2022

The Indian Creek subwatershed was represented by two monitoring sites; both are in the lower portion of the watershed. E. coli values at the downstream site (21717) were mostly above the state criteria and varied greatly (Figure 8). E. coli levels at the upstream site (21769) were consistently low with a slight decreasing trend.

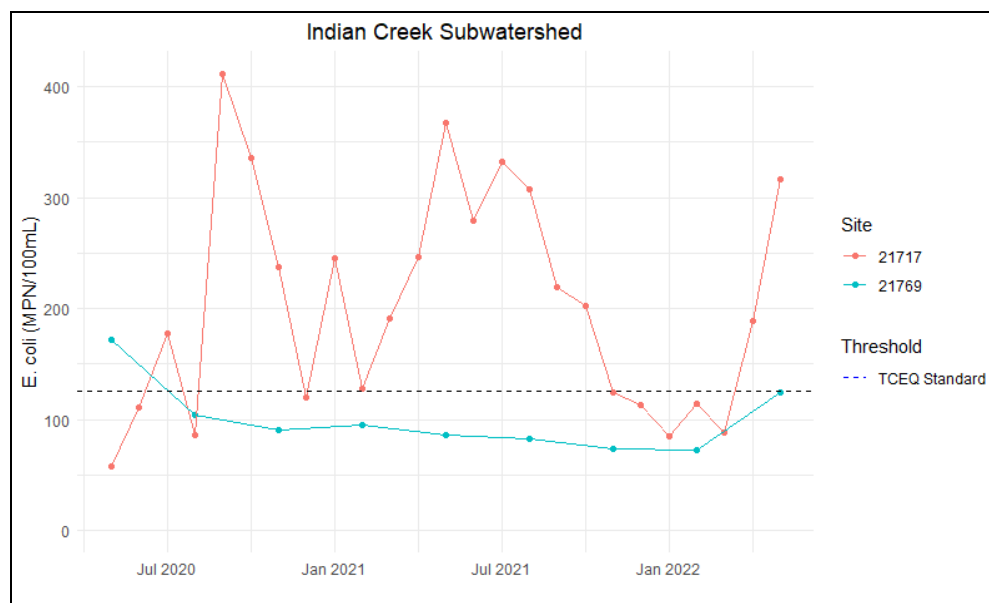


Figure 8. E.coli trends in the Indian Creek subwatershed, May 2020 – May 2022

In the Elm Creek watershed, all samples collected from Site 21773 contained E.coli levels above the state criteria (Figure 9). Bacteria levels at the site increased during the sampling period.

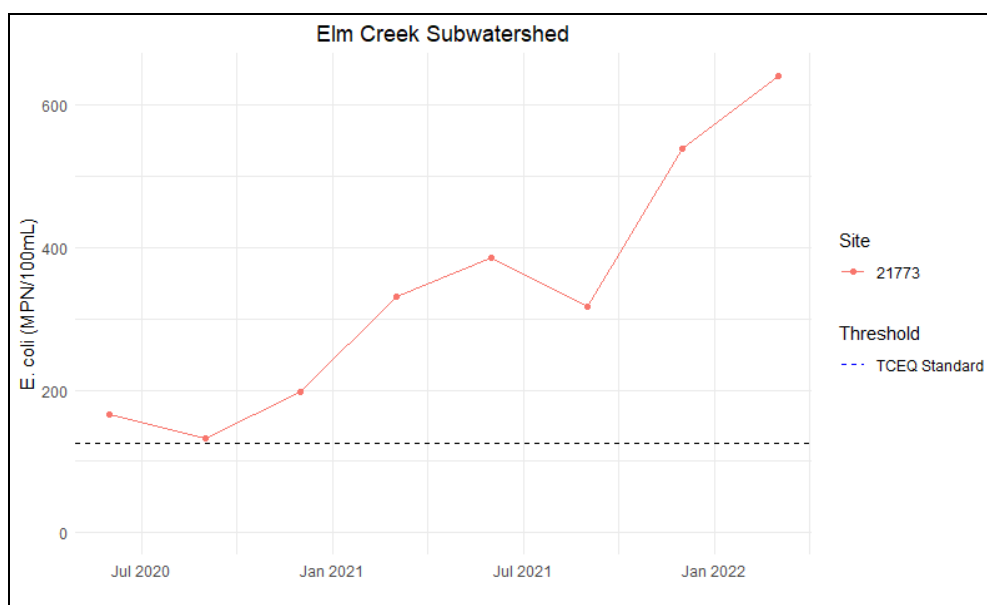


Figure 9. E.coli trends in the Elm Creek subwatershed, Jun 2020 – Mar 2022

Education and Outreach Activities

Education and outreach activities performed by NTMWD during the project period were vital for the effective implementation of the WPP. NTMWD facilitated the delivery of a variety of workshops educating the public about nonpoint source pollution and water quality.

Educational Programming

Seven in-person or hybrid workshops were carried out and one online course was offered (Table 1). Attendees had an opportunity to provide input related to the WPP implementation during each of the in-person/hybrid events. The Lavon Lake WPP updates were delivered to stakeholders at in-person or virtual workshops. At the beginning of each program, the Watershed Manager presented the WPP updates, which included the project overview, water quality summaries and announcements about upcoming events.

Program	Date	Location	Attendance
Texas Well Owner Network	February 2, 2019	McKinney	11
New Landowner Workshop	May 17, 2019	McKinney	19
Urban Stream Restoration	September 19, 2019	McKinney	29
Lavon Lake Partnership Meeting	December 10, 2019	Wylie	24
Texas Watershed Steward	March 20, 2020	McKinney	19
Healthy Lawn Healthy Waters	June 22, 2021	Wylie	19
New Landowner Workshop	July 23, 2021	McKinney	9
Aerobic Septic System Maintenance	Varies	Online Course	8

Table 1. Workshops and Stakeholder meetings for Lavon Lake WPP Implementation

The Covid-19 pandemic impacted the implementation by restricting face-to-face delivery of educational events. Two workshops planned for 2020 had to be temporarily postponed due to safety concerns (Table 2).

Program	Date
Lavon Lake Watershed Partnership meeting	July 9, 2020
Homeowner Maintenance of Septic Systems	April 7, 2021

Table 2. List of the events postponed due to Covid-19.

Texas Well Owner Network (TWON)

A four-hour TWON program took place on February 2, 2019 (Figure 10). The TWON program is an educational training designed for residents who depend on household wells for their drinking water needs. The half-day program provided training on Texas' groundwater resources, water quality, water treatment, and well maintenance issues. The program also included training on the operation and maintenance of septic systems as they relate to health and safety of well water. Attendees were encouraged to bring water samples to the trainings to be screened for total dissolved solids, nitrates, pH, and *E. coli* bacteria. Those well owners whose water tested positive for bacteria received follow-up contact from Texas A&M AgriLife Extension on how to resolve the issue.

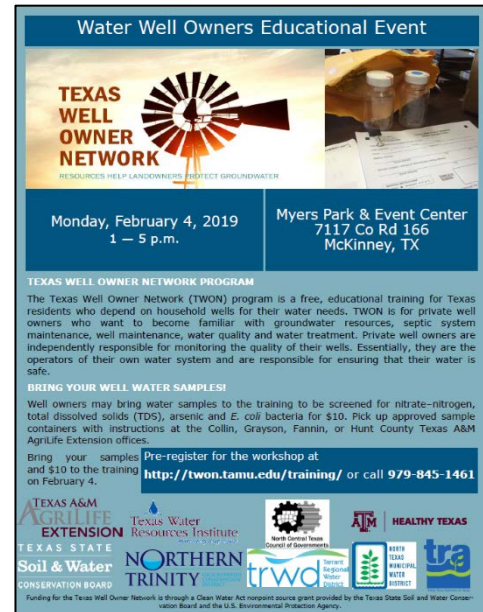


Figure 10. TWON Workshop, McKinney

Urban Stream Restoration

An Urban Stream Restoration Workshop was held on September 19, 2019. NTMWD hosted the program in partnership with Texas A&M AgriLife (Figure 11). Twenty-nine people participated to learn about watershed hydrology, water quality and riparian restoration specific to urban environments. The course consisted of classroom time and field work to provide participants with a hands-on experience measuring and assessing stream conditions.



Figure 11. Urban Stream Restoration program in McKinney, September 2019.

Healthy Lawns and Healthy Waters (hybrid)

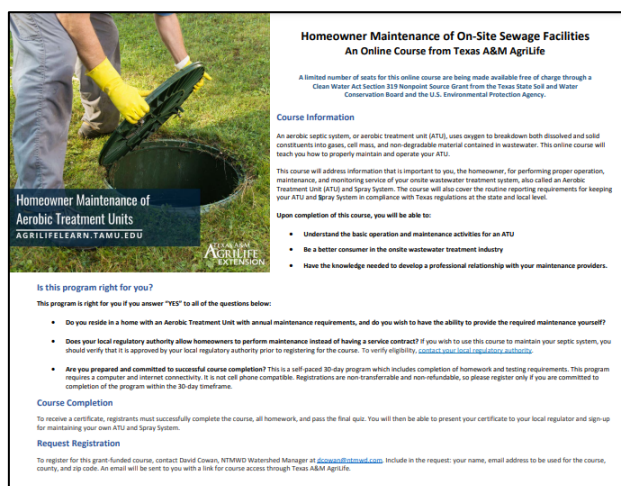
The Healthy Lawns and Healthy Waters program was conducted as a hybrid in-person/virtual event on June 22, 2021. Nineteen people attended the workshop. Attendees learned about the design and installation of residential rainwater harvesting systems and appropriate turf and landscape species based on local conditions.

Homeowner Maintenance of Septic Systems

The 6-hour Homeowner Maintenance of Septic Systems course was scheduled in McKinney on April 7, 2021. However, it was canceled due to the Covid-19 concerns.

To continue offering educational opportunities during the pandemic, Texas A&M AgriLife Extension offered the Homeowner Maintenance of Septic Systems class as a self-paced virtual course (Figure 12). Participants of the online course learned about the operation and maintenance of aerobic septic systems and how activities in the home can impact proper functioning of septic systems. Treatment processes, health and safety considerations, and inspection and maintenance were covered.

NTMWD worked closely with the online class developers to review the online curriculum and coordinate with representatives of the Environmental Health Offices in Collin and Grayson counties to support and advertise the course. The online course was made available on April 22 at <https://agrilifelearn.tamu.edu>. NTMWD will continue to support and offer the course as part of the continued implementation of the WPP.



Homeowner Maintenance of On-Site Sewage Facilities
An Online Course from Texas A&M AgriLife

A limited number of seats for this online course are being made available free of charge through a Clean Water Act Section 519 Nonpoint Source Grant from the Texas State Soil and Water Conservation Board and the U.S. Environmental Protection Agency.

Course Information

An aerobic septic system, or aerobic treatment unit (ATU), uses oxygen to breakdown both dissolved and solid constituents into gases, cell mass, and non-degradable material contained in wastewater. This online course will teach you how to properly maintain and operate your ATU.

This course will address information that is important to you, the homeowner, for performing proper operation, maintenance, and monitoring service of your on-site wastewater treatment system, also called an Aerobic Treatment Unit (ATU) and Spray System. The course will also cover the routine reporting requirements for keeping your ATU and Spray System in compliance with Texas regulations at the state and local level.

Upon completion of this course, you will be able to:

- Understand the basic operation and maintenance activities for an ATU
- Be a better consumer in the on-site wastewater treatment industry
- Have the knowledge needed to develop a professional relationship with your maintenance providers.

Is this program right for you?

This program is right for you if you answer "YES" to all of the questions below:

- Do you reside in a home with an Aerobic Treatment Unit with annual maintenance requirements, and do you wish to have the ability to provide the required maintenance yourself?
- Does your local regulatory authority allow homeowners to perform maintenance instead of having a service contract? If you wish to use this course to maintain your septic system, you should verify that it is approved by your local regulatory authority prior to registering for the course. To verify eligibility, [contact your local regulatory authority](#).
- Are you prepared and committed to successful course completion? This is a self-paced 30-day program which includes completion of homework and testing requirements. This program requires a computer and internet connectivity. It is not cell phone compatible. Registrations are non-transferable and non-refundable, so please register only if you are committed to completion of the program within the 30-day timeframe.

Course Completion

To receive a certificate, registrants must successfully complete the course, all homework, and pass the final quiz. You will then be able to present your certificate to your local regulator and sign-up for maintaining your own ATU and Spray System.

Request Registration

To register for this grant-funded course, contact David Cowan, NTMWD Watershed Manager at dcowan@ntmwd.com. Include in the request: your name, email address to be used for the course, county, and zip code. An email will be sent to you with a link for course access through Texas A&M AgriLife.

Figure 12. Online Homeowner Maintenance for on-site sewage facilities

Texas Watershed Steward

The Texas Watershed Steward Program (TWS) was offered in McKinney on March 20, 2020 (Figure 13). The TWS program is a science-based education program that helps citizens identify and take action to address local water quality impairments. Participants learn about the nature and function of watersheds, potential impairments, and strategies for watershed protection. The program included an overview of watershed systems, federal and state water policy, impaired waterbodies in the Lavon Lake watershed, and how to manage and improve function in watershed systems.



Figure 13. Texas Watershed Steward Workshop, McKinney

Partnership Meetings

A Lavon Lake Watershed Partnership meeting was held on December 10, 2019 in Wylie. The topics of discussion included updates about implementation, identification of desired future programs, and introduction of the Collin County SWCD Technician, overview of WQMPs, and updates related to the water quality monitoring program focusing on 14 monitoring locations.

Public Communication

Project Brochure

During the project period, NTMWD updated the Lavon Lake WPP brochure (Figure 14) and distributed it to public agencies and businesses around the community. Additionally, NTMWD disseminated the brochures at public events and workshops when held in-person. The full brochure is in Appendix B.

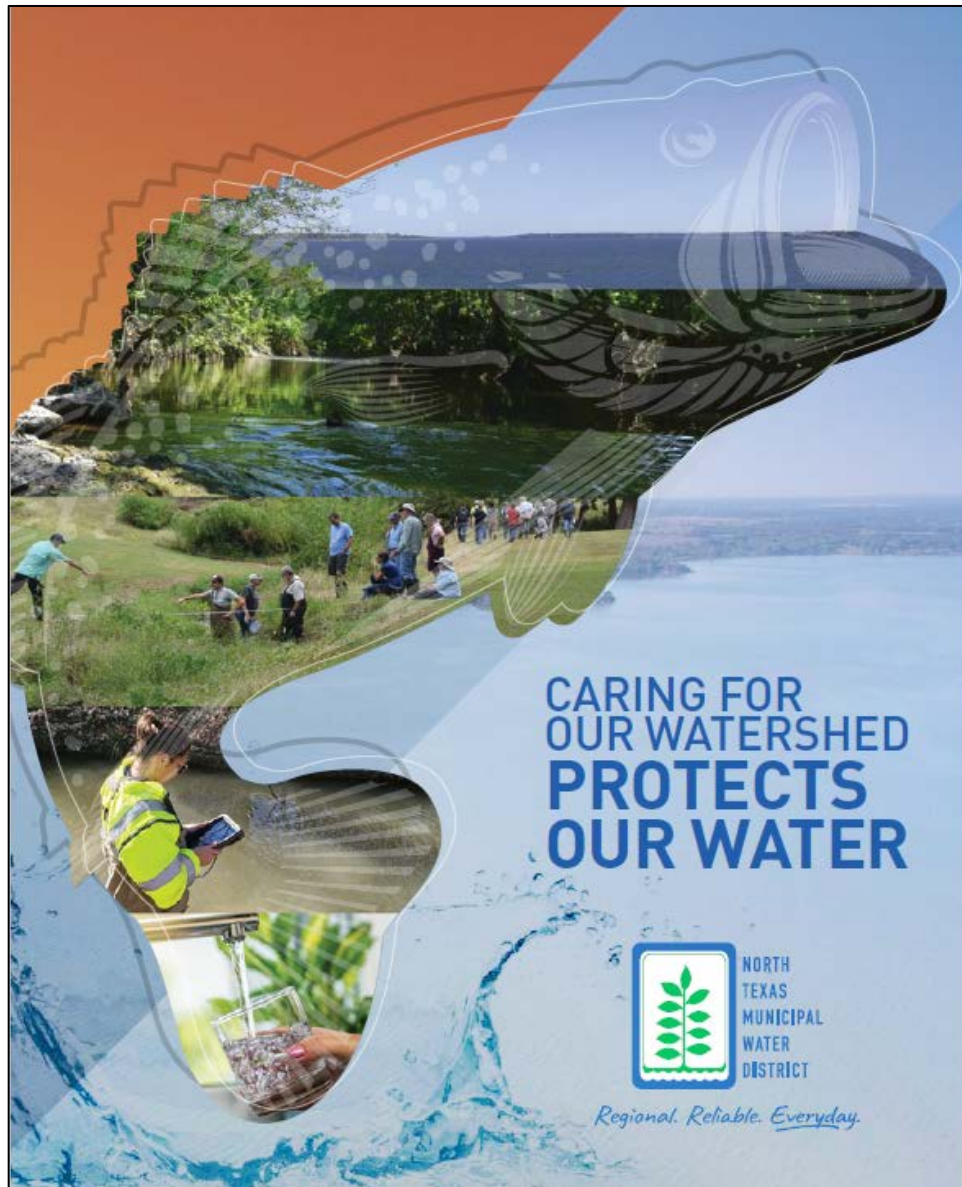


Figure 14. Cover of the four-page Lavon WPP Brochure.

Project Webpage and Social Media

NTMWD continued to maintain the project's webpage, <https://www.ntmwd.com/watershed/> (Figure 15). The web page offers a narrative on the Lavon Lake Watershed and the Watershed planning process. Project-related documents and information such as the WPP, watershed videos and upcoming events and training opportunities were posted regularly on the webpage and social media sites such as Facebook and Instagram.

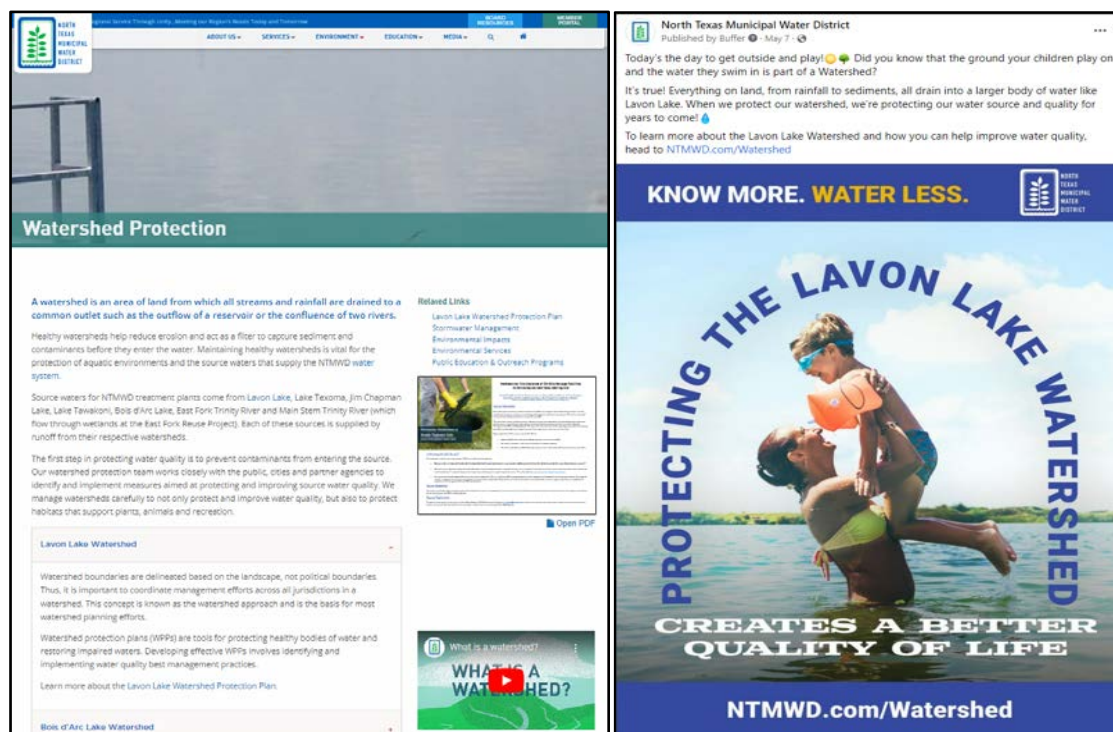


Figure 15. Lavon Lake Watershed outreach on the Partnership website and social media.

Watershed Videos

During the project period, NTMWD created two educational videos about the Lavon Lake watershed. The first, called *What is a Watershed*, defines and describes a watershed and how land uses can impact water quality (Figure 16). The second, called *Clean Water Starts with You*, delves into potential pollutant sources and management practices we can use to help protect water quality. The animated videos were routinely shown during stakeholder meetings and on social media. Both can be viewed at <https://www.ntmwd.com/watershed/>.



Figure 16. What is a Watershed video

Protect Lavon Lake Watershed Street Signs

To create awareness and help generate interest in watershed issues, NTMWD designed and purchased *Protect Lavon Lake Watershed* street signs (Figure 17). The signs, poles and hardware were made available to local governments with jurisdictions within the watershed. NTMWD coordinated with representatives to select locations and assist with installation. Fourteen signs were installed in four cities in the watershed (Table 3).



city

Figure 17. Watershed Sign at Eldorado Parkway, McKinney

Description	Traffic Direction	City	County
Redbud Dr near 380	South	Frisco	Collin
Eldorado Pkwy East of Hillsdale Dr.	East	McKinney	Collin
S Ridge Rd near Eldorado Pkwy	North	McKinney	Collin
Lake Forest Dr near Eldorado Pkwy	North	McKinney	Collin
Custer Rd near N Cotton Ridge Rd	North	McKinney	Collin
Lake Forest Dr at Wilson Creek	South	McKinney	Collin
Hardin Blvd south of Lands End Dr	South	McKinney	Collin
McKinney Ranch Rd west of Hardin Blvd	East	McKinney	Collin
Wilson Creek Parkway north of Park View	South	McKinney	Collin
Virginia Pkwy East of Stonebridge Dr.	East	McKinney	Collin
Whitley Place Drive at Wilson Creek	East	Prosper	Collin
Prosper Trail at Wilson Creek	West	Prosper	Collin
Frontier Parkway at Wilson Creek	West	Prosper	Collin
St Paul Rd near Butschers Block	East	St Paul	Collin

Table 3. Location of installed Protect Lavon Lake Watershed signs

Stream Hydrology Trailer

Using grant funds, NTMWD purchased a stream hydrology trailer early in 2020. The stream trailer is a hands-on rolling classroom that demonstrates how streams and rivers can change over time (Figure 18). The interactive trailer has a large flat tray that acts as a "land area". The tray is filled with plastic media that acts as soil as water is pumped through the trailer to create a stream. This rolling classroom demonstrates how natural streams are formed, the importance of streamside (riparian) vegetation to protect the banks, impacts of dams, flooding, development, and also how slope, flow, and structure affect stream formation.

The trailer was used infrequently in 2020 due to limitations imposed by Covid 19. During the summer 2021 requests for the stream trailer increased as public gatherings became more common. NTMWD staff exhibited the trailer at schools and community events throughout the watershed.

In 2021, NTMWD initiated a loan program to make the trailer widely available for individual events. In conjunction with the Tarrant Regional Water District, NTMWD developed a train-the-trainer workshop. The workshop includes lessons on safe handling and towing, using the pumps and valves and delivering lessons, including TEKS-approved lessons 6th, 7th and 8th grade science courses. Train the trainer events were held on August 25, 2021 and June 30, 2022.



Figure 18. Stream hydrology trailer outreach

Collaboration with Partners

NTMWD collaborated with partners to facilitate the implementation of the WPP and foster public/private partnerships to develop watershed protection projects. NTMWD remained in contact with the Collin County SWCD, NRCS, Texas A&M AgriLife, Texas A&M Forest Service and local government personnel and others.

Riparian Tree Planting

In February 2021, NTMWD and Texas A&M Forest Service applied for a grant from the Bonneville Environmental Foundation (BEF), a non-profit organization that connects corporate donors with environmental projects. BEF facilitated a grant from the Coors Seltzer Change the Course Partnership in the amount of \$51,000 to go toward tree planting along a riparian area of Wilson Creek in McKinney.

The Wilson Creek Restore the Canopy project planted 1,600 native trees to help stabilize soils and prevent erosion along the creek (Figure 19). The 73-acre site was selected based on positive impacts to water quality, sufficient planting and staging areas, land ownership and an active stakeholder group; the Partnership.

In addition to benefits to water quality, the project had an outreach and education component. A community planting day was held on November 6, 2021; Texas Arbor Day. Over 100 volunteers participated in the event and learned about the benefits of protecting riparian areas. Project partners included the City of McKinney, McKinney Parks Foundation, Texas A&M AgriLife Extension, Blackland Prairie Master Naturalists and the Heard Natural Science Museum.



Figure 19. Wilson Creek Restore the Canopy Event, McKinney

Continuation of the Project

NTMWD prepared and submitted a grant proposal to facilitate continued implementation of the Lavon Lake WPP. The funding was received, and the new project titled *Implementation of the Lavon Lake Watershed Protection Plan* began on March 14, 2022.

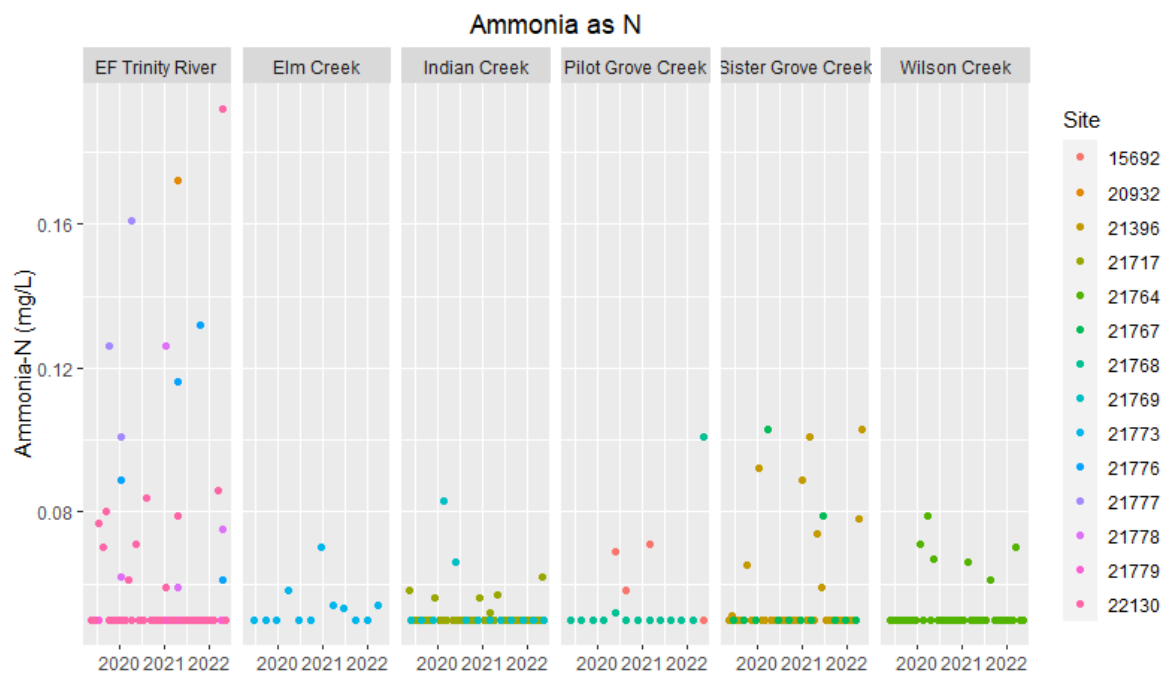
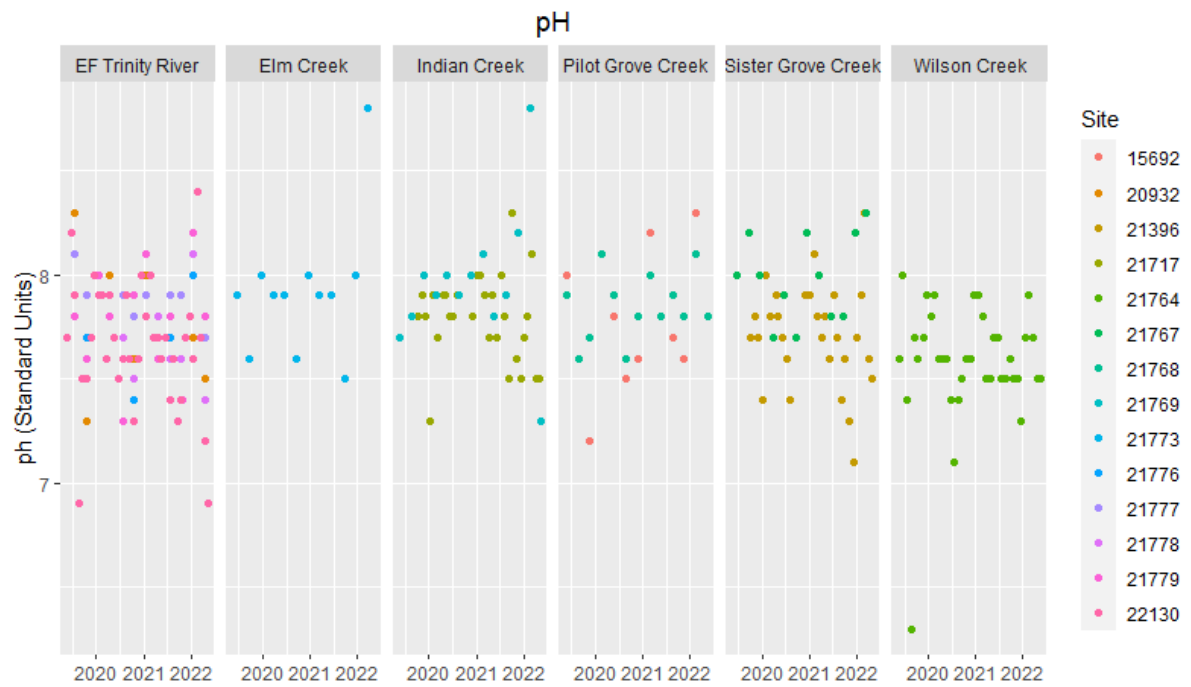
Conclusion

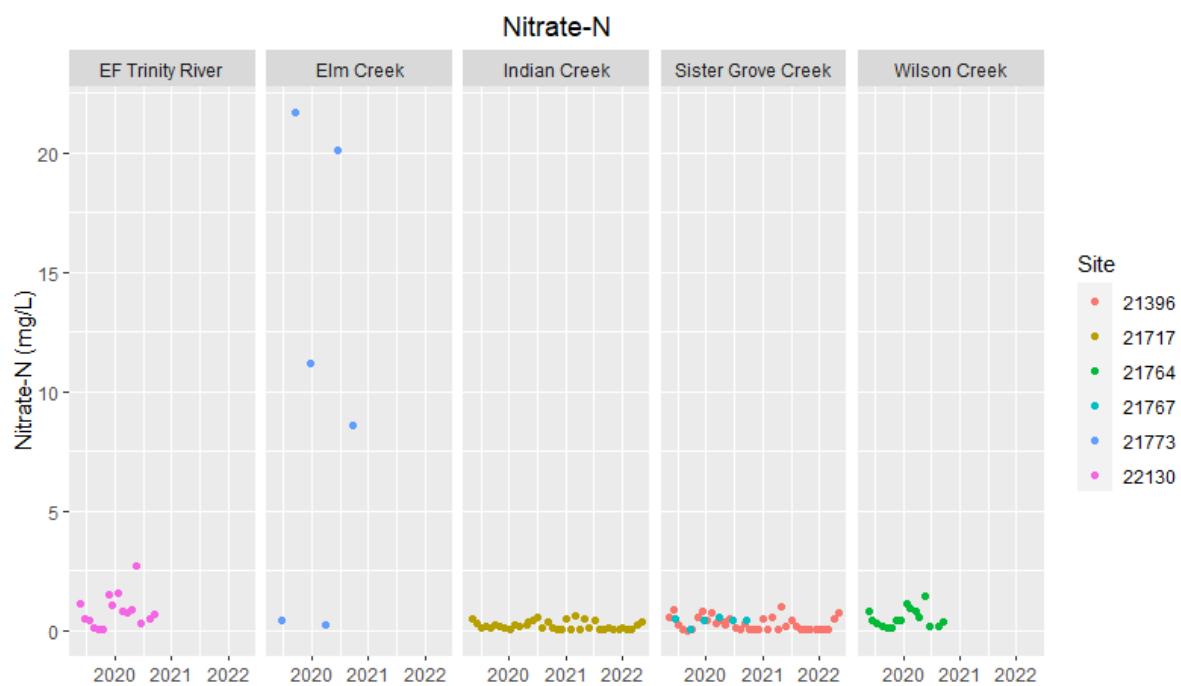
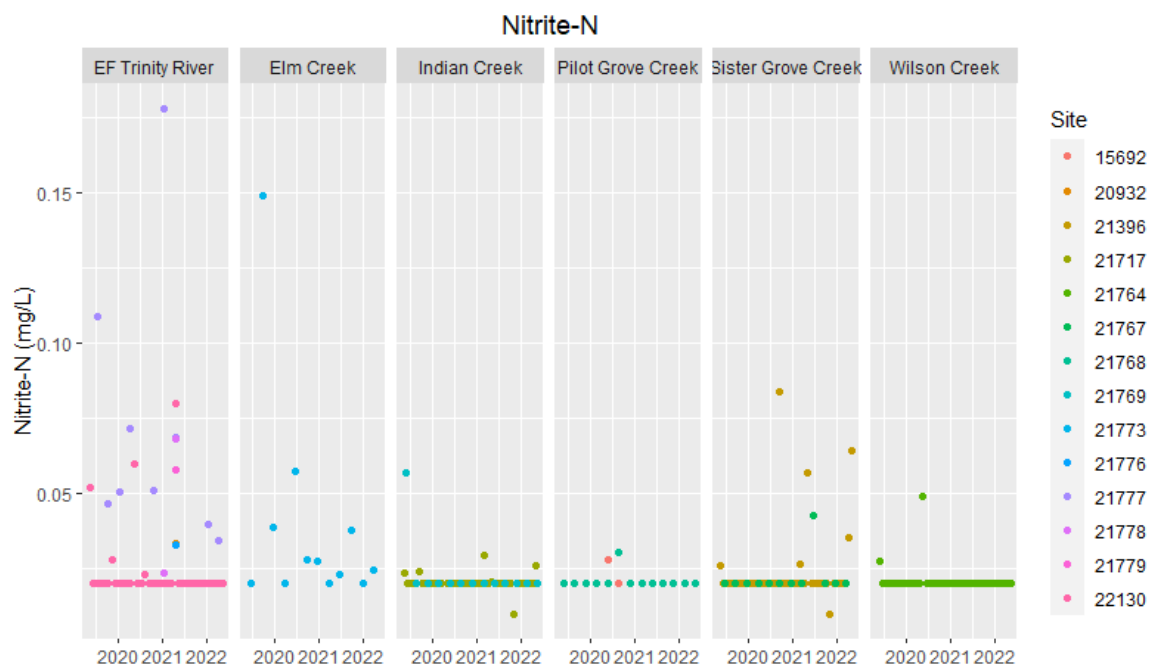
In summary, TSSWCB Project 18-10, *Coordinating Facilitation and Implementation of the Lavon Lake Watershed Protection Plan*, has been completed and successfully achieved its goals for implementation of the Lavon Lake WPP. Facilitation of the Partnership was maintained, and stakeholders were engaged in implementation through a variety of educational workshops, meetings, and events. Outreach to the stakeholders was accomplished through a variety of methods including email, the project webpage, and social media.

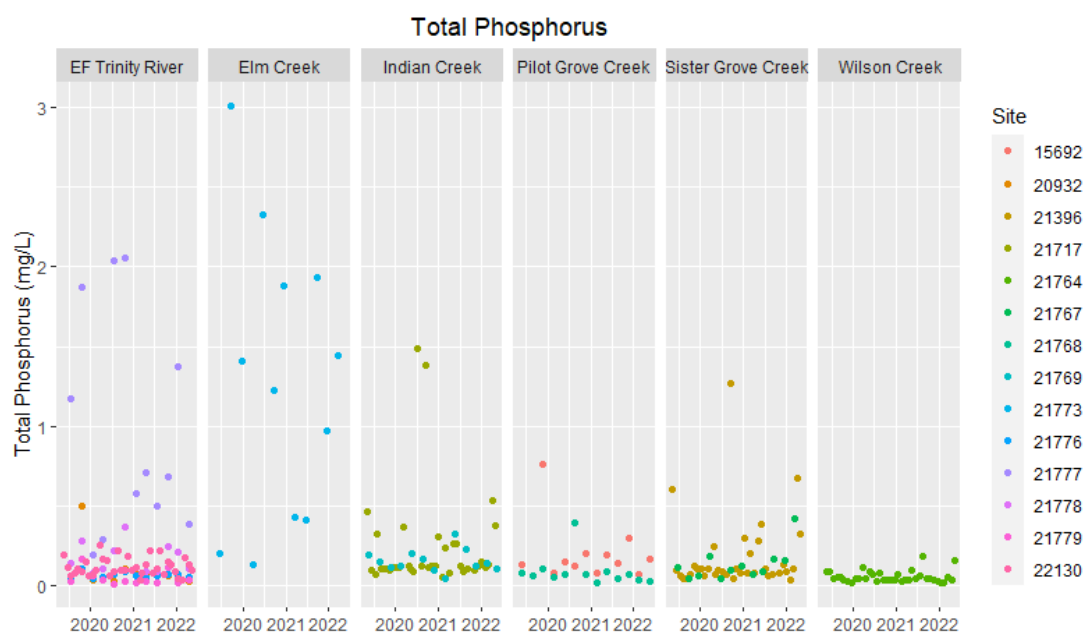
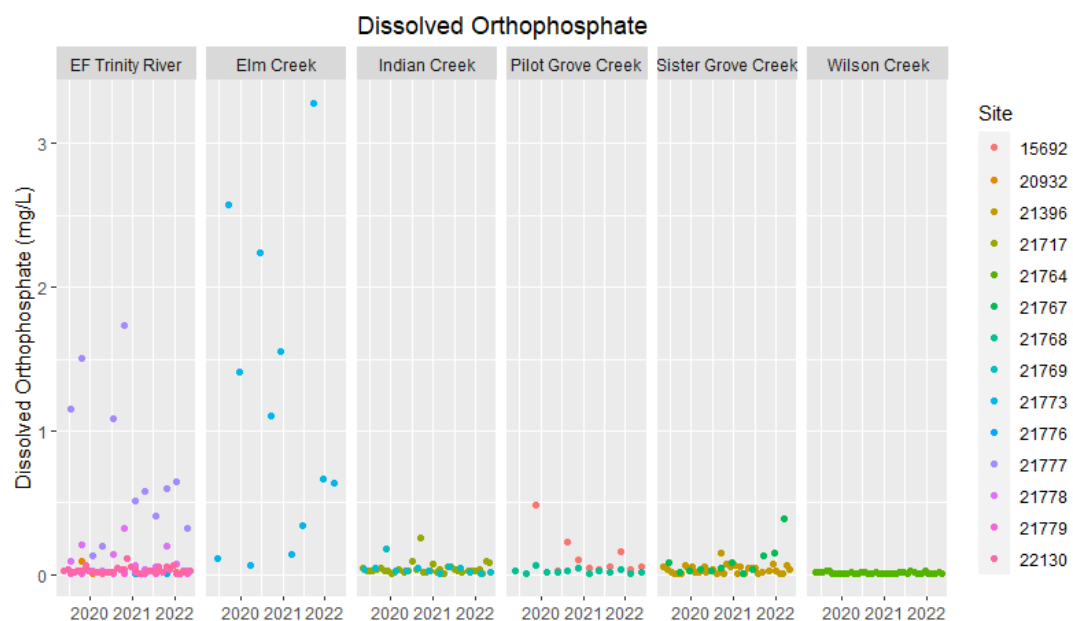
Implementation of the Lavon Lake WPP will continue through TSSWCB Project 21-09, *Implementation of the Lavon Lake Watershed Protection Plan*. This workplan facilitates continued implementation of management measures contained in the WPP. The workplan will continue to support the watershed manager position and will include an outreach coordinator, who will coordinate outreach and education efforts, assist project partners, and communicate water quality conditions to the public. Additionally, the project will support continued water quality sampling and data analysis to be performed by NTMWD Environmental Services field staff.

Appendix A. Lavon Lake Watershed Water Quality Data.

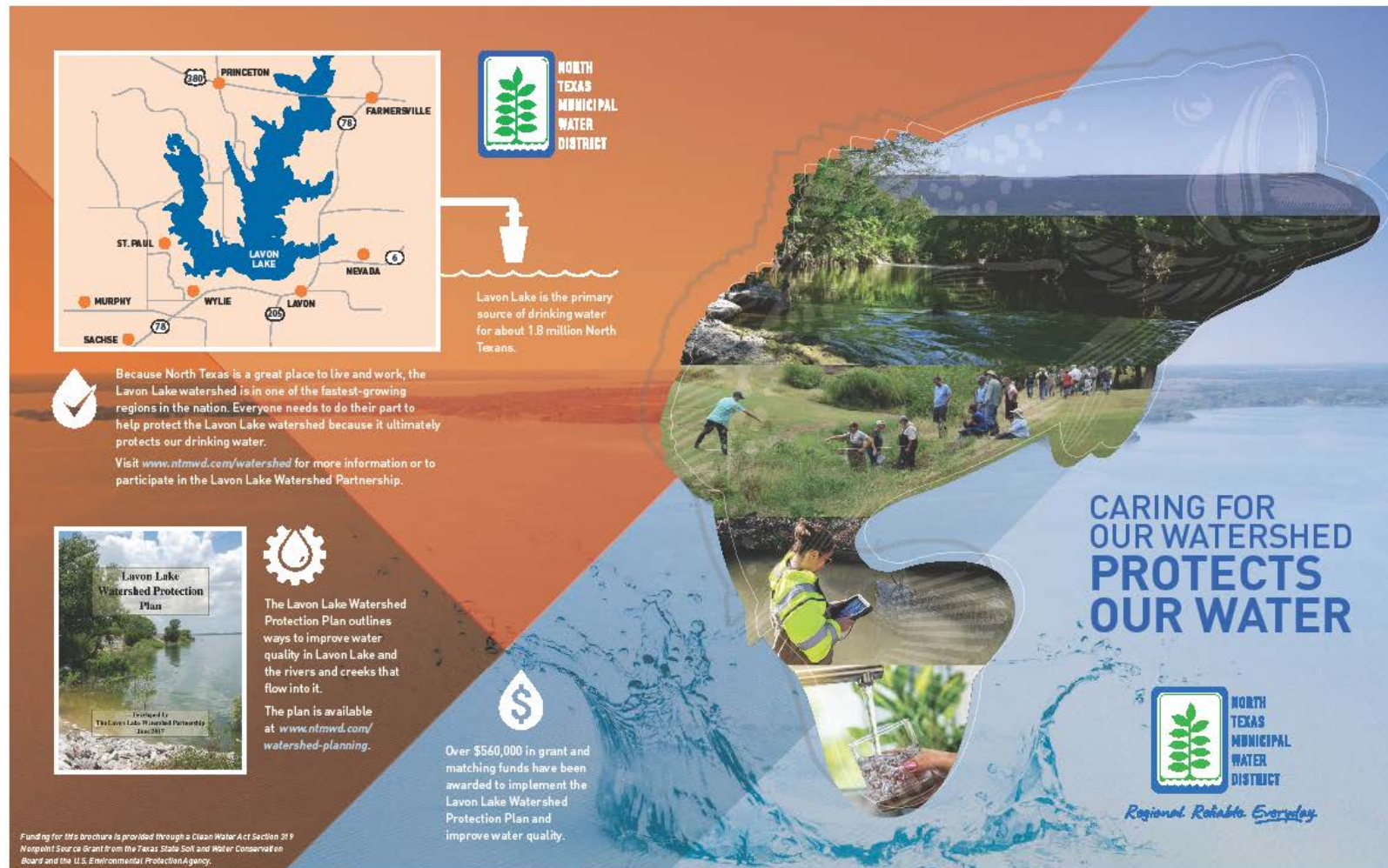








Appendix B. Lavon Lake Watershed Partnership Brochure.



The brochure features a large, stylized graphic of a water drop on the right side, which contains images of a lake, people fishing, and a person using a tablet. The background is a mix of orange and blue gradients.

Map: A map of the Lavon Lake watershed area, showing the lake and surrounding towns: Princeton, Farmersville, St. Paul, Murphy, Wylie, Nevada, and Sachse. Major highways 280, 75, 205, and 5 are also indicated.

North Texas Municipal Water District: Logo featuring a green leaf and the text "NORTH TEXAS MUNICIPAL WATER DISTRICT".

Water Drop Icon: A white water drop icon with a checkmark inside.

Because North Texas is a great place to live and work, the Lavon Lake watershed is in one of the fastest-growing regions in the nation. Everyone needs to do their part to help protect the Lavon Lake watershed because it ultimately protects our drinking water.

Visit www.ntmwd.com/watershed for more information or to participate in the Lavon Lake Watershed Partnership.

Lavon Lake Watershed Protection Plan: A small image of the plan cover, which shows a lake and the text "Lavon Lake Watershed Protection Plan" and "Issued by The Lavon Lake Watershed Partnership June 2017".

Water Drop Icon: A white water drop icon with a gear inside.

The Lavon Lake Watershed Protection Plan outlines ways to improve water quality in Lavon Lake and the rivers and creeks that flow into it.

The plan is available at www.ntmwd.com/watershed-planning.

Dollar Sign Icon: A white dollar sign icon inside a water drop.

Over \$560,000 in grant and matching funds have been awarded to implement the Lavon Lake Watershed Protection Plan and improve water quality.

Water Drop Icon: A white water drop icon with a dollar sign inside.

Text: CARING FOR OUR WATERSHED PROTECTS OUR WATER

North Texas Municipal Water District: Logo featuring a green leaf and the text "NORTH TEXAS MUNICIPAL WATER DISTRICT".

Regional. Reliable. Everyday.

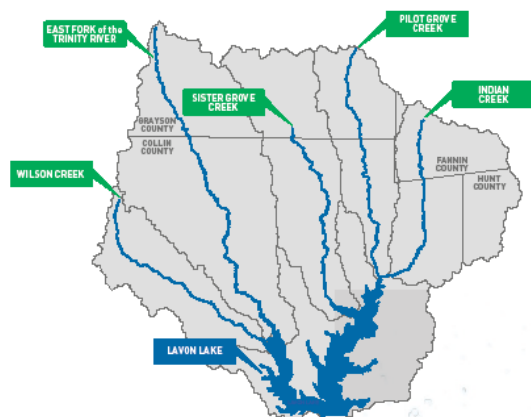
Funding for this brochure is provided through a Clean Water Act Section 319 Nonpoint Source Grant from the Texas State Soil and Water Conservation Board and the U.S. Environmental Protection Agency.

June 2020

LOVE LAVON LAKE

Lavon Lake provides drinking water, habitat for wildlife and a place for recreational fun in North Texas. When the U. S. Army Corps of Engineers first planned the reservoir in the 1940s, its sole purpose was to control flooding. Thanks to forward-thinking leaders who saw the lake's potential to supply drinking water as well, the necessary water rights were secured by the time the reservoir was filled in 1953.

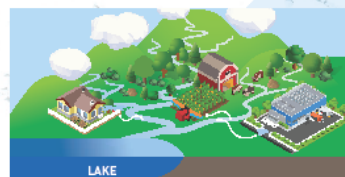
Today, Lavon Lake is the primary source of drinking water for about 1.8 million North Texans. It is one of four lakes that the North Texas Municipal Water District (NTMWD) uses to provide water for up to 80 communities.



The Lavon Lake watershed encompasses about 492,095 acres (768 square miles) and stretches across parts of Grayson, Collin, Fannin and Hunt counties. The lake is fed by five major streams and rivers: East Fork of the Trinity River, Wilson, Sister Grove, Pilot Grove, and Indian Creeks.

PROTECTING OUR SOURCE WATER

Before water comes out of your tap, it flows over a watershed to one of NTMWD's water supply reservoirs, where it can be collected for treatment and delivery to homes and businesses. A watershed is all the land where rainwater runs off into a stream, river or lake. How we use this land can impact water quality. As the North Texas population grows and our land uses dramatically change in the coming years, it is more important than ever that we protect the Lavon Lake watershed.



Stormwater that flows across land that is used for agriculture, industry, and housing can carry pollutants from the land into Lavon Lake. Most of the Lavon Lake watershed is agriculture, but new growth in the area could increase the amount of pollutants that travel into the lake.

WATERSHED PROTECTION

In 2010, the Texas Commission on Environmental Quality (TCEQ) identified elevated levels of bacteria in Wilson Creek and the East Fork of the Trinity River. The streams were subsequently placed on the Texas 303(d) List of impaired waters because they did not meet Texas Surface Water Quality Standards for Primary Contact Recreation (swimming or wading).

Treated water from Lavon Lake is safe to drink and use. Bacteria are removed at the NTMWD water treatment plant. However, it is still very important to protect the source water in the lake. Watershed and source water protection provide the first barrier against contamination. Removing pollutants at the source not only reduces treatment costs, it benefits the environment. That's why NTMWD formed the Lavon Lake Watershed Partnership to help protect water quality in the Lavon Lake watershed. The Partnership consists of NTMWD, Texas State Soil and Water Conservation Board, Texas A&M AgriLife and local stakeholders including citizens, civic organizations, businesses, municipalities, county governments, river authorities, soil and water conservation districts, agricultural committees, nonprofit organizations and state and federal agencies. Participation is voluntary and open to any individual or group affected by water quality or watershed protection activities.

In 2016, the Texas State Soil and Water Conservation Board awarded NTMWD a grant to help fund water quality monitoring and to develop a watershed protection plan for Lavon Lake.

Based on water quality data, modeling, land uses and stakeholder input, the Partnership identified potential sources of pollution and recommended specific management measures aimed at protecting water quality. Implementing these voluntary management measures will help Wilson Creek and the East Fork of the Trinity River meet criteria for primary contact recreation and improve water quality in the Lavon Lake.

The watershed protection plan is available online at www.ntmwd.com/watershed-planning.

The Environmental Protection Agency accepted the Lavon Lake Watershed Protection Plan in 2017, opening the door for federal and state funding of water quality improvement projects. Grants and in-kind donations have totaled more than \$560,000 to fund key projects including:

Working with farmers and ranchers to develop and implement **WATER QUALITY MANAGEMENT PLANS** on agricultural lands

MONITORING water quality

Creating "green" stormwater infrastructure **DEMONSTRATION SITES**

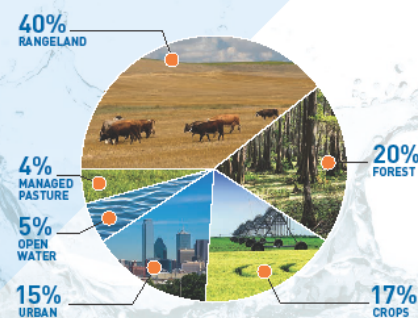
Hosting **WORKSHOPS** on low impact development and stream restoration

Creating **OUTREACH** signage and videos

EDUCATING about hydrology with a mobile classroom stream demonstration trailer



CURRENT LAND USE



For more information, visit www.ntmwd.com

Appendix C. NRCS Fact Sheet National Water Quality Initiative – Lavon Lake



Overview

Through the National Water Quality Initiative (NWQI), the Natural Resources Conservation Service (NRCS) is offering financial and technical assistance to farmers, ranchers and forest landowners interested in improving water quality and aquatic habitats in priority watersheds with impaired streams. NRCS will help producers implement conservation and management practices through a systems approach to avoid, control and trap nutrients and sediment, which in high quantities negatively impact water quality. Qualified producers will receive assistance for installing conservation practices such as filter strips, cover crops, prescribed grazing, riparian buffers, field borders and manure management, which promote soil health, reduce erosion and lessen nutrient runoff. For over 75 years, NRCS has provided agricultural producers with assistance to implement voluntary conservation practices that protect natural resources while maintaining production and profits.

Priority Watersheds

NRCS in Texas is committed to improving impaired waterways through the Lavon Lake NWQI priority area. This area includes six HUC12 sub-watersheds, which are located within the Lake Lavon watershed. Lavon Lake is the uppermost reservoir on the East Fork of the Trinity River and is a primary source of raw water supply for the North Texas Municipal Water District. Sub-watersheds are located in Grayson, Fannin, Collin and Hunt Counties. These sub-watersheds were selected because of nutrient, sediment and bacterial loading. Through this concentrated effort, eligible producers will invest in voluntary conservation practices to help provide cleaner water for

themselves, their neighbors and downstream communities. NRCS will provide technical and financial assistance to producers for implementing conservation practices. Through this initiative, landowners, NRCS and our partners will work together to preserve and maintain water quality, which in turn will ensure prosperity, productivity and quality of life for surrounding communities and lands.

NRCS Conservation Funding and Practices

Natural Resources Conservation Service (NRCS) conservation professionals will provide technical assistance and planning tools to determine which conservation actions will provide the best results to improve water quality on your land. Nutrient management systems, erosion control, conservation tillage, prescribed grazing, and buffer systems are just some of the practices offered as part of the National Water Quality Initiative. To help install these conservation practices, financial assistance is available through the agency's Environmental Quality Incentives Program (EQIP).

Partnerships

NRCS identified priority watersheds through the help of local partnerships and state and federal water quality agencies. NRCS will work with their partners in this initiative.

Partners include the Texas State Soil & Water Conservation Board, Texas Commission on Environmental Quality and the Environmental Protection Agency, along with the local Soil & Water Conservation Districts and the North Texas Municipal Water District.

NRCS will continue to coordinate with local, state and federal agencies, conservation

How to Apply

Interested parties can apply for assistance at their local USDA NRCS Service Centers. You will need to establish eligibility and farm records for your land. NRCS will help you complete an application while explaining which conservation practices are available in your watershed. Remember to check with your local NRCS office to see if you are located in a selected watershed.

NRCS provides assistance to private landowners and operators free of charge and there is no obligation to participate in this program.

For More Information

Kyle Wright
State Water Quality
Specialist
USDA - NRCS,
TEXAS
101 N. Main Street
Temple, TX 76701
(254) 742-9800

Partnerships (cont.)

districts, nongovernmental organizations and others to implement this initiative. This strategic approach will leverage funds and provide stream-lined assistance to help individual agricultural producers take needed actions to reduce the flow of sediment, nutrients, bacteria and other runoff into impaired waterways.

Producer Benefits

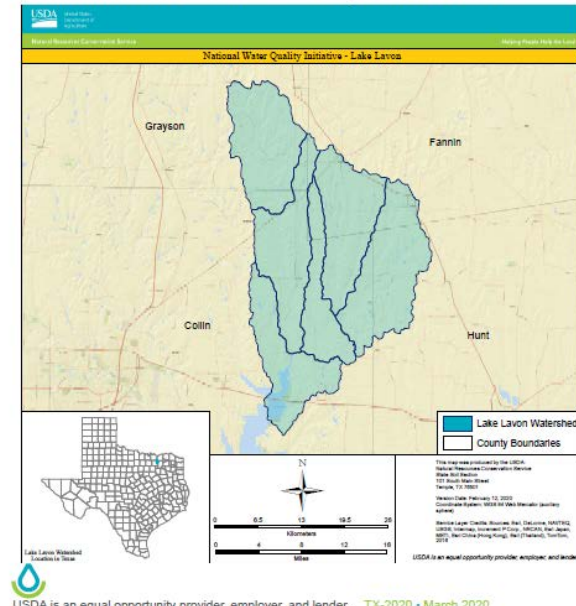
Water quality conservation practices benefit agricultural producers by lowering input costs and enhancing the productivity of working lands.

Conservation investments are good for all Americans because well-managed farms limit pollution from runoff, produce food and fiber,

sustain rural economies, and provide food security to the Nation. All across the country - farmers, ranchers and forest landowners are voluntarily taking action and putting conservation on the ground to improve water quality on millions of acres!

Public Benefits

Natural Resources Conservation Service is proud to be involved in a nationwide effort with landowners and communities to improve and protect our water resources. The landowners and farmers participating in the initiative will receive conservation payments to work on the land in a sustainable way which provides cleaner water. In addition to the financial assistance, the land will remain productive into the future. Communities benefit by having clean waterways, safer drinking water and healthy habitat for fish and wildlife.



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www.tx.nrcs.usda.gov