

NOLAN CREEK

WPP Partnership Meeting

Sponsored by

Texas Commission on Environmental Quality (TCEQ)

Environmental Protection Agency (EPA)

Texas Institute for Applied Environmental Research (TIAER) at
Tarleton State University

via Clean Water Act 319(h) Funding

October 30, 2017



Project Recap & Update

Station 11913 South Nolan Creek at Roy
Reynolds Rd taken on June 4, 2013



Nolan Creek/South Nolan Creek Segment 1218

Impaired due to elevated bacteria

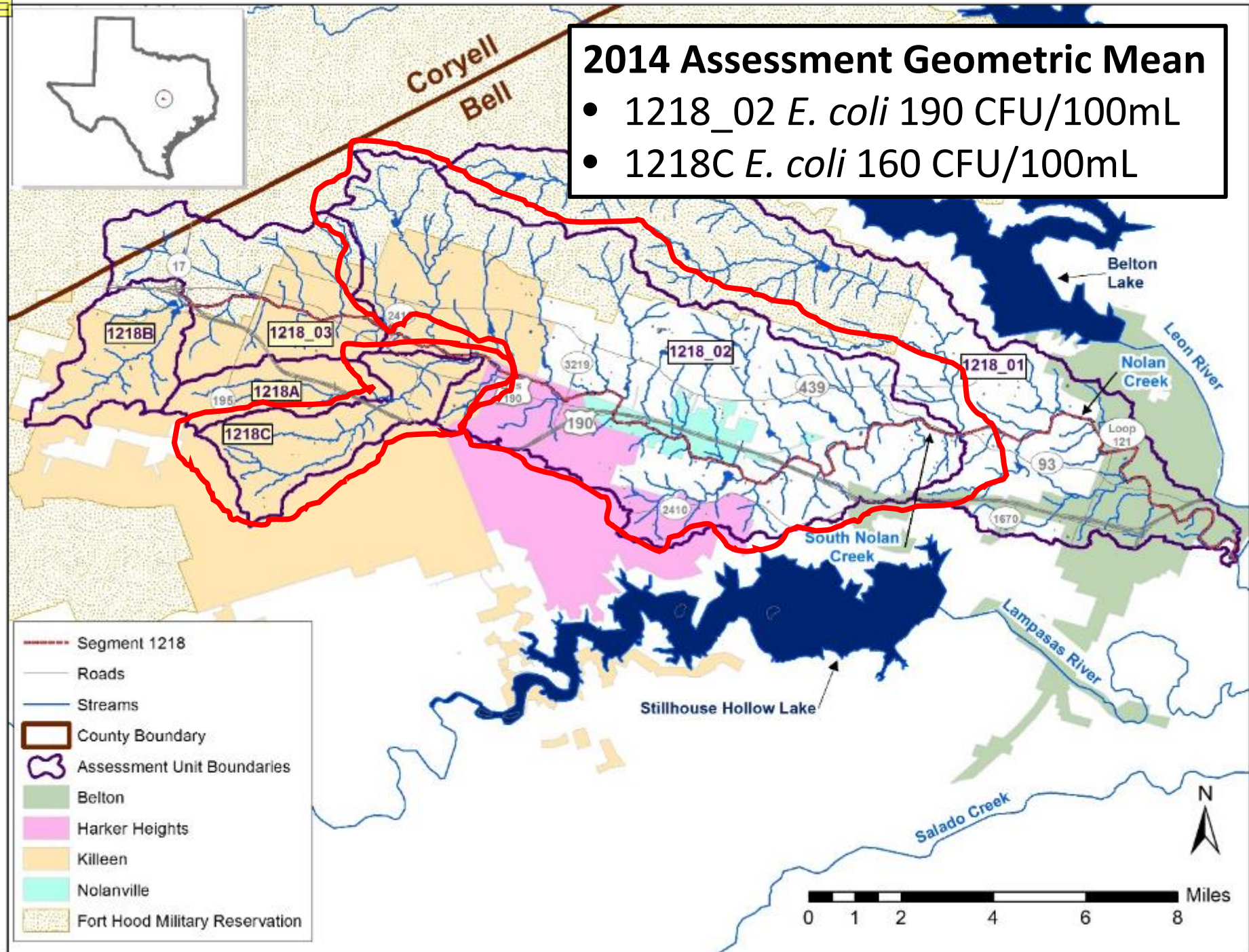
- **1218_02 – South Nolan from Liberty Ditch to confluence with North Nolan/Nolan Creek (listed since 1996)**
 - **1218C_01 – Little Nolan Creek (listed since 2010)**
-

Source: 2014 Texas Integrated Report - Texas 303(d) List

https://www.tceq.texas.gov/assets/public/waterquality/swqm/assess/14txir/2014_303d.pdf

2014 Assessment Geometric Mean

- 1218_02 *E. coli* 190 CFU/100mL
- 1218C *E. coli* 160 CFU/100mL





Nolan Creek/South Nolan Creek Segment 1218

Concerns

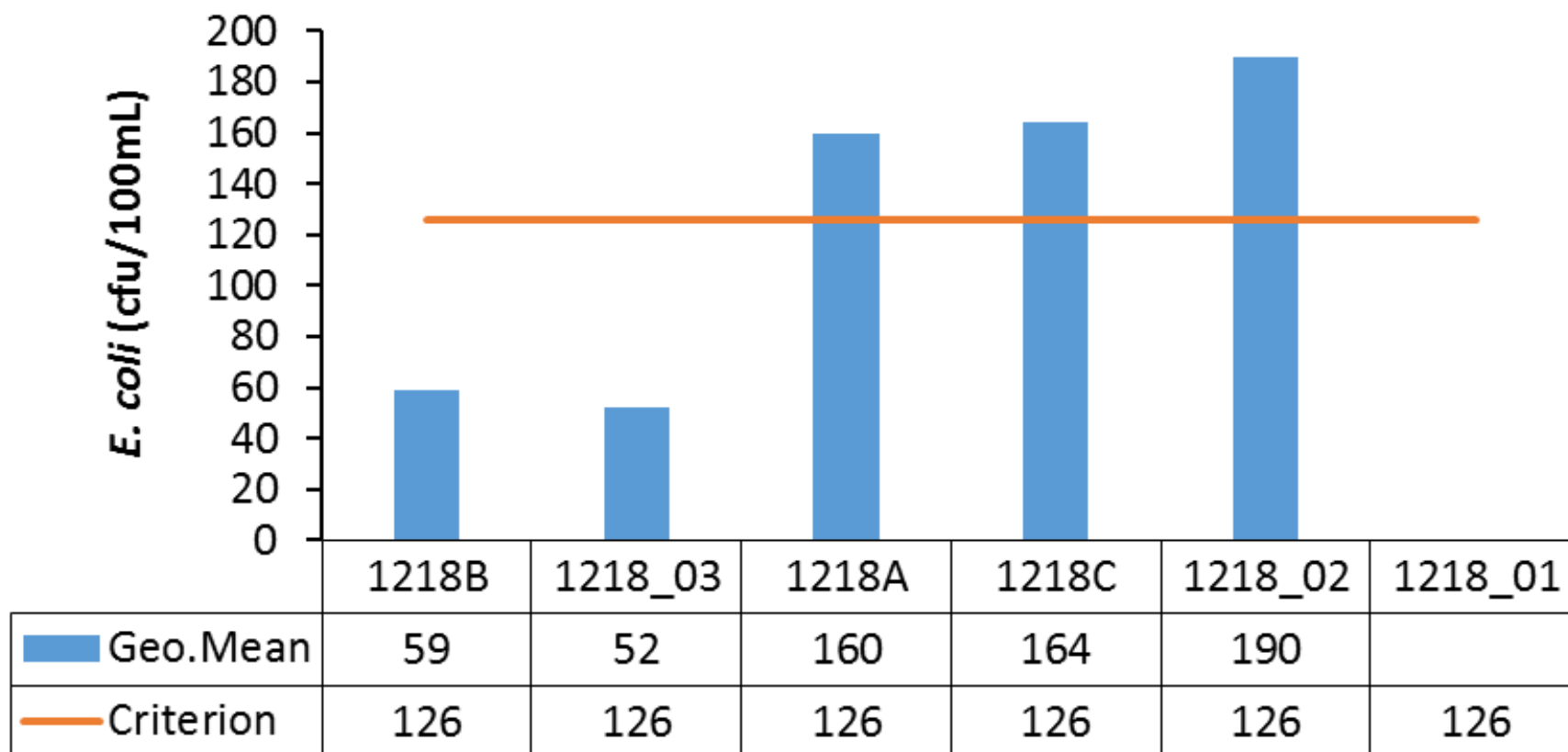
- Elevated nutrients (nitrate and total phosphorus) in 1218_02
 - Bacteria 1218A_01 Unnamed Tributary to Little Nolan Creek
-

Source: 2014 Texas Integrated Report Water Bodies with Concerns for Use Attainment and Screening Levels

https://www.tceq.texas.gov/assets/public/waterquality/swqm/assess/14txir/2014_concerns.pdf

2014 Assessment Results

(01Dec2005 – 30Nov2012)



Source: 2014 Texas Integrated Report: Assessment Results for Basin 12 - Brazos River

https://www.tceq.texas.gov/assets/public/waterquality/swqm/assess/14txir/2014_basin12.pdf



Nutrient Concerns – 1218_02

	# Exceeded	# Samples	Screening Level (mg/L)	Mean of Samples Exceeding Screening Level (mg/L)
Nitrate	37	38	1.95	8.64
Total Phosphorus	22	28	0.69	1.93

Source: 2014 Texas Integrated Report: Assessment Results for Basin 12 - Brazos River

https://www.tceq.texas.gov/assets/public/waterquality/swqm/assess/14txir/2014_basin12.pdf



Nutrient Criteria for Water Quality

- In development

Nutrient Criteria Development Plan

Texas Commission on Environmental Quality

Texas Surface Water Quality Standards

06/27/2014

https://www.tceq.texas.gov/waterquality/standards/WQ_standards_nutrient_criteria.html



Brazos River Authority

Presentation by Tiffany Morgan
January 16, 2014 Partnership Meeting

***Development of Statewide
Nutrient Standards
Impacts to Wastewater
Treatment***

<http://tiaer.tarleton.edu/ruaa/nolan-creek-watershed.html>

A photograph of a shallow creek with clear water flowing over mossy rocks. The banks are lined with green trees and foliage. A semi-transparent grey box is overlaid on the upper half of the image, containing text.

Goal -

To develop a stakeholder, TCEQ & EPA approved Watershed Protection Plan (WPP) for the Nolan Creek/South Nolan Creek

Needs to meet EPA's nine elements for watershed-based plans



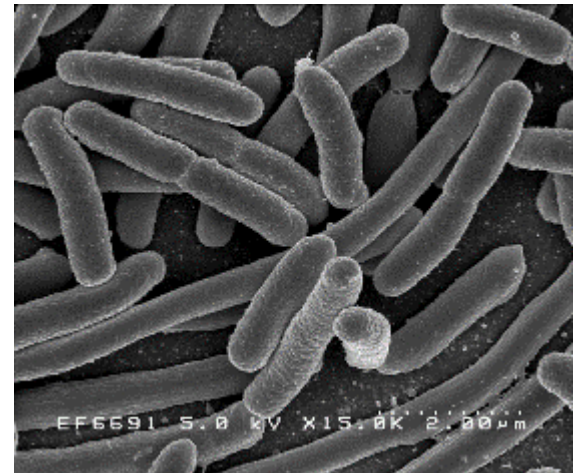
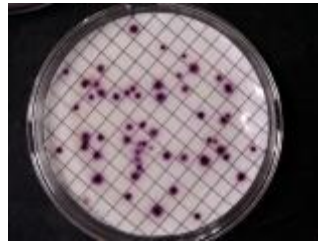
Elements of a WPP

- a) Identification of pollutant causes & sources**
- b) Estimates of needed load reductions**
- c) Description of management measures**
- d) Estimates of resources needed to implement plan**
- e) Education & outreach program**
- f) Implementation schedule for management measures**
- g) Interim, measurable milestones for implementation of management measures**
- h) Criteria for evaluating plan success**
- i) Monitoring to evaluate plan effectiveness**

Identification of Causes & Sources

What has been done?

- Visual source survey
- Land Use/Land Cover evaluation of potential sources
- More intensive and targeted monitoring



Deer Pellets



Swallows under
Bridges

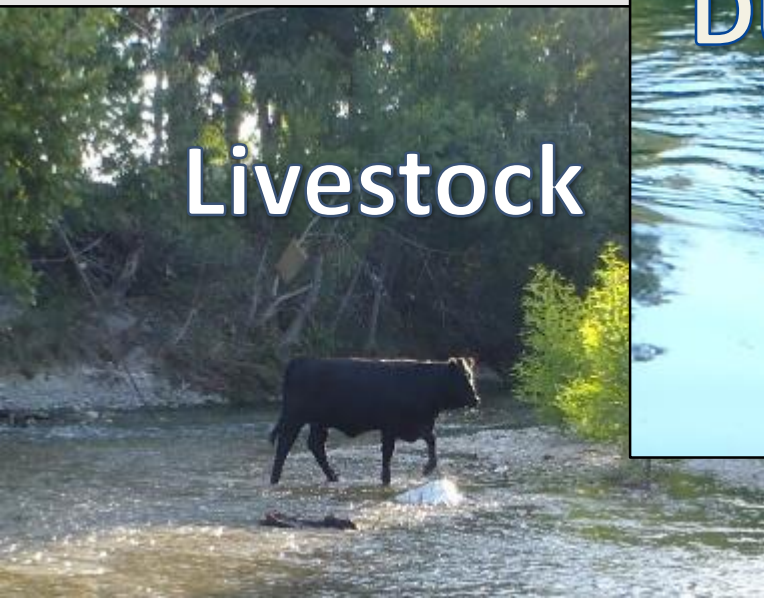


Visual Source Survey

Ducks & Geese



Livestock



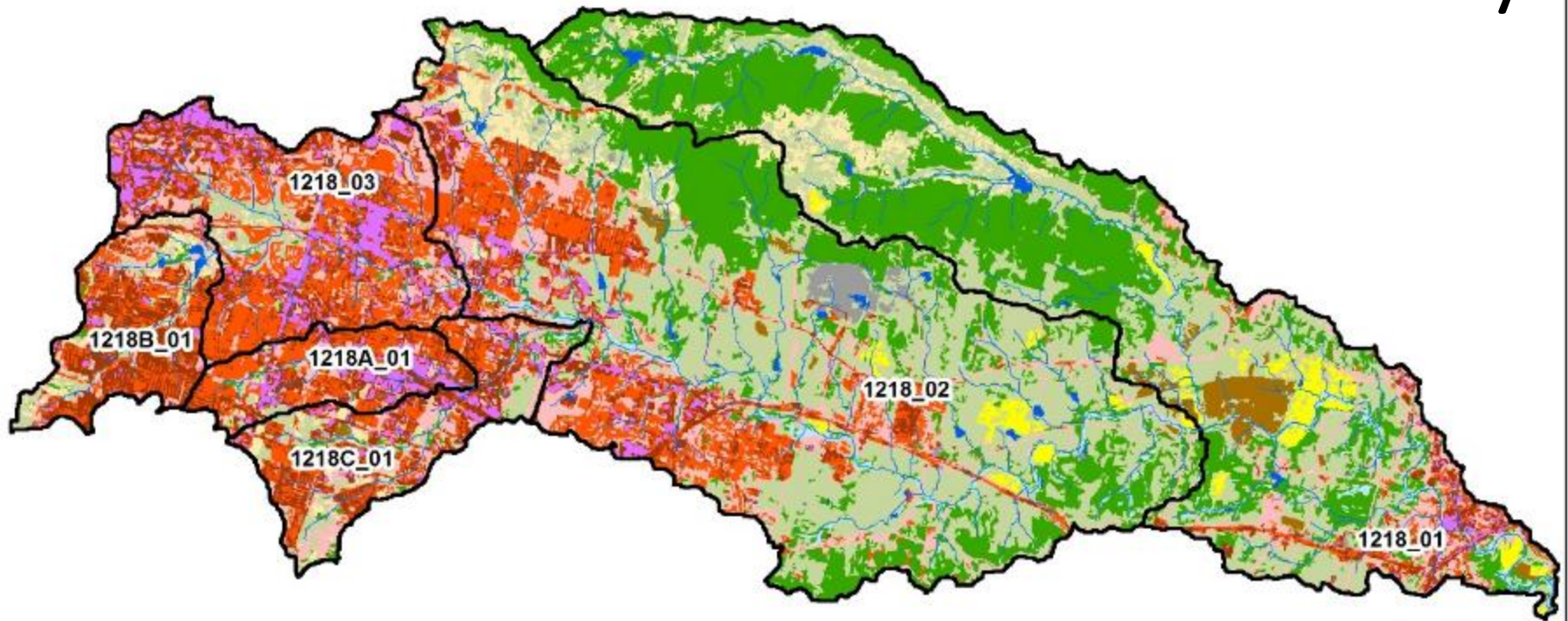
Raccoon
Tracks



Sources ?? - Rely on Local Knowledge



Watershed Characterization Study



2011 NLCD

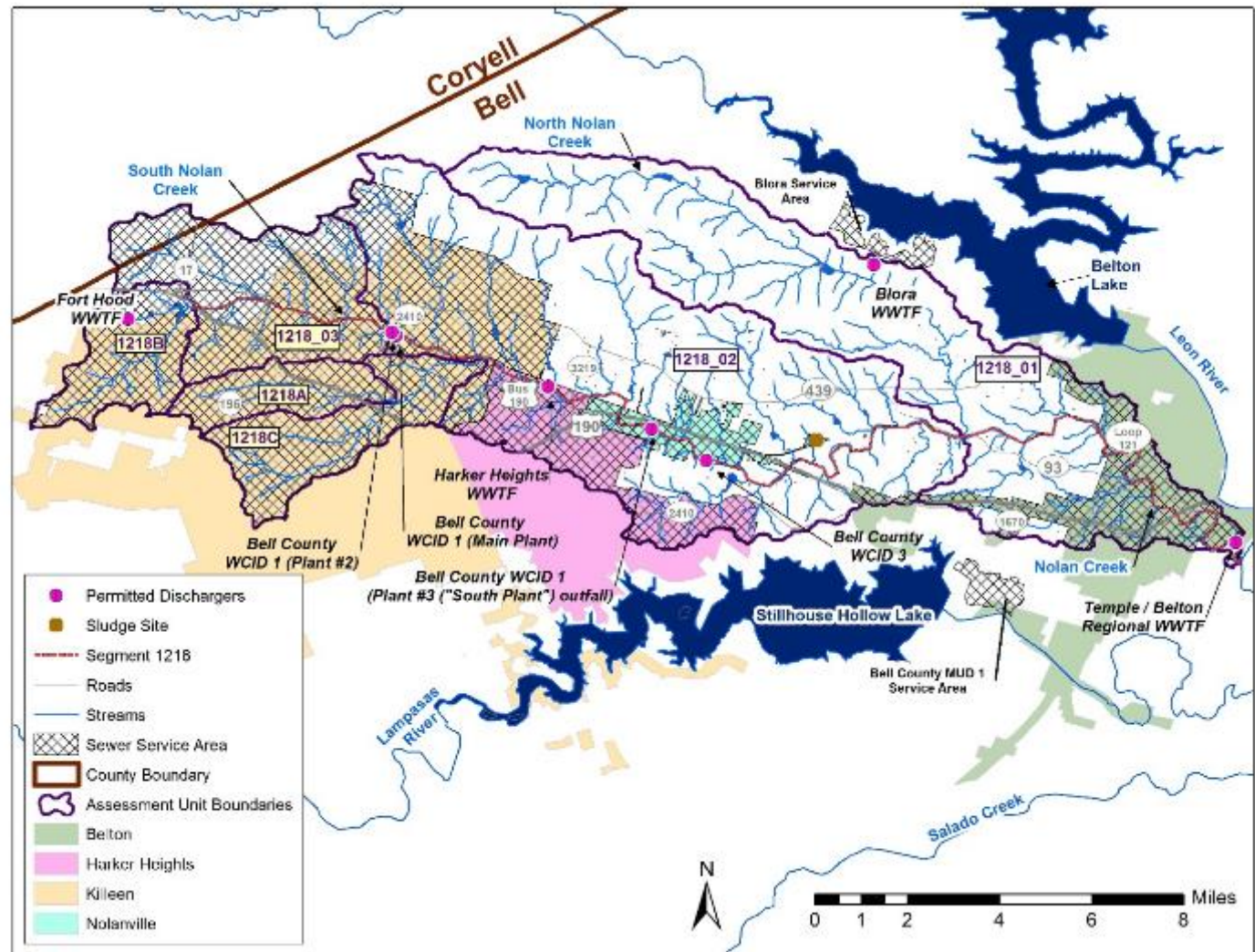


NLCD – National Land Cover Database

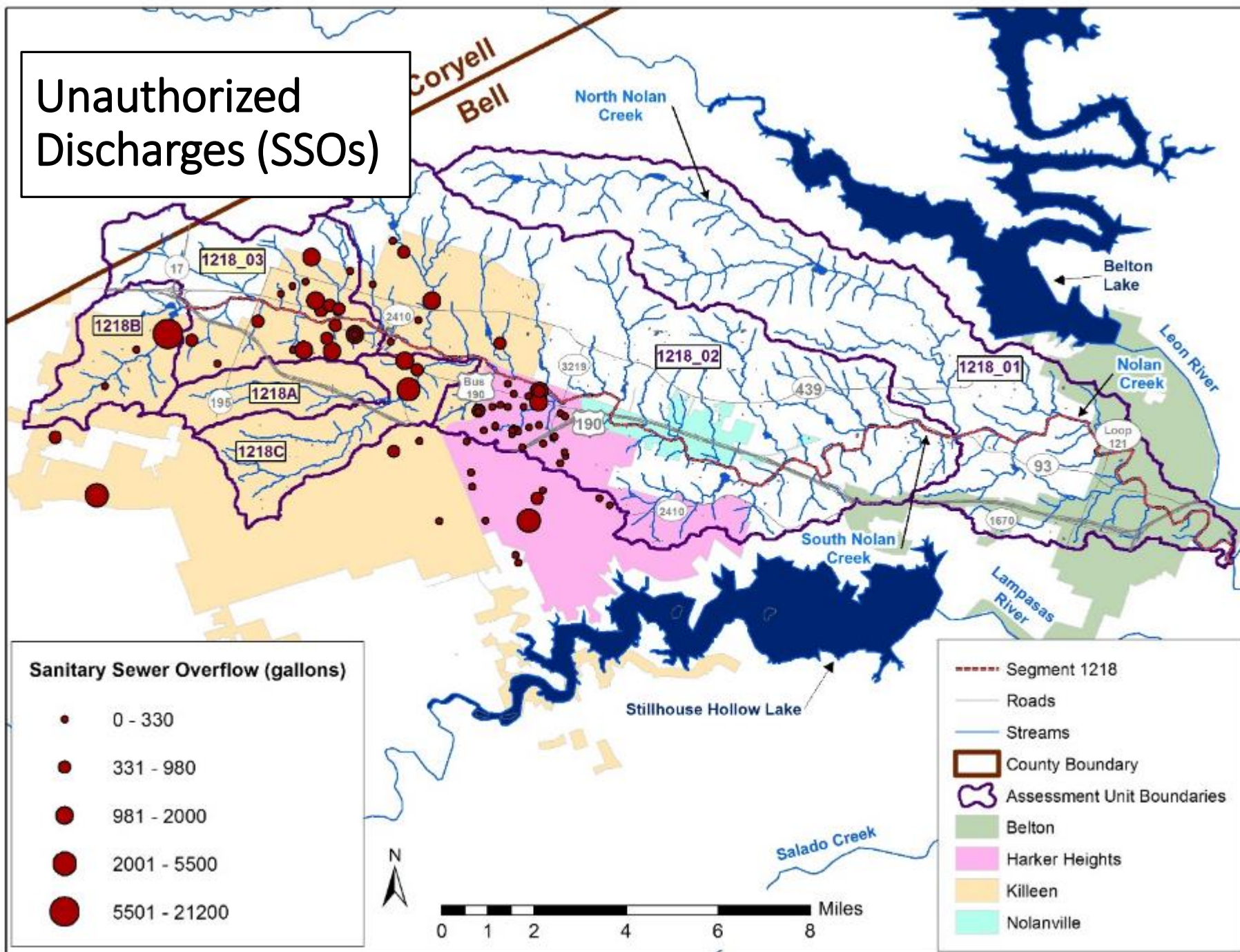


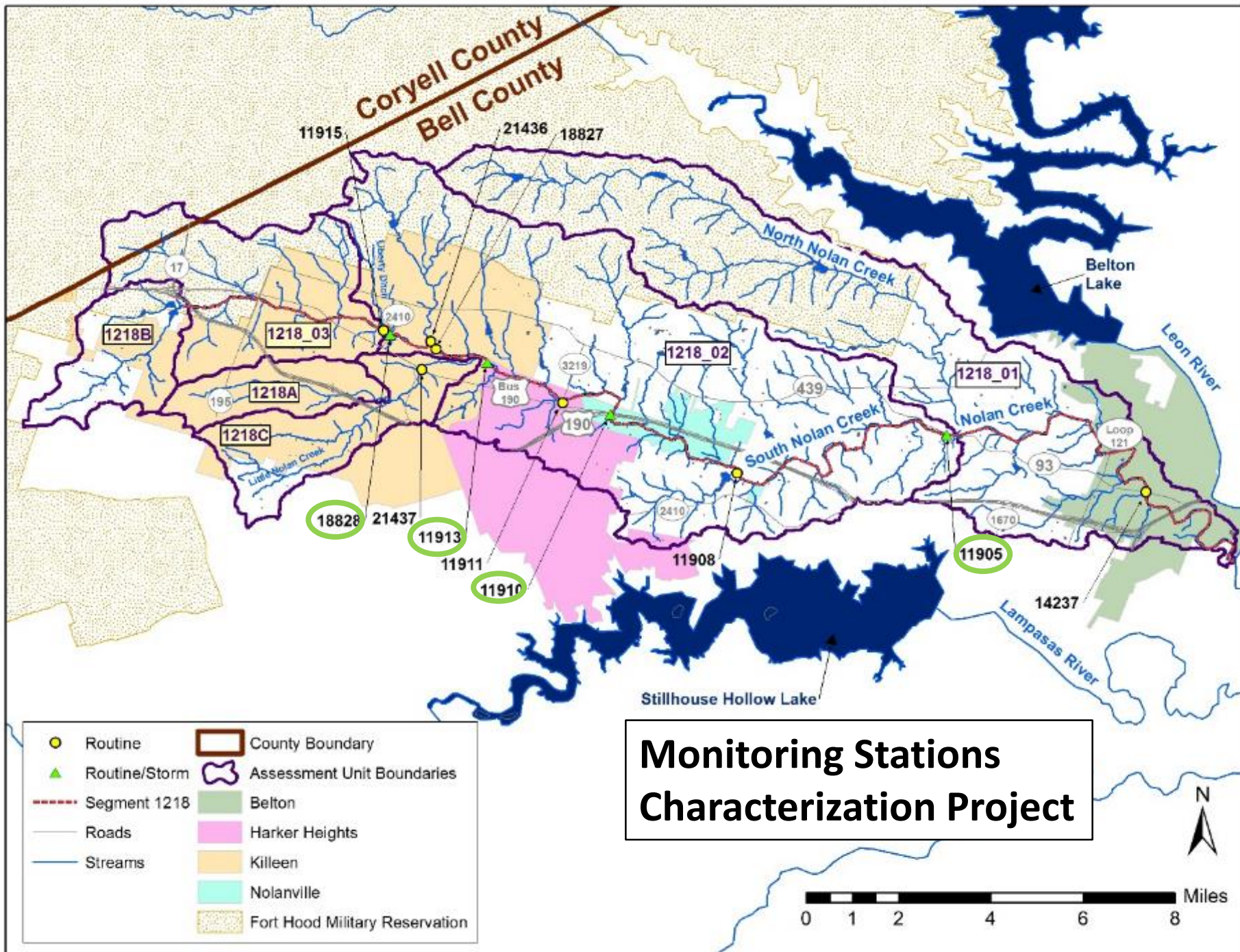
Regulated Sources - Wastewater Treatment Facility (WWTF) Discharges

Note: Service area for WWTF discharges extends beyond the watershed largely following municipal boundaries



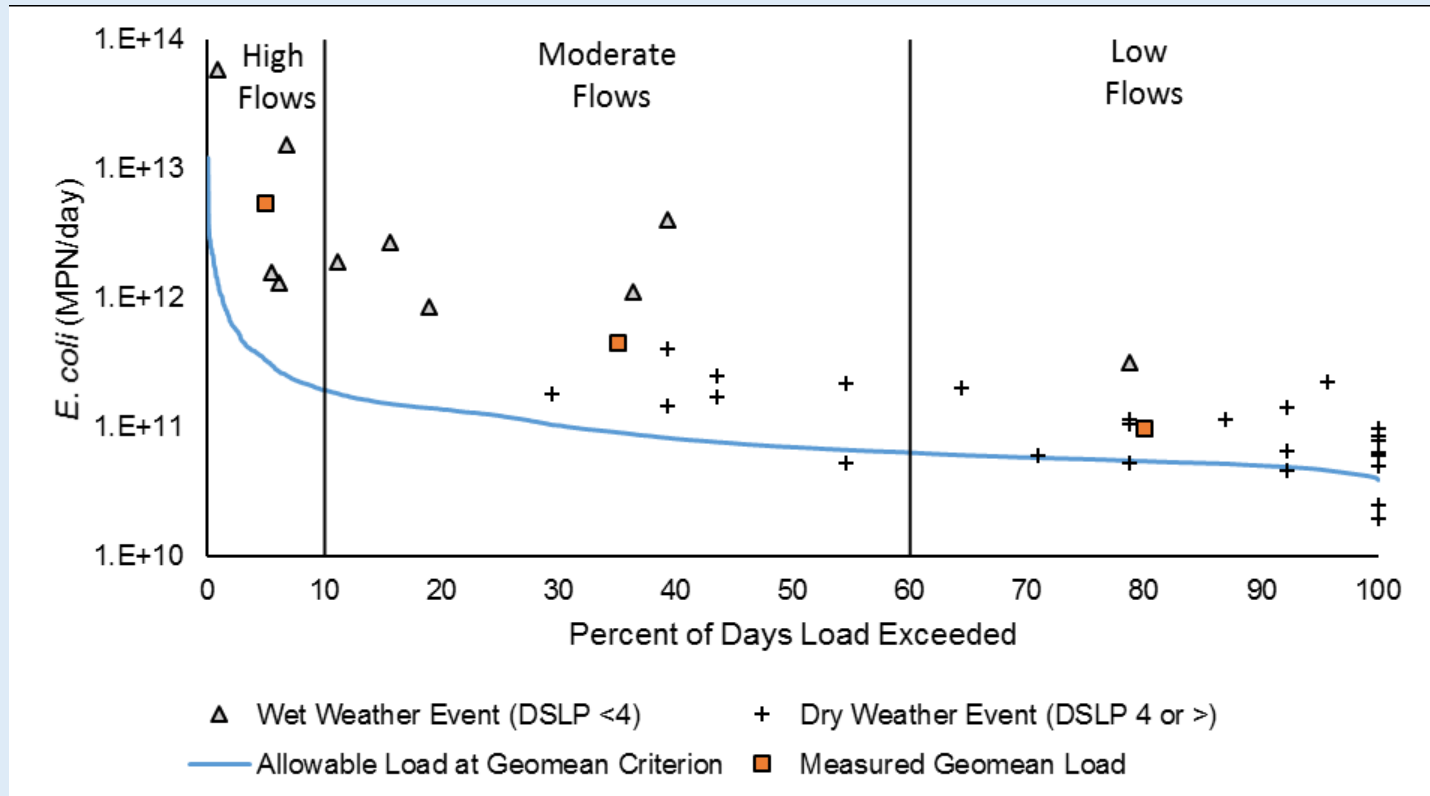
Unauthorized Discharges (SSOs)





Setting Goals - needed Load Reductions

- Defined using Load Duration Curves



Across sites at moderate to low flows, 39% to 62% reduction needed

Past Information on Characterization Project

<http://tiaer.tarleton.edu/nolan-creek-watershed.html>

PUBLICATIONS

Building Partnerships Report - Public Participation Plan for Nolan Creek/South Nolan Creek Watershed Based Planning

Data Inventory Report - Data Inventory for the Nolan Creek/South Nolan Creek Watershed Segment 1218

Monitoring Plan – Monitoring Plan for Nolan Creek/South Nolan Creek

Source Survey Report - Survey of Potential Bacteria and Nutrient Sources in the Nolan Creek/South Nolan Creek Watershed

Monitoring Report - Characterizing Water Quality within Nolan Creek/South Nolan Creek

Loading Report - Characterizing Potential Pollutant Loads to Nolan Creek/South Nolan Creek

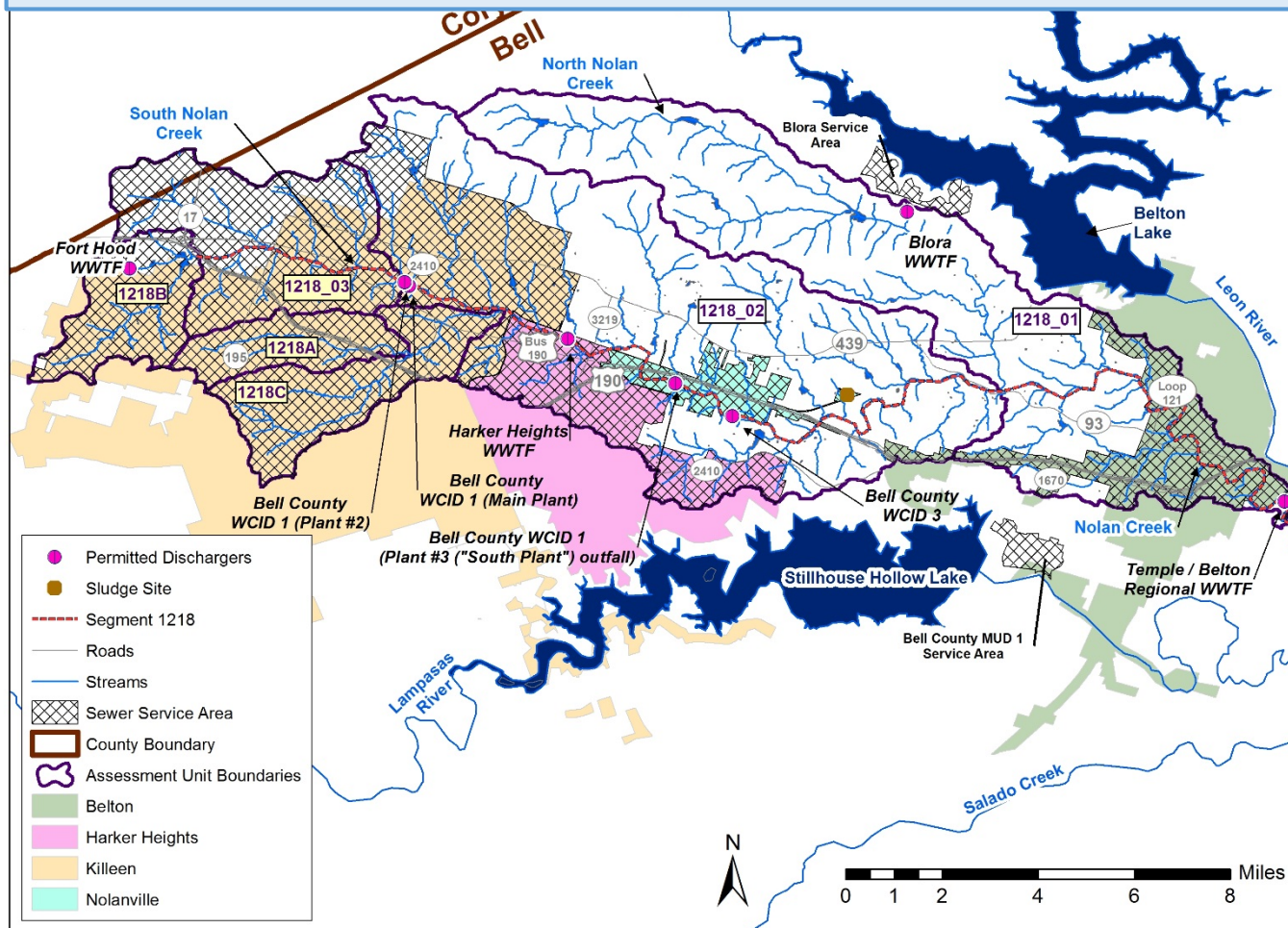
Education & Outreach Report – Outreach and Education Strategy for the Nolan Creek/South Nolan Creek Watershed

Assessment of Water Quality and Watershed Based Planning for Nolan Creek/South Nolan Creek – Final Project Report

Point Sources of Bacteria

Point Sources – end of pipe

- Wastewater Treatment Facility Discharges



Nonpoint Sources

- **Urban Stormwater Runoff**

- Animal Waste – primarily dogs, but also wildlife & livestock
- Illicit Discharges – focus on sanitary sewer and stormwater systems
- Trash – such as improperly disposed diapers or food

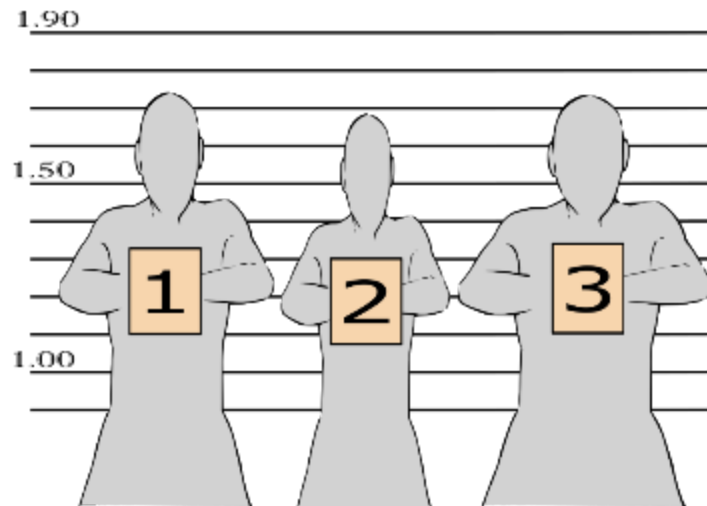
- **Rural Runoff**

- Leaky or Failing On-Site Sewage Facilities (OSSFs)
- Agricultural & Recreational Livestock
- Wildlife & Feral Animals

Control of Nonpoint Sources

Challenging –

- There often is no clear source
- Dealing with the cumulative impact of contributions from many different sources
- Activities of many individuals from a variety of sources may need to be addressed



Today's Task

- **Prioritizing Management Practices for the Watershed Protection Plan**

Nolan Creek at Levi Crossing (station 11908) taken on July 26, 2017

Success Stories

- The 319(h) Nonpoint Source Program is measured by Success Stories.
- A success story highlights a waterbody that is removed from the 303(d) List of Impaired Waters.
- The state has a goal of producing two success stories per year.

How are success stories achieved?

Through on-the-ground implementation and education guided by a watershed protection plan or total maximum daily load (TMDL)

Two Success Stories from 2016:



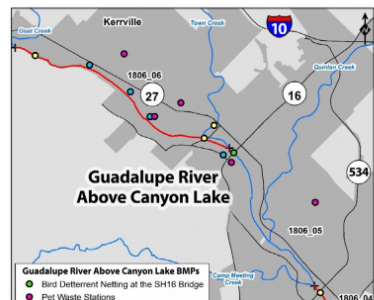
Best Management Practices, Infrastructure Improvements, and Outreach Improve the Guadalupe River Above Canyon Lake

Waterbodies Improved High levels of bacteria prompted the Texas Commission on Environmental Quality (TCEQ) to add the Guadalupe River Above Canyon Lake to the state's 2002 Clean Water Act (CWA) section 303(d) list of impaired waters. Local and state watershed partners addressed the bacteria impairment by implementing best management practices (BMPs), improving municipal wastewater collection infrastructure, and conducting education and outreach in the watershed. Thanks to the collaborative efforts, water quality in assessment units (AUs) 1806_04 and 1806_06 has improved. As a result, TCEQ removed AU 1806_04 and 1806_06 from the state's impaired waters list in 2012 and 2014, respectively.

Problem

The Guadalupe River Above Canyon Lake is in south-central Texas, beginning in western Kerr County and ending at Canyon Lake Reservoir. The 3.5-mile reach of Segment 1806 that includes the impaired AUs, 1806_04 and 1806_06, is defined as the Guadalupe River from Ranch Road 394 to 1 mile upstream of Flat Rock Dam (Figure 1). These AUs run through the city of Kerrville; land use immediately surrounding the river is predominately urban.

The designated beneficial use for Segment 1806 is primary contact recreation (PCR). To meet the PCR Texas water quality standard, *Escherichia coli* levels cannot exceed a geometric mean of 126 colony forming units



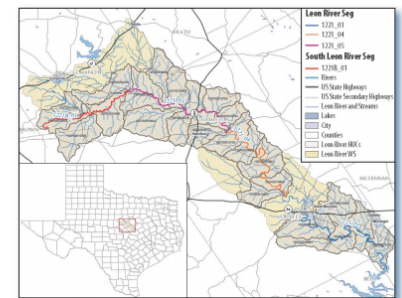
Addressing Agricultural and Residential Bacteria Sources Improves Water Quality in the Leon and South Leon Rivers

Waterbodies Improved High levels of bacteria prompted the Texas Commission on Environmental Quality (TCEQ) to add the Leon River (in 1996) and South Leon River (in 2006) to the Clean Water Act (CWA) section 303(d) list of impaired waters for not supporting the primary contact recreation use. The Texas State Soil and Water Conservation Board (TSSWCB) provided CWA section 319(h) grant funding to develop a watershed protection plan (WPP) to address the bacteria impairments in the Leon River watershed. Watershed stakeholders voluntarily implemented best management practices (BMPs) and conducted public outreach and education. Through these efforts, water quality improved and the South Leon River (assessment unit [AU] 1221B_01) and three assessment units of the Leon River below Proctor Lake (AU 1221_01, 1221_04, and 1221_05) were removed from the state's list of impaired waters in 2014.

Problem

The 1,375-square-mile Leon River watershed in central Texas is bounded by Proctor Lake upstream and Belton Lake downstream (Figure 1). The Leon River is 190 miles long, and drains portions of Comanche, Erath, Hamilton, and Coryell counties. The watershed is largely rural, with most of the land suited for grazing by cattle and goats; a few animal feeding operations are also present. These agricultural operations, wildlife, feral hogs and on-site sewage facilities (OSSFs) have the potential to be sources of bacteria loadings. South Leon River, a tributary of the Leon River, shares the land use features of the larger watershed.

Data collected in the Leon River (1990–1995) showed that fecal coliform levels exceeded the bacteria water quality standard (WQS) for contact recreation. As a



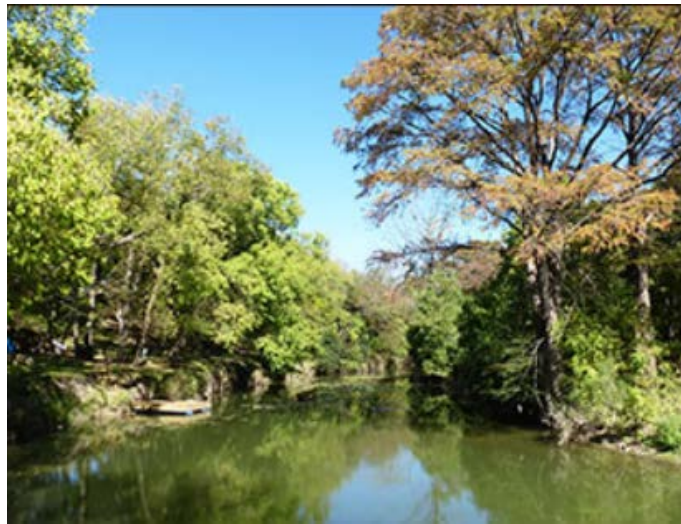
Guadalupe River Above Canyon Lake

Background

Listed in 2002 for high levels of bacteria

TMDL adopted in 2007; TMDL Implementation Plan approved 2011

Removed from 303(d) List of Impaired waters in 2012 and 2014 (different assessment units removed at different times)



Guadalupe River Above Canyon Lake

Implementation Activities

- Pet waste stations
- Bird deterrent structures
- “Don’t feed the ducks and geese” signs in parks
- Waterfowl removal
- Improvements to wastewater collection infrastructure (collection lines, lift stations, sewer system access points, man holes, tree root removal)
- Education and outreach through PSAs and presentations
- Creek clean-up events

Leon River

Background

Listed in 1996 for high levels of bacteria

TMDL initiated in 2002

Watershed Protection Plan initiated in 2006

Removed from 303(d) List of Impaired waters in 2014



Leon River

Implementation Activities

- Water Quality Management Plans (alternative water sources, prescribed grazing, cross-fencing, grassed waterways, nutrient management, grass planting)
- Septic system repair and replacement
- Education through workshops and stakeholder meetings

What you need for a success story?

- A plan to follow
- Implementation of a variety management measures
- Routine monitoring
- Everyone in the watershed onboard
- Time

WPP Updated Timeline -

**Watershed
Plan of
Action
May – Nov
2017**

**Draft WPP
for TCEQ
Review
Jan – Apr
2018**

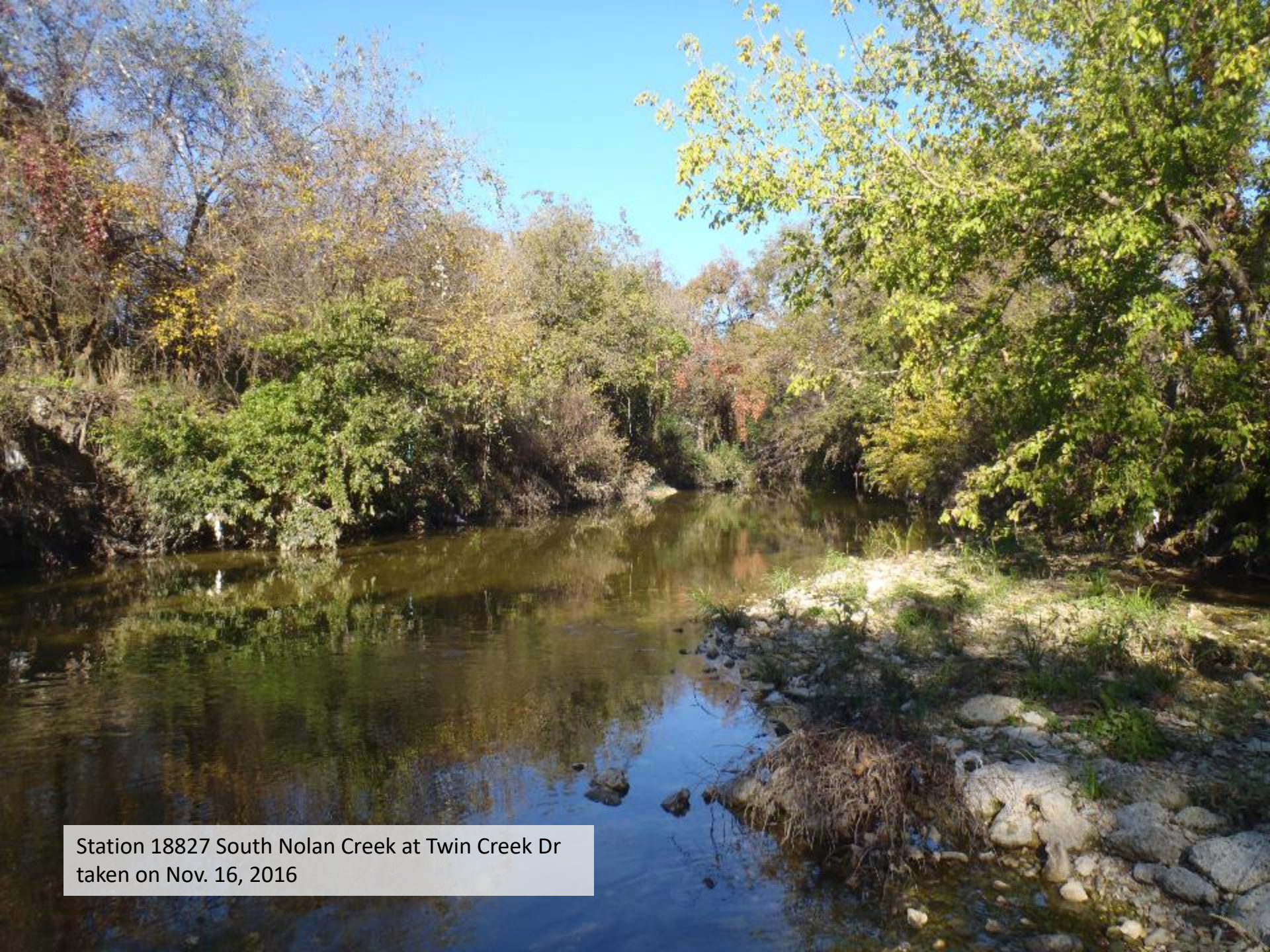
**Draft WPP
for
Stakeholder
Review
Mar - Jul
2018**

**Draft WPP
for EPA
Review
Aug – Oct
2018**

**Response
to
Comments
Nov 2018**

**Final EPA
Approved
WPP
Feb 2019**

**Chapters will be made
available over time, then
the complete document**



Station 18827 South Nolan Creek at Twin Creek Dr
taken on Nov. 16, 2016

Contact Information -

Project Website

<http://www.nolancreekwpp.com/>

PREPARED IN COOPERATION WITH THE TEXAS COMMISSION OF ENVIRONMENTAL QUALITY
AND U.S. ENVIRONMENTAL PROTECTION AGENCY

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