TRINITY RIVER AUTHORITY CLEAN RIVERS PROGRAM 2023 BASIN HIGHLIGHTS REPORT

Trinity River Authority of Texas

Acknowledgements

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Cover Photo: Sampling on the Lower Trinity River at dusk

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Introduction

The Texas Clean Rivers Program

In 1991, Texas Senate Bill 818 created the Clean Rivers Program (CRP). This program is administered by the Texas Commission on Environmental Quality (TCEQ) and is conducted in each of the major river basins by local planning agencies like the Trinity River Authority. The CRP is funded, in part, by fees assessed to water right and wastewater permit holders. The goals of the program are to protect the water resources of the state and to maintain and improve water quality.

Annual Reports

Each year, the local planning agencies produce a Basin Highlights Report which summarizes the CRP activities in their basin. The format of this report varies annually and can include information on events affecting water quality, a summary of water quality data, updates, and an overview of public outreach activities and special projects. Every third biennium, a greatly expanded Basin Summary Report provides a detailed analysis of water quality data and potential sources, as well as offering recommendations for future basin activities. All past reports are available on TRA's Reports webpage at https://www.trinityra.org/basin_planning/clean_rivers_program/reports.php#outer-29.

Goals and Objectives of the TRA CRP

The TRA CRP focuses on three main aspects of the program: water quality monitoring, special projects, and public outreach. Routine water quality monitoring data are vital to the success of the CRP. Data are used for regulatory purposes such as setting water quality standards, constructing models for permit limits, and evaluating the health of waterbodies. In the Trinity River Basin, monitoring is leveraged with the existing programs of several municipalities and other entities. This partnership has allowed TRA to provide much more information to the TCEQ than would be possible with in-house resources.

Special projects are typically short-term sampling activities focused on answering a specific water quality question. Other projects that do not generate water quality data may include in-depth analyses of existing data for various purposes and compilation of historic data sources.

Public outreach and stakeholder engagement involves annual updates to the Steering Committee which helps guide the activities of the TRA CRP. Other outreach activities include sponsorship of trash clean-ups and public education events. Education on the importance and protection of Trinity River Basin water resources is accomplished via participation in organized public and school events.

Trinity Basin and Water Quality Characteristics

The Trinity River extends approximately 715 miles and drains about 18,000 square miles of the state before ending at Trinity Bay near Anahuac. A majority of the basin topography is flat to gently rolling. A large portion of the watershed flows through the Blackland Prairies which lends the river its characteristic muddy brown color. This ecoregion is made up of soil types that, while excellent for row crop agriculture, are highly erodible.

The northern portion of the basin is dominated by the Dallas-Fort Worth (DFW) Metroplex. Legacy pollutants from persistent banned chemicals are a concern. Other results of urban life include storm water runoff that is polluted by oil and grease, pesticides, fertilizers, and animal waste. During the summer months, the native flow of the river in this area is reduced to a trickle generally made up of seeps from groundwater and occasional rainfall events. The larger fraction of summer flow is made up of effluent from wastewater dischargers. This allows the river to maintain a habitat far greater in flow and better water quality than historical levels.

The far northern and middle reaches of the basin are characterized by agriculture. These activities can result in elevated nutrient levels from fertilizer use, bacteria from concentrated animal feeding operations (CAFOs), and soil erosion. Many areas of the basin are also experiencing increased oil and gas drilling activities which can have negative impacts on water quality.

Public Involvement

The TRA participates in several public involvement activities which range from trash clean-ups to public education events. Public interest in the welfare of local water bodies is vital to improving water quality in the Trinity Basin.

The TRA Clean Rivers Program Steering Committee is made up of basin stakeholders and other interested parties, including city officials and the general public. The steering committee provides input and information that is used to guide the program. Annual public meetings are held to update committee members on the activities of the program and to provide a forum to share ideas. If you are interested in participating in the Steering Committee, contact the TRA CRP at tra@trinityra.org.

Trash clean-ups are public events that are organized by cities and counties. TRA staff participate in several of these events. Volunteers at these events remove many tons of debris from water bodies and water ways. In addition to the immediate benefit of the waste removal, volunteers become more aware of their impact on local water bodies.

The Texas Stream Team utilizes a network of trained volunteers to monitor the quality of water bodies in Texas. The Meadows Center at Texas State University administers this program in cooperation with the Texas Commission on Environmental Quality (TCEQ) and the Environmental Protection Agency (EPA). For more information about this program, visit their website hosted by the Texas State University Meadows Center for Water and the Environment at https://www.meadowscenter.txst.edu/Leadership/TexasStreamTeam.html.

In addition to the activities discussed above, the TRA CRP participates in several organized public outreach and education events each year. These range from local Earth Day events to educational field trips for large school groups. At these events, information is presented on the Trinity River Basin as well as the Trinity River Authority. Educational materials are supplied to teach the public about how they can take a personal role in reducing and preventing water pollution. Over the past year, TRA CRP staff have participated in the Environmental and Earth Science Career Day at the University of Texas at Arlington, lead a field lab for Southern Methodist University School of Civil and Environmental Engineering, and participated in several trash clean-ups.

Website

The TRA CRP webpage can be found under the Basin Planning homepage at https://www.trinityra.org/basin_planning/index.php. Information about the TRA Clean Rivers Program activities, reports, and links to helpful resources and data are located under the Clean Rivers Program header. Other information linked from the homepage include information on the Village Creek-Lake Arlington and Joe Pool Lake Watershed Protection Plans, regional water and flood planning, and other environmental initiatives including threatened and endangered species, native freshwater mussels, and turtles.

Routine Water Quality Monitoring

Routine water quality monitoring under the TRA CRP Quality Assurance Project Plan is being conducted by thirteen partner entities as well as TRA; the cities of Arlington, Dallas Water Utilities Watershed Management, Dallas Trinity Watershed Group, Fort Worth, Grand Prairie, Irving, Frisco, and Plano, as well as the DFW Airport Environmental Affairs Department, TRA Lake Livingston Project, North Texas Municipal Water District, Tarrant Regional Water District, Upper Trinity Regional Water District. Monitoring for FY 2023 covers 259 stations throughout the basin. These partner entities have contributed their monitoring efforts to the Clean Rivers Program and have greatly increased the range of the program in the basin. With the cooperation of these partners, TRA has received a four to one return for each dollar spent on monitoring activities. Almost 77% of the TRA CRP monitoring is conducted by these partners. The statewide Coordinated Monitoring Schedule is hosted on the Lower Colorado River Authority website. The FY 2023 monitoring schedule for the Trinity River Basin can be found at https://cms.lcra.org/schedule.aspx?basin=8&FY=2023. This schedule also includes monitoring by the United States Geological Survey, Houston-Galveston Area Council, and TCEQ. An interactive map of the monitoring locations can be found by clicking on the globe icon at the top of the page or by going directly to https://cms.lcra.org/map.aspx?basin=8.

The following list is a generalized summary of the parameters included in each parameter group shown in the coordinated monitoring schedule. The specific parameters collected by each entity and the frequency vary.

- 24-Hour Dissolved Oxygen – 24-hour deployment summary data for Water Temperature, Dissolved Oxygen, pH, and Specific Conductance
- Metals in Water – Total and/or Dissolved Aluminum, Arsenic, Barium, Cadmium, Calcium, Chromium, Copper, Iron, Lead, Magnesium, Manganese, Nickel, Potassium, Selenium, Silver, Sodium, and Zinc
    - Metals can be toxic to aquatic life; the toxicity of metals decreases with increasing hardness levels. Metals can be mobilized from sediments, released from surrounding geology, or from various industrial uses and processes.
- Organics in Water – Total Petroleum Hydrocarbons
    - Total Petroleum Hydrocarbons are a mixture of chemicals that can include any of the products of petroleum processing such as oil, fuel, solvents.
- Conventionals – Total Alkalinity, Biochemical Oxygen Demand, Chemical Oxygen Demand, Total and Dissolved Organic Carbon, Chlorophyll-*a*, Pheophytin-*a*, Phytoplankton Density, Hardness, Nitrogen series, Phosphorus series, Solids, Bromide, Fluoride, Chloride, Sulfate, Silica, and Turbidity
    - Total Alkalinity – A measure of the buffering capacity of water and its ability to resist rapid pH changes. Sources are generally the surrounding geology.
    - Chlorophyll-*a* – Photosynthetic pigment that is found in all green plants. The concentration of Chlorophyll-*a* is used to estimate phytoplankton biomass in surface water.
    - Nitrogen series,
        - Ammonia – Substance found in water and wastewater that is a nutrient for algal growth. Sources can include human and animal waste and fertilizers.
        - Nitrate – The fraction of Nitrogen that is readily available for plants and algae. High levels of Nitrate in drinking water can cause methemoglobinemia, especially in infants.
        - Nitrite – Reduction of Nitrate. Nitrite is the intermediate that oxidizes iron in the blood to methemoglobin and reduces oxygen-carrying capacity.
    - Phosphorus series,
        - Orthophosphate – The inorganic fraction of Phosphorous most commonly found in water, generally the limiting nutrient for plant growth.
        - Total Phosphorus – The total of all Phosphorus and can lead to eutrophication.
    - Solids
        - Total Dissolved Solids – The total amount of inorganic and organic material dissolved in water.
        - Total Suspended Solids – The total amount of nonfilterable inorganic and organic material suspended in water.
        - Volatile Suspended Solids – The total amount of nonfilterable inorganic and organic material that suspended in water that volatilizes when baked at high temperatures.
    - Chloride – One of the major ions in water and wastewater. Concentrations can be increased by industrial processes. High Chloride concentrations can affect metallic objects and growing plants.

    - Sulfate – A naturally occurring substance commonly found in the water column that may cause digestive issues when in drinking water at high concentration levels.
- Bacteria – *E. coli*
    - Escherichia coli (*E. coli*) – A gram negative rod-shaped bacterium that can be an ideal indicator of environmental samples for fecal contamination. 0157:H7 is the illness causing strain of *E. Coli*.
- Flow – Flow Severity, Instantaneous Flow or Flow Estimate, and Flow Measurement Method
    - Flow – Quantity of water moving through a stream at a given point measured in cubic feet per second.
- Field – Air and Water Temperature, Dissolved Oxygen, pH, Specific Conductance, drought parameters, Secchi Depth, Water Column Depth, and Turbidity
    - Temperature – Lower water temperatures have a higher oxygen saturation potential.
    - Dissolved Oxygen – The measure of the amount of Oxygen that is freely available in water. It is vital to fish and other aquatic life. Dissolved oxygen is widely accepted as the single most important indicator of a waterbody's ability to support desirable aquatic life. It can be affected by water temperature, algal activity, decaying organic matter, and chemical or wastewater spills.
    - pH – Measures how acidic or basic the water is. It can be affected by algal activity, alkalinity, and humic or tannic acids.
    - Specific Conductance – The measure of water's ability to conduct an electrical current due to the amount of dissolved solids in the water. Value is corrected to standard temperature (25ºC). This is the most commonly reported value.
    - Secchi Depth – Measures the clarity of the water and can be affected by algal activity and suspended solids.

Assessments

TCEQ releases an assessment of all waterbodies in the state every two years. The homepage for the *Texas Integrated Report of Surface Water Quality for Clean Water Act Sections 305(b) and 303(d)* can be found at https://www.tceq.texas.gov/waterquality/assessment. The Integrated Report (IR), describes the attainment of designated uses by each waterbody. Designated uses include:

- Aquatic Life Use – "Assessment of dissolved oxygen criteria, toxic substances in water criteria, ambient water and sediment toxicity test results, and indices for habitat, benthic macroinvertebrate and fish community" to protect the health of aquatic life.
- General Use – Assessment of Water Temperature, pH, Chloride, Sulfate, Total Dissolved Solids, Chlorophyll-*a*, and nutrients to "safeguard general water quality, rather than for protection of one specific use." Fish kill reports are assessed under this category as well.

- Recreation Use – Assessment of *E. coli* in fresh water or *Entercoccus* in tidal waters to protect the health of humans recreating in waterbodies.
- Fish Consumption Use – Assessment of several toxic substances in fish tissue to protect human health. Sampling is conducted by the Texas Department of State Health Services.
- Domestic Water Supply Use – Assessment of several metals, organic compounds, Fluoride, and Nitrate in waterbodies designated as domestic water supplies to protect human health.

Below is a simplified outline of the six possible findings of the assessment and the requirements for each of these classifications. A full description of the assessment process is available in the *2022 Guidance for Assessing and Reporting Surface Water Quality in Texas* which is located at https://www.tceq.texas.gov/downloads/water-quality/assessment/integrated-report-2022/2022-guidance.pdf.

1. Fully Supporting
    a. Data are assessed against a water quality standard
    b. A sufficient number of data points are available for assessment (for example: 10 data points)
    c. A majority of the data set is meeting the water quality standard
2. Not Supporting
    a. Data are assessed against a water quality standard
    b. A sufficient number of data points are available for assessment (for example: 10 data points)
    c. A specified number of data points (dependent on the total number of data points in the sample set) are not meeting the water quality standard
3. No Concern
    a. For Near Non-Attainment
        i. Data are assessed against a water quality standard
        ii. Less than a sufficient number of data points are available for assessment (for example: 4 to 9 data points)
        iii. A majority of the data set is meeting the water quality standard
    b. For Screening Level
        i. Data are assessed against a screening level
        ii. A sufficient number of data points are available for assessment (for example: 4 data points)
        iii. A majority of the data set is meeting the screening level
4. Concern
    a. For Near Non-Attainment
        i. Data are assessed against a water quality standard
        ii. Less than a sufficient number of data points are available for assessment (for example: 4 to 9 data points)
        iii. A specified number of data points (dependent on the total number of data points in the sample set) are not meeting the water quality standard
    b. For Screening Level
        i. Data are assessed against a screening level

ii. A sufficient number of data points are available for assessment (for example: 4 data points)
iii. A specified number of data points (dependent on the total number of data points in the sample set) are not meeting the screening level

Fish Consumption Use

Because Fish Consumption Use impairments cannot be addressed by CRP sampling, they will be summarized in this section. Most impairments for Fish Consumption Use are based on elevated levels of PCBs and Dioxin in fish tissue as shown in Table 1. Sampling for fish tissue and issuance of advisories and bans is conducted by the Texas Department of State Health Services. Details for these advisories and bans can be found at https://www.dshs.texas.gov/seafood-aquatic-life-group/information-on-consumption-advisories-possession-bans-rescinded-orders-seafood-aquatic-life.

Production of PCBs has been banned since 1979. There are various items manufactured prior to 1979 that may still be in use. These items can include electrical transformers, fluorescent light ballasts, building materials such as caulks and paints, and carbonless copy paper. Additionally, there is some inadvertent production of PCBs particularly in the manufacture of pigments and dyes. Inadvertent PCBs are regulated by EPA. In general, PCBs that are currently in the environment came from historic uses and may continue to make their way into water bodies from various sources including leaking electrical transformers and improperly maintained waste facilities. Unlike PCBs, Dioxins are not banned and are not intentionally produced for any commercial purpose. They are by-products of other activities such as fuel combustion, pesticide and herbicide manufacturing, and paper pulp bleaching. Flooding of waste facilities such as landfills and salvage yards or manufacturing facilities could transport PCBs and Dioxins into water bodies. Additionally, flooding can mobilize stream and reservoir sediments and push these contaminants downstream. Both PCBs and Dioxins are persistent in the environment and there is very little that can be done to solve the problem other than natural attenuation.

Table 1: Findings of TCEQ 2022 Texas Integrated Report for Fish Consumption Use

Segment	Waterbody	Parameter	Finding	Species Affected
0808	West Fork Trinity River below Eagle Mountain Reservoir	PCBs & Dioxins	NS	All species
0807	Lake Worth	PCBs & Dioxins	NS	Blue Catfish, Flathead Catfish, Common Carp, Freshwater Drum, Smallmouth Buffalo, Striped Bass, White Bass
0829	Clear Fork Trinity River Below Benbrook Lake	PCBs & Dioxins	NS	All species
0829A	Lake Como	PCBs & Dioxins	NS	Common Carp
0829A	Lake Como	Dieldrin	NS	Common Carp
0829A	Lake Como	Arsenic	CS (Carry Forward)	
0806		PCBs & Dioxins	NS	All species
0806B	Echo Lake	PCBs & Dioxins	NS	Common Carp, Largemouth Bass

Segment	Waterbody	Parameter	Finding	Species Affected
0806B	Echo Lake	Dieldrin	NS	Common Carp, Largemouth Bass
0806A	Fosdic Lake	PCBs	NS	Common Carp
0806A	Fosdic Lake	Arsenic	CS (Carry Forward)	
0841	Lower West Fork Trinity River	PCBs & Dioxins	NS	All species
0841A	Mountain Creek Lake	PCBs & Dioxins	NS	Channel Catfish, Flathead Catfish, Common Carp, Freshwater Drum, Smallmouth Buffalo, Largemouth Bass, White Bass
0805	Upper Trinity River	PCBs & Dioxins	NS	All species
0804	Trinity River Above Lake Livingston	PCBs & Dioxins	NS	Blue Catfish, Flathead Catfish, Freshwater Drum, Gar (all species), Smallmouth Buffalo, Striped Bass, White Bass
0803G	Lake Madisonville	Mercury	NS	Largemouth Bass
0803	Lake Livingston	PCBs & Dioxins	NS	Blue Catfish, Flathead Catfish, Freshwater Drum, Gar (all species), Smallmouth Buffalo, Striped Bass, White Bass
0802	Trinity River Below Lake Livingston	PCBs & Dioxins	NS	Blue Catfish, Flathead Catfish, Freshwater Drum, Gar (all species), Smallmouth Buffalo, Striped Bass, White Bass

Water Quality

The following sections discuss the concerns and impairments identified in the TCEQ 2022 Texas Integrated Report for each classified and unclassified segment. Classified segments are waterbodies that are defined in Appendix A of the *Texas Surface Water Quality Standards* which can be found at https://www.tceq.texas.gov/waterquality/standards. Unclassified waterbodies are not defined in Appendix A and are identified by the segment number of the waterbody into which they flow followed by a letter suffix.

Each section presents a map and description of the segment, a summary of the monitoring and assessment findings, a discussion of water quality data in support of those findings, recommendations, and any other water quality activities occurring in those segments.

West Fork Trinity River

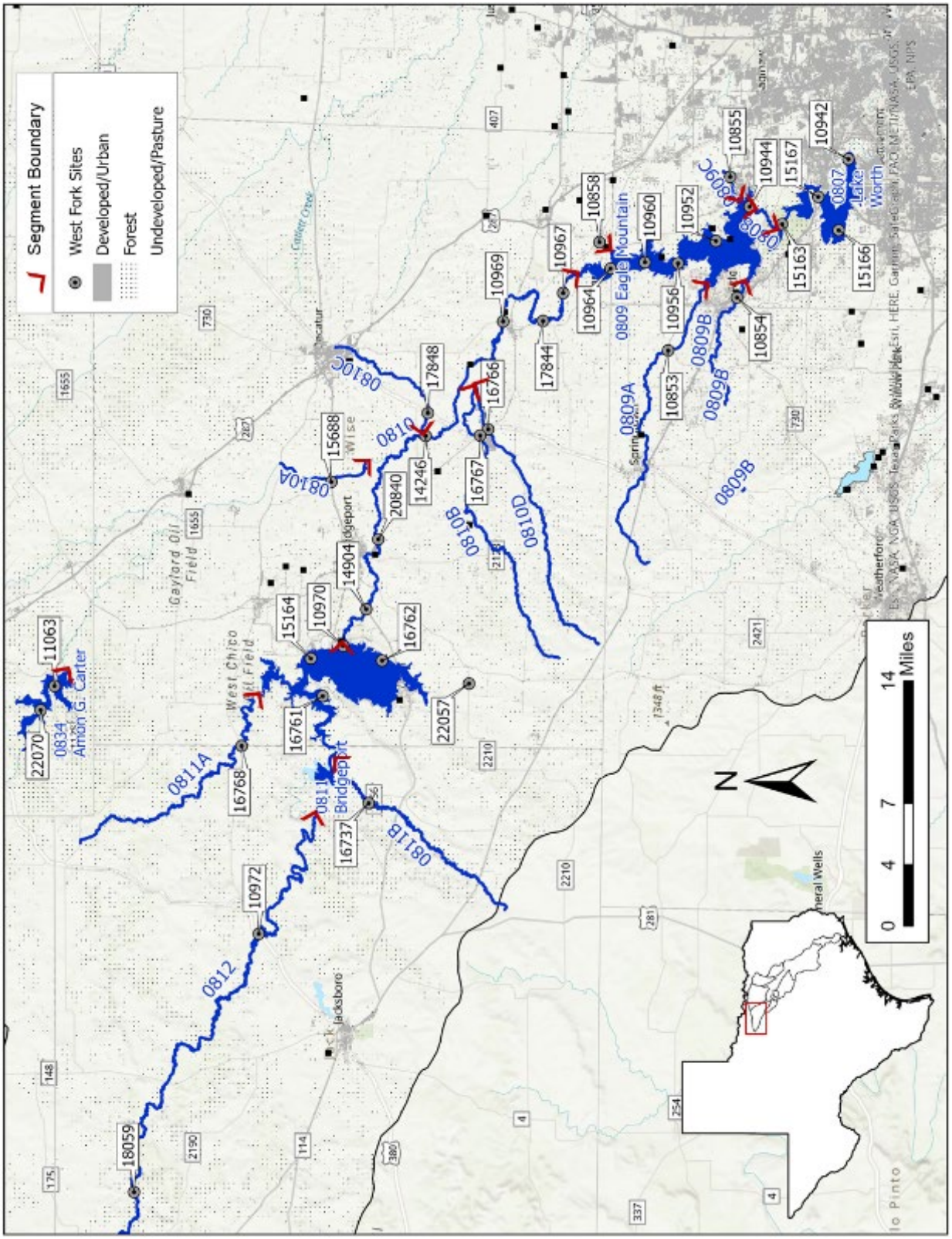

Figure 1: Map of segments and stations of the West Fork Trinity River subwatershed

0812 – West Fork Trinity River above Bridgeport

Figure 2: West Fork Trinity River upstream of SH 59 northeast of Jacksboro

This 97-mile segment begins immediately upstream of the confluence of Bear Hollow in Jack County and continues to State Highway 79 in Archer County (see Figure 1). Segment 0812 has its headwaters in the Broken Red Plains and flows into the Western Cross Timbers. The vast majority of this segment is rural with the predominant land use being grassland.

Clean Rivers Program water quality monitoring is being conducted at one site within this segment as shown in Table 2. Monitoring is being conducted by Tarrant Regional Water District. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 2: FY2023 Monitoring stations in Segment 0812

Assessment Unit	Station Description	Station ID	Collecting Entity
0812_01	WEST FORK TRINITY RIVER 30 METERS DOWNSTREAM OF SH 59 NORTHEAST OF JACKSBORO	10972	Tarrant Regional Water District

A summary of the concerns and impairments identified in the TCEQ 2022 Texas Integrated Report is shown in Table 3.

Table 3: Findings of TCEQ 2022 Texas Integrated Report for Segment 0812

Assessment Unit	Use	Parameter	Criteria	Finding
0812_01	General Use	Total Dissolved Solids	500 mg/L	NS
0812_01	General Use	Chloride	100 mg/L	NS
0812_01	Recreation Use	*E. coli*	126 MPN/100 mL	NS
0812_02	General Use	Total Dissolved Solids	500 mg/L	NS
0812_02	General Use	Chloride	100 mg/L	NS

The 2022 TCEQ Integrated Report identified impairments for Total Dissolved Solids and Chloride in Assessment Units 0812_01 and 0812_02. These parameters are assessed as a segment-wide average. As shown in Figure 3 for Total Dissolved Solids, these parameters are generally reported below their associated standards of 500 and 100 mg/L, respectively, except during periods of drought. This indicates that concentrations of these parameters increased due to evaporation during drought periods.

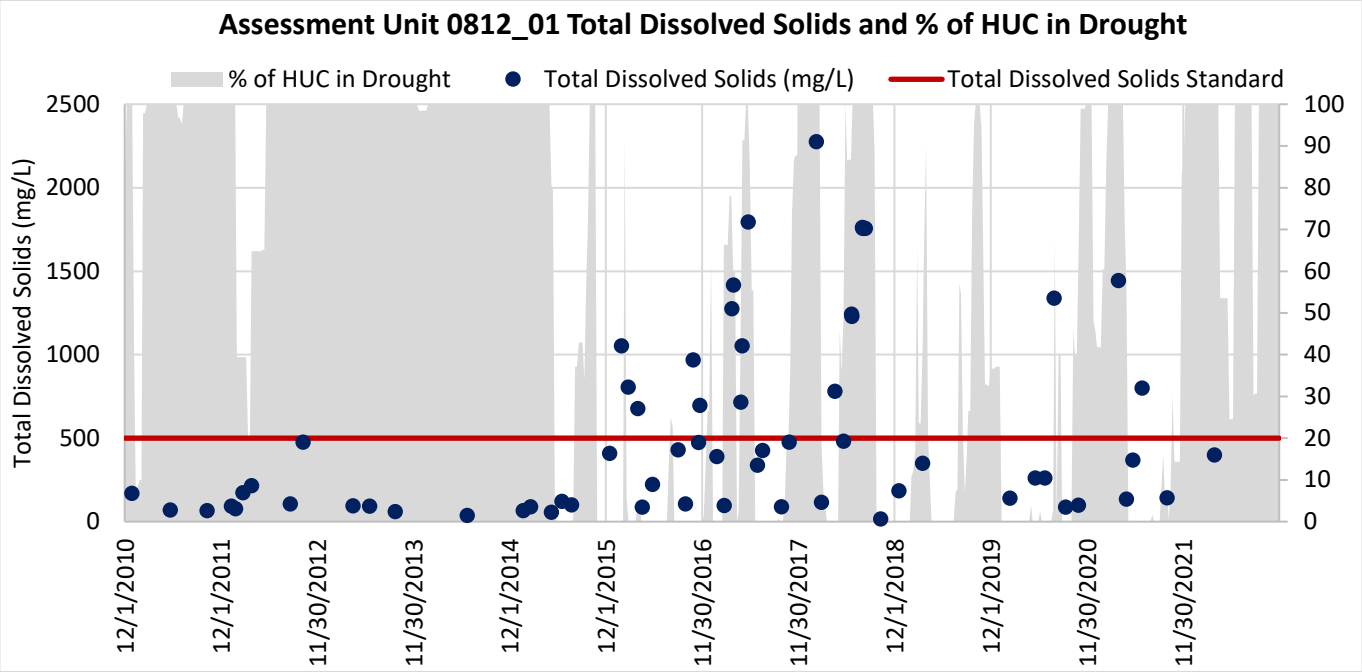

Figure 3: Assessment Unit 0812_01 Total Dissolved Solids and % of HUC in Drought

As shown in Figure 4, there is no relationship between *E. coli* and drought condition. 84% of *E. coli* were reported above the standard of 126 MPN/100 ML. There is evidence of livestock trails entering the river upstream of Station 10972 (see Figure 5). Landowner education and livestock best management practices could reduce *E. coli* loadings in this segment.

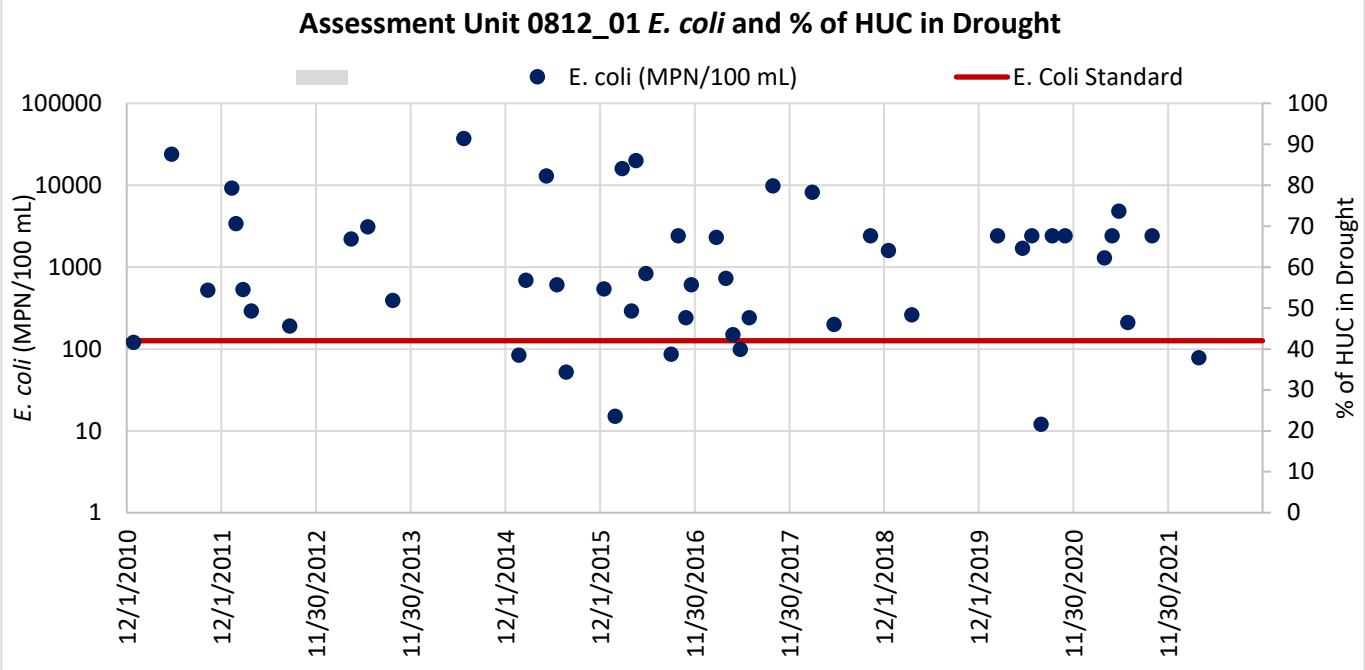

Figure 4: Assessment Unit 0812_01 E. coli and % of HUC in Drought

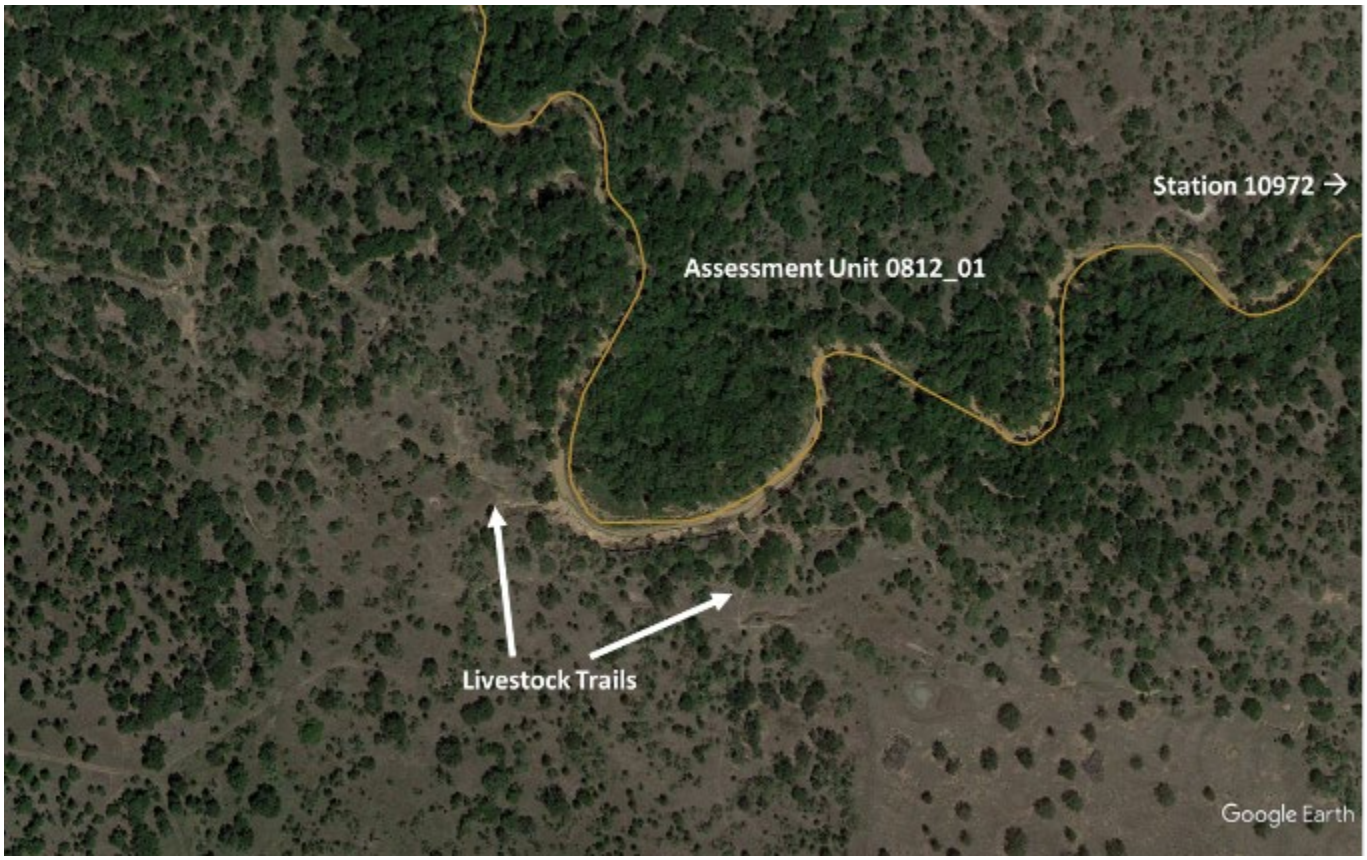

Figure 5: Livestock trails entering stream

0811 – Bridgeport Reservoir

This 10,784-acre segment impounds the West Fork Trinity River from the Bridgeport Dam in Wise County to the confluence of Bear Hollow in Jack County, up to a normal pool elevation of 836 feet (see Figure 1). Bridgeport Reservoir lies within the Western Cross Timbers ecoregion. The majority of the land directly around the reservoir is rural with grassland being the predominant land use. There are some areas of development directly adjacent to the reservoir especially along the eastern and southern shores.

Clean Rivers Program water quality monitoring is being conducted at five sites within this segment as shown in Table 4. Monitoring is being conducted by Tarrant Regional Water District. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 4: FY2023 Monitoring stations in Segment 0811

Assessment Unit	Station Description	Station ID	Collecting Entity
0811_03	LAKE BRIDGEPORT 178 METERS WEST AND 187 METERS SOUTH OF NORTH EDGE OF DAM	10970	Tarrant Regional Water District
0811_04	LAKE BRIDGEPORT AT NORTH END OF MAIN BODY OF RESERVOIR 10 METERS NORTH AND 1.21 KM WEST OF INTERSECTION OF VALLEY STREET AND FM 2952	15164	Tarrant Regional Water District
0811_05	LAKE BRIDGEPORT WEST FORK CHANNEL 27 M WEST OF STEELE ISLAND 1.07 KM N AND 400 M W OF INTERSECTION OF EL LAGO RD AND BETTY DR	16761	Tarrant Regional Water District
0811_01	LAKE BRIDGEPORT MAIN CHANNEL 0.8KM EAST OF RATTLESNAKE ISLAND 636 M N AND 180 M W OF INTERSECTION OF E BAY DR AND PRIVATE RD 1505	16762	Tarrant Regional Water District
0811	WILLOW CREEK AT WISE COUNTY ROAD 2210 SOUTH OF RUNAWAY BAY	22057	Tarrant Regional Water District

A summary of the concerns and impairments identified in the TCEQ 2022 Texas Integrated Report is shown in Table 5.

Table 5: Findings of TCEQ 2022 Texas Integrated Report for Segment 0811

Assessment Unit	Use	Parameter	Criteria	Finding
0811_01	General Use	Nutrients	Nutrient Reservoir Criteria	NS
0811_02	General Use	Nutrients	Nutrient Reservoir Criteria	NS
0811_03	General Use	Nutrients	Nutrient Reservoir Criteria	NS
0811_04	General Use	Nutrients	Nutrient Reservoir Criteria	NS
0811_05	General Use	Nutrients	Nutrient Reservoir Criteria	NS

The 2022 TCEQ Integrated Report identified impairments for Nutrients in Assessment Units 0811_01 through 0811_05. These parameters are based on the Assessment Unit 0811_03 for the whole of the reservoir. As seen in Figure 6, 50% Chlorophyll-*a* for this assessment unit was found to be over the standard of 5.32 for this parameter. The Total Nitrogen and Phosphorous

throughout the reservoir show little variation, with the ranges being 0.5 (mg/L) to 0.55 (mg/L) and 0.02 (mg/L) to 0.04 (mg/L) respectively, but the Chlorophyll-*a* average is highest towards the northern arms where the riverine portion is found, with only Assessment Unit 0811_01 averaging under the standard at 5.2 (ug/L). The other Assessment units ranged from 5.9 (ug/L) to 6.9 (ug/L). This could suggest an influence of the river flowing into the reservoir but there is currently no Chlorophyll-*a* data for the Trinity River above Bridgeport Reservoir. Future collection of Chlorophyll-*a* data could help determine if algal populations are being introduced to the reservoir from the river.

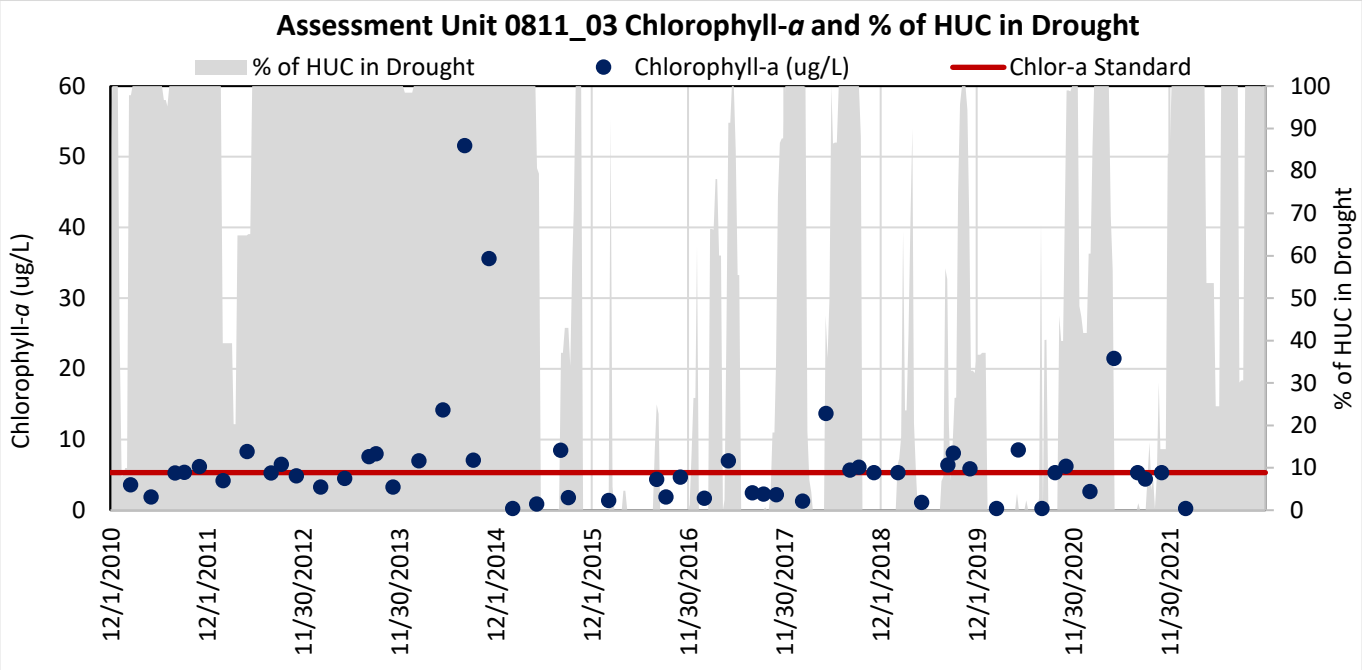

Figure 6: Assessment Unit 0811_03 Chlorophyll-a and % of HUC in Drought

0811A – Big Creek

This unclassified segment runs approximately 23 miles from the headwaters adjacent to FM 2127 in Jack County to the confluence with Bridgeport Reservoir at normal pool elevation (see Figure 1). It lies within the Western Cross Timbers ecoregion. The watershed around this stream is predominately rural with grassland and forested areas being the major land uses.

Clean Rivers Program water quality monitoring is being conducted at one site within this segment as shown in Table 6. Monitoring is being conducted by Tarrant Regional Water District. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 6: FY2023 Monitoring stations in Segment 0811A

Assessment Unit	Station Description	Station ID	Collecting Entity
0811A_01	BIG CREEK AT FM 1810 UPSTREAM OF LAKE BRIDGEPORT	16768	Tarrant Regional Water District

A summary of the concerns and impairments identified in the TCEQ 2022 Texas Integrated Report is shown in Table 7.

Table 7: Findings of TCEQ 2022 Texas Integrated Report for Segment 0811A

Assessment Unit	Use	Parameter	Criteria	Finding
0811A_01	Recreation Use	*E. coli*	126 MPN/100 mL	NS

The impairment for *E. coli* in this segment may be due to a mix of point and runoff related sources. As shown in Figure 7, *E. coli* were generally reported above the standard of 126 MPN/100 ML. There is limited flow data in this data set, however, there was a moderate correlation to flow severity (correlation coefficient = 0.48). The highest *E. coli* value were reported within one day of precipitation which indicates the runoff related sources may be the largest contributors. Because of the land use in this watershed, livestock and wildlife are the likely sources of bacteria in this stream. Landowner education and livestock best management practices may help reduce bacterial loading in this segment.

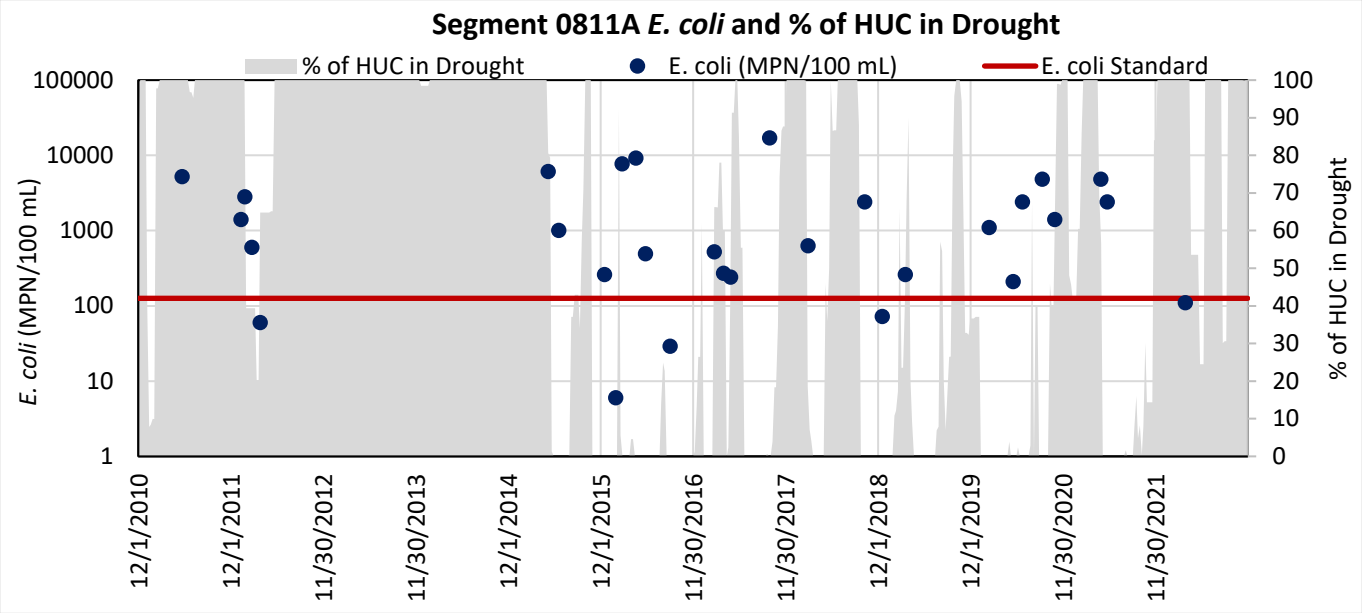

Figure 7: Segment 0811A E. coli and % of HUC in Drought

0811B – Beans Creek

Beans Creek is a perennial stream that runs approximately 19 miles from the headwaters approximately 4.4 km north of Perrin in Jack County to the confluence with Bridgeport Reservoir at normal pool elevation (see Figure 1). It lies within the Western Cross Timbers ecoregion. The watershed is largely rural with the predominate land uses being grassland and forested areas. There are some areas of cultivated crops adjacent to the intersection of the stream and SH114.

Clean Rivers Program water quality monitoring is being conducted at one site within this segment as shown in Table 8. Monitoring is being conducted by Tarrant Regional Water District. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 8: FY2023 Monitoring stations in Segment 0811B

Assessment Unit	Station Description	Station ID	Collecting Entity
0811B_01	BEANS CREEK AT FM 1156 5.2KM UPSTREAM OF BRIDGEPORT LAKE EAST OF WIZARD WELLS	16737	Tarrant Regional Water District

A summary of the concerns and impairments identified in the TCEQ 2022 Texas Integrated Report is shown in Table 9.

Table 9: Findings of TCEQ 2022 Texas Integrated Report for Segment 0811B

Assessment Unit	Use	Parameter	Criteria	Finding
0811B_01	Recreation Use	*E. coli*	126 MPN/100 mL	NS

The impairment for *E. coli* in this segment may be due to a mix of point and runoff related sources. As shown in Figure 8, *E. coli* were generally reported above the standard of 126 MPN/100 ML. There was a moderate correlation to flow severity (correlation coefficient = 0.47). The highest *E. coli* value were reported within two days of precipitation which indicates the runoff related sources may be the largest contributors. However, *E. coli* levels remained elevated up to ten days after precipitation which indicates that there may also be point sources of bacteria into the stream. Because of the land use in this watershed, livestock and wildlife are the likely sources of bacteria in this stream; either due to runoff carrying waste from pastures or from livestock and wildlife visiting the stream for watering. Landowner education and livestock best management practices may help reduce bacterial loading in this segment. Additionally, there is a small community directly adjacent to the sampling station. Improperly functioning septic systems can introduce bacteria into waterbodies. Homeowner education and septic system inspections may help determine if human sources are also contributing to the impairment.

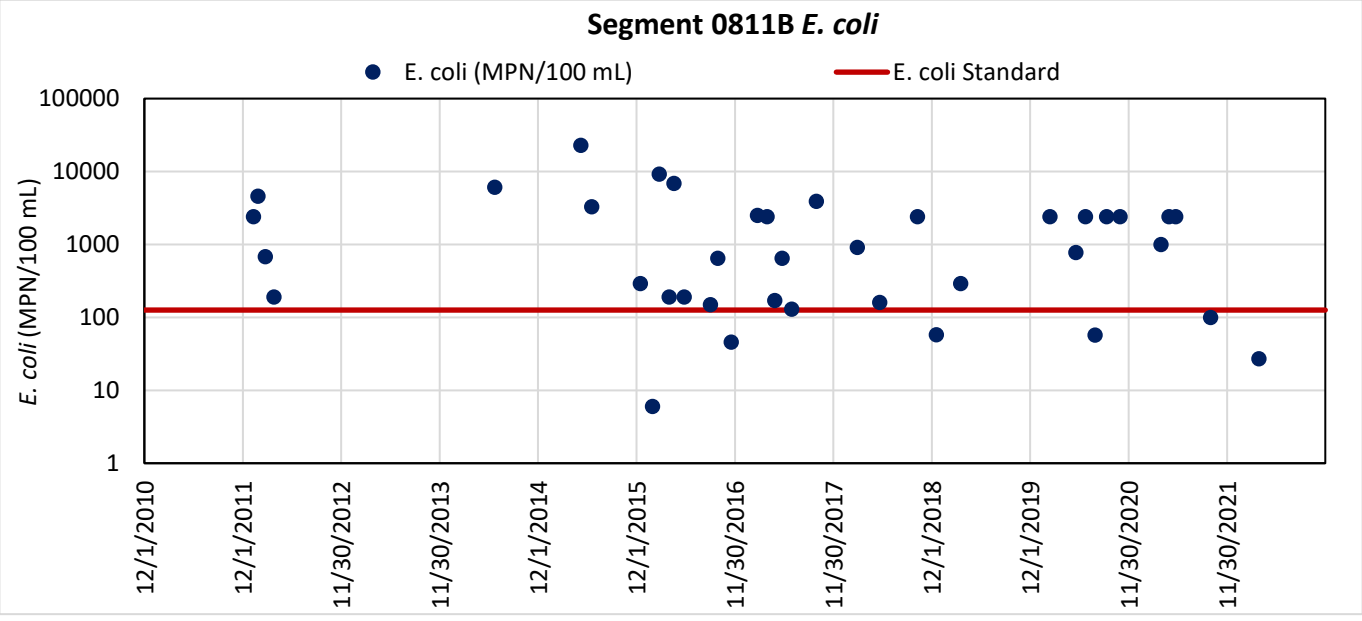

Figure 8: Segment 0811B E. coli

0810 – West Fork Trinity River below Bridgeport

This 43-mile segment begins at Bridgeport Dam in Wise County and continues to 0.4 miles downstream of the confluence of Oates Branch in Wise County (see Figure 1). It flows through the Western Cross Timbers ecoregion. Land use in this segment is a mixture of pasture, hay, and crop lands with smaller areas of grasslands and forest. Developed areas in the watershed are centered mainly around the cities of Chico, Bridgeport, Decatur, Boyd, and Rhome.

Clean Rivers Program water quality monitoring is being conducted at six sites within this segment as shown in Table 10. Monitoring is being conducted by Tarrant Regional Water District. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 10: FY2023 Monitoring stations in Segment 0810

Assessment Unit	Station Description	Station ID	Collecting Entity
0810_01	WEST FORK TRINITY RIVER AT WISE CR 4757/VAN METER BRIDGE	10967	Tarrant Regional Water District
0810_01	WEST FORK TRINITY RIVER 30 METERS DOWNSTREAM OF FM 730 NE OF BOYD	10969	Tarrant Regional Water District
0810_01	WEST FORK TRINITY RIVER 281 METERS DOWNSTREAM OF CONFLUENCE WITH MARTIN BRANCH 2.2 MI SE OF PARADISE	14246	Tarrant Regional Water District
0810_01	WEST FORK TRINITY RIVER AT BOBO BRIDGE ON WISE CR 4668 SOUTH OF BOYD	17844	Tarrant Regional Water District
0810_02	WEST FORT TRINITY RIVER IMMEDIATELY DOWNSTREAM OF US 380 1.8 MI SW OF BRIDGEPORT	14904	Tarrant Regional Water District
0810_02	WEST FORK TRINITY RIVER BELOW BRIDGEPORT RESERVOIR AT SH 114 APPROX 333 METERS SOUTH AND 647 METERS EAST OF THE INTERSECTION OF SH 114 AND INDUSTRIAL BOULEVARD IN WISE COUNTY	20840	Tarrant Regional Water District

A summary of the concerns and impairments identified in the TCEQ 2022 Texas Integrated Report is shown in Table 11.

Table 11: Findings of TCEQ 2022 Texas Integrated Report for Segment 0810

Assessment Unit	Use	Parameter	Criteria	Finding
0810_01	General Use	Chlorophyll-*a*	14.1 ug/L	CS (Carry Forward)
0810_01	Recreation Use	*E. coli*	126 MPN/100 mL	NS

The concern for Chlorophyll-*a* was carried forward from previous assessments. Only three data points were available for the period of record for this report and two of those exceeded the screening level of 14.1 ug/L. It is recommended that Chlorophyll-*a* be collected in order to determine if this concern still exists.

An impairment for *E. coli* was identified in Assessment Unit 0810_01. Monitoring has been conducted at Stations 10967, 10969, 14246, and 17844. Geometric means at these stations ranged from 133 to 345 MPN/100 ML and there was little correlation to flow, flow severity, or days since precipitation. As shown in Figure 9 for Station 10969, *E. coli* levels were regularly reported above the standard of 126 MPN/100 ML. This indicates that a mix of point and runoff related sources may be contributing bacteria to the river. The riparian areas of this portion of the segment are forested and much of the remainder of the watershed is grassland and pasture or hay fields. It is likely that both wildlife and livestock are the primary source of bacteria in this portion of the river with loads being introduced via runoff and direct deposition when animals visit the river for water. Landowner education and livestock best management practices may help reduce bacterial loading in this segment. Additionally, the watershed is a rather densely populated rural area with few permitted discharges. Therefore, failing septic systems may also be contributing bacteria. Homeowner education and septic system inspections may help determine if human sources are also contributing to the impairment.

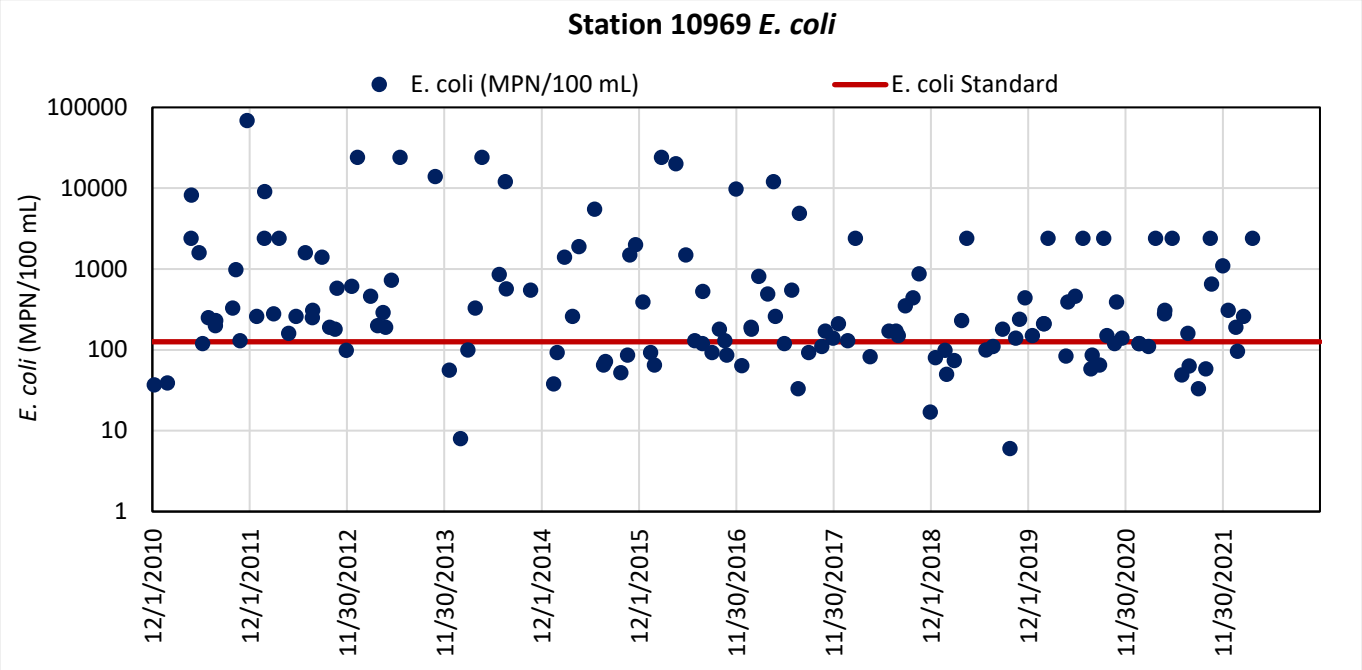

Figure 9: Station 10969 E. coli

0810A – Big Sandy Creek

This unclassified segment runs approximately 7 miles from FM 1810 west of Decatur to the confluence with Waggoner Branch (see Figure 1). It lies within the Western Cross Timbers ecoregion and is surrounded mainly by pasture, hay, and crop land.

Clean Rivers Program water quality monitoring is being conducted at one site within this segment as shown in Table 12. Monitoring is being conducted by Tarrant Regional Water District. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 12: FY2023 Monitoring stations in Segment 0810A

Assessment Unit	Station Description	Station ID	Collecting Entity
0810A_01	BIG SANDY CREEK 42 METERS DOWNSTREAM OF US 380 4.0 MI EAST OF BRIDGEPORT	15688	Tarrant Regional Water District

No impairments or concerns for aquatic life, recreation, or general uses were identified in this segment.

0810B – Garrett Creek

This 18-mile unclassified segment runs from Wise County Road approximately 14 miles upstream of SH114 in Wise County to the confluence with Salt Creek (see Figure 1). It lies within the Western Cross Timbers ecoregion. Land use in this watershed is predominantly rural with pasture, hay, and crop land with some forested areas throughout.

Clean Rivers Program water quality monitoring is being conducted at one site within this segment as shown in Table 13. Monitoring is being conducted by Tarrant Regional Water District. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 13: FY2023 Monitoring stations in Segment 0810B

Assessment Unit	Station Description	Station ID	Collecting Entity
0810B_01	GARRETT/RUSH CREEK AT SH 114 NORTH OF EAGLE MOUNTAIN RESERVOIR NW OF BOYD	16767	Tarrant Regional Water District

No impairments or concerns for aquatic life, recreation, or general uses were identified in this segment.

0810C – Martin Branch

This eight-mile unclassified segment runs from FM 730 south of Decatur in Wise County to the confluence with Center Creek (see Figure 1). The headwaters lie in the Grand Prairie ecoregion and flows into the Western Cross Timbers. The stream begins in the City of Decatur and then travels through rural areas consisting largely of pasture, hay, and crop lands before joining the West Fork Trinity River.

Clean Rivers Program water quality monitoring is being conducted at one site within this segment as shown in Table 14. Monitoring is being conducted by Tarrant Regional Water District. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 14: FY2023 Monitoring stations in Segment 0810C

Assessment Unit	Station Description	Station ID	Collecting Entity
0810C_01	MARTIN BRANCH CENTER CREEK AT FM 51 EAST OF PARADISE	17848	Tarrant Regional Water District

A summary of the concerns and impairments identified in the TCEQ 2022 Texas Integrated Report is shown in Table 15.

Table 15: Findings of TCEQ 2022 Texas Integrated Report for Segment 0810C

Assessment Unit	Use	Parameter	Criteria	Finding
0810C_01	Recreation Use	*E. coli*	126 MPN/100 mL	NS

An impairment for *E. coli* was identified in this segment. Monitoring has been conducted at Stations 10967, 10969, 14246, and 17844. As shown in Figure 10, *E. coli* were generally reported above the standard of 126 MPN/100 ML. The geometric mean was 442 MPN/100 ML and there was little correlation to flow, flow severity, or days since precipitation although the highest levels were reported within four days of precipitation. This indicates that a mix of point and runoff related sources may be contributing bacteria to the river. Based on the land use in the watershed, it is likely that livestock are the source of bacteria in this segment. There are livestock trails visible in Google Earth imagery on both sides of the stream just upstream from station 17848 as shown in Figure 11. Landowner education and livestock best management practices may help reduce bacterial loading in this stream.

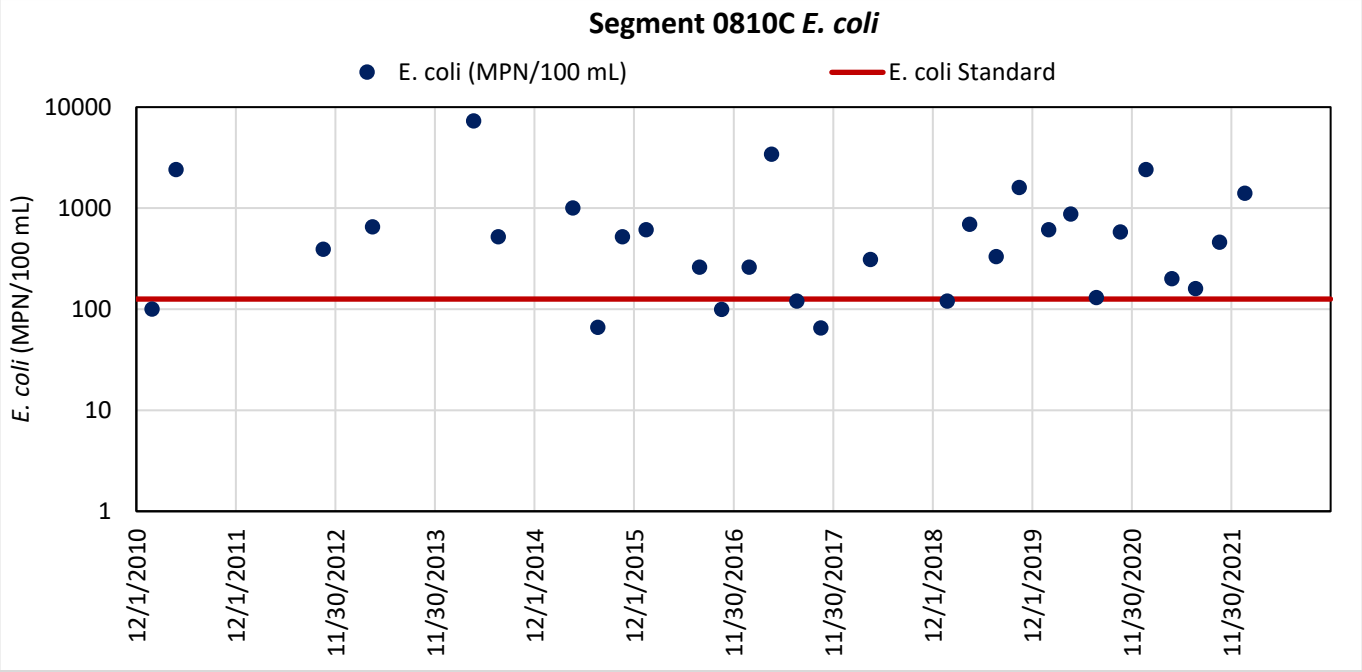

Figure 10: Segment 0810C E. coli

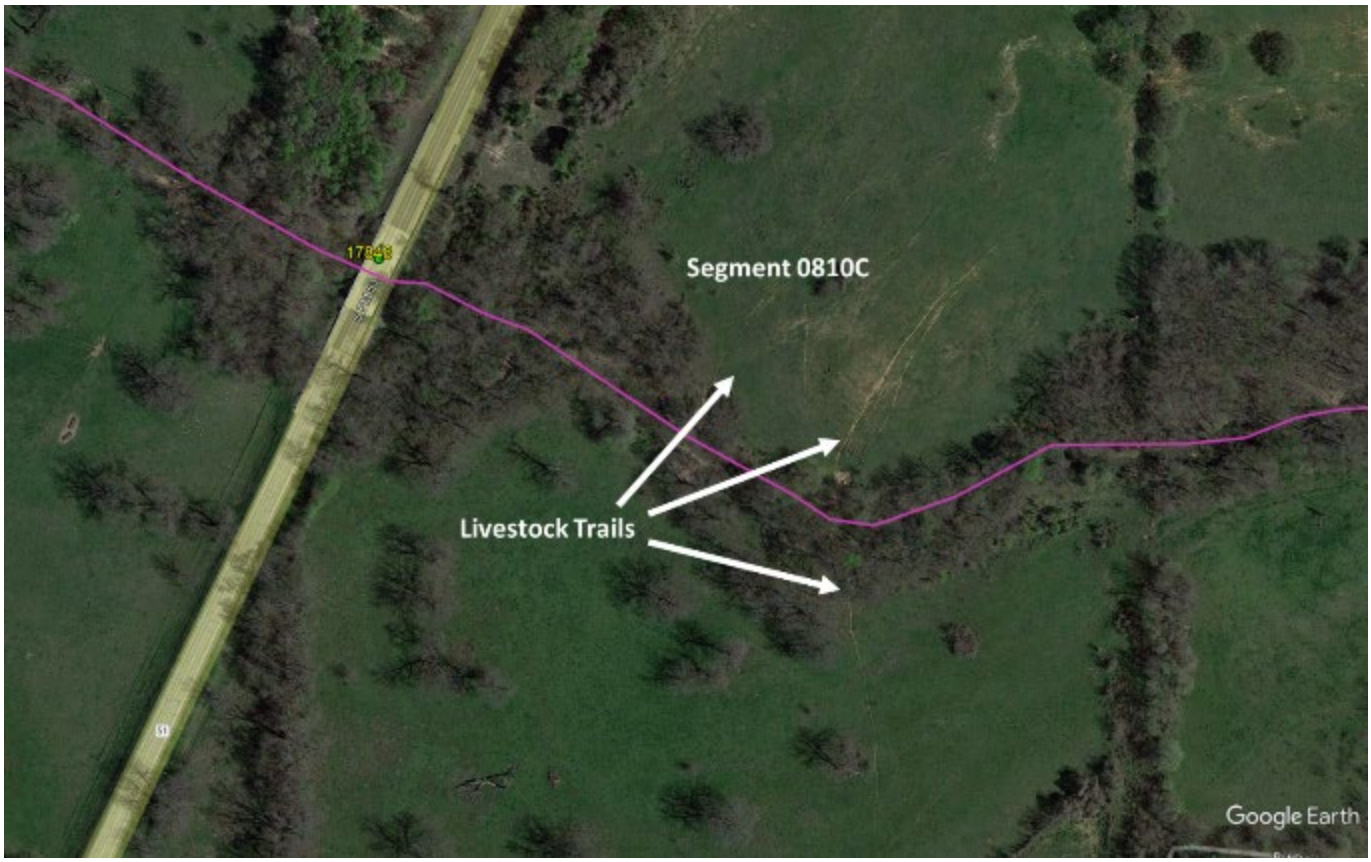

Figure 11: Livestock trails entering stream

0810D – Salt Creek

This 11-mile unclassified segment runs from near SH199 northeast of Poolville to the confluence with Garrett Creek in Wise County (see Figure 1). It lies within the Western Cross Timbers ecoregion. Land use in this watershed is predominantly rural with pasture, hay, and crop land with some forested areas throughout.

Clean Rivers Program water quality monitoring is being conducted at one site within this segment as shown in Table 16. Monitoring is being conducted by Tarrant Regional Water District. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 16: FY2023 Monitoring stations in Segment 0810D

Assessment Unit	Station Description	Station ID	Collecting Entity
0810D_01	SALT CREEK AT SH 114 NORTH OF EAGLE MOUNTAIN RESERVOIR NW OF BOYD	16766	Tarrant Regional Water District

No impairments or concerns for aquatic life, recreation, or general uses were identified in this segment.

0809 – Eagle Mountain Reservoir

This segment covers 8,974 acres and stretches from Eagle Mountain Dam in Tarrant County to a point 0.4 miles downstream of the confluence of Oates Branch in Wise County, up to a normal pool elevation of 649.1 feet (see Figure 1). The western portion of the watershed for Eagle Mountain Reservoir lies in the Western Cross Timbers ecoregion and the eastern portion lies in the Grand Prairie ecoregion. Large sections of land around the lake are classified as developed and the remainder is grassland and pasture.

Clean Rivers Program water quality monitoring is being conducted at five sites within this segment as shown in Table 17. Monitoring is being conducted by Tarrant Regional Water District. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 17: FY2023 Monitoring stations in Segment 0809

Assessment Unit	Station Description	Station ID	Collecting Entity
0809_01	EAGLE MOUNTAIN RESERVOIR 250 METERS NORTH OF EAST EDGE OF DAM	10944	Tarrant Regional Water District
0809_05	EAGLE MOUNTAIN RESERVOIR 1.5 KM W AND 308 METERS S OF INTERSECTION BETWEEN VILLAGE RD AND EAGLE MOUNTAIN PLANT ROAD NEAR TEXAS ELECTRIC	10952	Tarrant Regional Water District
0809_08	EAGLE MOUNTAIN RESERVOIR 645 METERS WEST AND 485 METERS SOUTH OF INTERSECTION OF OAKWOOD LANE AND PEDEN ROAD NEAR COLE SUBDIVISION	10956	Tarrant Regional Water District
0809_10	EAGLE MOUNTAIN RESERVOIR 112 METERS NORTH AND 818 METERS EAST OF INTERSECTION OF MILLER RD AND GANTT ROAD NEAR INDIAN CREEK COVE	10960	Tarrant Regional Water District
0809_12	EAGLE MOUNTAIN RESERVOIR 187 METERS NORTH AND 788 METERS EAST OF INTERSECTION OF BRIAR ROAD AND LIBERTY SCHOOL ROAD NEAR NEWARK BEACH	10964	Tarrant Regional Water District

A summary of the concerns and impairments identified in the TCEQ 2022 Texas Integrated Report is shown in Table 18.

Table 18: Findings of TCEQ 2022 Texas Integrated Report for Segment 0809

Assessment Unit	Use	Parameter	Criteria	Finding
0809_01	Aquatic Life Use	Dissolved oxygen Grab	5 mg/L	CS

The concern for Dissolved Oxygen in Assessment Unit 0809_01 appears to be related to drought conditions and low reservoir elevations. As shown in Figure 12, 14% of the data were reported below the Dissolved Oxygen grab standard of 5 mg/L. Each of the exceedances was reported when the reservoir was between 0.07 and 10.5 feet below conservation pool elevation. All but one of the exceedances occurred when the HUC was noted to be in some level of drought. Additionally, there was a moderately strong correlation to Water Temperature

(correlation coefficient = -0.71). As Water Temperature increases, the saturation potential of Oxygen decreases which generally results in lower Dissolved Oxygen levels. There was no correlation to Chlorophyll-*a* indicating that algal populations were not influencing dissolved oxygen concentrations.

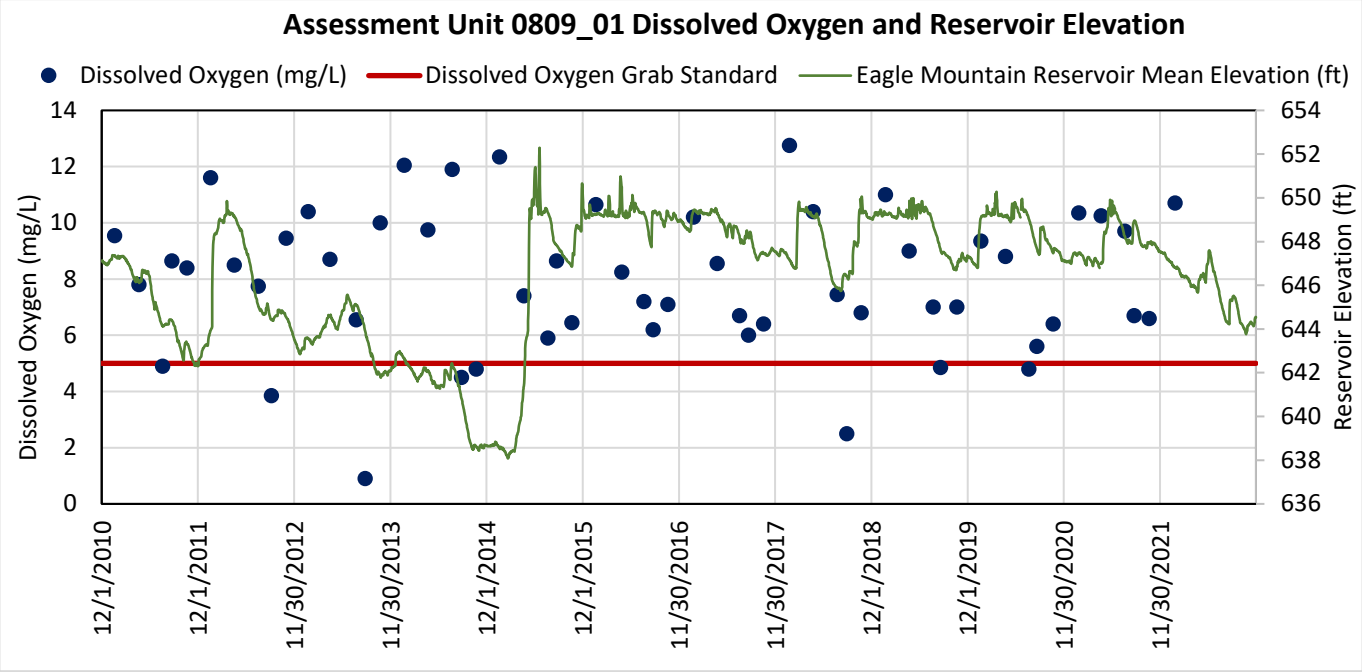

Figure 12: Assessment Unit 0809_01 Dissolved Oxygen and Reservoir Elevation

0809A – Walnut Creek

This unclassified segment runs 20 miles from the headwaters approximately 2.1 mi upstream of State Highway 199 in Parker County to the normal pool elevation of Eagle Mountain Reservoir (see Figure 1). It lies within the Western Cross Timbers ecoregion. The majority of the watershed is rural with pasture, hay, and crop land directly adjacent to the stream. However, the upper portion of the stream flows through the City of Springtown.

Clean Rivers Program water quality monitoring is being conducted at one site within this segment as shown in Table 19. Monitoring is being conducted by Tarrant Regional Water District. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 19: FY2023 Monitoring stations in Segment 0809A

Assessment Unit	Station Description	Station ID	Collecting Entity
0809A_01	WALNUT CREEK AT FM 1542	10853	Tarrant Regional Water District

No impairments or concerns for aquatic life, recreation, or general uses were identified in this segment.

0809B – Ash Creek

This 10-mile unclassified segment runs from the confluence with Mill Branch in Parker County to normal pool elevation of Eagle Mountain Reservoir in Tarrant County (see Figure 1). The downstream end flows through the City of Azle but the remainder of the stream flows through grassland and forested areas.

Clean Rivers Program water quality monitoring is being conducted at one site within this segment as shown in Table 20. Monitoring is being conducted by Tarrant Regional Water District. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 20: FY2023 Monitoring stations in Segment 0809B

Assessment Unit	Station Description	Station ID	Collecting Entity
0809B_01	ASH CREEK 56 METERS DOWNSTREAM OF SH 199 NORTHBOUND SERVICE ROAD	10854	Tarrant Regional Water District

A summary of the concerns and impairments identified in the TCEQ 2022 Texas Integrated Report is shown in Table 21.

Table 21: Findings of TCEQ 2022 Texas Integrated Report for Segment 0809B

Assessment Unit	Use	Parameter	Criteria	Finding
0809B_01	General Use	Nitrate	1.95 mg/L	CS
0809B_01	Recreation Use	*E. coli*	126 MPN/100 mL	NS

A concern for Nitrate was identified in this segment. As shown in Figure 13, 53% of the data were reported above the screening level of 1.95 mg/L. There were no correlations to flow or days since precipitation which indicates that the concern may be due to a mix of point and runoff related sources. There is a discharge point for the City of Azle on Reynolds Branch which confluences with Ash Creek just upstream of Station 10854. Wastewater treatment facilities typically release elevated levels of nutrients as most wastewater treatment facilities do not yet have advanced nutrient removal systems. Nutrient levels in receiving streams can become elevated especially during drought periods due to effluent releases but will generally decrease during elevated flows via dilution from precipitation. However, because Nitrate levels were consistently high runoff from either over-irrigation or precipitation could have washed Nitrate into the stream from animal waste or agricultural or residential fertilizer use.

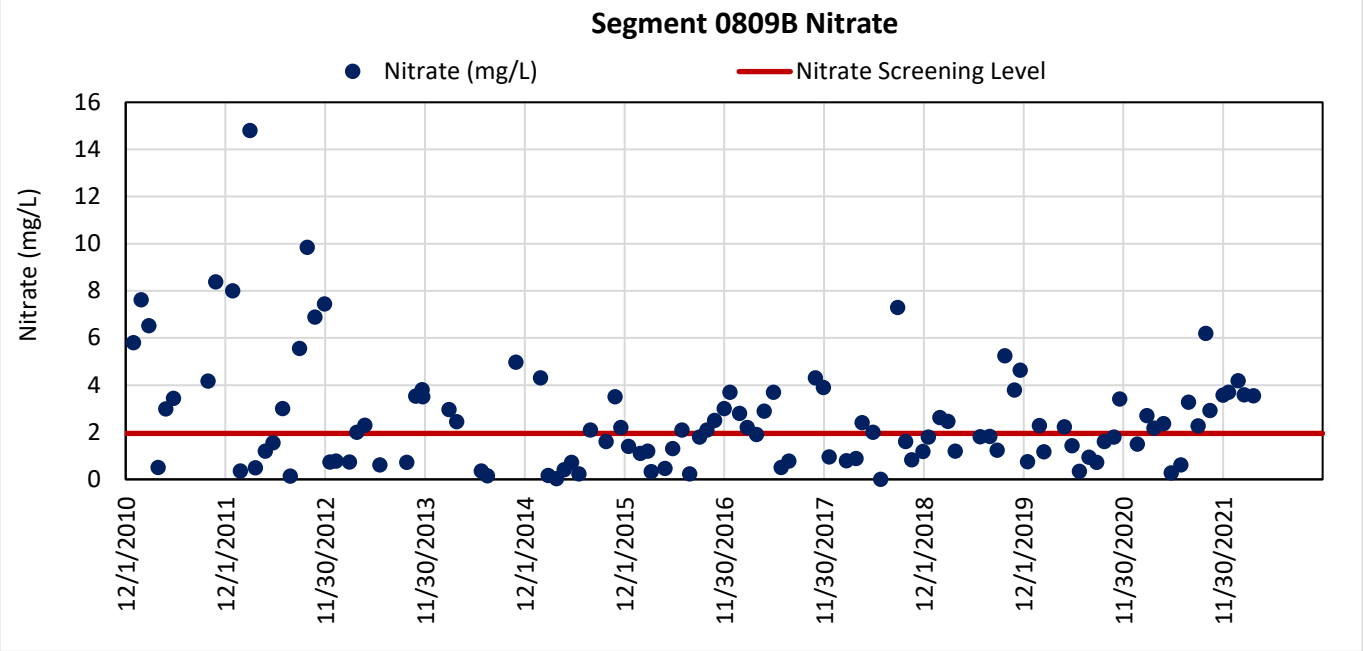

Figure 13: Segment 0809B Nitrate

Similar to Nitrate, the *E. coli* impairment in this segment is not well correlated to flow or days since precipitation although most of the highest values were reported within two days of precipitation. It is moderately correlated to Flow Severity (correlation coefficient =0.46), however this a categorical parameter that represents a broad range of measured flow values. As shown in Figure 14, 75% of the data were reported above the standard of 126 MPN/100 ML. The lack of correlations and the consistently high values indicates that the impairment may be due to a mix of point and runoff related sources. As much of this segment upstream of Azle is rural, livestock, wildlife, and failing septic systems may be contributing bacteria to the stream.

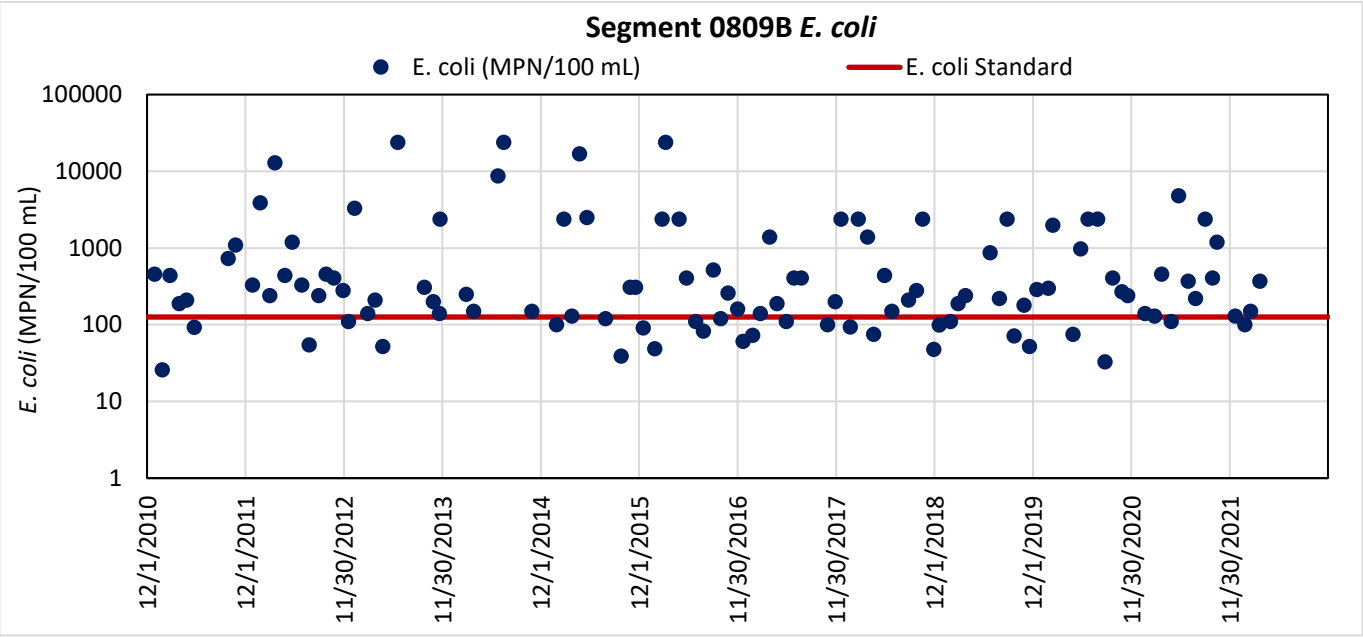

Figure 14: Segment 0809B E. coli

There is a stable immediately upstream of Station 10854 that may be introducing both *E. coli* and Nitrate into the stream. It is recommended that sampling be collected upstream of the stable to determine if this is the source of the elevated levels of these parameters observed at station 10854. Overall, homeowner and landowner education and fertilizer and livestock best management practices may be beneficial in reducing levels of these parameters in this segment.

0809C – Dosier Creek

This unclassified segment runs approximately 1 mile from the confluence with an intermittent stream 1 km upstream of Boat Club Road to the confluence of Dosier Slough cove (see Figure 1). It lies within the Grand Prairie ecoregion and is largely grassland with some pasture and crop land directly adjacent to the stream before it enters Dosier Slough near the south end of Eagle Mountain Reservoir.

Clean Rivers Program water quality monitoring is being conducted at one site within this segment as shown in Table 22. Monitoring is being conducted by Tarrant Regional Water District. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 22: FY2023 Monitoring stations in Segment 0809C

Assessment Unit	Station Description	Station ID	Collecting Entity
0809C_01	DOSIER CREEK AT FM 1220	10855	Tarrant Regional Water District

A summary of the concerns and impairments identified in the TCEQ 2022 Texas Integrated Report is shown in Table 23.

Table 23: Findings of TCEQ 2022 Texas Integrated Report for Segment 0809C

Assessment Unit	Use	Parameter	Criteria	Finding
0809C_01	Recreation Use	*E. coli*	126 MPN/100 mL	NS

E. coli in this segment is very well correlated to flow (correlation coefficient = 0.91). As shown in Figure 15, 67% of the data was reported above the standard of 126 MPN/100 mL. Because *E. coli* levels are both consistently high and well correlated to flow, a mix of both point and runoff related sources may be introducing bacteria into the stream. Based on the land use in the watershed, it is likely that livestock and, to a lesser extent, wildlife are the source of bacteria in this segment. There is evidence of livestock trails in the pastures surrounding and entering the stream. Landowner education and livestock best management practices may be beneficial in reducing bacterial loads in this segment.

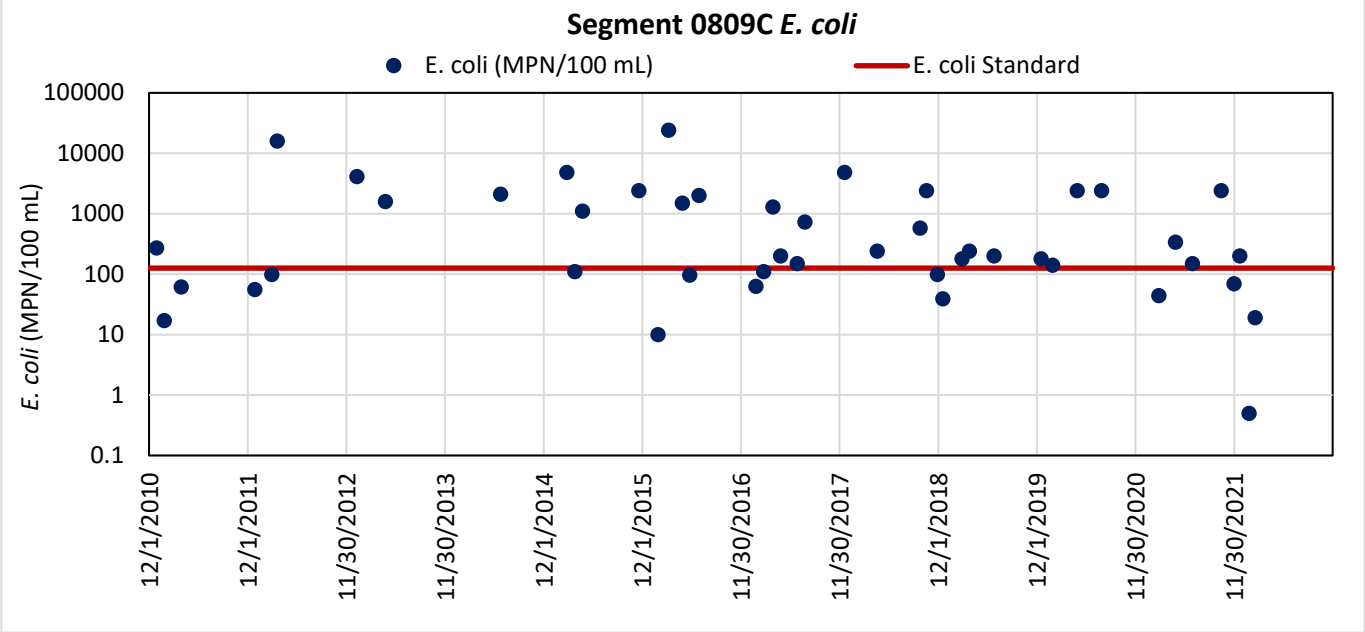

Figure 15: Segment 0809C E. coli

0809D – Derrett Creek

This 1.2-mile unclassified segment runs from an intermittent stream just upstream of FM 718 in the City of Newark to the confluence with Derrett Creek cove (see Figure 1). The upper portion of the watershed flows through the Grand Prairie ecoregion into the Western Cross Timbers just before entering the northern Eagle Mountain Reservoir.

Clean Rivers Program water quality monitoring is being conducted at one site within this segment as shown in Table 24. Monitoring is being conducted by Tarrant Regional Water District. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 24: FY2023 Monitoring stations in Segment 0809D

Assessment Unit	Station Description	Station ID	Collecting Entity
0809D_01	DERRETT CREEK AT CENTRAL AVENUE IN NEWARK EAST OF EAGLE MOUNTAIN LAKE APPROX 1.2KM UPSTREAM OF EAGLE MOUNTAIN LAKE	10858	Tarrant Regional Water District

A summary of the concerns and impairments identified in the TCEQ 2022 Texas Integrated Report is shown in Table 25.

Table 25: Findings of TCEQ 2022 Texas Integrated Report for Segment 0809D

Assessment Unit	Use	Parameter	Criteria	Finding
0809D_01	Recreation Use	*E. coli*	126 MPN/100 mL	NS

An impairment for E. coil was identified in this segment. As shown in Figure 16, 81% of the data were reported above the standard of 126 MPN/100 ML indicating that there are direct sources of bacteria into the stream. There were no correlations to flow or days since precipitation although many of the highest values were reported within one day of precipitation which indicates that runoff may also be contributing bacteria to the stream. There are several pastures upstream of Station 10858 with evidence of livestock trails entering the stream. Landowner education and livestock best management practices may be beneficial in reducing bacterial loads in this segment.

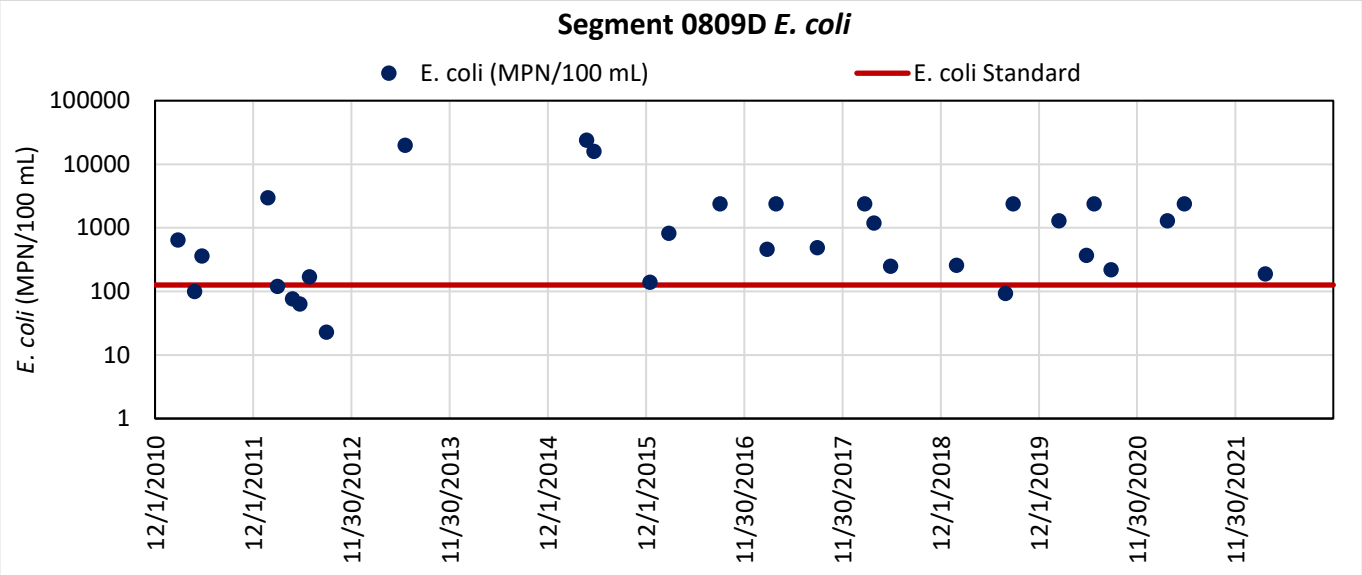

Figure 16: Segment 0809D E. coli

0808 – West Fork Trinity River below Eagle Mountain Reservoir

This 2.5-mile segment runs from Eagle Mountain dam downstream to the headwaters of Lake Worth in Tarrant County (see Figure 1). Land use in this watershed is split between forest and grassland with some pastures. The main channel of this segment lies within the Western Cross Timbers ecoregion but drains the Grand Prairie ecoregion to the east. There is no Clean Rivers Program monitoring scheduled in this segment for FY 2023.

No impairments or concerns for aquatic life, recreation, or general uses were identified in this segment.

0807 – Lake Worth

This segment covers 3,614 acres from Lake Worth Dam in Tarrant County to a point 2.5 miles downstream of Eagle Mountain Dam in Tarrant County up to a normal pool elevation of 594.3 feet (see Figure 1). The watershed for Lake Worth is highly urbanized to the south and east with the remainder being mostly forested areas with some grassland and pastures. The majority of the watershed and reservoir is located in the Grand Prairie ecoregion with the west side of the watershed draining the Western Cross Timbers.

Clean Rivers Program water quality monitoring is being conducted at four sites within this segment as shown in Table 26. Monitoring is being conducted by Tarrant Regional Water District. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 26: FY2023 Monitoring stations in Segment 0807

Assessment Unit	Station Description	Station ID	Collecting Entity
0807_01	LAKE WORTH 546 METERS SOUTH AND 319 METERS EAST OF INTERSECTION OF QUEBEC STREET AND CAHOBA DRIVE MID LAKE NEAR DAM	10942	Tarrant Regional Water District
0807_01	LAKE WORTH MID CHANNEL 35 M DOWNSTREAM OF MOUTH OF WEST FORK OF THE TRINITY RIVER	15163	Tarrant Regional Water District
0807_01	LAKE WORTH AT MOUTH OF SILVER CREEK 957 METERS SOUTH AND 1.08 KM WEST OF INTERSECTION OF SILVER CREEK ROAD AND HERON DRIVE	15166	Tarrant Regional Water District
0807_01	LAKE WORTH MID CHANNEL SOUTH OF SH 199 472 METERS SOUTH AND 298 METERS WEST OF INTERSECTION OF WATERCRESS DRIVE AND SH 199	15167	Tarrant Regional Water District

No impairments or concerns for aquatic life, recreation, domestic water supply, or general uses were identified in this segment.

0834 – Lake Amon G. Carter

This 1,614-acre segment impounds Big Sandy Creek from Amon G. Carter Dam in Montague County up to the normal pool elevation of 920 feet (see Figure 1). Much of the watershed is rural with grassland and forested areas but there is some residential development directly adjacent to the reservoir. This reservoir lies within the Western Cross Timbers ecoregion.

Clean Rivers Program water quality monitoring is being conducted at two sites within this segment as shown in Table 27. Monitoring is being conducted by TCEQ Region 3. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 27: FY2023 Monitoring stations in Segment 0834

Assessment Unit	Station Description	Station ID	Collecting Entity
0834_01	LAKE AMON G. CARTER MID LAKE NEAR DAM 992 METERS EAST OF INTERSECTION OF FM 1125 AND WILLIAMSON ROAD	11063	TCEQ Region 3
0834_01	LAKE AMON G CARTER MIDLAKE 365 METERS SOUTH OF THE SELMA PARK PUBLIC BOAT RAMP IN MONTAGUE COUNTY	22070	TCEQ Region 3

No impairments or concerns for aquatic life, recreation, domestic water supply, or general uses were identified in this segment.

Clear Fork Trinity River

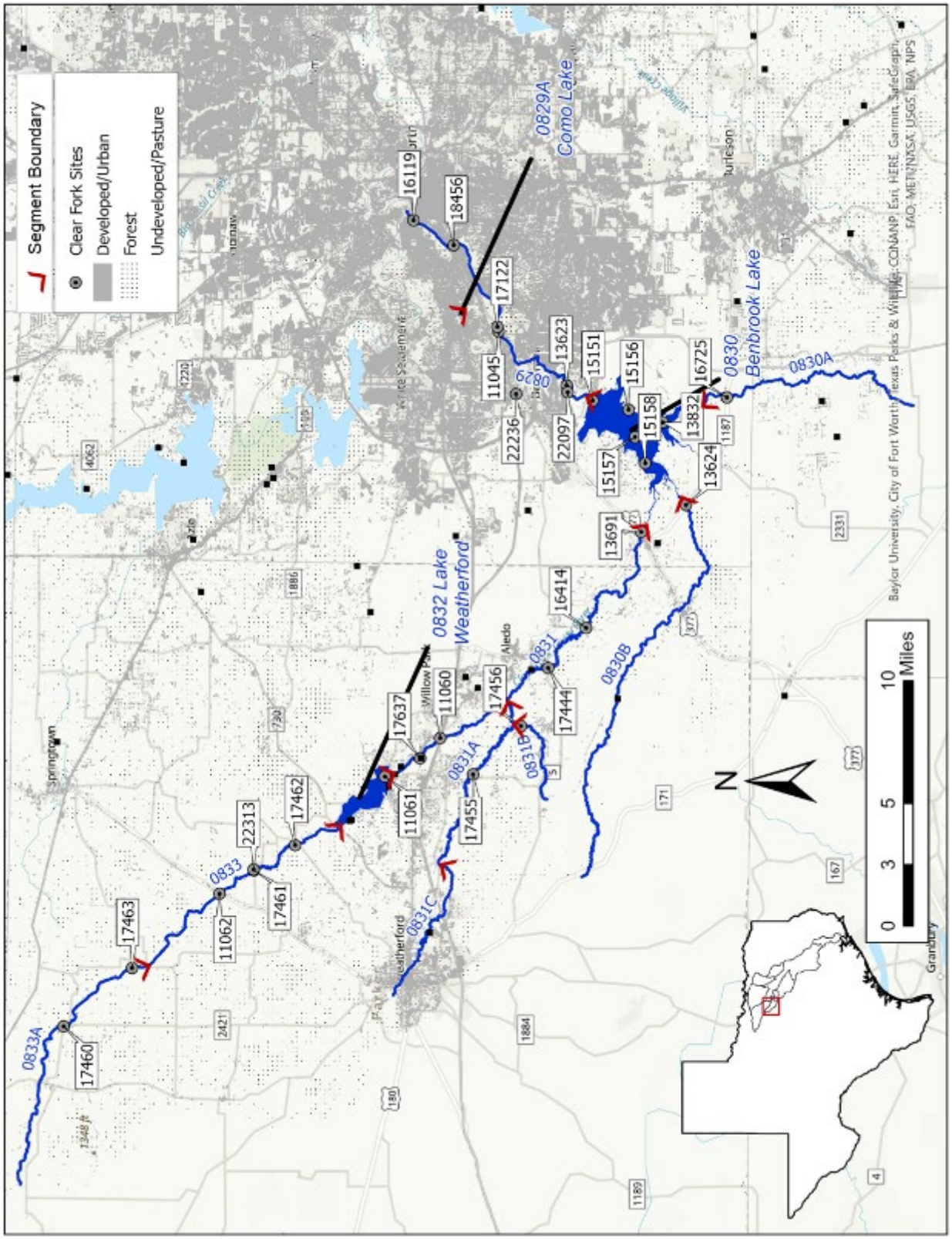

Figure 17: Map of segments and stations of the Clear Fork Trinity River subwatershed

0833A – Clear Fork Trinity River Above Strickland Creek

This 11.8-mile unclassified segment runs from Turpin Lake Road in Parker County to the confluence with Strickland Creek (see Figure 17). Much of the watershed is grassland with pasture and hay fields adjacent to the stream. Crop lands are found at the headwaters of this segment. It lies within the Western Cross Timbers ecoregion. There is no Clean Rivers Program monitoring scheduled in this segment for FY 2020.

Clean Rivers Program water quality monitoring is being conducted at two sites within this segment as shown in Table 28. Monitoring is being conducted by TRA. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 28: FY2023 Monitoring stations in Segment 0833A

Assessment Unit	Station Description	Station ID	Collecting Entity
0833A_01	CLEAR FORK TRINITY RIVER AT ERWIN ROAD 3.0 KM DOWNSTREAM OF FM 920 EAST OF POOLEVILLE	17460	TRA
0833A_01	CLEAR FORK TRINITY RIVER IMMEDIATELY DOWNSTREAM OF SARRA LANE 7.2 KM UPSTREAM OF FM 51 NORTH OF WEATHERFORD	17463	TRA

A summary of the concerns and impairments identified in the TCEQ 2022 Texas Integrated Report is shown in Table 29.

Table 29: Findings of TCEQ 2022 Texas Integrated Report for Segment 0833A

Assessment Unit	Use	Parameter	Criteria	Finding
0833A_01	Aquatic Life Use	Dissolved oxygen 24hr Avg	4 mg/L	NS (Carry Forward)
0833A_01	Aquatic Life Use	Dissolved oxygen 24hr Min	2 mg/L	NS (Carry Forward)
0833A_01	General Use	Chlorophyll-*a*	14.1 ug/L	CS (Carry Forward)

Impairments for low Dissolved Oxygen were carried forward from previous assessments. Segment 0833A was designated in the TCEQ 2014 Integrated Report and was previously identified as Assessment Unit 0833_02. Based on a limited dataset of sampled collected at Stations 17460 and 17463, this segment is a low flow and flashy system. The average flow was 0.47 cfs with a range of 0.4 to 0.7 cfs and the stream was reported to be dry on two visits – three and five days after precipitation. It is very likely that the previous assessment results were due to the low flow nature of this segment. Data collection is currently taking place to further address these findings. However, of the three diel Dissolved Oxygen samples collected within the period of record for this report, the lowest minimum and 24-hour average Dissolved Oxygen values were 5 and 7.1 mg/L, respectively.

Similarly, the Chlorophyll-*a* concern was carried forward from previous assessments. There are four data points available for the period of record for this report with one value reported above the screening level of 14.1 ug/L. Maximum Nitrate and Total Phosphorus values were 0.09 and 0.302 mg/L, respectively. Currently, there is insufficient data to further address this concern but

sampling will continue through FY 2023 and be re-evaluated to determine if sampling should be extended.

0833 – Clear Fork Trinity River Above Lake Weatherford

This 10.5-mile segment runs from the confluence with Strickland Creek in Parker County to 1.9 miles upstream of FM 1707 in Parker County (see Figure 17). Much of the watershed is grassland with pasture and hay fields adjacent to the stream. Most of the segment lies within the Western Cross Timbers with a small portion flowing through the Grand Prairie ecoregion just before entering Lake Weatherford.

Clean Rivers Program water quality monitoring is being conducted at one site within this segment as shown in Table 30. Monitoring is being conducted by TRA. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 30: FY2023 Monitoring stations in Segment 0833

Assessment Unit	Station Description	Station ID	Collecting Entity
0833_04	CLEAR FORK/DOBBS BRANCH AT FRIENDSHIP ROAD NORTHEAST OF WEATHERFORD	22313	TRA

A summary of the concerns and impairments identified in the TCEQ 2022 Texas Integrated Report is shown in Table 31.

Table 31: Findings of TCEQ 2022 Texas Integrated Report for Segment 0833

Assessment Unit	Use	Parameter	Criteria	Finding
0833_04	Aquatic Life Use	Dissolved oxygen Grab	3 mg/L	NS (Carry Forward)

Impairments for low Dissolved Oxygen in Assessment Unit 0833_04 were carried forward from previous assessments. Sampling was conducted at Station 17461 in FY 2015 and 2016 but was identified as being dry during all sampling events. It was later determined that the river had abandoned the channel at Station 17461 and moved to the Dobbs Branch channel approximately 70 meters to the east. Currently, there is insufficient data to further address this concern. Sampling began in the new channel at Station 22313 in FY 2022 and will continue through FY 2023 at which time sampling will be re-evaluated to determine if sampling should be extended. Of the three diel samples available for the period of record for this report, the lowest 24-hour minimum and average Dissolved Oxygen levels were 4 and 8.3 mg/L. It is recommended that an aquatic life use attainability analysis study be conducted to determine if the standards are appropriate for this segment as it has been observed to be a very low flow system and has been intermittent even after recent precipitation.

0832 – Lake Weatherford

This 1,133-acre segment impounds the Clear Fork Trinity River from the Lake Weatherford dam in Parker County to a point 1.9 miles upstream of FM 1707 in Parker County, up to a normal pool elevation of 896 feet (see Figure 17). The watershed is mostly grassland and forest on the eastern side of the reservoir with some residential development on the southeastern shores. The western side of the watershed is more developed with the cities of Weatherford and Hudson Oaks to the southwest of the reservoir. The remainder of the western side of the watershed is grassland, pasture, and hay. The watershed to the west of Lake Weatherford is in the Western Cross Timbers ecoregion while the east side is in the Grand Prairie ecoregion.

Clean Rivers Program water quality monitoring is being conducted at one site within this segment as shown in Table 32. Monitoring is being conducted by TCEQ Region 4. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 32: FY2023 Monitoring stations in Segment 0832

Assessment Unit	Station Description	Station ID	Collecting Entity
0832_01	LAKE WEATHERFORD MID LAKE NEAR DAM 310 METERS NORTH AND 98 METERS EAST OF INTERSECTION OF E LAKE DRIVE AND WEST SHORE DRIVE	11061	TCEQ Region 4

No impairments or concerns for aquatic life, recreation, domestic water supply, or general uses were identified in this segment.

0831 – Clear Fork Trinity River Below Lake Weatherford

Figure 18: Clear Fork Trinity River at IH 20 downstream of Lake Weatherford

This 20-mile segment runs from the Lake Weatherford dam in Parker County to 220 yards downstream of US 377 in Tarrant County (see Figure 17). The majority of the land use in 0831 is grassland and pasture especially along the lower half of the segment. The upper half of the segment has some development along the IH-20 corridor, including the cities of Hudson Oaks, Willow Park, and Aledo. This river flows through the Western Cross Timbers ecoregion but the surrounding watershed drains the Grand Prairie ecoregion.

Clean Rivers Program water quality monitoring is being conducted at two sites within this segment as shown in Table 33. Monitoring is being conducted by Tarrant Regional Water District. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 33: FY2023 Monitoring stations in Segment 0831

Assessment Unit	Station Description	Station ID	Collecting Entity
0831_01	CLEAR FORK TRINITY RIVER AT KELLY ROAD 8.7KM UPSTREAM OF US 377 SOUTH OF ALEDO	16414	Tarrant Regional Water District
0831_01	CLEAR FORK TRINITY RIVER AT FM 5 3.2 KM DOWNSTREAM OF CONFLUENCE OF CLEAR FORK AND SOUTH FORK SOUTH OF ALEDO	17444	TCEQ Region 4

A summary of the concerns and impairments identified in the TCEQ 2022 Texas Integrated Report is shown in Table 34.

Table 34: Findings of TCEQ 2022 Texas Integrated Report for Segment 0831

Assessment Unit	Use	Parameter	Criteria	Finding
0831_01	General Use	Total Phosphorus	0.69 mg/L	CS
0831_01	General Use	Nitrate	1.95 mg/L	CS
0831_01	Recreation Use	*E. coli*	126 MPN/100 mL	NS
0831_04	Aquatic Life Use	Dissolved oxygen 24hr Avg	5 mg/L	NS (Carry Forward)
0831_04	Aquatic Life Use	Dissolved oxygen 24hr Min	3 mg/L	NS (Carry Forward)

Concerns for Total Phosphorus and Nitrate were identified in Assessment Unit 0831_01. As shown in Figure 19 for Nitrate and Figure 20 for Total Phosphorus, values were regularly reported above their screening levels; 38% of Nitrate data and 43% of Total Phosphorus data. There were no correlations between these parameters and flow or days since precipitation, however, the highest values were reported at low flows. There are several wastewater treatment facilities located in the upstream watershed which could be contributing the higher nutrient levels seen at lower flows. This pattern is common in effluent dominated stream as most wastewater treatment facilities do not have advanced nutrient removal technology. The lack of correlation with flow is likely due to the size of the watershed and multiple unimpacted tributaries complicating the system.

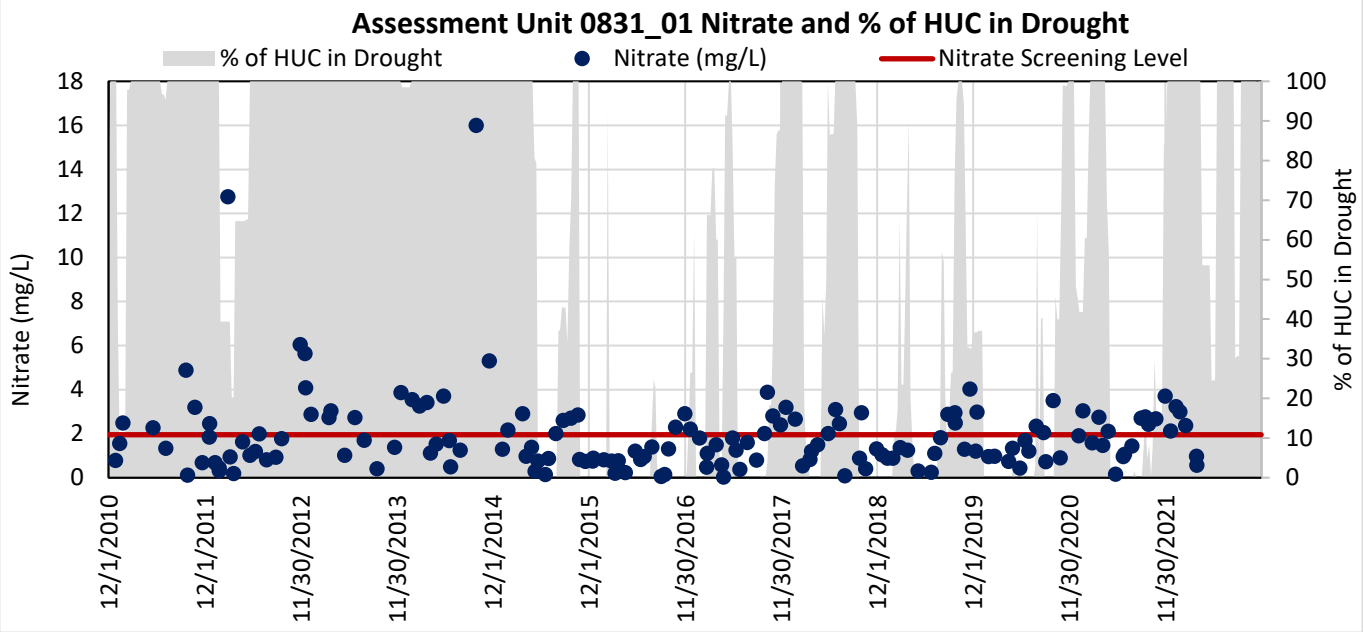

Figure 19: Assessment Unit 0831_01 Nitrate and % of HUC in Drought

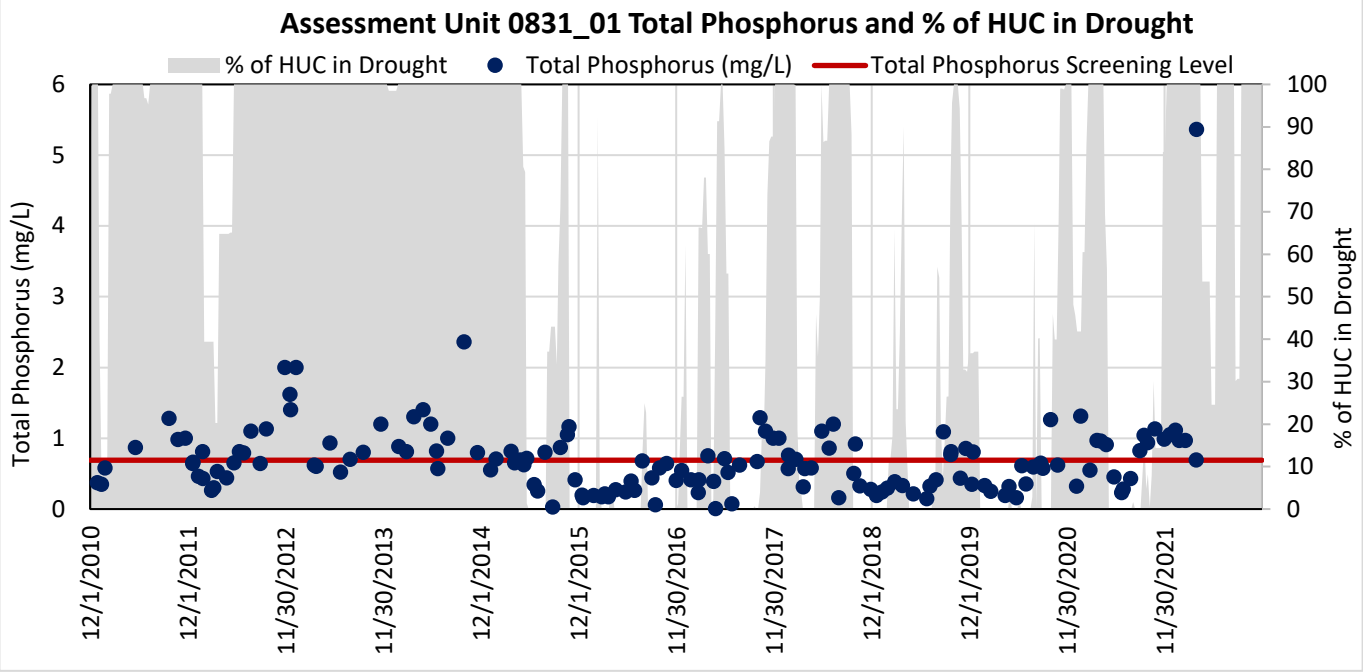

Figure 20: Assessment Unit 0831_01 Total Phosphorus and % of HUC in Drought

The impairment for *E. coli* in Assessment Unit 0831_01 may be due to a mix of point and runoff related sources. As shown in Figure 21, 92% of the were reported above the standard of 126 MPN/100 ML which indicates that there may be point sources of bacteria into the stream. There was a moderate correlation to the number of days since precipitation (correlation coefficient = -0.42) indicating that runoff may be washing in additional bacteria during precipitation events. Livestock may be the major contributor to the *E. coli* impairment via runoff and direct deposition as there are several pastures in the upstream watershed with evidence of livestock trails in the

pastures and leading into the river. Landowner education and livestock best management practices may be beneficial in reducing bacterial loading in this assessment unit.

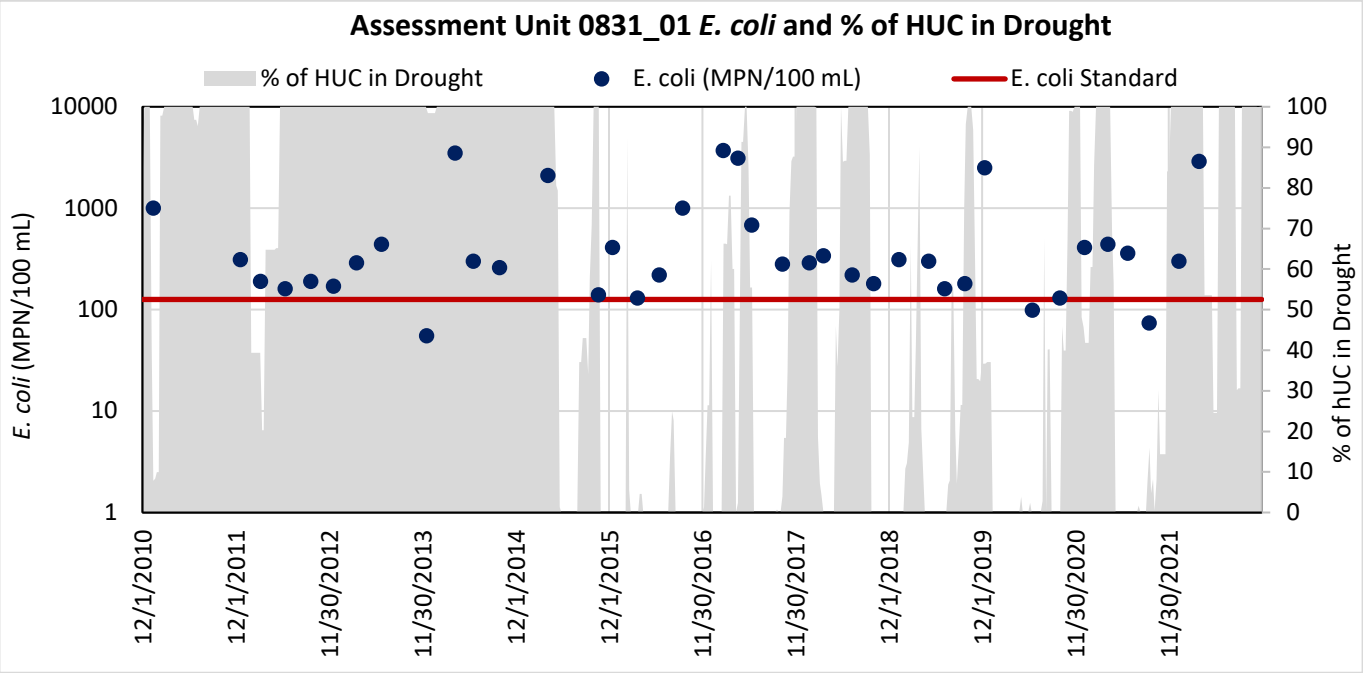

Figure 21: Assessment Unit 0831_01 E. coli and % of HUC in Drought

Impairments for low Dissolved Oxygen in Assessment Unit 0833_04 were carried forward from previous assessments. Sampling was conducted at Station 11060 in FY 2015 and 2016. The lowest 24-hour minimum and average Dissolved Oxygen levels were 3.2 and 3.6 mg/L, respectively. Although this segment is downstream of Lake Weatherford, it has been observed to be a low flow system. It is recommended that an aquatic life use attainability analysis study be conducted to determine if the standards are appropriate for this segment.

0831C – Town Creek

This 19.5-mile unclassified segment runs from the upper end of the creek upstream of Weatherford to the confluence with the South Fork of the Trinity River (see Figure 17). The extreme upper and lower ends of the segment drain rural areas with grassland and pasture. The remainder of the segment drains the City of Weatherford and surrounding developed areas. The stream flows through the Western Cross Timbers but there is a small portion of the Grand Prairie ecoregion to the west of the stream. There is no Clean Rivers Program monitoring scheduled in this segment for FY 2023.

No impairments or concerns for aquatic life, recreation, or general uses were identified in this segment.

0831A – South Fork Trinity River

This 12-mile stretch of the South Fork Trinity River runs from the confluence with Willow Creek in Parker County to the confluence with the Clear Fork Trinity River (see Figure 17). Much of the watershed is rural with grassland and pasture being the predominant land use. There are some forested areas spread throughout the watershed and some development along the IH-20 corridor on the north side of the river. The river flows through the Western Cross Timbers with a small portion of the Grand Prairie ecoregion along the southwestern edge of the watershed.

Clean Rivers Program water quality monitoring is being conducted at one site within this segment as shown in Table 35. Monitoring is being conducted by TRA. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 35: FY2023 Monitoring stations in Segment 0831A

Assessment Unit	Station Description	Station ID	Collecting Entity
0831A_01	SOUTH FORK TRINITY RIVER AT FM 5 4.1 KM UPSTREAM OF CONFLUENCE WITH CLEAR FORK TRINITY RIVER NORTH OF ANNETA	17455	TRA

A summary of the concerns and impairments identified in the TCEQ 2022 Texas Integrated Report is shown in Table 36.

Table 36: Findings of TCEQ 2022 Texas Integrated Report for Segment 0831A

Assessment Unit	Use	Parameter	Criteria	Finding
0831A_01	General Use	Total Phosphorus	0.69 mg/L	CS
0831A_01	General Use	Nitrate	1.95 mg/L	CS
0831A_01	Recreation Use	*E. coli*	126 MPN/100 mL	CN

Concerns for Nitrate and Total Phosphorus appear to be related to upstream wastewater treatment facilities. Correlations to flow were moderately strong for both Nitrate and Total Phosphorus (correlation coefficients = -0.73 and -0.76, respectively). As shown in Figure 22, levels of these parameters were higher at lower flows and decreased as flows increased. This is commonly seen in streams receiving effluent from wastewater treatment facilities as most facilities do not have advanced nutrient removal technology. It does not appear that the elevated nutrient levels were influencing algal populations or Dissolved Oxygen concentrations. The average Chlorophyll-*a* level was 2.8 ug/L with most of the observed values being non-detects with a maximum value of 16 ug/L. The lowest Dissolved Oxygen value was 6.1 mg/L which was reported during the summer.

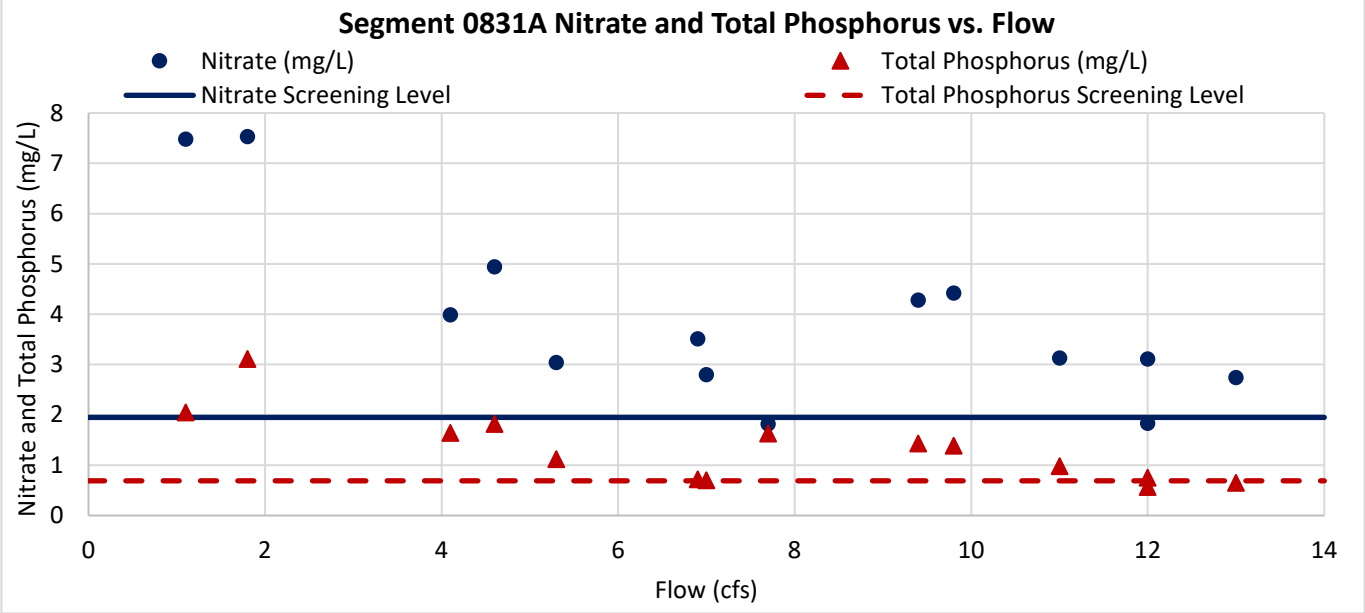

Figure 22: Segment 0831A Nitrate and Total Phosphorus vs. Flow

The concern for *E. coli* appeared to be somewhat runoff related. As shown in Figure 23, 85% of the data were reported above the standard of 126 MPN/100 ML but levels tended to increase with increasing flow. Because *E. coli* levels were generally high, it is likely that there were also point sources of bacteria into the stream as well. There are several pastures and paddocks with evidence of livestock trails in the watershed upstream of Station 17455, therefore, livestock are most likely the predominant source of bacteria in this segment. There is also a small forested area surround the stream immediately upstream of Station 17455 from which wildlife may also be contributing. Landowner education and livestock best management practices may be beneficial in reducing bacterial loadings in this segment.

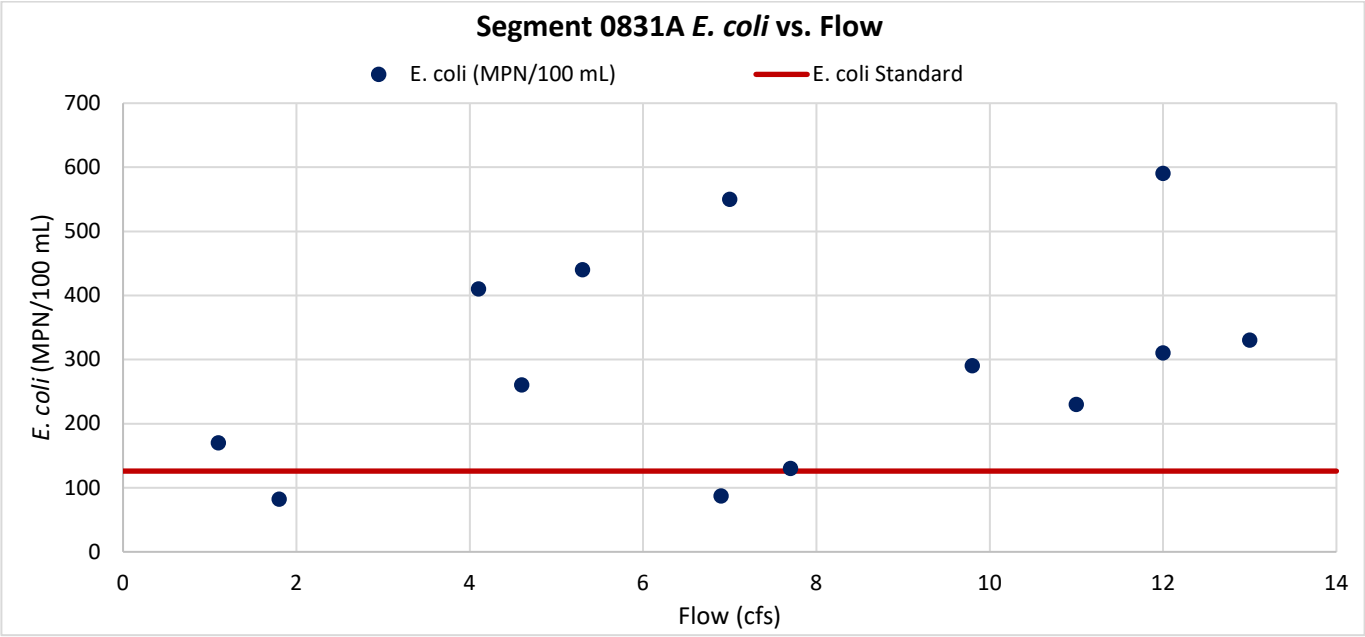

Figure 23: Segment 0831A E. coli vs. Flow

0831B – Unnamed Tributary of South Fork Trinity River

This 4.4-mile unclassified segment runs from the upper end of the creek upstream of Savage Lane near Annetta to the confluence with the South Fork Trinity River (see Figure 17). The watershed is mostly grassland with some forested areas and pasture adjacent to the stream and residential developments outside of Annetta. The upper portion of the segment flows through the Grand Prairie ecoregion before entering the Western Cross Timbers. There is no Clean Rivers Program monitoring scheduled in this segment for FY 2023.

No impairments or concerns for aquatic life, recreation, or general uses were identified in this segment.

0830 – Benbrook Lake

This 3,671-acre segment impounds the Clear Fork Trinity River from the Benbrook Lake dam in Tarrant County to 220 yards downstream of US 377 in Tarrant County, up to a normal pool elevation of 694 feet (see Figure 17). The majority of the watershed is grassland with some smaller areas of forest, pasture, and crop land. There is significant urban development on the north side of the lake. The entire segment is located within the Grand Prairie ecoregion.

Clean Rivers Program water quality monitoring is being conducted at four sites within this segment as shown in Table 37. Monitoring is being conducted by Tarrant Regional Water District. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 37: FY2023 Monitoring stations in Segment 0830

Assessment Unit	Station Description	Station ID	Collecting Entity
0830_01	BENBROOK LAKE EAST END OF DAM 285 METERS SOUTH AND 332 METERS WEST OF INTERSECTION OF PECAN VALLEY DRIVE AND LAKESIDE DRIVE	15151	Tarrant Regional Water District
0830_02	BENBROOK LAKE 1.36 KM NORTH AND 223 METERS WEST OF INTERSECTION OF ST FRANCIS VILLAGE RD AND ST ANTHONY DR EAST SIDE IN MAIN CHANNEL	15156	Tarrant Regional Water District
0830_03	BENBROOK LAKE EAST OF BOAT RAMP AT HOLIDAY PARK IN MAIN CHANNEL 1.21 KM N AND 58 M E OF INTERSECTION OF PENINSULA RD AND BEAR CREEK DR	15158	Tarrant Regional Water District
0830_05	BENBROOK LAKE USGS SITE CR 92 METERS NORTH AND 1.27 KM EAST OF INTERSECTION OF PENINSULA ROAD AND PLOVER ROAD	13832	Tarrant Regional Water District

No impairments or concerns for aquatic life, recreation, domestic water supply, or general uses were identified in this segment.

0830A – Rock Creek

This 11-mile unclassified segment is an intermittent stream with perennial pools that runs from the headwaters near FM 917 near Burleson in Johnson County to the confluence with Benbrook Lake at normal pool elevation upstream (see Figure 17). The watershed is mostly grassland interspersed with pasture and hay fields. There is some residential development in the southern portion of the watershed. It lies within the Grand Prairie ecoregion but drains the Eastern Cross Timbers in the southeastern portion of the watershed.

Clean Rivers Program water quality monitoring is being conducted at one site within this segment as shown in Table 38. Monitoring is being conducted by Tarrant Regional Water District. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 38: FY2023 Monitoring stations in Segment 0830A

Assessment Unit	Station Description	Station ID	Collecting Entity
0830A_01	ROCK CREEK AT FM 1187 3.7KM UPSTREAM OF BENBROOK LAKE	16725	Tarrant Regional Water District

No impairments or concerns for aquatic life, recreation, or general uses were identified in this segment.

0830B – Bear Creek

This 20-mile unclassified segment is an intermittent stream with perennial pools that runs from the headwaters adjacent to SH 171 southeast of Weatherford in Parker County to the confluence with Benbrook Lake at normal pool elevation upstream (see Figure 17). The watershed is mostly grassland with some pasture and hay fields adjacent to the stream. There is some residential and industrial development along the US 377 corridor. This segment lies within the Grand Prairie ecoregion.

Clean Rivers Program water quality monitoring is being conducted at one site within this segment as shown in Table 39. Monitoring is being conducted by Tarrant Regional Water District. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 39: FY2023 Monitoring stations in Segment 0830B

Assessment Unit	Station Description	Station ID	Collecting Entity
0830B_01	BEAR CREEK AT FM 1187 NEAR BENBROOK	13624	Tarrant Regional Water District

No impairments or concerns for aquatic life, recreation, or general uses were identified in this segment.

0829 – Clear Fork Trinity River Below Benbrook Lake

Figure 24: Clear Fork Trinity River near Art Cowsen Trailhead in Benbrook

This 12.5-mile segment runs from the Benbrook Lake dam in Tarrant County to the confluence of the West Fork Trinity River in Tarrant County (see Figure 17). The watershed is heavily developed as it flows from the City of Benbrook and into the City of Fort Worth. It lies within the Grand Prairie ecoregion.

Clean Rivers Program water quality monitoring is being conducted at three sites within this segment as shown in Table 40. Monitoring is being conducted by TCEQ Region 4 and the City of Fort Worth. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 40: FY2023 Monitoring stations in Segment 0829

Assessment Unit	Station Description	Station ID	Collecting Entity
0829_02	CLEAR FORK TRINITY RIVER 161 METERS DOWNSTREAM OF BRYANT-IRVIN STREET IN FORT WORTH	11045	TCEQ Region 4
0829_02	CLEAR FORK TRINITY RIVER MID CHANNEL 85 M UPSTREAM OF SPILLWAY AND IMMEDIATELY UPSTREAM OF WEST ROSEDALE STREET IN FORT WORTH	18456	City of Fort Worth
0829	MARYS CREEK AT WINSCOTT ROAD IN FORT WORTH	22236	City of Fort Worth

A summary of the concerns and impairments identified in the TCEQ 2022 Texas Integrated Report is shown in Table 41.

Table 41: Findings of TCEQ 2022 Texas Integrated Report for Segment 0829

Assessment Unit	Use	Parameter	Criteria	Finding
0829_02	General Use	Chlorophyll-*a*	14.1 ug/L	CS
0829_02	Recreation Use	*E. coli*	126 MPN/100 mL	NS
0829_03	Aquatic Life Use	Macrobenthic community	29	CN

A concern for Chlorophyll-*a* was identified in Assessment Unit 0829_02. There were no correlations to nutrients, flow, or drought conditions. As shown in Figure 25, 28% of the data exceeded the screening level of 14.1 ug/L. Although there was no correlation to drought conditions, eight of these exceedances occurred during drought periods. Assessment Unit 0829_02 is a channelized portion of the river. The wetted width of the river averages approximately 50 meters during normal flow conditions and is relatively shallow and clear. The maximum water column depth reported at Station 11045 was two meters and the average Secchi Depth was 0.45 meters. Additionally, there is no wooded riparian area along most of this assessment unit. It is likely that the channel morphology as well as the clear water and lack of shade allows algal populations to increase.

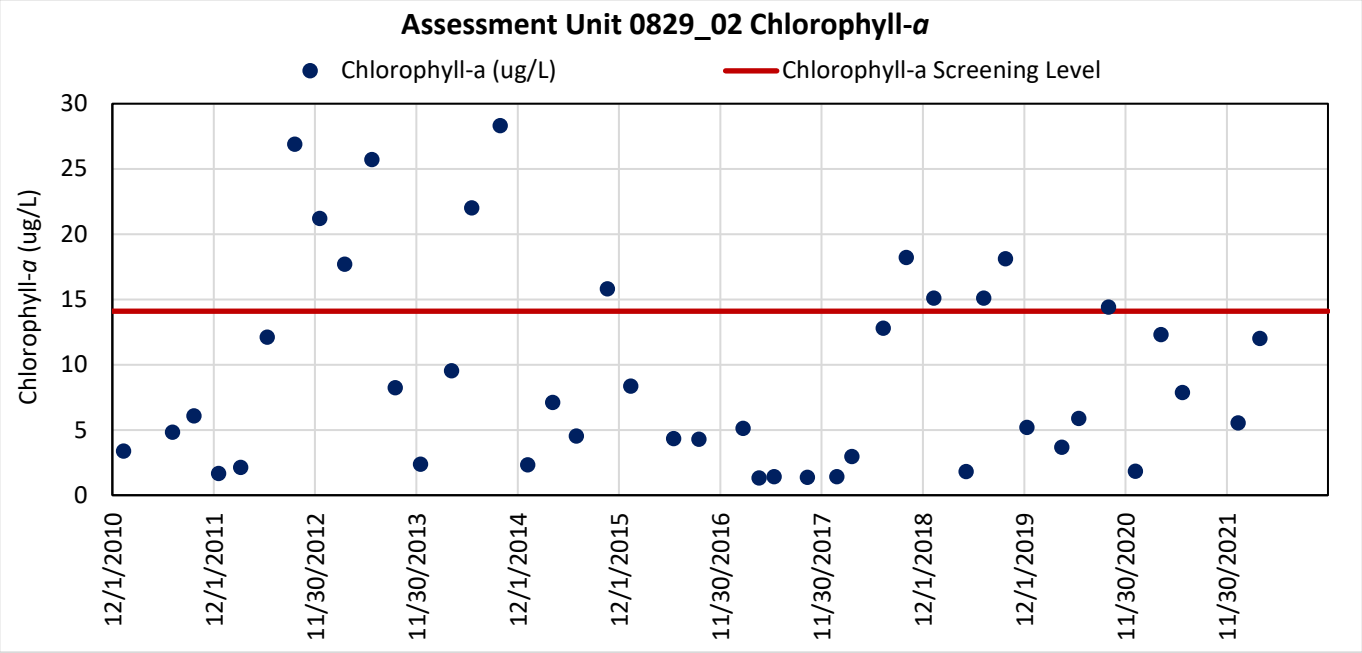

Figure 25: Assessment Unit 0829_02 Chlorophyll-a

The impairment for *E. coli* may have been due to a mix of point and runoff related sources. There were no correlations to flow or days since precipitation and *E. coli* were regularly reported above the standard of 126 MPN/100 ML (see Figure 26). This segment is highly developed with golf courses and dense residential areas upstream of Station 11045 and 18456. Runoff containing waste from pets and wildlife could be introducing bacteria to the river. Additionally, failing infrastructure such as broken sewage lines could be sources of bacteria. Further, Mary's

Creek, which is the upstream boundary of this assessment unit, drains a rural area with several pastures throughout the watershed. Homeowner and landowner education as well as livestock and pet waste best management practices may help reduce bacterial loadings from these sources. Inspections of the watershed and tributaries could help identify any failed wastewater infrastructure that may also be contributing bacteria to the river.

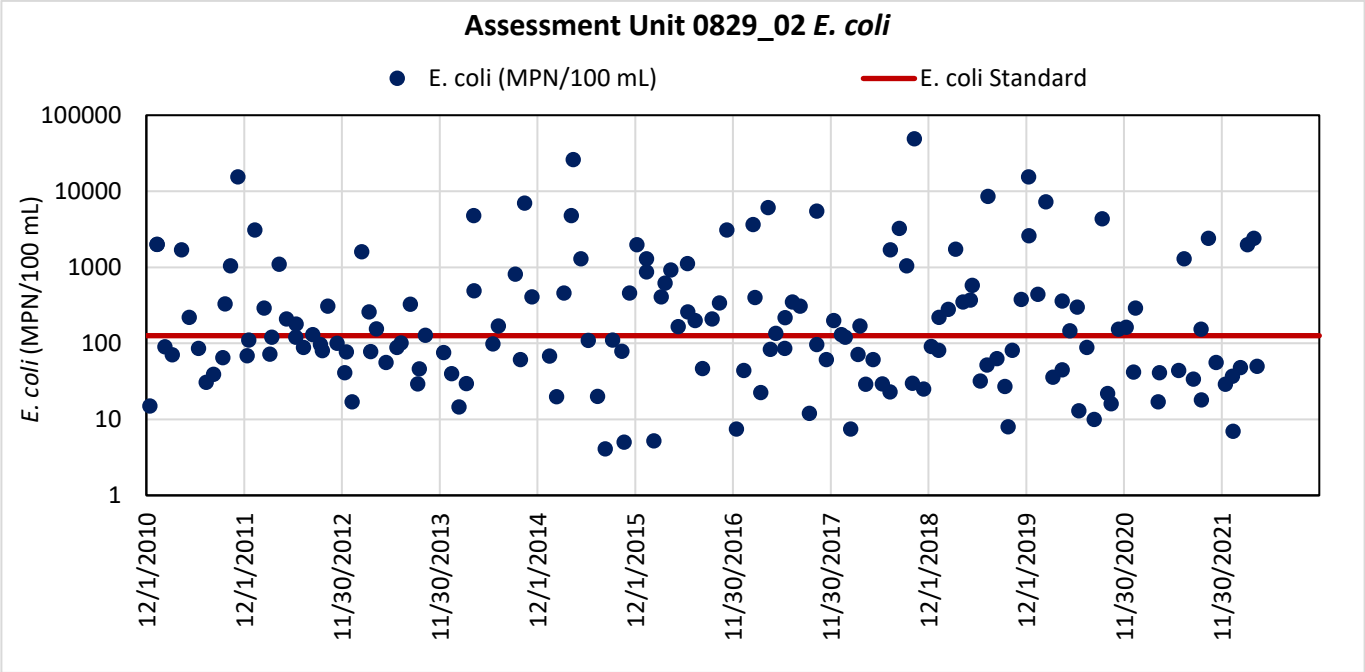

Figure 26: Assessment Unit 0829_02 E. coli

A concern for macrobenthic communities was identified in Assessment Unit 0829_03 based on an aquatic life monitoring event conducted by TRA staff in 2019. The critical period event was conducted in late August and resulted in a high score for macrobenthic invertebrates. The index period event was conducted in early October and resulted in an intermediate score. TRA suspect that this lower score in October may be due to many of the aquatic insects in this area having already emerged by the time sampling is conducted.

0829A – Lake Como

This 11-acre unclassified segment runs from Lake Como Dam to the reservoir headwaters in Lake Como Park in Tarrant County (see Figure 17). It is surrounded by the developed suburbs of Fort Worth and lies within the Grand Prairie ecoregion.

No impairments or concerns for aquatic life, recreation, or general uses were identified in this segment.

Elm Fork Trinity River

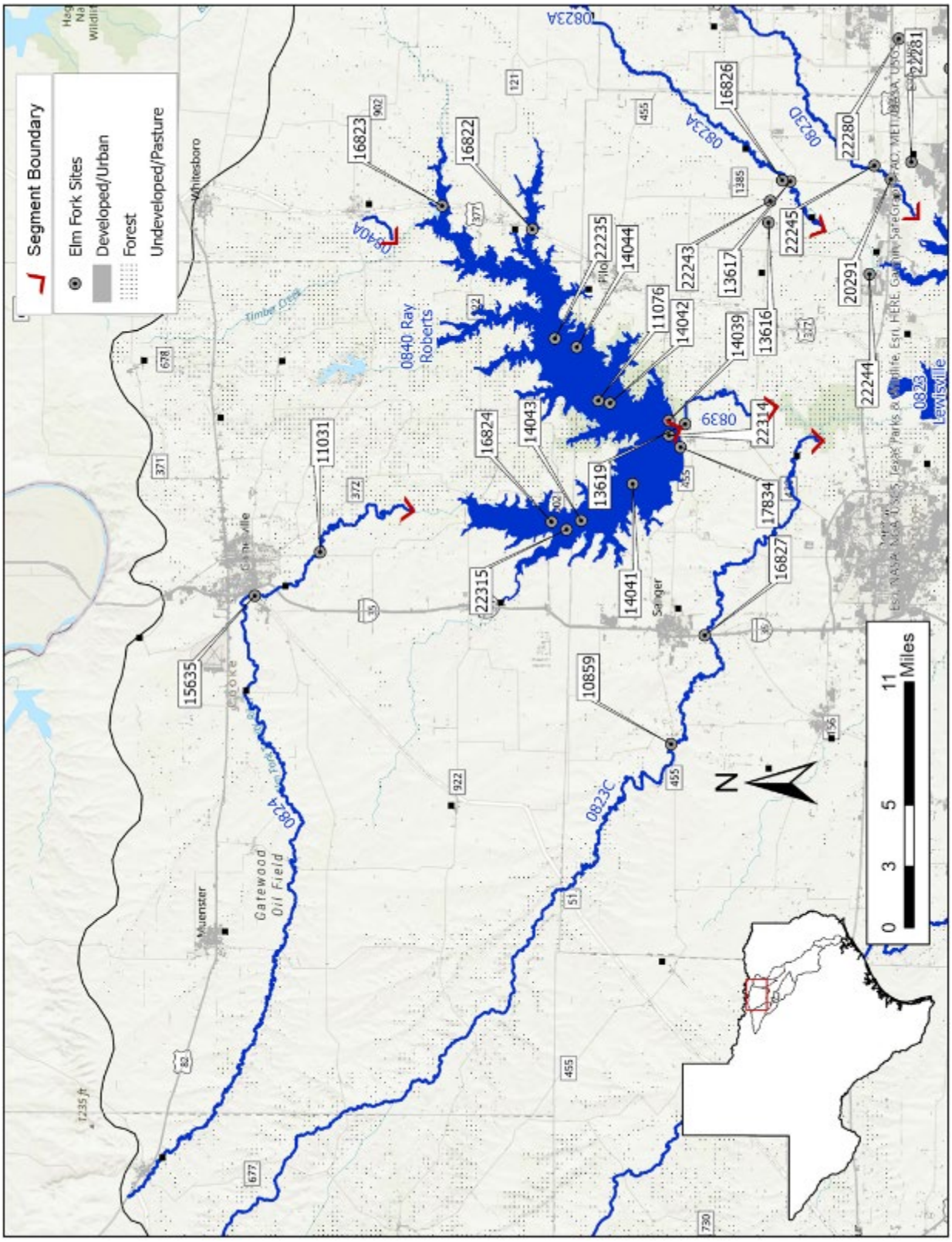

Figure 27: Map of segments and stations of the upper Elm Fork Trinity River subwatershed

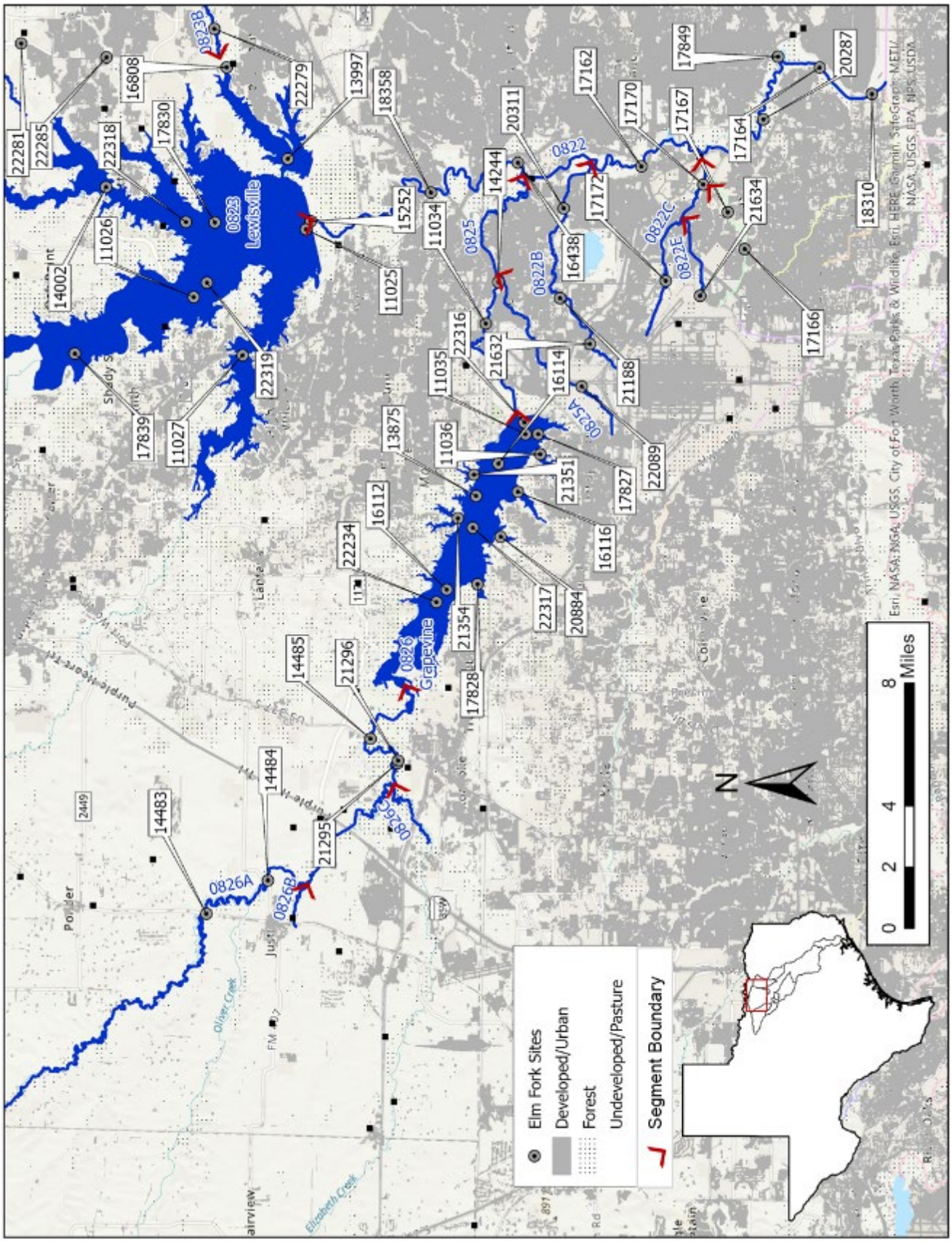

Figure 28: Map of segments and stations of the lower Elm Fork Trinity River subwatershed

0824 – Elm Fork Trinity River Above Ray Roberts Lake

This 51-mile segment runs from US 82 in Montague County to 5.9 miles downstream of the confluence of Pecan Creek in Cooke County (see Figure 27). The entire segment runs through the Grand Prairie ecoregion with almost all land use classified as pasture and crop land with more grassland in the upstream portion of the segment. Oil production has been heavy in the area over the last century and natural gas drilling has increased tremendously in the last 20 years.

Clean Rivers Program water quality monitoring is being conducted at two sites within this segment as shown in Table 42. Monitoring is being conducted by the City of Dallas and TCEQ Region 4. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 42: FY2023 Monitoring stations in Segment 0824

Assessment Unit	Station Description	Station ID	Collecting Entity
0824_01	ELM FORK TRINITY RIVER IMMEDIATELY DOWNSTREAM OF FM 2071 SOUTH OF GAINESVILLE (R1)	11031	City of Dallas (DA)
0824_04	ELM FORK TRINITY RIVER 59 METERS DOWNSTREAM OF FM 51 IN GAINESVILLE	15635	TCEQ Region 4

A summary of the concerns and impairments identified in the TCEQ 2022 Texas Integrated Report is shown in Table 43.

Table 43: Findings of TCEQ 2022 Texas Integrated Report for Segment 0824

Assessment Unit	Use	Parameter	Criteria	Finding
0824_03	General Use	Chlorophyll-*a*	14.1 ug/L	CS
0824_03	Recreation Use	*E. coli*	126 MPN/100 mL	NS
0824_01	General Use	Nitrate	1.95 mg/L	CS (Carry Forward)
0824_01	General Use	Chlorophyll-*a*	14.1 ug/L	CS (Carry Forward)
0824_02	General Use	Nitrate	1.95 mg/L	CS (Carry Forward)

The concern for Chlorophyll-*a* in Assessment Unit 0824_03 appears to be largely related to drought conditions. As shown in Figure 29, 14 of the 16 values that exceeded the screening level of 14.1 ug/L occurred during the prolonged drought of 2011 to 2015. Chlorophyll-*a* was moderately well correlated to both Total Kjeldahl Nitrogen and Total Phosphorus (correlation coefficients = 0.74 and 0.53, respectively). It is likely that the lower flows and longer residence times in the river during drought conditions allowed algal colonies to take advantage of the available nutrients and increase their populations during this time.

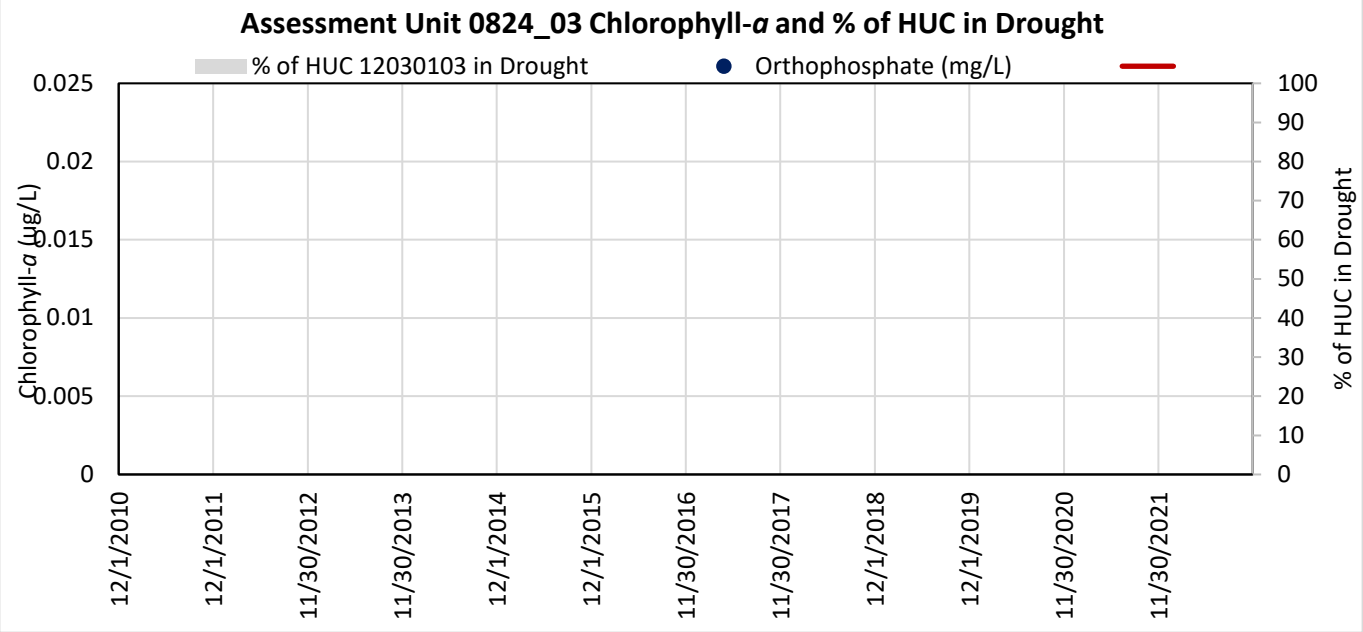

Figure 29: Assessment Unit 0824_03 Chlorophyll-a and % of HUC in Drought

The *E. coli* impairment that was identified in Assessment Unit 0824_03 may have been related to a mix of point and runoff related sources. As shown in Figure 30, *E. coli* levels were regularly reported above the standard of 126 MPN/100 ML which indicate that there may be point sources of *E. coli* into the river. There were no correlations to flow or days since precipitation although 78% of the exceedances occurred within a week of precipitation which indicates that runoff may be carrying bacteria into the river. There are several pastures upstream of Station 15635 with evidence of livestock trails. Additionally, livestock have been seen entering the stream for watering during past sampling in this segment. Landowner education and livestock best management practices may help reduce bacteria levels in this segment.

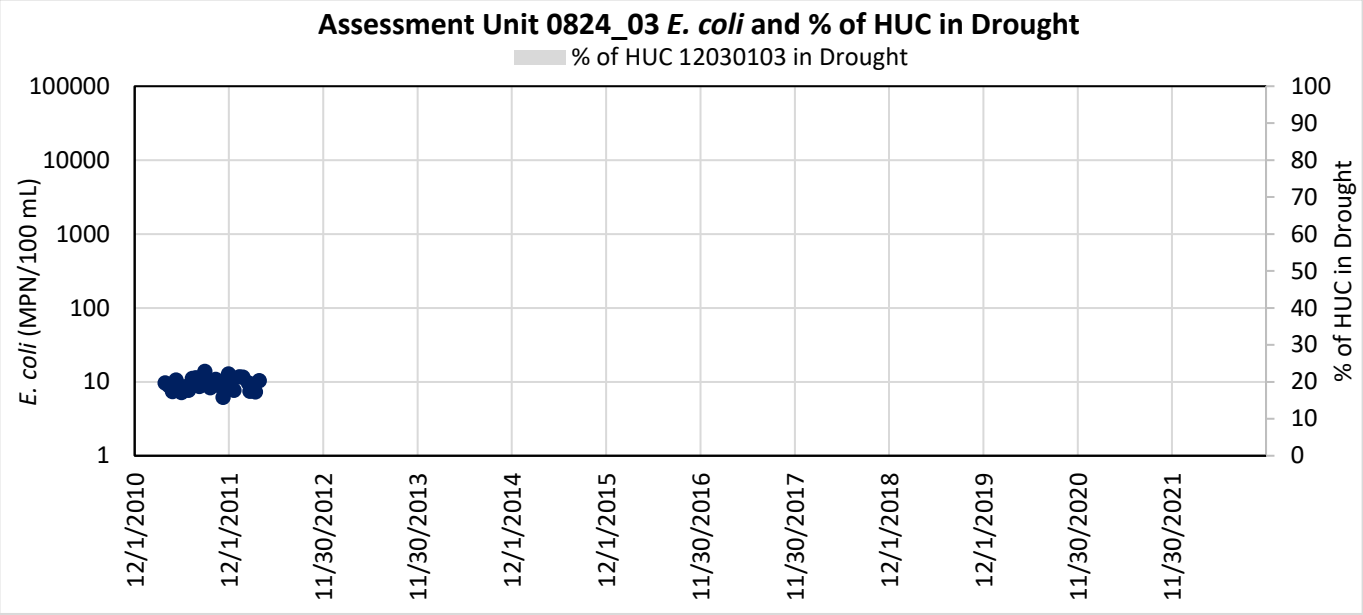

Figure 30: Assessment Unit 0824_03 E. coli and % of HUC in Drought

Concerns for Nitrate and Chlorophyll-*a* in Assessment Unit 0824_01 were carried forward from previous assessments. Recent Nitrate data has been analyzed by a NELAP certified laboratory and will likely be addressed in future assessments. Based on data that includes samples that were not analyzed by a NELAP certified laboratory, it appears that the concern for Nitrate may continue; 45% of the data exceeded the screening level of 1.95 mg/L. The highest values were reported at low and normal flow severities. Although Flow Severity is a categorical value and represents a range of flows, this remains consistent with what is typically seen downstream of wastewater treatment facilities; there are five in the upstream watershed. There are no recent Chlorophyll-*a* data available. It is recommended that Chlorophyll-*a* be collected to further address this concern.

There is no current data available to address the Nitrate concern in Assessment Unit 0824_02. It is unlikely that additional monitoring in this assessment unit will provide meaningful data to address this concern or be a good use of limited resources. Both Station 15607 and 11033 in this assessment unit are located immediately downstream of a wastewater treatment facility and are upstream of Station 11031 in Assessment Unit 0824_01. Therefore, Nitrate levels are likely to mirror those seen in Assessment Unit 0824_01.

0840 – Ray Roberts Lake

This 28,374-acre reservoir impounds the Elm Fork Trinity River from Ray Roberts Dam in Denton County to a point 5.9 miles upstream of the confluence of Pecan Creek in Cooke County up to the normal pool elevation of 632.5 feet (see Figure 27). Land use in this segment is nearly all classified as pasture and crop land. The watershed between the two arms of the reservoir has some wooded areas. The eastern portion of the watershed is in the Eastern Cross Timbers ecoregion and the western portion is in the Grand Prairie ecoregion.

Clean Rivers Program water quality monitoring is being conducted at ten sites within this segment as shown in Table 44. Monitoring is being conducted by TCEQ Region 4, the City of Dallas, and TRA. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 44: FY2023 Monitoring stations in Segment 0840

Assessment Unit	Station Description	Station ID	Collecting Entity
0840_01	RAY ROBERTS LAKE USGS SITE AC 98 METERS NORTH AND 1.26 KM WEST OF INTERSECTION OF FM 455 AND LAKE RAY ROBERTS ROAD	14039	TCEQ Region 4
0840_01	RAY ROBERTS LAKE NEAR THE DAM 600 METERS NORTH AND 395 METERS WEST OF THE OUTLET WORKS (R6)	22314	City of Dallas (DA)
0840_02	RAY ROBERTS LAKE USGS SITE CC 1.99 KM NORTH AND 737 METERS WEST OF INTERSECTION OF QUAIL RUN CIRCLE AND ISLE DU BOIS STATE PARK ROAD (R5)	14042	City of Dallas (DA)
0840_02	RAY ROBERTS LAKE USGS SITE EC 399 METERS NORTH AND 2.61 KM WEST OF INTERSECTION OF JACK GRAY ROAD AND ALEXANDER ROAD	14044	TCEQ Region 4

Assessment Unit	Station Description	Station ID	Collecting Entity
0840_03	RAY ROBERTS LAKE IN RANGE CREEK COVE AT US 377 BRIDGE 600 M SOUTH AND 57 M WEST OF INTERSECTION OF PATTON RD AND US 377 SW OF SHERMAN (R2)	16823	City of Dallas (DA)
0840_04	RAY ROBERTS LAKE BUCK CREEK COVE AT US377 BRIDGE 1.06 KM N AND 428 M E OF INTERSECTION OF US 377 AND EMBERSON CHAPEL RD SW OF SHERMAN (R3)	16822	City of Dallas (DA)
0840_05	RAY ROBERTS LAKE USGS SITE BC 444 METERS NORTH AND 2.21 KM EAST OF INTERSECTION OF FM 1190 AND JONES ROAD	14041	TRA
0840_06	RAY ROBERTS LAKE USGS SITE DC 778 METERS NORTH AND 2.42 KM WEST OF INTERSECTION OF TYSON LANE AND HEMMING ROAD	14043	TCEQ Region 4
0840_07	RAY ROBERTS LAKE AT ELM FORK ARM 1.4 KM SOUTH AND 0.82 KM EAST OF THE INTERSECTION OF FM 231 AND FM 3002/EAST LONE OAK ROAD (R4)	22315	City of Dallas (DA)
0840_08	RAY ROBERTS LAKE UPPER PORTION OF JORDAN CREEK ARM 1.87 KM SOUTH AND 2.11 KM EAST OF INTERSECTION OF BLOOMFIELD ROAD AND FM 372	22235	TRA

A summary of the concerns and impairments identified in the TCEQ 2022 Texas Integrated Report is shown in Table 45.

Table 45: Findings of TCEQ 2022 Texas Integrated Report for Segment 0840

Assessment Unit	Use	Parameter	Criteria	Finding
0840_08	Aquatic Life Use	Dissolved oxygen Grab	5 mg/L	CS (Carry Forward)

The concern for low Dissolved Oxygen in Assessment Unit 0840_08 was carried forward from previous assessments. In FY 2021, TRA staff began sampling in this assessment unit. Sampling is scheduled to continue through FY 2025 to provide data for assessment. Continued sampling will be re-evaluated in FY 2026. Based on the recently collected data, Dissolved Oxygen levels averaged 10.1 mg/L with a range of 8.3 to 12.8 mg/L.

0840A – Unnamed Tributary of Jordan Creek

This 2.2-mile unclassified segment runs from the headwaters near South Neathery Street in Collinsville in Grayson County to the confluence with Jordan Creek south of CR 226 (see Figure 27). Land use on the northwest side of the creek is forested and pasture or hay and on the southeast side is cropland and pasture or hay. The segment flows from the Northern Blackland Prairie ecoregion and into the Eastern Cross Timbers. There is no Clean Rivers Program monitoring scheduled in this segment for FY 2023.

No impairments or concerns for aquatic life, recreation, or general uses were identified in this segment.

0839 – Elm Fork Trinity River Below Ray Roberts Lake

This 5.5-mile segment stretches from Ray Roberts Dam in Denton County to 110 yards upstream of US 380 in Denton County (see Figure 27). Land use in this segment is largely pasture and hay. The river flows through the Eastern Cross Timbers but drains the Grand Prairie ecoregion to the west.

Clean Rivers Program water quality monitoring is being conducted at one site within this segment as shown in Table 46. Monitoring is being conducted by the City of Dallas. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 46: FY2023 Monitoring stations in Segment 0839

Assessment Unit	Station Description	Station ID	Collecting Entity
0839_01	ELM FORK TRINITY RIVER 336 METERS DOWNSTREAM OF RAY ROBERTS DAM 5.7 MI SW OF PILOT POINT 3.3 MI UPSTREAM FROM BRAY BRANCH (L2)	13619	City of Dallas (DA)

No impairments or concerns for aquatic life, recreation, domestic water supply, or general uses were identified in this segment.

0823 – Lewisville Lake

This 26,654-acre reservoir impounds the Elm Fork Trinity River from Lewisville Dam in Denton County to a point 110 yards upstream of US 380 in Denton County up to normal pool elevation of 515 feet (see Figure 28). Land use is heavily developed around most of the reservoir by the cities of Denton, Little Elm, Frisco, The Colony, and Lewisville. Between the Elm Fork and Little Elm Creek arms, land use is mostly pasture and hay land with some smaller areas of development. There is a large area of crop land to the east along the Little Elm Creek and Doe Branch drainages. The watershed drains portions of the Grand Prairie, Eastern Cross Timbers, and Northern Blackland Prairie ecoregions.

Clean Rivers Program water quality monitoring is being conducted at fifteen sites within this segment as shown in Table 47. Monitoring is being conducted by TCEQ Region 4, the City of Dallas, TRA, Upper Trinity Regional Water District, and the City of Frisco. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 47: FY2023 Monitoring stations in Segment 0823

Assessment Unit	Station Description	Station ID	Collecting Entity
0823_01	LEWISVILLE LAKE MID LAKE NEAR DAM	11025	TCEQ Region 4
0823_02	LEWISVILLE LAKE USGS SITE BC 1.71 KM NORTH AND 1.68 KM WEST OF INTERSECTION OF HILLPARK ROAD AND KINE PAC ROAD	13997	TCEQ Region 4
0823_02	LAKE LEWISVILLE IN STEWART CREEK ARM AT FM 423 BRIDGE 389 METERS NORTH OF INTERSECTION OF OVERLAKE DRIVE AND FM 423/MAIN STREET (L4)	16808	City of Dallas (DA)

Assessment Unit	Station Description	Station ID	Collecting Entity
0823_03	LEWISVILLE LAKE AT I 35E IN THE HICKORY CREEK ARM 681 METERS NORTH OF INTERSECTION OF I 35E AND COPPERAS BRANCH ROAD (L7)	11027	City of Dallas (DA)
0823_04	LEWISVILLE LAKE USGS SITE EC 362 METERS NORTH AND 536 METERS WEST OF INTERSECTION OF MAIN STREET AND WEST PARK STREET	14002	TRA
0823_04	LEWISVILLE LAKE AT ENTRANCE TO LITTLE ELM CREEK COVE SOUTH OF LAKEWOOD VILLAGE AND 1.9 KM WEST OF THE HIDDEN COVE PARK BUNKHOUSES (L6)	22318	City of Dallas (DA)
0823_05	LEWISVILLE LAKE ELM FORK ARM 170 METERS NORTH AND 1.58 KM EAST OF INTERSECTION OF HUNDLEY AND MARINA DRIVE	11026	TCEQ Region 4
0823_05	LEWISVILLE LAKE AT OLD LAKE DALLAS 1.2 KM NORTHEAST OF THE GREEN ASH PAVILION AT WESTLAKE PARK (L5)	22319	City of Dallas (DA)
0823_06	LEWISVILLE LAKE MID LAKE NEAR PECAN CREEK ARM 366 METERS SOUTH AND 1.24 KM EAST OF INTERSECTION OF EAST MCKINNEY STREET AND CAMP COPASS	17839	TRA
0823	PECAN CREEK 27 METERS DOWNSTREAM OF FM 428 4.0 MI EAST OF AUBREY	13616	Upper Trinity Regional Water District
0823	RUNNING BRANCH AT UPSTREAM SIDE OF FISHTRAP ROAD AND IMMEDIATELY UPSTREAM OF LEWISVILLE LAKE EAST OF CROSS ROADS	22244	Upper Trinity Regional Water District
0823	PARVIN BRANCH 65 METERS UPSTREAM OF PRESTON ROAD/SH 289 IN THE CITY OF FRISCO	22280	City of Frisco
0823	PANTHER CREEK AT FM 423 IN THE CITY OF FRISCO	22281	City of Frisco
0823	PANTHER CREEK 62 METERS UPSTREAM OF COBB HILL DRIVE AND THE BURLINGTON NORTHERN SANTA FE RAILROAD BRIDGE	22282	City of Frisco
0823	COTTONWOOD BRANCH 410 METERS UPSTREAM OF FM 423 AND 117 METERS SOUTH OF CRESTRIDGE DRIVE DEAD END IN THE CITY OF FRISCO	22285	City of Frisco

No impairments or concerns for aquatic life, recreation, domestic water supply, or general uses were identified in this segment.

0823C – Clear Creek

This 68.4-mile unclassified segment runs from the headwaters west of Montague in Montague County to the confluence with Lake Lewisville in Denton County (see Figure 27). Much of this watershed is grassland. There are pockets of pasture and hay and crop lands directly adjacent to the stream. The upper half of the segment flows through the Western Cross Timbers while

the lower half flows through the Grand Prairie ecoregion. A small stretch of the creek flows through the Eastern Cross Timbers before entering Lewisville Lake.

Clean Rivers Program water quality monitoring is being conducted at two sites within this segment as shown in Table 48. Monitoring is being conducted by TCEQ Region 4 and the City of Dallas. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 48: FY2023 Monitoring stations in Segment 0823C

Assessment Unit	Station Description	Station ID	Collecting Entity
0823C_01	CLEAR CREEK 80 METERS UPSTREAM OF FM 455 WEST OF SANGER	10859	TCEQ Region 4
0823C_01	CLEAR CREEK AT I 35 WEST OF US 377 APPROX 24.7 KM UPSTREAM OF LEWISVILLE LAKE SOUTH OF SANGER (L1)	16827	City of Dallas (DA)

A summary of the concerns and impairments identified in the TCEQ 2022 Texas Integrated Report is shown in Table 49.

Table 49: Findings of TCEQ 2022 Texas Integrated Report for Segment 0823C

Assessment Unit	Use	Parameter	Criteria	Finding
0823C_01	Recreation Use	*E. coli*	126 MPN/100 mL	NS

The impairment for *E. coli* in this segment may be due to a mix of point and runoff related sources. As shown in Figure 31, 48% of the data were reported above the standard of 126 MPN/100 mL. Elevated levels of *E. coli* were reported at low, normal, high, and flood flow severities and at all measured flows. There was no correlation to days since precipitation although most of the highest values were reported within a week of precipitation. There are several pastures and areas with evidence of livestock trails upstream of these stations. There are also several forested areas adjacent to the stream. Therefore, livestock and wildlife are the most likely sources of bacteria in this segment. Landowner education and livestock best management practices may help reduce *E. coli* levels.

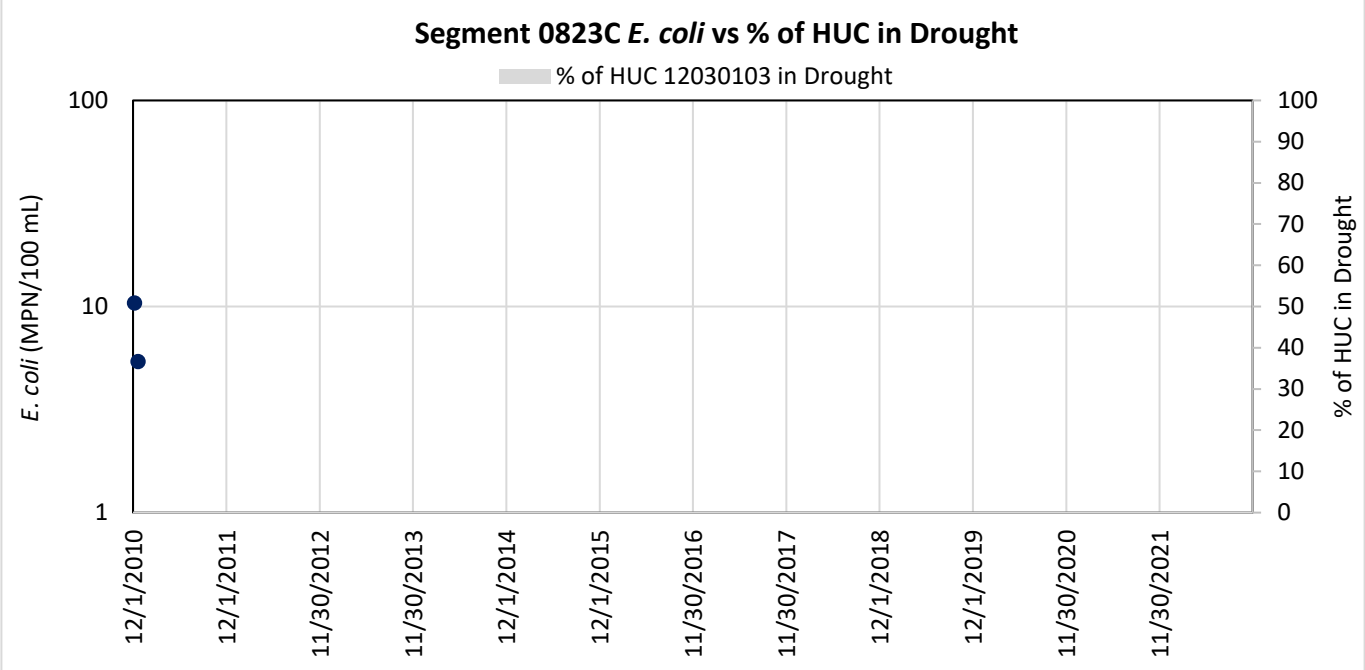

Figure 31: Segment 0823C E. coli vs % of HUC in Drought

0823A – Little Elm Creek

This 24.8-mile unclassified segment runs from 1.4 km above FM 453 in Collin County to the confluence with Lake Lewisville in Denton County (see Figure 27). Land use in this watershed is mainly pasture and hay and crop land. The watershed lies within the Northern Blackland Prairie ecoregion.

Clean Rivers Program water quality monitoring is being conducted at two sites within this segment as shown in Table 50. Monitoring is being conducted by the Upper Trinity Regional Water District. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 50: FY2023 Monitoring stations in Segment 0823A

Assessment Unit	Station Description	Station ID	Collecting Entity
0823A_01	LITTLE ELM CREEK AT FM 1385 5.5 MI EAST OF AUBREY 1.5 MI UPSTREAM FROM MUSTANG CREEK	13617	Upper Trinity Regional Water District
0823A	MUSTANG CREEK AT FM 428 AND 4.7 MILES EAST OF AUBREY	22243	Upper Trinity Regional Water District

No impairments or concerns for aquatic life, recreation, or general uses were identified in this segment.

0823D – Doe Branch

This 19-mile unclassified segment runs from the headwaters northeast of Celina in Collin County to the confluence with Lake Lewisville in Denton County (see Figure 27). Land use is this watershed is mostly crop land with some areas of development near the headwaters around the City of Celina and some residential development as the stream approaches Lewisville Lake. The watershed lies within the Northern Blackland Prairie ecoregion.

Clean Rivers Program water quality monitoring is being conducted at two sites within this segment as shown in Table 51. Monitoring is being conducted by the City of Dallas and Upper Trinity Regional Water District. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 51: FY2023 Monitoring stations in Segment 0823D

Assessment Unit	Station Description	Station ID	Collecting Entity
0823D_01	DOE BRANCH AT US 380 NEAR PROSPER (L3)	20291	City of Dallas (DA)
0823D_01	DOE BRANCH EAST CHANNEL AT FISHTRAP ROAD TWO MILES WEST OF PROSPER	22245	Upper Trinity Regional Water District

No impairments or concerns for aquatic life, recreation, or general uses were identified in this segment.

0823B – Stewart Creek

This 9.8-mile unclassified segment runs from the headwaters near Frisco in Collin County to the confluence with Lake Lewisville in Denton County (see Figure 28). This watershed drains mostly developed land around the City of Frisco.

Clean Rivers Program water quality monitoring is being conducted at two sites within this segment as shown in Table 52. Monitoring is being conducted by the City of Frisco. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 52: FY2023 Monitoring stations in Segment 0823B

Assessment Unit	Station Description	Station ID	Collecting Entity
0823B_01	STEWART CREEK AT GRAND PARK 713 METERS DOWNSTREAM OF DALLAS NORTH TOLLWAY IN THE CITY OF FRISCO	22278	City of Frisco
0823B_01	STEWART CREEK AT THE SOUTH END OF TEEL PARKWAY 1.68 KM DOWNSTREAM OF LEBANON ROAD IN THE CITY OF FRISCO	22279	City of Frisco

A summary of the concerns and impairments identified in the TCEQ 2022 Texas Integrated Report is shown in Table 53.

Table 53: Findings of TCEQ 2022 Texas Integrated Report for Segment 0823B

Assessment Unit	Use	Parameter	Criteria	Finding
0823B_01	General Use	Total Phosphorus	0.69 mg/L	CS (Carry Forward)
0823B_01	General Use	Nitrate	1.95 mg/L	CS (Carry Forward)

Concerns for Total Phosphorus and Nitrate in this segment were carried forward from previous assessments. The City of Frisco joined the TRA Clean Rivers Program in FY 2022 and began providing field data for two stations in this segment; Station 22278 and 22279. Station 22279 is located downstream of a wastewater treatment facility so it is likely that any nutrient monitoring in this segment would continue to show elevated levels of these parameters. Nutrients are typically elevated below wastewater treatment facilities as many locations do not have advanced nutrient removal technology. It is important to note that there does not appear to be an algal growth issue in this stream as the Dissolved Oxygen levels for the first year of sampling have ranged between 5.2 and 9.4 mg/L.

In FY 2022, TRA staff conducted an aquatic life monitoring event in this segment approximately 1.5 miles downstream of the wastewater treatment facility outfall. Fish and benthic macroinvertebrates scored high and habitat quality scored exceptional for both events.

Figure 32: Flathead catfish caught in Stewart Creek

0822 – Elm Fork Trinity River Below Lewisville Lake

Figure 33: Elm Fork Trinity River at Wildwood Drive in Dallas acoustic Doppler flow measurement

This 30-mile segment begins at the Lewisville Dam in Denton County and runs to the confluence with the West Fork Trinity River in Dallas County (see Figure 28). While there are some small areas of forested land, the majority of the watershed is highly developed by the cities of Lewisville, Carrollton, Farmers Branch, Irving, and Dallas, and Dallas-Fort Worth International Airport. This segment lies mainly within the Northern Blackland Prairie ecoregion with the Eastern Cross Timbers to the west edge of the watershed.

Clean Rivers Program water quality monitoring is being conducted at five sites within this segment as shown in Table 54. Monitoring is being conducted by TRA, the City of Dallas, and the City of Plano. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 54: FY2023 Monitoring stations in Segment 0822

Assessment Unit	Station Description	Station ID	Collecting Entity
0822_01	ELM FORK TRINITY RIVERA AT WILDWOOD DRIVE-TOMBRANIFF DRIVE IN DALLAS	20287	TRA
0822_02	ELM FORK TRINITY RIVER AT INTAKE OF DALLAS WATER UTILITIES ELM FK TREATMENT PLANT 738 M DOWNSTREAM OF CONFLUENCE WITH DENTON CK IN CARROLLTON (E2)	16438	City of Dallas (DA)
0822_03	ELM FORK TRINITY RIVER IMMEDIATELY DOWNSTREAM OF HEBRON PARKWAY SOUTHEAST OF LEWISVILLE TR255 (E4)	18358	City of Dallas (DA)

Assessment Unit	Station Description	Station ID	Collecting Entity
0822_04	ELM FORK TRINITY RIVER AT LEWISVILLE LAKE SPILLWAY 3 MI NORTHEAST OF LEWISVILLE (E1)	15252	City of Dallas (DA)
0822	INDIAN CREEK 315 METERS DOWNSTREAM OF KINGS MANOR LANE NEAR THE END OF SHADY BROOK TRAIL	22258	City of Plano

A summary of the concerns and impairments identified in the TCEQ 2022 Texas Integrated Report is shown in Table 55.

Table 55: Findings of TCEQ 2022 Texas Integrated Report for Segment 0822

Assessment Unit	Use	Parameter	Criteria	Finding
0822_01	General Use	Chlorophyll-*a*	14.1 ug/L	CS
0822_04	General Use	Chlorophyll-*a*	14.1 ug/L	CS (Carry Forward)

Concerns for Chlorophyll-*a* in assessment unit 0822_04 were carried forward from previous integrated reports. There is no current Chlorophyll-*a* monitoring in this assessment unit. The concern is clearly related to the location of the sampling station in relation to the upstream reservoir. Station 15252 is located at the spillway of Lewisville Lake and samples collected at this station are dominated by releases from the reservoir. The screening level for Chlorophyll-*a* in reservoirs is 26.7 µg/L while it is 14.1 in rivers and streams. It is recommended that TCEQ re-evaluate this concern and determine if the screening level for rivers and streams is appropriate for stations immediately downstream from reservoir spillways. Additional Chlorophyll-*a* monitoring would be needed provide further information to TCEQ to address this recommendation.

Concerns for Chlorophyll-*a* in assessment unit 0822_01 were based on current data. Chlorophyll-*a* was negatively correlated to flow and positively correlated to only Total Kjeldahl Nitrogen (correlation coefficients = -0.44 and 0.5, respectively). It is unlikely that nutrients were increasing algal populations. As shown in Figure 34, 49% of the data exceeded the screening level of 14.1 ug/L and most of these exceedances occurred during drought periods. It appears that long residence times during low flows may have been allowing algal populations to increase in the river. Algal populations do not appear to be having a negative impact on Dissolved Oxygen levels; of 55 values, only four were reported below 5 mg/L and none were below 3 mg/L.

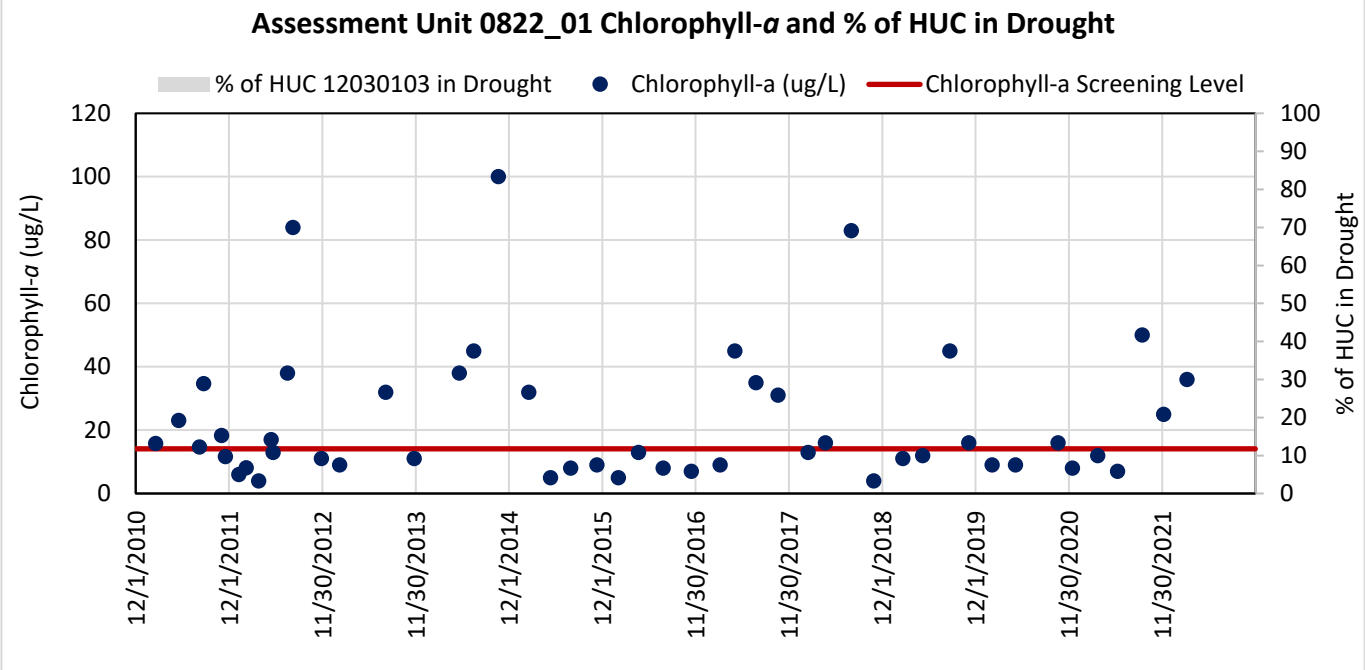

Figure 34: Assessment Unit 0822_01 Chlorophyll-a and % of HUC in Drought

0826A – Denton Creek

Figure 35: Denton Creek upstream of US 377

This 85-mile unclassified segment runs from 2.3 km upstream of TX-59 to the confluence with Grapevine Lake in Denton County (see Figure 28). The upper portion of the watershed is grassland and forest with small areas of pasture and crop land adjacent to the stream. The lower portion of the watershed becomes more dominated by pasture, hay, and crop land. The stream flows through the Western Cross Timbers and the Grand Prairie ecoregions.

Clean Rivers Program water quality monitoring is being conducted at four sites within this segment as shown in Table 56. Monitoring is being conducted by TRA and the City of Dallas. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 56: FY2023 Monitoring stations in Segment 0826A

Assessment Unit	Station Description	Station ID	Collecting Entity
0826A_01	DENTON CREEK 30 METERS UPSTREAM OF CONFLUENCE WITH CADE BRANCH ABOVE THE MIXING ZONE	21295	TRA
0826A_01	DENTON CREEK 100 METERS DOWNSTREAM OF THE CONFLUENCE WITH CADE BRANCH BELOW MIXING ZONE	21296	TRA
0826A_02	DENTON CREEK AT FM 156 2.4 MILES NORTH OF JUSTIN (G1)	14483	City of Dallas (DA)
0826A_02	DENTON CREEK AT FM 407 1.2 MILES EAST OF JUSTIN (G2)	14484	City of Dallas (DA)

A summary of the concerns and impairments identified in the TCEQ 2022 Texas Integrated Report is shown in Table 57.

Table 57: Findings of TCEQ 2022 Texas Integrated Report for Segment 0826A

Assessment Unit	Use	Parameter	Criteria	Finding
0826A_01	General Use	Nitrate	1.95 mg/L	CS (Carry Forward)

The concern for Nitrate in Assessment Unit 0826A_01 was carried forward from previous assessments. As shown in Figure 36, 37% of the data was reported above the screening level of 1.95 mg/L. Data was collected through the drought of 2011 to 2015 and was discontinued in 2017. Most of the exceedances were reported during the drought period. It is likely that the concern was due to nutrients from upstream wastewater treatment facilities compounded by the effects of drought conditions. Most wastewater treatment facilities do not have advanced nutrient removal and as a result can introduce nutrients into receiving streams. If there is a lack of freshwater inflows from precipitation as occurs during drought conditions, the stream can become effluent-dominated and nutrients levels increase. TRA began sampling in this assessment unit in FY 2022 to provide additional data for the assessment. Based on the recent data, this concern may no longer exist. Continued sampling will be re-evaluated for FY 2024.

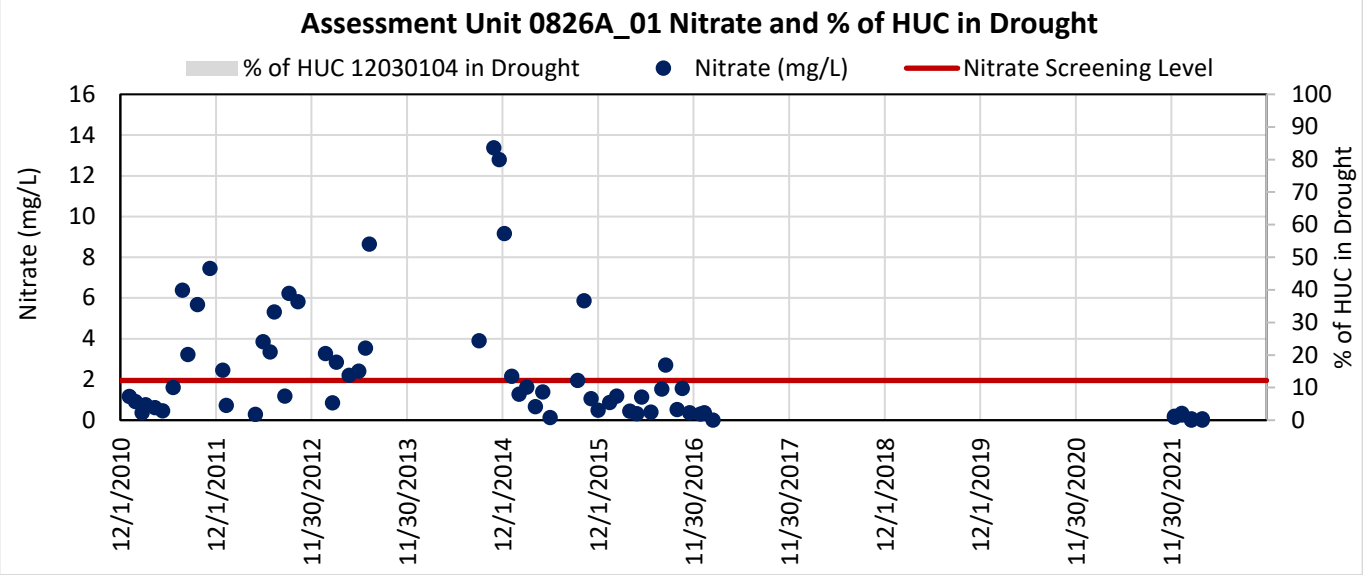

Figure 36: Assessment Unit 0826A_01 Nitrate and % of HUC in Drought

0826B – Trail Creek

This 1.8-mile unclassified segment is a perennial stream that runs from 2.1 km upstream of SH 156 in Justin to the confluence with Denton Creek (see Figure 28). The watershed is a mix of development around the City of Justin on the north side and pasture, hay, and crop land to the south. It flows through the Grand Prairie ecoregion. There is no Clean Rivers Program monitoring scheduled in this segment for FY 2023.

No impairments or concerns for aquatic life, recreation, or general uses were identified in this segment.

0826C – Henrietta Creek

This 3-mile unclassified segment runs from the confluence with Elizabeth Creek to the confluence with Denton Creek (see Figure 28). The stream passes through the developed areas in the City of Roanoke to the southeast and Texas Motor Speedway to the northwest. The immediate riparian area downstream of SH 114 is forested. This watershed lies within the Grand Prairie ecoregion. There is no Clean Rivers Program monitoring scheduled in this segment for FY 2023.

No impairments or concerns for aquatic life, recreation, or general uses were identified in this segment.

0826 – Grapevine Lake

This 6,617-*a*cre segment impounds Denton Creek up to a normal pool elevation of 535 feet (see Figure 28). With the exception of the northeast portion of the watershed, most of the land use is highly developed with cities including Flower Mound, Grapevine, Southlake, and Trophy Club.

To the northeast, there is less development and some areas of pasture and hay. This segment lies within the Eastern Cross Timbers ecoregion.

Clean Rivers Program water quality monitoring is being conducted at eleven sites within this segment as shown in Table 58. Monitoring is being conducted by TCEQ Region 4, the City of Dallas, and TRA. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 58: FY2023 Monitoring stations in Segment 0826

Assessment Unit	Station Description	Station ID	Collecting Entity
0826_01	GRAPEVINE RESERVOIR MID LAKE NEAR DAM 1.01 KM NORTH AND 318 METERS EAST OF INTERSECTION OF PARK ROAD 7 AND SILVERSIDE DRIVE	11035	TCEQ Region 4
0826_01	GRAPEVINE LAKE NEAR THE DAM 427 METERS SOUTH AND 182 METERS WEST OF THE OUTLET WORKS (G4)	22316	City of Dallas (DA)
0826_02	GRAPEVINE RESERVOIR AT MOREHEAD CREEK COVE 443 METERS NORTH AND 120 METERS EAST OF INTERSECTION OF PARK ROAD 8 AND DOOLEY STREET	11036	TRA
0826_03	GRAPEVINE LAKE MID LAKE NORTH OF OAK GROVE PARK 1.26 KM NORTH AND 269 METERS EAST OF INTERSECTION OF MESQUITE BEND AND PARK ROAD	16114	TRA
0826_04	GRAPEVINE LAKE AT MOUTH OF NORTH MAIN SLOUGH COVE 749 METERS N AND 149 METERS W OF INTERSECTION OF OAK GROVE PARK RD AND DOVE LOOP RD	16116	TRA
0826_05	GRAPEVINE LAKE AT MIDLAKE 860 METERS SOUTHWEST OF THE END OF MURRELL PARK ROAD (G5)	22317	City of Dallas (DA)
0826_06	GRAPEVINE LAKE MID LAKE BETWEEN WALNUT GROVE PARK AND RED BUD PT 882 M N AND 1.39 KM E OF INTERSECTION OF BOB JONES RD AND SADDLE RIDGE	16112	TCEQ Region 4
0826_07	GRAPEVINE LAKE UPSTREAM END MID LAKE 1.37 KM NORTH AND 1.18 KM EAST OF INTERSECTION OF WHITE CHAPEL ROAD AND BOB JONES ROAD	22234	TRA
0826_08	GRAPEVINE LAKE DOVE CREEK COVE MIDDLE OF COVE APPROX 250 METERS SOUTH AND 280 METERS EAST OF THE INTERSECTION OF PERCH E LANE AND MEADOWMERE LANE-SNAKEY ROAD	20884	TRA
0826_08	GRAPEVINE LAKE AT MURRELL PARK E 60 METERS EAST AND 40 METERS SOUTH OF BOAT RAMP 1 NEAR GRAPEVINE	21351	TRA
0826_08	GRAPEVINE LAKE AT TWIN COVES PARK 270 METERS SOUTH AND 30 METERS EAST OF THE SOUTHERNMOST BOAT RAMP AT THE END OF TWIN COVES PARK ROAD NEAR GRAPEVINE (G3)	21354	City of Dallas (DA)

A summary of the concerns and impairments identified in the TCEQ 2022 Texas Integrated Report is shown in Table 59.

Table 59: Findings of TCEQ 2022 Texas Integrated Report for Segment 0826

Assessment Unit	Use	Parameter	Criteria	Finding
0826_07	General Use	pH	9	NS (Carry Forward)

The impairment for high pH in Assessment Unit 0826_07 was carried forward from previous assessments. TRA staff began monitoring in this assessment unit in FY 2021. Sampling will continue through FY 2025 after which time it will be re-evaluated for continued monitoring. Based on the limited dataset for the period of record for this report, the average pH was 8.0 S.U. with a range of 7.8 to 8.2 S.U. Continued monitoring will allow for a more thorough review of this impairment in upcoming years.

0825A – Cottonwood Branch

This 8.3-mile unclassified segment runs from Minters Chapel Road in Tarrant County to the confluence with Denton Creek in Dallas County (see Figure 28). Most of the watershed is highly developed and runs from just north of DFW International Airport where there are some areas of woods and grassland to Coppell. It lies within the Northern Blackland Prairie ecoregion.

Clean Rivers Program water quality monitoring is being conducted at one site within this segment as shown in Table 60. Monitoring is being conducted by the DFW Airport Environmental Affairs Department. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 60: FY2023 Monitoring stations in Segment 0825A

Assessment Unit	Station Description	Station ID	Collecting Entity
0825A	COTTONWOOD BRANCH AT KELLER GRAPEVINE ROAD IN IRVING	22089	DFW Airport Environmental Affairs Department

No impairments or concerns for aquatic life, recreation, or general uses were identified in this segment.

0825 – Denton Creek

This 11-mile segment runs from Grapevine Dam in Tarrant County to the confluence with the Elm Fork Trinity River in Dallas County (see Figure 28). The watershed is highly developed; lying between the cities of Lewisville and Coppell. It begins in the Eastern Cross Timbers and flows into the Northern Blackland Prairie ecoregion.

Clean Rivers Program water quality monitoring is being conducted at two sites within this segment as shown in Table 61. Monitoring is being conducted by TRA and the City of Dallas. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 61: FY2023 Monitoring stations in Segment 0825

Assessment Unit	Station Description	Station ID	Collecting Entity
0825_01	DENTON CREEK IMMEDIATELY DOWNSTREAM OF SH 121 SOUTH OF LEWISVILLE	11034	TRA
0825_01	DENTON CREEK 41 METERS UPSTREAM OF DENTON TAP ROAD 2 MI NORTH OF COPPELL (E5)	14244	City of Dallas (DA)

A summary of the concerns and impairments identified in the TCEQ 2022 Texas Integrated Report is shown in Table 62.

Table 62: Findings of TCEQ 2022 Texas Integrated Report for Segment 0825

Assessment Unit	Use	Parameter	Criteria	Finding
0825_01	Recreation Use	*E. coli*	126 MPN/100 mL	CN (Carry Forward)

The concern for *E. coli* in this segment was carried forward from previous assessments. As shown in Figure 37, 38% of the data was reported above the standard of 126 MPN/100 mL but the geometric mean was 101 MPN/100 mL. Most of the data in Figure 37 was analyzed by a lab that was not NELAP certified and was therefore not available for assessment purposes. A certified lab is now being used and TRA staff began monitoring in FY 2020 and will continue through FY 2024. There were no correlations between *E. coli* and flow or days since precipitation. This indicates that elevated levels of *E. coli* may be due to a mix of point and runoff related sources. The watershed is highly developed with some small wooded riparian areas, parks, and a golf course. Runoff containing waste from pets and wildlife may be introducing bacteria to the stream during precipitation events. Homeowner education and pet waste best management practices may help reduce bacterial loading from pet sources. However, because *E. coli* levels were frequently elevated at low flow, failing wastewater infrastructure may be introducing bacteria into the stream as well. It is recommended that the stream be inspected for failing pipelines or overflows to determine if human waste may be contributing to the elevated levels of bacteria observed in this stream.

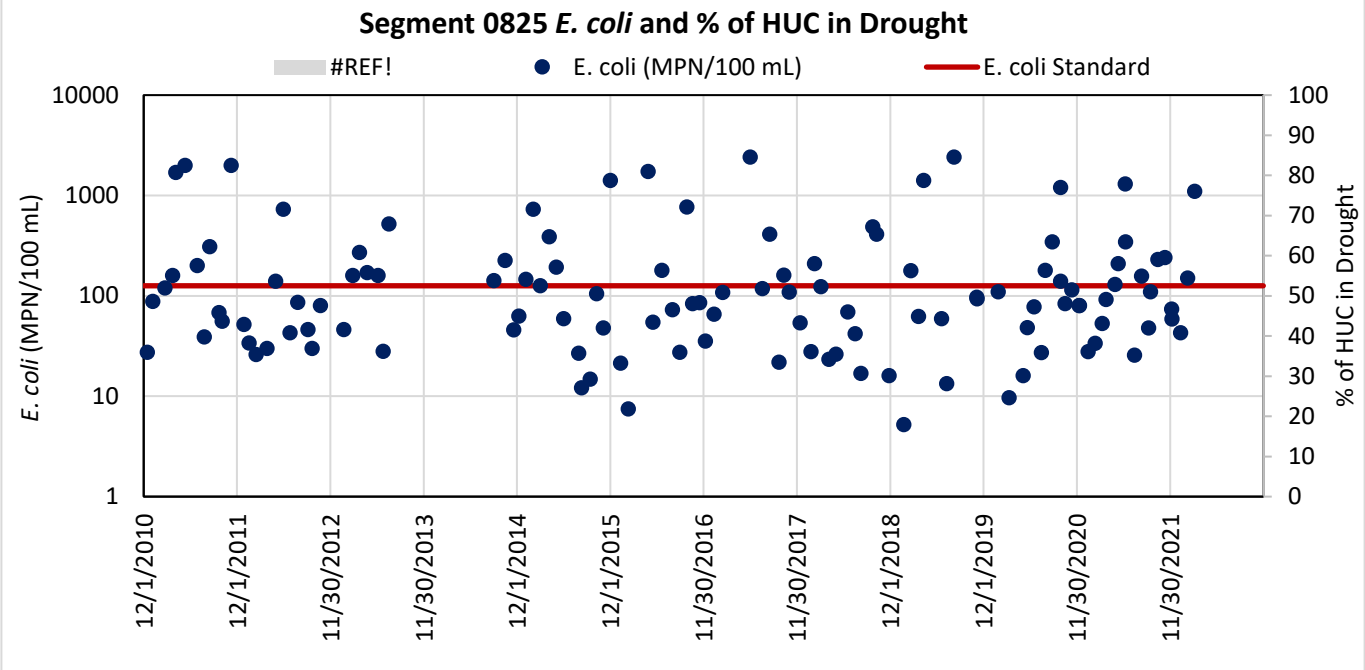

Figure 37: Segment 0825 E. coli and % of HUC in Drought

0822B – Grapevine Creek

This 10.5-mile unclassified segment runs from its headwaters west of International Parkway at Dallas-Fort Worth Airport in Tarrant County to the confluence with the Elm Fork Trinity River in Dallas County upstream (see Figure 28). The watershed is heavily developed with the airport at its headwaters and flowing through the City of Coppell. It lies within the Northern Blackland Prairie ecoregion.

Clean Rivers Program water quality monitoring is being conducted at two sites within this segment as shown in Table 63. Monitoring is being conducted by the City of Irving and DFW Airport Environmental Affairs Department. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 63: FY2023 Monitoring stations in Segment 0822B

Assessment Unit	Station Description	Station ID	Collecting Entity
0822B_01	GRAPEVINE CREEK AT NORTH MACARTHUR BLVD. 3.5 KM UPSTREAM OF THE CONFLUENCE WITH THE ELM FORK TRINITY RIVER	20311	City of Irving
0822B_01	GRAPEVINE CREEK APPROX 225 METERS UPSTREAM OF N ROYAL LANE AND 25 METERS UPSTREAM OF RAILROAD TRACKS IN IRVING	21632	DFW Airport Environmental Affairs Department

A summary of the concerns and impairments identified in the TCEQ 2022 Texas Integrated Report is shown in Table 64.

Table 64: Findings of TCEQ 2022 Texas Integrated Report for Segment 0822B

Assessment Unit	Use	Parameter	Criteria	Finding
0822B_01	Recreation Use	*E. coli*	126 MPN/100 mL	NS

The impairment for *E. coli* in this segment may be due to a mix of point and runoff related sources. As shown in Figure 38, 63% of the data were reported above the standard of 126 MPN/100 mL. There were no correlations to flow or days since precipitation although most of the highest values were reported within two days of precipitation. This watershed is highly developed with a narrow wooded riparian corridor. Runoff carrying waste from pets and wildlife may be contributing bacteria to the stream during precipitation events. However, because elevated levels of *E. coli* were reported during low flows, failing wastewater infrastructure may be contributing bacteria as well. An inspection of the stream may be beneficial in determining if there are any broken pipelines or overflows in the area. This segment is part of the North Central Texas Council of Governments Total Maximum Daily Load Implementation Plan for several waterbodies in the Dallas-Fort Worth Metroplex. The Implementation Plan describes practices that stakeholders may implement in order to reduce bacteria levels.

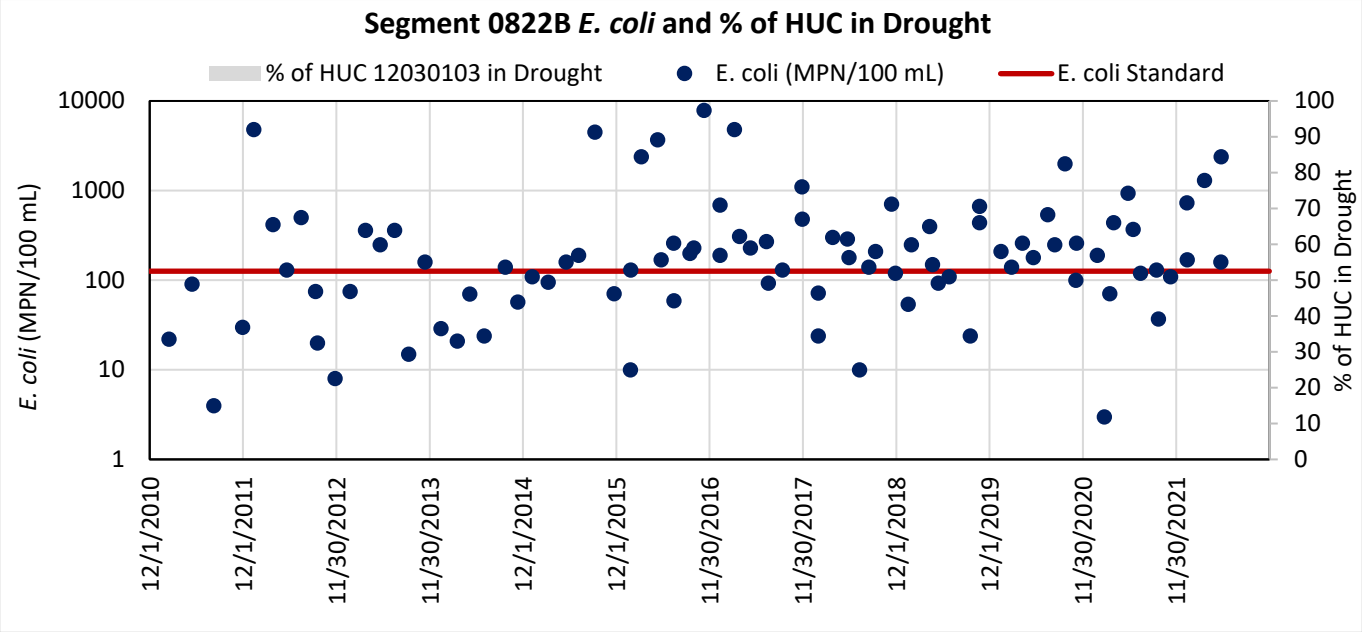

Figure 38: Segment 0822B E. coli and % of HUC in Drought

0822E – South Fork Hackberry Creek

This 2.7-mile segment runs from Valley View Lane to the confluence with Hackberry Creek in Dallas County (see Figure 28). This watershed is highly developed and runs from areas of woods and grasslands near inside of the DFW International Airport to Las Colinas. It lies within the Northern Blackland Prairie ecoregion.

Clean Rivers Program water quality monitoring is being conducted at one site within this segment as shown in Table 65. Monitoring is being conducted by the DFW Airport

Environmental Affairs Department. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 65: FY2023 Monitoring stations in Segment 0822E

Assessment Unit	Station Description	Station ID	Collecting Entity
0822E	SOUTH FORK HACKBERRY CREEK AT VALLEY VIEW LANE IN IRVING	21634	DFW Airport Environmental Affairs Department

No impairments or concerns for aquatic life, recreation, or general uses were identified in this segment.

0822C – Hackberry Creek

This 7-mile unclassified segment runs upstream from approximately 2.4 mi upstream of SH 114 in Irving to the confluence with Cottonwood Branch (see Figure 28). The watershed is heavily developed; beginning at Dallas-Fort Worth International Airport and flowing through the City of Irving. It lies within the Northern Blackland Prairie ecoregion.

Clean Rivers Program water quality monitoring is being conducted at two sites within this segment as shown in Table 66. Monitoring is being conducted by the City of Irving and DFW Airport Environmental Affairs Department. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 66: FY2023 Monitoring stations in Segment 0822C

Assessment Unit	Station Description	Station ID	Collecting Entity
0822C_01	HACKBERRY CREEK AT COLWELL BOULEVARD IN IRVING	17170	City of Irving
0822C_01	HACKBERRY CREEK AT CABELL ROAD IN IRVING	17172	DFW Airport Environmental Affairs Department

A summary of the concerns and impairments identified in the TCEQ 2022 Texas Integrated Report is shown in Table 67.

Table 67: Findings of TCEQ 2022 Texas Integrated Report for Segment 0822C

Assessment Unit	Use	Parameter	Criteria	Finding
0822C_01	General Use	Chlorophyll-*a*	14.1 ug/L	CS

Chlorophyll-*a* concerns were identified in this segment. Figure 39 shows that 46% of the data were reported above the screening level of 14.1 µg/L. Chlorophyll-*a* was moderately correlated to Total Kjeldahl Nitrogen (correlation coefficient = 0.5). This stream has low water dams and very low flows with a wide channel and very little tree cover. These conditions provide ideal conditions for algal growth - sufficient nutrients, sunlight, and high residence times. The watershed contains several dense residential developments and a golf course which may be

contributing Total Kjeldahl Nitrogen via the use of residential and turf fertilizers. Homeowner and business education and fertilizer best management practices may help reduce nutrient and Chlorophyll-*a* levels in this segment. Algal populations did not appear to be excessively affecting Dissolved Oxygen levels in this segment. The average Dissolved Oxygen level was 8.7 mg/L; 16% of the data were reported below the screening level of 5 mg/L but no data were reported below minimum standard of 3 mg/L.

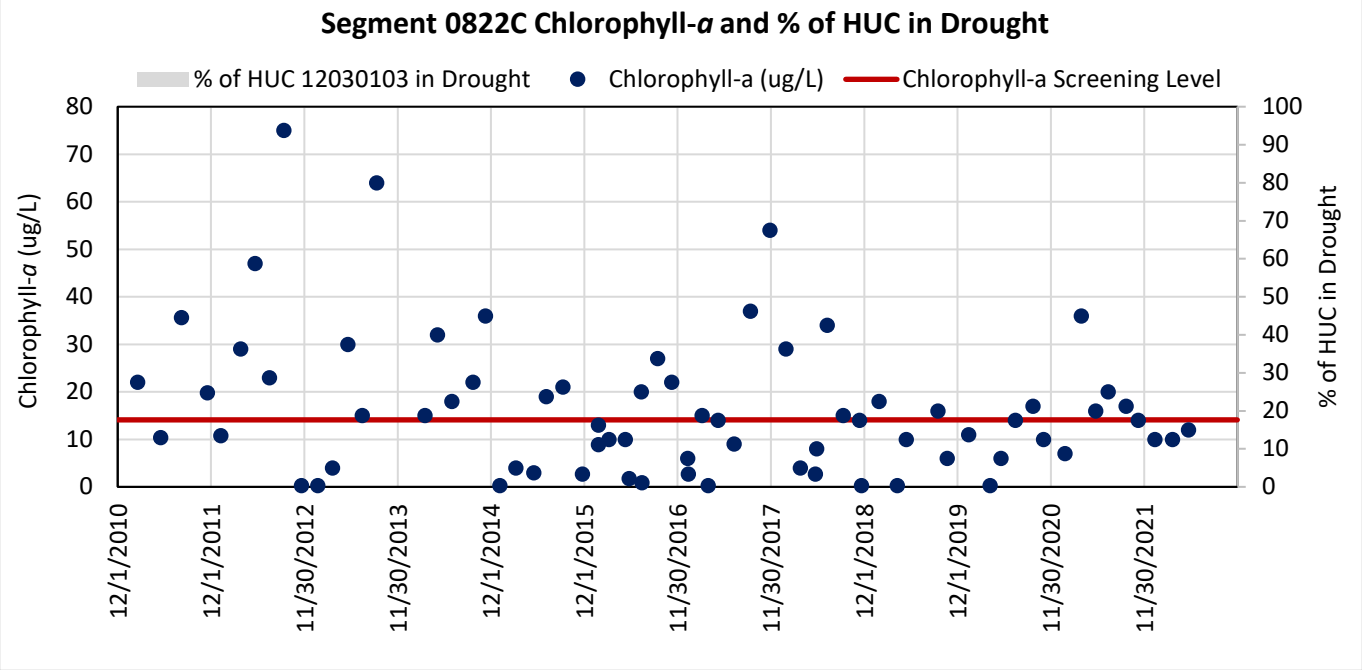

Figure 39: Segment 0822C Chlorophyll-a and % of HUC in Drought

0822A – Cottonwood Branch

This 5-mile unclassified segment runs from Valley View Road in Dallas County to the confluence with Hackberry Creek (see Figure 28). The watershed is heavily developed; beginning at Dallas-Fort Worth International Airport and flowing through the City of Irving. It lies within the Northern Blackland Prairie ecoregion.

Clean Rivers Program water quality monitoring is being conducted at two sites within this segment as shown in Table 68. Monitoring is being conducted by the City of Irving. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 68: FY2023 Monitoring stations in Segment 0822A

Assessment Unit	Station Description	Station ID	Collecting Entity
0822A_01	COTTONWOOD BRANCH 71 METERS UPSTREAM OF NORTH MACARTHUR BOULEVARD IN IRVING	17167	City of Irving
0822A_02	COTTONWOOD BRANCH AT NORTH STORY ROAD IN IRVING	17166	City of Irving

A summary of the concerns and impairments identified in the TCEQ 2022 Texas Integrated Report is shown in Table 69.

Table 69: Findings of TCEQ 2022 Texas Integrated Report for Segment 0822A

Assessment Unit	Use	Parameter	Criteria	Finding
0822A_01	General Use	Chlorophyll-*a*	14.1 ug/L	CS
0822A_02	Recreation Use	*E. coli*	126 MPN/100 mL	NS

Chlorophyll-*a* concerns were identified in Assessment Unit 0822A_01. Figure 40 shows that 44% of the data were reported above the screening level of 14.1 ug/L. This portion of the stream is likely a low flow system. Assessment Unit 0822A_02 upstream had an average flow of 0.66 cfs and there are no major tributaries to this stream. It also flows through a golf course and has a widened channel with several low water dams, little tree cover, and relatively clear water with an average Secchi Depth of 0.44 meters. There were no correlations to nutrients. It is likely that the long residence times and clarity of the stream were responsible for the concern in this assessment unit. Algal populations did not appear to be excessively affecting Dissolved Oxygen levels in this assessment unit. The average Dissolved Oxygen was 6.02 mg/L with 5% of the data below the screening level of 3 mg/L and no data below the minimum standard of 2 mg/L.

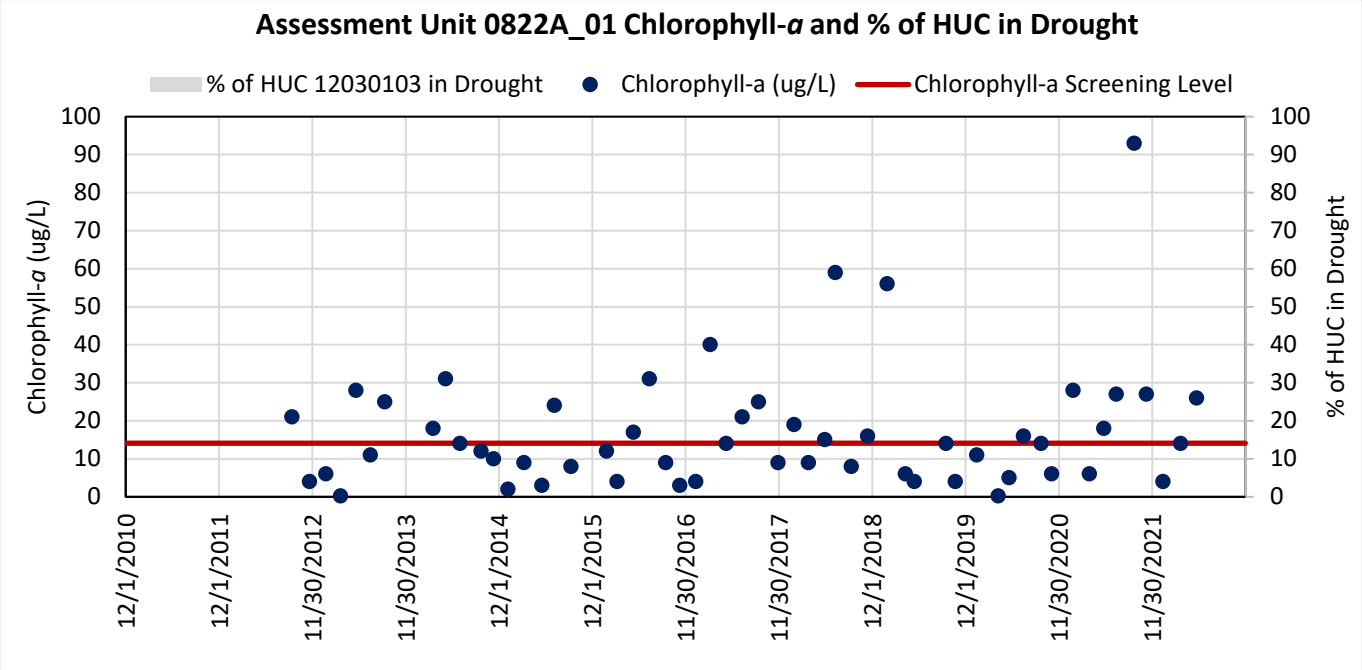

Figure 40: Assessment Unit 0822A_01 Chlorophyll-a and % of HUC in Drought

An impairment for *E. coli* was identified in Assessment Unit 0822A_02. As shown in Figure 41, 48% of the data were reported above the standard of 126 MPN/100 mL. There were no correlations to flow or days since precipitation although all exceedances were reported within one week of precipitation. Therefore, the impairment may be due largely to runoff related sources. The watershed above the monitoring station in this assessment unit contains several large multifamily developments in addition to small single family neighborhoods and wooded areas directly adjacent to the stream so pets and wildlife may be the source of bacterial loadings to the stream. Homeowner and renter education and pet waste best management practices may help reduce bacteria levels in this stream. This segment is part of the North Central Texas

Council of Governments Total Maximum Daily Load Implementation Plan for several waterbodies in the Dallas-Fort Worth Metroplex. The Implementation Plan describes practices that stakeholders may implement in order to reduce bacteria levels.

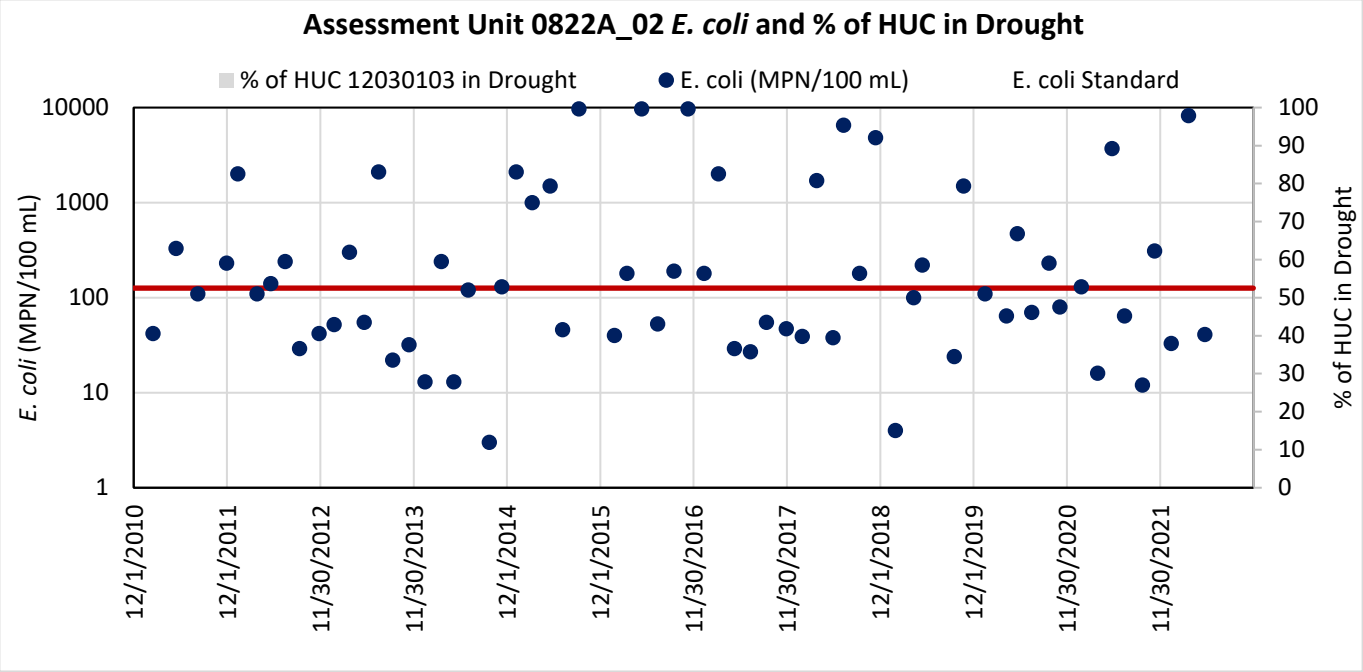

Figure 41: Assessment Unit 0822A_02 E. coli and % of HUC in Drought

0822D – Ski Lake

This 68-acre reservoir is located just south of the intersection of US 35E and spur 482 in Irving (see Figure 28). The watershed is heavily developed and lies within the Northern Blackland Prairie ecoregion.

Clean Rivers Program water quality monitoring is being conducted at one site within this segment as shown in Table 70. Monitoring is being conducted by the City of Dallas. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 70: FY2023 Monitoring stations in Segment 0822D

Assessment Unit	Station Description	Station ID	Collecting Entity
0822D_01	SKI LAKE NEAR BARCHMAN TREATMENT PLANT INTAKE 543 METERS SOUTH AND 99 METERS WEST OF INTERSECTION OF SH 482 AND I 35 EAST (E3)	17849	City of Dallas (DA)

No impairments or concerns for aquatic life, recreation, domestic water supply, or general uses were identified in this segment.

Main Stem Trinity River

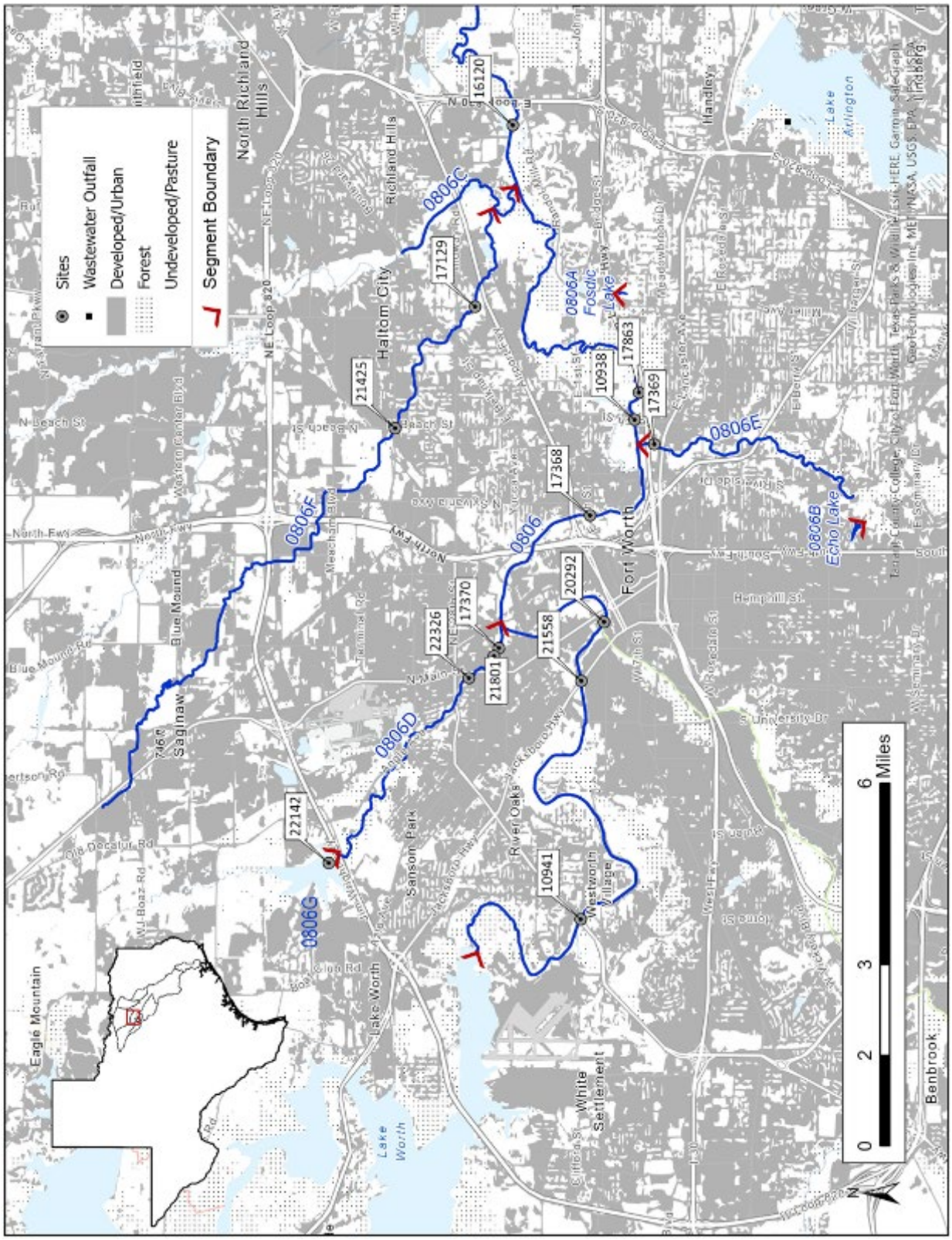

Figure 42: Map of segments and stations of the Fort Worth area Main Stem Trinity River subwatershed

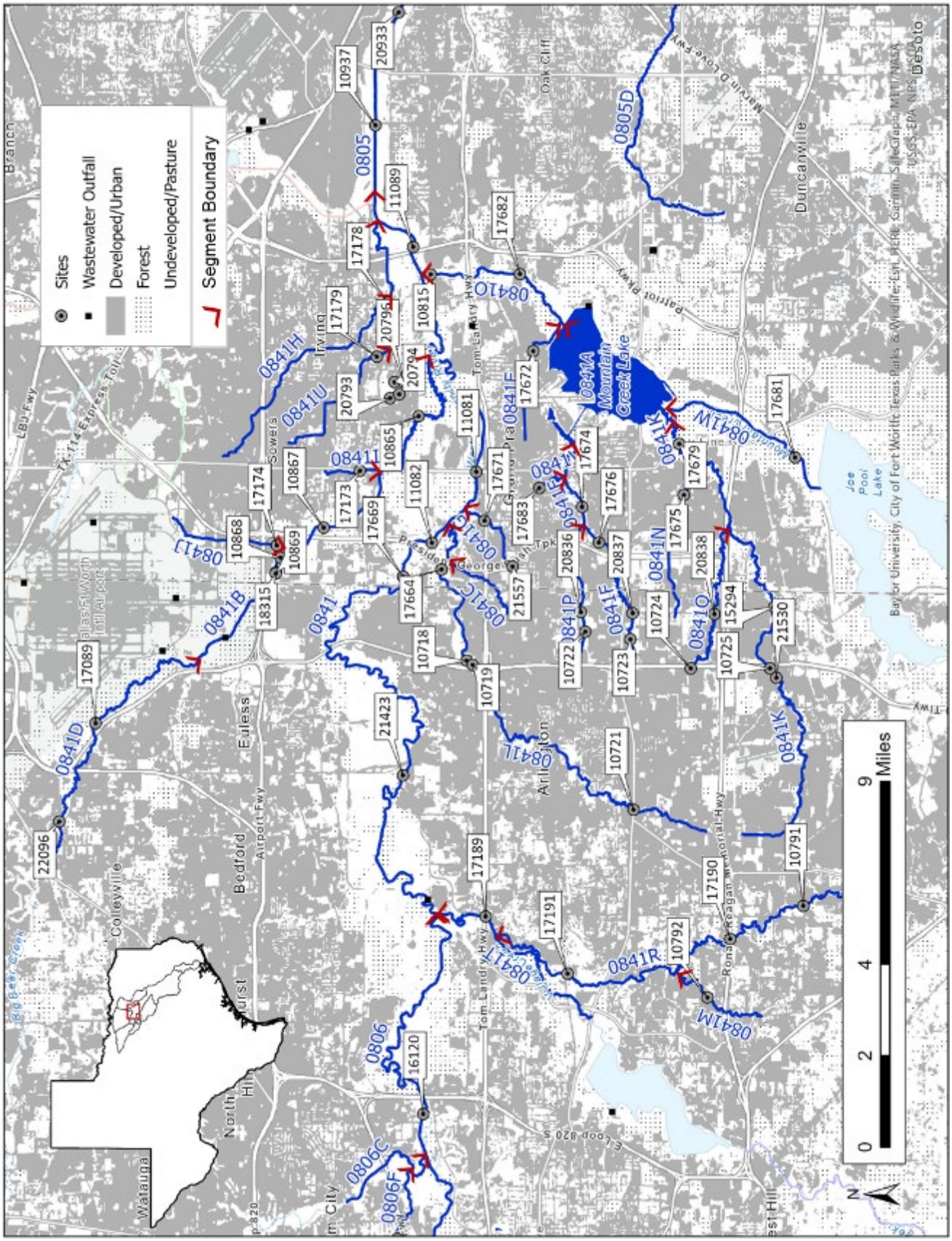

Figure 43: Map of segments and stations of the Dallas area Main Stem Trinity River subwatershed

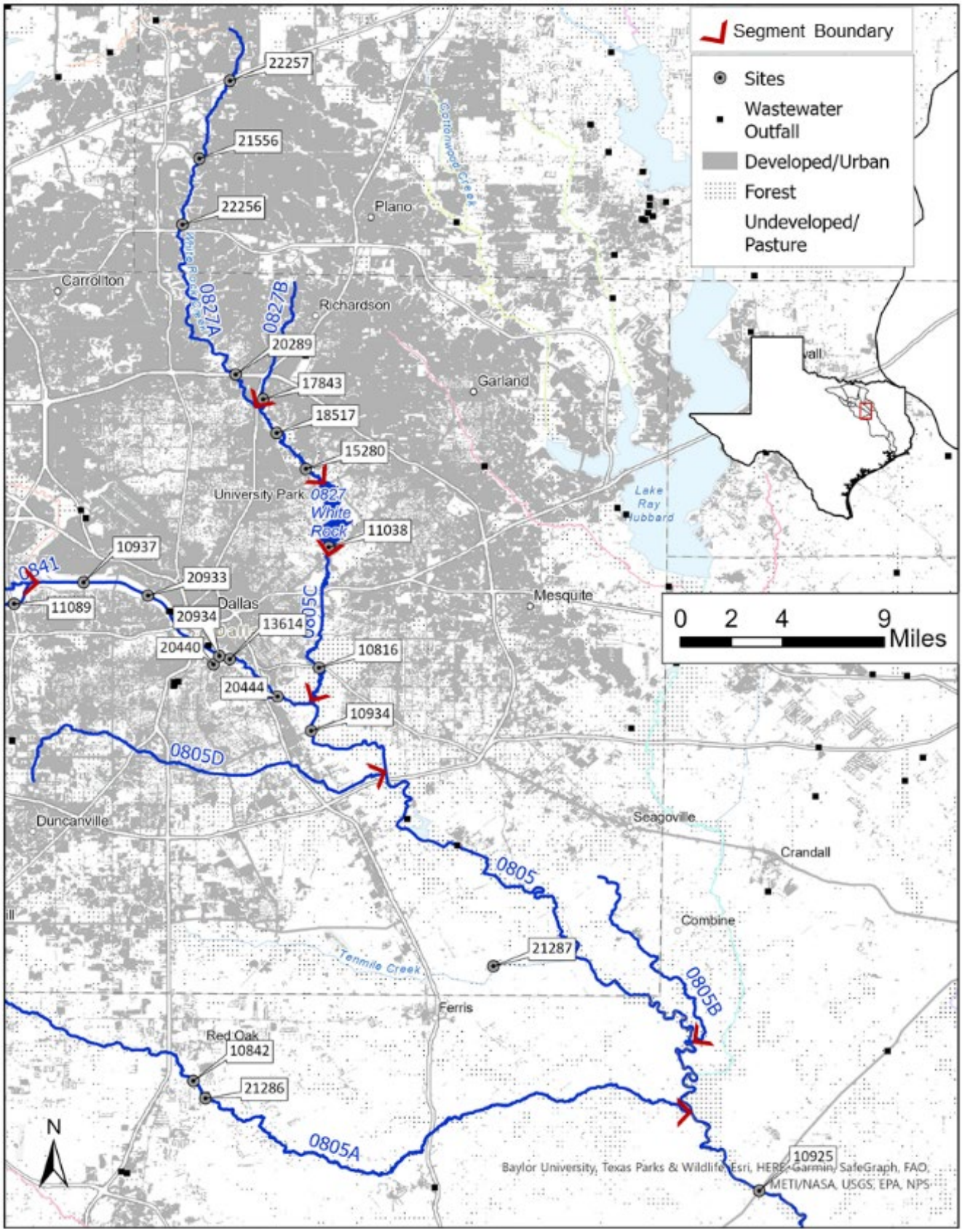

Figure 44: Map of segments and stations of the White Rock area Main Stem Trinity River subwatershed

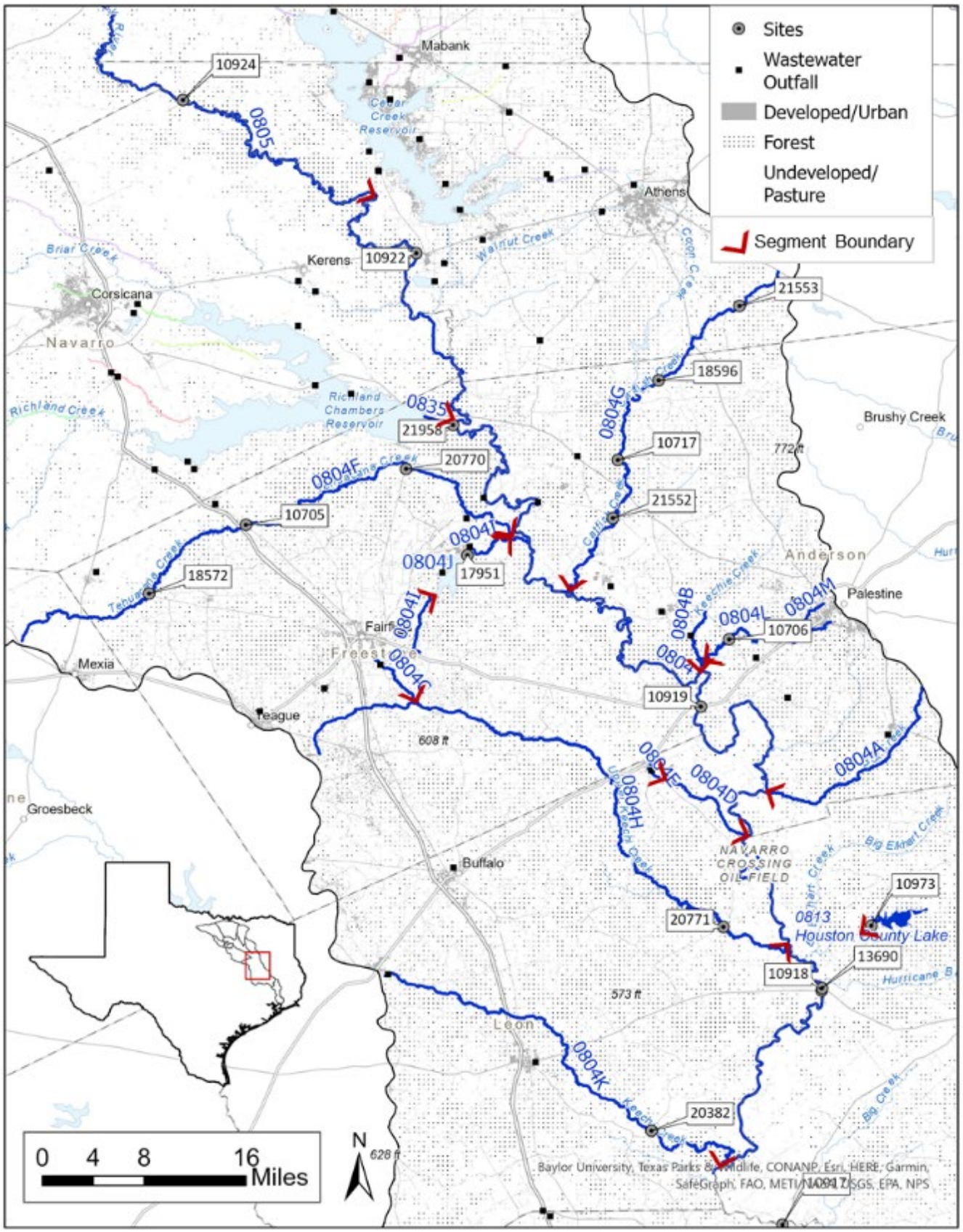

Figure 45: Map of segments and stations of the Main Stem Trinity River subwatershed below Dallas

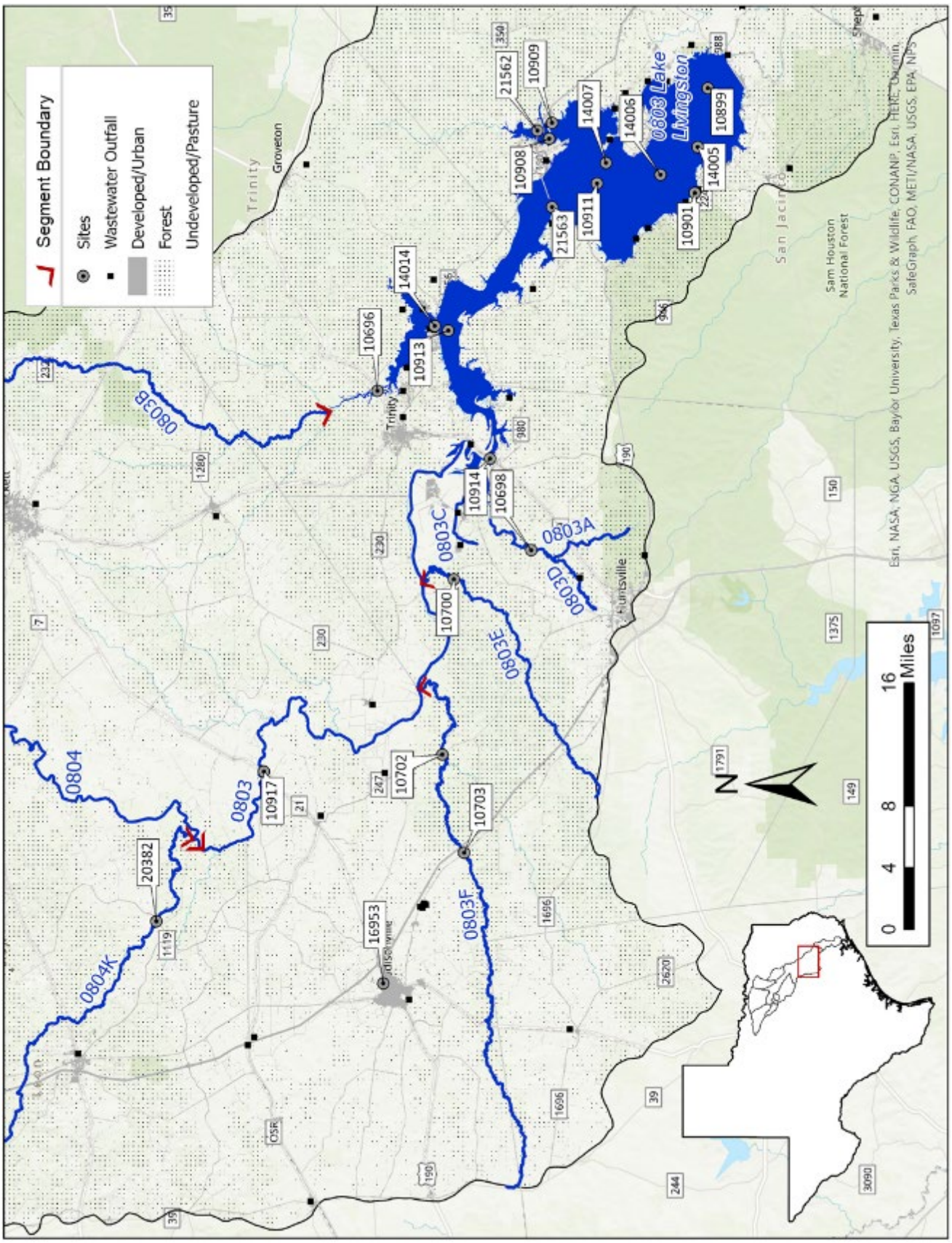

Figure 46: Map of segments and stations of the Lake Livingston area Main Stem Trinity River subwatershed

0806 West Fork Trinity River Below Lake Worth

This 32-mile segment of the West Fork Trinity River travels southeast from the Lake Worth dam to the confluence of Village Creek in Tarrant County (see Figure 42). A majority of the segment is heavily developed by the cities of White Settlement, Fort Worth, Haltom City, and Arlington. There are some forested areas directly adjacent to the river. This segment begins in the Grand Prairie and ends in the Eastern Cross Timbers ecoregion.

Clean Rivers Program water quality monitoring is being conducted at four sites within this segment as shown in Table 71. Monitoring is being conducted by Tarrant Regional Water District and the City of Fort Worth. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 71: FY2023 Monitoring stations in Segment 0806

Assessment Unit	Station Description	Station ID	Collecting Entity
0806_01	WEST FORK TRINITY RIVER 54 METERS DOWNSTREAM OF BEACH STREET IN FORT WORTH	10938	Tarrant Regional Water District
0806_01	WEST FORK TRINITY RIVER 260 METERS DOWNSTREAM OF HANDLEY EDERVILLE ROAD 0.55KM UPSTREAM OF IH 820 IN FORT WORTH	16120	City of Fort Worth
0806_01	WEST FORK TRINITY RIVER IMMEDIATELY DOWNSTREAM OF 4TH STREET EAST OF FORT WORTH	17368	Tarrant Regional Water District
0806_02	WEST FORK TRINITY RIVER AT BOAT RAMP IMMEDIATELY UPSTREAM OF JACKSBORO HIGHWAY/SH 199 IN FORT WORTH	21558	City of Fort Worth

A summary of the concerns and impairments identified in the TCEQ 2022 Texas Integrated Report is shown in Table 72.

Table 72: Findings of TCEQ 2022 Texas Integrated Report for Segment 0806

Assessment Unit	Use	Parameter	Criteria	Finding
0806_01	General Use	Chlorophyll-*a*	14.1 ug/L	CS (Carry Forward)
0806_01	Aquatic Life Use	Dissolved oxygen Grab	5 mg/L	CS
0806_02	Aquatic Life Use	Dissolved oxygen Grab	5 mg/L	CS
0806_02	Recreation Use	*E. coli*	126 MPN/100 mL	CN

The 2022 TCEQ Integrated Report identified a concern for Chlorophyll-*a* in Assessment 0806_01 which was carried forward from previous assessments. However, based on the data shown in Figure 47, it appears that this concern remains as 61% of the data were above the screening level of 14.1 ug/L. It does not appear that nutrient availability were impacting Chlorophyll-*a* levels; there were no positive correlations with nutrients. However, the river upstream of these sampling stations is channelized and has a series of low water dams that slow down the movement of water under low and normal flows. The channel is wide and lacks

shading from riparian vegetation. These conditions – ample sunlight and long residence times – likely allowed algal populations to increase to these levels.

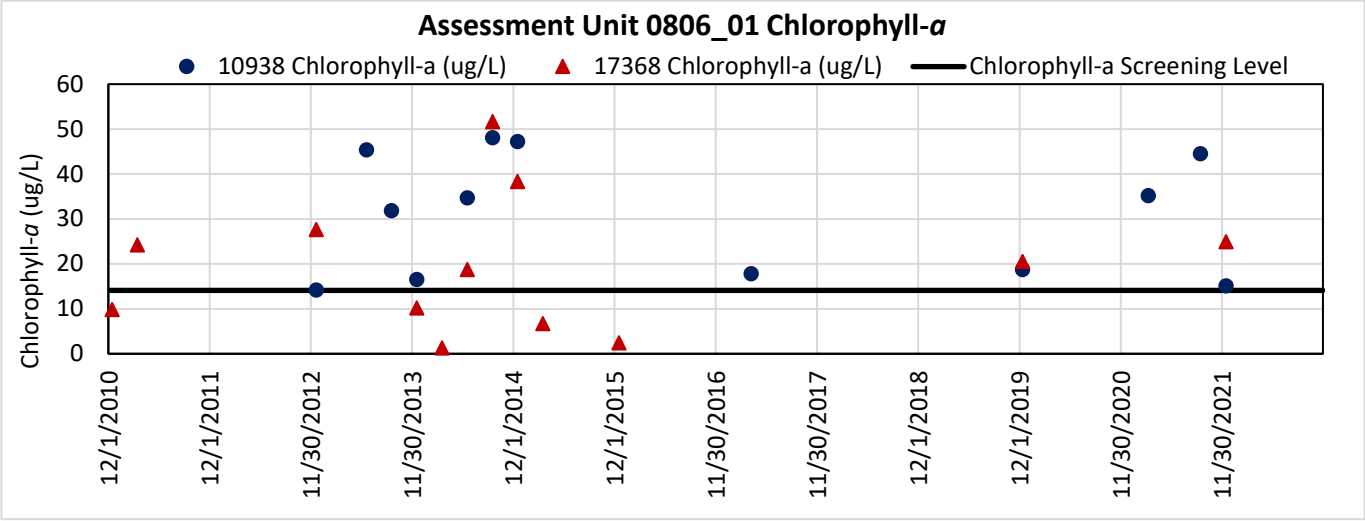

Figure 47: Assessment Unit 0806_01 Chlorophyll-a

Dissolved Oxygen concerns were identified in both assessments units in Segment 0806 as shown in Figure 48. There were no correlations between Dissolved Oxygen and Chlorophyll-*a* at the two stations where Chlorophyll-*a* was collected; Stations 10938 and 17368. It appears that these concerns were related to water temperatures; as temperatures increase, the solubility of Oxygen in water decreases. Data in this segment was collected at Station 10938, 16120, and 17368 in Assessment Unit 0806_01 and at Station 21558 in 0806_02. Correlation coefficients at these sites between Dissolved Oxygen and Water Temperature ranged from -0.65 and -0.77. As Chlorophyll-*a* data were somewhat limited, it is recommended that this data be collected in the future to more fully assess these concerns. If low Dissolved Oxygen levels are truly due to high Water Temperatures, there may be no solution to these concerns.

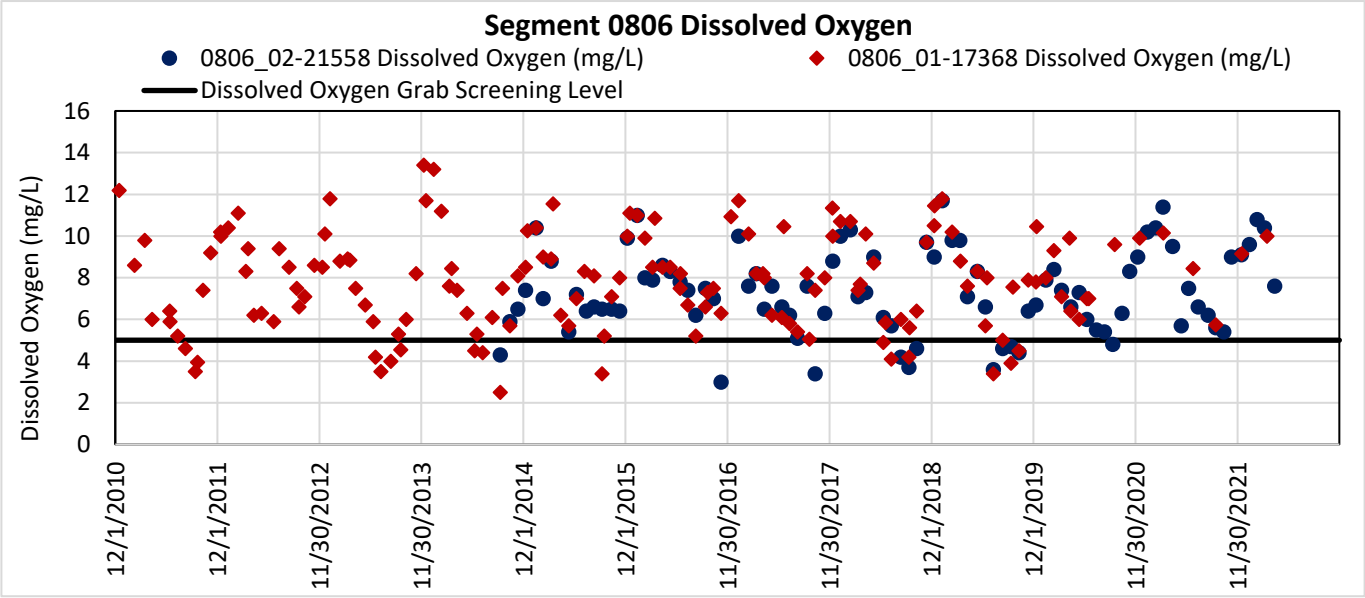

Figure 48: Segment 0806 Dissolved Oxygen

A concern was identified for *E. coli* in Assessment Unit 0806_02. As shown in Figure 49, *E. coli* were regularly reported above the standard of 126 MPN/100 mL and was not correlated to flow. This indicates that elevated levels of *E. coli* in this segment may be due to both runoff and point source related. The geometric mean of the data for the period of record for this report was 127.6 MPN/100 mL. The watershed upstream of Station 21558 in this assessment unit is heavily developed and largely residential. Therefore, runoff from pet waste is likely the major contributor to bacterial concerns in this assessment unit. Failing infrastructure may have also contributed to this concern. Additional sampling along the assessment unit is recommended to determine if there are point sources of bacteria that may be repaired. Homeowner education and pet waste best management practices may help reduce bacteria levels.

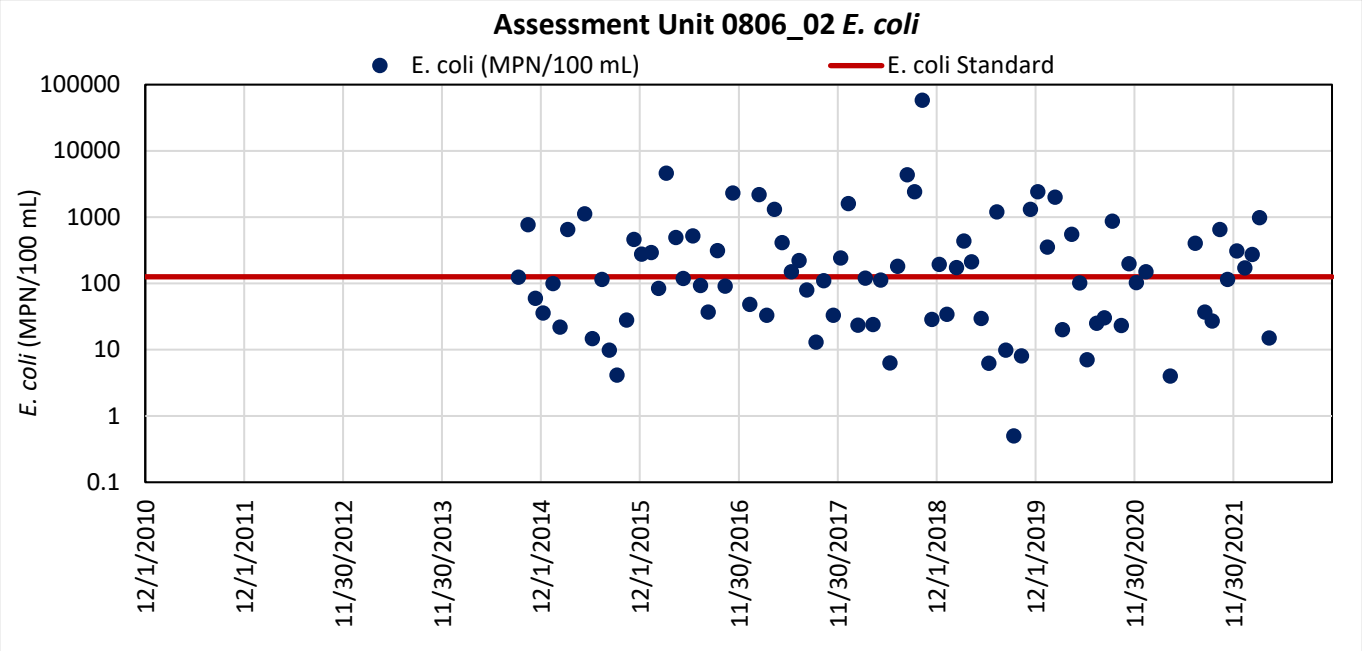

Figure 49: Assessment Unit 0806_02 E. coli

0806G Marine Creek Reservoir

Marine Creek Reservoir is a 238-acre unclassified segment upstream of Loop 820 in Fort Worth (see Figure 42). The watershed is heavily developed but has some areas of wood and grassland upstream of the reservoir and lies entirely within the Grand Prairie ecoregion.

Clean Rivers Program water quality monitoring is being conducted at one site within this segment as shown in Table 73. Monitoring is being conducted by TCEQ Region 4. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 73: FY2023 Monitoring stations in Segment 0806G

Assessment Unit	Station Description	Station ID	Collecting Entity
0806G_01	MARINE CREEK LAKE 400 METERS WEST OF MARINE CREEK PUBLIC BOAT RAMP AND 210 METERS NORTH OF MARINE CREEK DAM IN FORT WORTH TEXAS	22142	TCEQ Region 4

No impairments or concerns for aquatic life, recreation, or general uses were identified in this segment.

0806D Marine Creek

Marine Creek is a 5.2-mile unclassified segment running from the Marine Creek Reservoir Dam in Fort Worth to the confluence with the West Fork Trinity River (see Figure 42). The watershed is heavily developed but has some areas of wood and grassland at the upstream end and lies entirely within the Grand Prairie ecoregion.

Clean Rivers Program water quality monitoring is being conducted at two sites within this segment as shown in Table 74. Monitoring is being conducted by the City of Fort Worth. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 74: FY2023 Monitoring stations in Segment 0806D

Assessment Unit	Station Description	Station ID	Collecting Entity
0806D_01	MARINE CREEK AT NE 23rd STREET CONCRETE APRON APPROX 25 METERS WEST OF THE MULE ALLEY AND NE 23RD STREET INTERSECTION	21801	City of Fort Worth
0806D_01	MARINE CREEK UPSTREAM OF NW 26TH STREET IN RODEO PARK IN FORT WORTH	22326	City of Fort Worth

A summary of the concerns and impairments identified in the TCEQ 2022 Texas Integrated Report is shown in Table 75.

Table 75: Findings of TCEQ 2022 Texas Integrated Report for Segment 0806D

Assessment Unit	Use	Parameter	Criteria	Finding
0806D_01	Recreation Use	*E. coli*	126 MPN/100 mL	NS

The 2022 TCEQ Integrated Report identified an impairment for *E. coli* in this segment. As shown in Figure 50, *E. coli* were regularly reported above the standard of 126 MPN/100 mL. Although there are no strong correlations, it does appear that the impairment is at least somewhat runoff related. Of the 139 data points in this segment, 79 exceeded the standard of 126 MPN/100 mL and 45 of these exceedances occurred within three days of precipitation. There are three stations that have been monitored throughout the segment. The geometric mean across all three stations was 186 MPN/100 mL. Sampling at the most downstream station, 17370, was discontinued in 2016 but had a geometric mean of 142 MPN/100 mL. Station 21801 is located just downstream of the Stockyards and had a geometric mean on 254 MPN/100 mL. Station 22326 has recently been added to the monitoring schedule and has a geometric mean of 337 MPN/100 mL, however, this is based on only seven samples. As more data are accumulated at this site, it will be more useful to evaluate if the Stockyards are the source of the impairment.

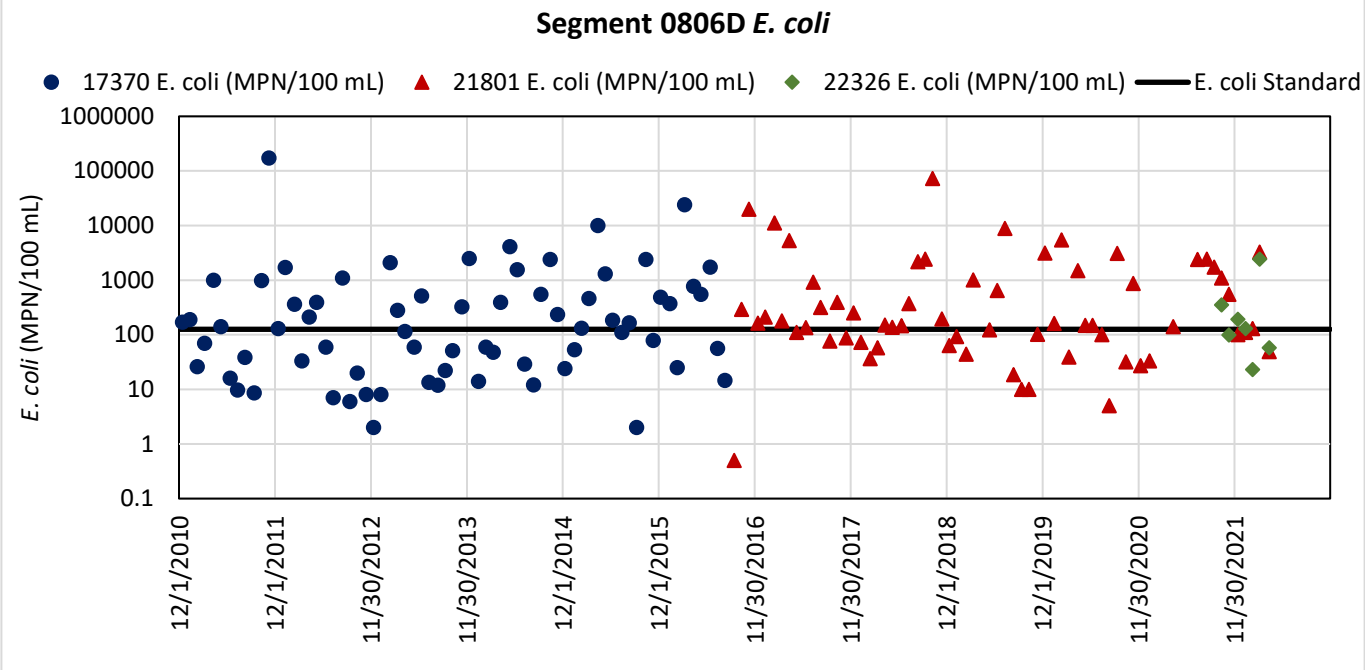

Figure 50: Segment 0806D E. coli

0806E Sycamore Creek

This unclassified segment is a five-mile stretch of Sycamore Creek running upstream from the confluence with Echo Lake Tributary in Fort Worth to the confluence with the West Fork Trinity River (see Figure 42). The watershed is heavily developed with some small wooded areas and parks directly adjacent to the stream. It lies within the Grand Prairie ecoregion.

Clean Rivers Program water quality monitoring is being conducted at one site within this segment as shown in Table 76. Monitoring is being conducted by the City of Fort Worth. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 76: FY2023 Monitoring stations in Segment 0806E

Assessment Unit	Station Description	Station ID	Collecting Entity
0806E_01	SYCAMORE CREEK AT WESTERN END OF PAVEMENT OF SCOTT AVENUE 179 M UPSTREAM OF IH 30 IN EAST FORT WORTH	17369	City of Fort Worth

A summary of the concerns and impairments identified in the TCEQ 2022 Texas Integrated Report is shown in Table 77.

Table 77: Findings of TCEQ 2022 Texas Integrated Report for Segment 0806E

Assessment Unit	Use	Parameter	Criteria	Finding
0806E_01	Recreation Use	*E. coli*	126 MPN/100 mL	NS

An impairment for *E. coli* was identified in this segment in the 2022 TCEQ Integrated Report. Figure 51 shows that *E. coli* were regularly reported above the standard of 126 MPN/100 mL and the geometric mean for this data was 355 MPN/100 mL. *E. coli* were moderately correlated to flow (correlation coefficient = 0.41) which indicates that the impairment in this segment may be runoff related. The monitoring station in this segment is located downstream from a golf course and large residential area. It is likely that runoff carrying pet and wildlife waste contributed to the impairment. This segment is part of the North Central Texas Council of Governments Total Maximum Daily Load Implementation Plan for several waterbodies in the Dallas-Fort Worth Metroplex. The Implementation Plan describes practices that stakeholders may implement in order to reduce bacteria levels.

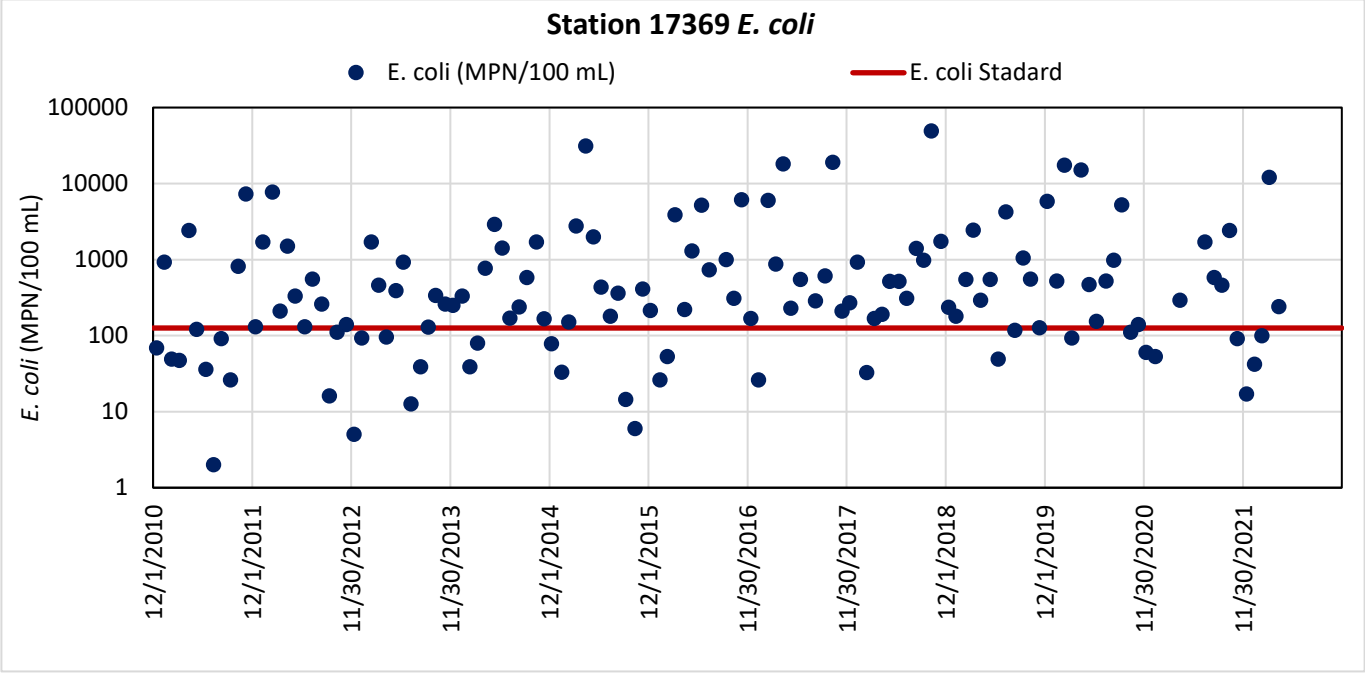

Figure 51: Station 17369 E. coli

0806B Echo Lake

Echo Lake is a 16.8-acre reservoir in Fort Worth (see Figure 42). The watershed is developed and lies within the Grand Prairie ecoregion. There is no Clean Rivers Program monitoring scheduled in this segment for FY 2023.

No impairments or concerns for aquatic life, recreation, or general uses were identified in this segment.

0806A Fosdic Lake

Fosdic Lake is a 6.7-acre reservoir in Fort Worth (see Figure 42). The watershed is developed and lies within the Grand Prairie ecoregion. There is no Clean Rivers Program monitoring scheduled in this segment for FY 2023.

No impairments or concerns for aquatic life, recreation, or general uses were identified in this segment.

0806C Big Fossil Creek

This unclassified segment is a 3-mile stretch of Big Fossil Creek that runs from Highway 183 in Haltom City to the confluence with the West Fork Trinity River (see Figure 42). The upper portion of the watershed is heavily developed but the lower portion has a narrow wooded riparian area and some grassy parks. The watershed begins in the Grand Prairie ecoregion and ends in the Eastern Cross Timbers. There is no Clean Rivers Program monitoring scheduled in this segment for FY 2023.

No impairments or concerns for aquatic life, recreation, or general uses were identified in this segment.

0806F Little Fossil Creek

Little Fossil Creek is a 13.7-mile stream that runs from the headwaters in Saginaw to the confluence with Big Fossil Creek (see Figure 42). Much of the watershed is heavily developed with a few small areas of grassland. A majority of the watershed drains the Grand Prairie ecoregion with a small portion at the most downstream end flowing through the Eastern Cross Timbers. There is no Clean Rivers Program monitoring scheduled in this segment for FY 2023.

A summary of the concerns and impairments identified in the TCEQ 2022 Texas Integrated Report is shown in Table 78.

Table 78: Findings of TCEQ 2022 Texas Integrated Report for Segment 0806F

Assessment Unit	Use	Parameter	Criteria	Finding
0806F_01	Recreation Use	*E. coli*	126 MPN/100 mL	CN

The 2022 TCEQ Integrated Report identified a concern for *E. coli* in this segment. Figure 52 shows that *E. coli* were regularly reported above the standard of 126 MPN/100 mL and the geometric mean for this data was 397 MPN/100 mL. Sampling was conducted at Station 21425 from 2013 to 2014 and had a geometric mean of 258 MPN/100 mL. Sampling at Station 17129 was conducted from 2017 to 2022 and had a geometric mean of 491 MPN/100 mL. *E. coli* were were not correlated to flow but were moderately correlated to the number of days since precipitation at Station 17129 (correlation coefficient = -0.42) with higher levels of *E. coli* generally being observed after recent precipitation. This indicates that the concern may be somewhat runoff related. There are paddocks located upstream of both stations that have been monitored. Landowner education and livestock best management practices may help reduce bacterial loading in this segment.

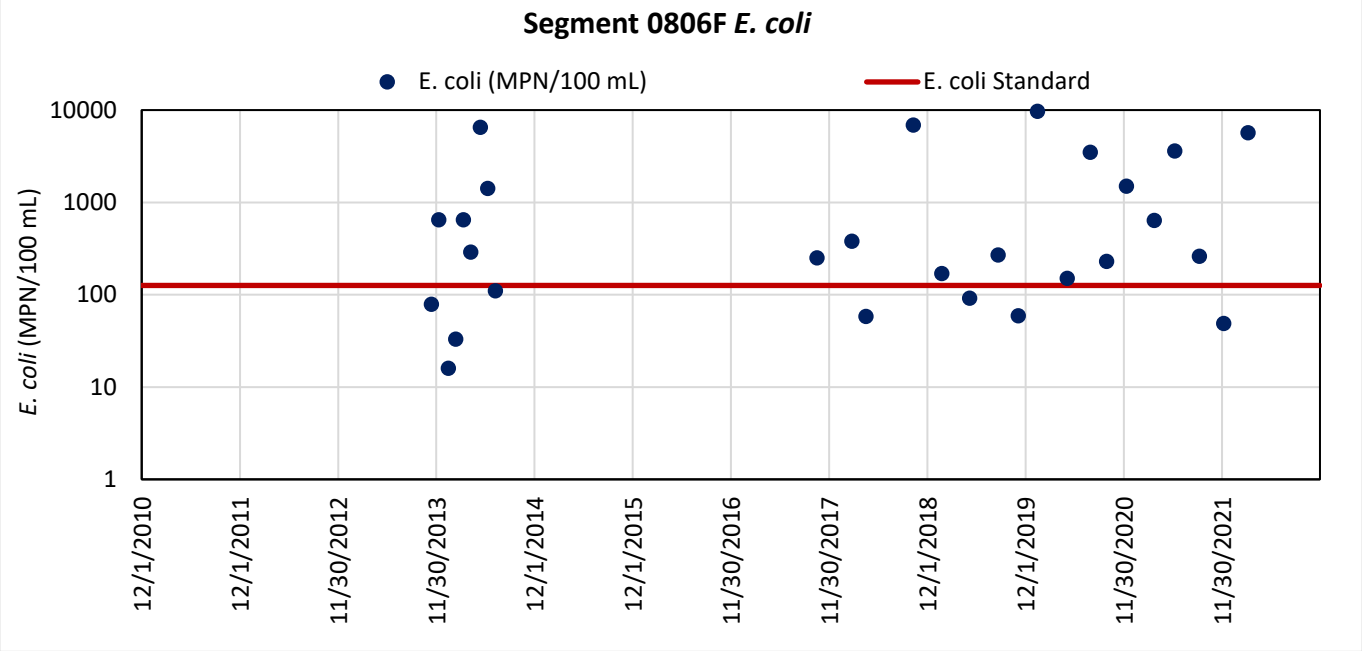

Figure 52: Segment 0806F E. coli

0841R Rush Creek

Rush Creek is a 14.9-mile stream that runs from near US 287 outside of Mansfield to the confluence with Village Creek (see Figure 43). The watershed is developed with a narrow wooded riparian buffer and small areas of grassland in the upper portion and lies entirely within the Eastern Cross Timbers.

Clean Rivers Program water quality monitoring is being conducted at two sites within this segment as shown in Table 79. Monitoring is being conducted by the City of Arlington. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 79: FY2023 Monitoring stations in Segment 0841R

Assessment Unit	Station Description	Station ID	Collecting Entity
0841R_01	RUSH CREEK IMMEDIATELY DOWNSTREAM OF WEST SUBLETT ROAD IN ARLINGTON	10791	City of Arlington
0841R_01	RUSH CREEK 46 METERS UPSTREAM OF SH 180 IN ARLINGTON	17191	City of Arlington

A summary of the concerns and impairments identified in the TCEQ 2022 Texas Integrated Report is shown in Table 80.

Table 80: Findings of TCEQ 2022 Texas Integrated Report for Segment 0841R

Assessment Unit	Use	Parameter	Criteria	Finding
0841R_01	Recreation Use	*E. coli*	126 MPN/100 mL	CN

The 2022 TCEQ Integrated Report identified a concern for *E. coli* in this segment. As shown in Figure 53, *E. coli* data were regularly reported above the standard of 126 MPN/100 mL. Most sampling was conducted at Station 10791 in the headwaters and at Station 17191 toward the confluence with Village Creek. The geometric mean of the data at the two stations was 128 and 182 MPN/100 mL. *E. coli* was very well correlated to flow at Station 10791 (correlation coefficient = 0.9). This indicated that bacterial loading in the upstream portions of the segment were largely runoff related. The watershed in this area is residential with wooded riparian corridors. Therefore, pets and wildlife are the most likely sources of *E. coli*. At the downstream Station 17191, there was no correlation to flow; the watershed for this station is larger and more complex than the upstream station and a mix of runoff related and point sources may be contributing bacteria. However, the watershed remains largely residential with wooded riparian areas, parks, and a golf course. It is likely that pets and wildlife are the major contributors of *E. coli* throughout the segment. Homeowner education and pet waste best management practices may help reduce bacterial loadings from pet sources.

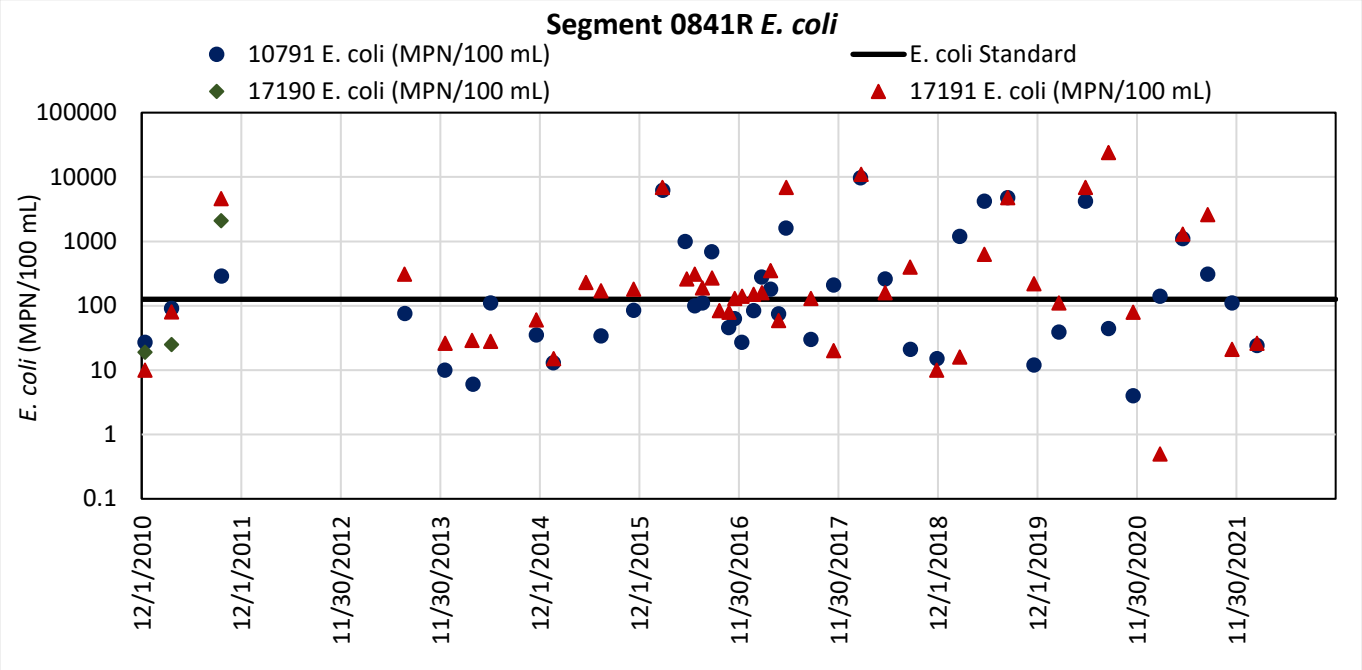

Figure 53: Segment 0841R E. coli

0841M Kee Branch

This unclassified segment is a 3-mile stretch of Kee Branch running from just upstream of Southwest Green Oaks Boulevard to the confluence with Rush Creek (see Figure 43). The watershed is developed with a narrow wooded riparian buffer and lies entirely within the Eastern Cross Timbers.

Clean Rivers Program water quality monitoring is being conducted at one site within this segment as shown in Table 81. Monitoring is being conducted by the City of Arlington. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 81: FY2023 Monitoring stations in Segment 0841M

Assessment Unit	Station Description	Station ID	Collecting Entity
0841M_01	KEE BRANCH AT WEST PLEASANT RIDGE ROAD IN ARLINGTON	10792	City of Arlington

A summary of the concerns and impairments identified in the TCEQ 2022 Texas Integrated Report is shown in Table 82.

Table 82: Findings of TCEQ 2022 Texas Integrated Report for Segment 0841M

Assessment Unit	Use	Parameter	Criteria	Finding
0841M_01	Aquatic Life Use	Dissolved oxygen Grab	5 mg/L	CS
0841M_01	Recreation Use	*E. coli*	126 MPN/100 mL	NS

An impairment for *E. coli* and a concern for low Dissolved Oxygen were identified in this segment by the 2022 TCEQ Integrated Report. As shown in Figure 54, *E. coli* were generally reported above the standard of 126 MPN/100 mL and had a geometric mean of 359 MPN/100 mL. There were no correlations for *E. coli* with flow or number of days since precipitation which indicates that a mix of runoff related and point sources may be contributing to this impairment. The watershed is largely residential with wooded riparian areas and parks. Therefore, pets and wildlife are the most likely sources of *E. coli*. Homeowner education and pet waste best management practices may help reduce bacterial loadings in this segment.

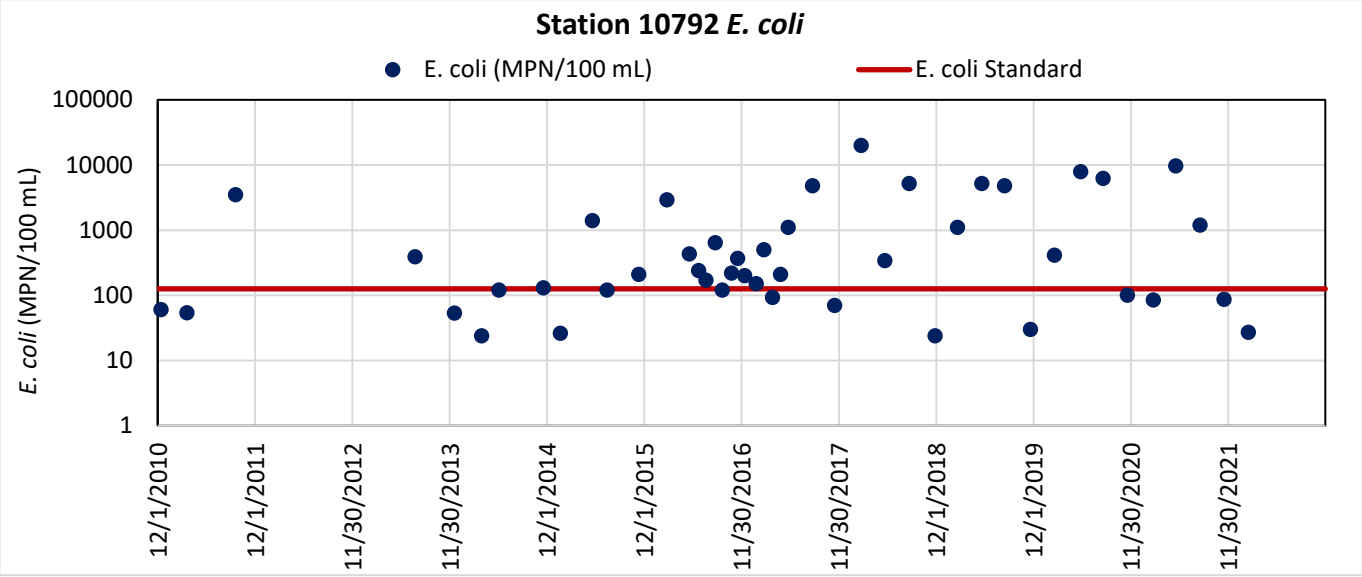

Figure 54: Station 10792 E. coli

It appears that the concern for low Dissolved Oxygen may be related to low flows and high water temperatures. As shown in Figure 55, Dissolved Oxygen were generally reported above the screening level of 5 mg/L. Approximately 16% of the data were reported below this screening level. Dissolved Oxygen was well correlated to Water Temperature and moderately correlated to flow (correlation coefficients = -0.74 and 0.44, respectively). As Water

Temperature increases, the saturation potential of Oxygen decreases which generally results in lower Dissolved Oxygen levels. Higher Dissolved Oxygen levels were reported at higher flows. However, there were no Chlorophyll-*a* data available to determine if algal blooms may have been contributing to this concern.

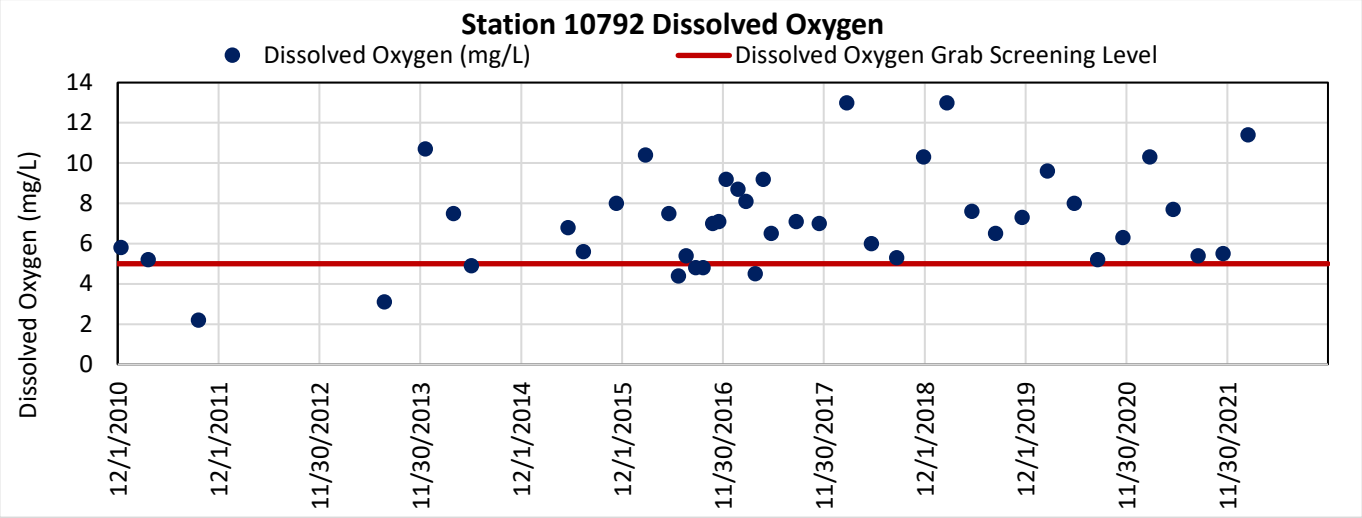

Figure 55: Station 10792 Dissolved Oxygen

0841T Village Creek

This unclassified segment is a 7-mile stretch of Village Creek running from SH 303 approximately 0.75-miles downstream of Lake Arlington to the confluence with the West Fork Trinity River (see Figure 43). Although the watershed is developed, the area directly adjacent to the stream is wooded with some grass and pasture land. The watershed lies within the Eastern Cross Timbers.

Clean Rivers Program water quality monitoring is being conducted at one site within this segment as shown in Table 83. Monitoring is being conducted by the City of Arlington. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 83: FY2023 Monitoring stations in Segment 0841T

Assessment Unit	Station Description	Station ID	Collecting Entity
0841T_01	VILLAGE CREEK IMMEDIATELY UPSTREAM OF IH 30 IN ARLINGTON	17189	City of Arlington

A summary of the concerns and impairments identified in the TCEQ 2022 Texas Integrated Report is shown in Table 84.

Table 84: Findings of TCEQ 2022 Texas Integrated Report for Segment 0841T

Assessment Unit	Use	Parameter	Criteria	Finding
0841T_01	Recreation Use	*E. coli*	126 MPN/100 mL	CN

The 2022 TCEQ Integrated Report identified a concern for *E. coli* in this segment. As shown in Figure 56, 45% of the *E. coli* data were reported above the standard of 126 MPN/100 mL and had a geometric mean of 141 MPN/100 mL. Station 17189 is just downstream of the confluence with Rush Creek and has a similar watershed; residential with wooded riparian areas and parks. There is no correlation to flow which indicates both runoff related and point sources may be contributing to the concern; pets and wildlife are the most likely sources. Homeowner education and pet waste best management practices may help reduce bacterial loadings from pet sources.

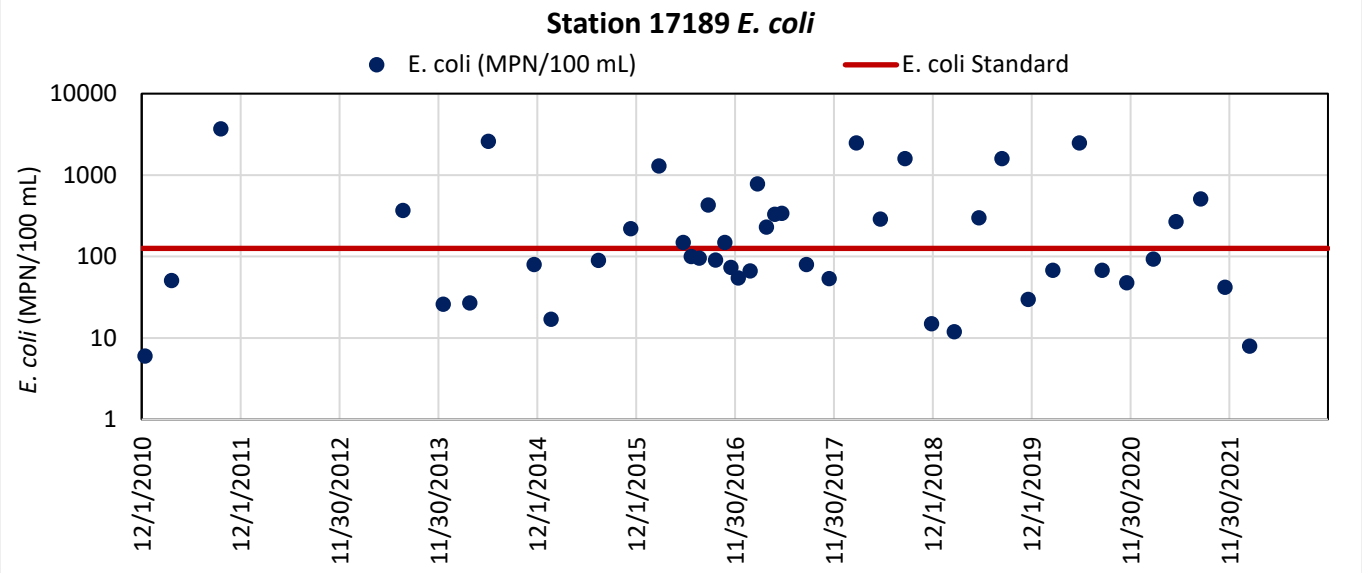

Figure 56: Station 17189 E. coli

0841 Lower West Fork Trinity River

This 26.6-mile segment runs from a point immediately upstream of the confluence of Village Creek in Tarrant County to a point immediately upstream of the confluence of the Elm Fork Trinity River in Dallas County (see Figure 43). The upper half of this highly urbanized watershed is in the Eastern Cross Timbers and the lower half is in the Northern Blackland Prairie ecoregion. There are some areas of wooded and grassy riparian zones.

Clean Rivers Program water quality monitoring is being conducted at two sites within this segment as shown in Table 85. Monitoring is being conducted by TRA and the City of Grand Prairie. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 85: FY2023 Monitoring stations in Segment 0841

Assessment Unit	Station Description	Station ID	Collecting Entity
0841_01	LOWER WEST FORK TRINITY RIVER AT BELT LINE ROAD IN GRAND PRAIRE	11081	TRA
0841_02	LOWER WEST FORK TRINITY RIVER AT ROY ORR BOULEVARD IN GRAND PRAIRIE (6)	17669	City of Grand Prairie

A summary of the concerns and impairments identified in the TCEQ 2022 Texas Integrated Report is shown in Table 86.

Table 86: Findings of TCEQ 2022 Texas Integrated Report for Segment 0841

Assessment Unit	Use	Parameter	Criteria	Finding
0841_01	General Use	Total Phosphorus	0.69 mg/L	CS
0841_01	General Use	Nitrate	1.95 mg/L	CS
0841_01	Recreation Use	*E. coli*	126 MPN/100 mL	NS
0841_02	General Use	Total Phosphorus	0.69 mg/L	CS
0841_02	General Use	Nitrate	1.95 mg/L	CS

Concerns were identified in the 2022 TCEQ Integrated Report for elevated Nitrate and Total Phosphorus in both assessment unit 0841_01 and 0841_02 were related to effluent from upstream wastewater treatment facilities. As shown in Figure 57, nutrient levels were elevated at low flows and decreased as flows increased. This pattern is commonly seen in waterbodies downstream of wastewater treatment facilities and becomes more pronounced in the warm months of the year when native base flows in waterbodies are lowest. During these times, the waterbody will become effluent-dominated. Most wastewater treatment facilities do not yet have advanced nutrient removal systems. It does not appear that these elevated nutrient levels were excessively affecting algal populations or Dissolved Oxygen in segment 0841. Of 153 records for Chlorophyll-*a*, 28 were reported above the screening level of 14.1 µg/L. Of 337 Dissolved Oxygen records, none were reported below screening level of 4 mg/L.

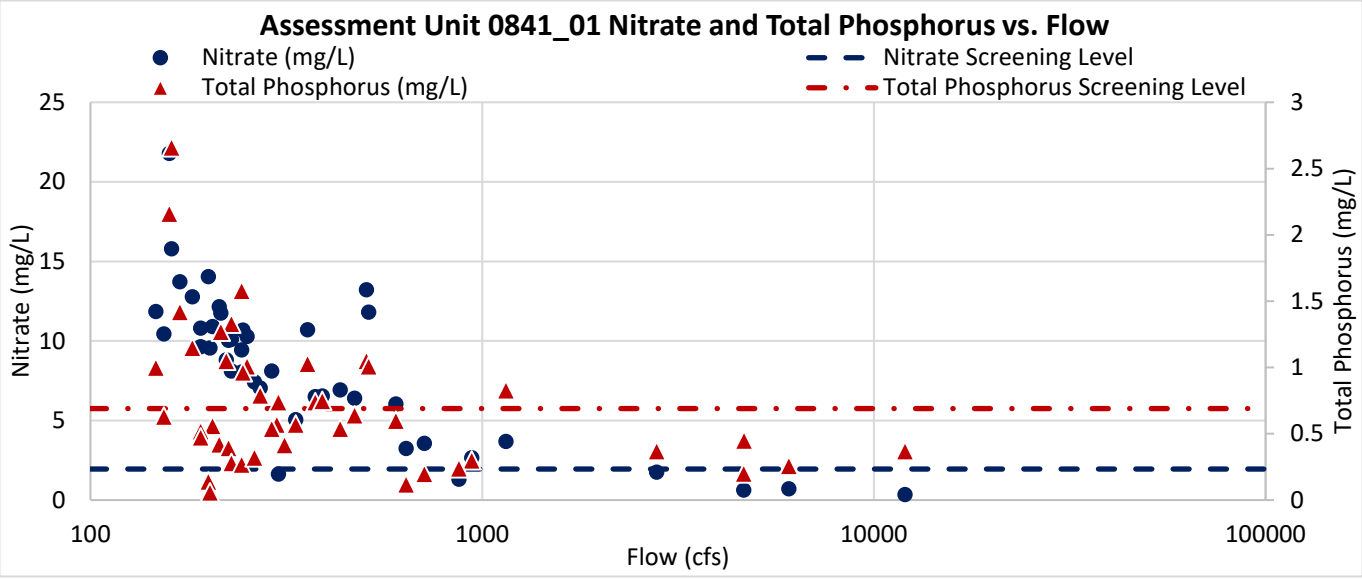

Figure 57: Assessment Unit 0841_01 Nitrate and Total Phosphorus vs. Flow

The *E. coli* impairment in assessment unit 0841_01 was influenced by flow as shown in Figure 58. Higher *E. coli* levels were generally reported under elevated flows (correlation coefficient = 0.55). This indicates that bacteria were being washed into the river from the watershed. The watershed above this assessment unit is quite large and of mixed uses. However, the

immediate watershed has a mix of industrial, residential, and wooded areas. It is likely that runoff containing waste from pets and wildlife were the main contributors. Bacteria may have also been introduced from failing infrastructure throughout the watershed. Bacterial source tracking studies would be required to determine if the bacteria were from animal or human sources. This segment is part of the North Central Texas Council of Governments Total Maximum Daily Load Implementation Plan for several waterbodies in the Dallas-Fort Worth Metroplex. The Implementation Plan describes practices that stakeholders may implement in order to reduce bacteria levels.

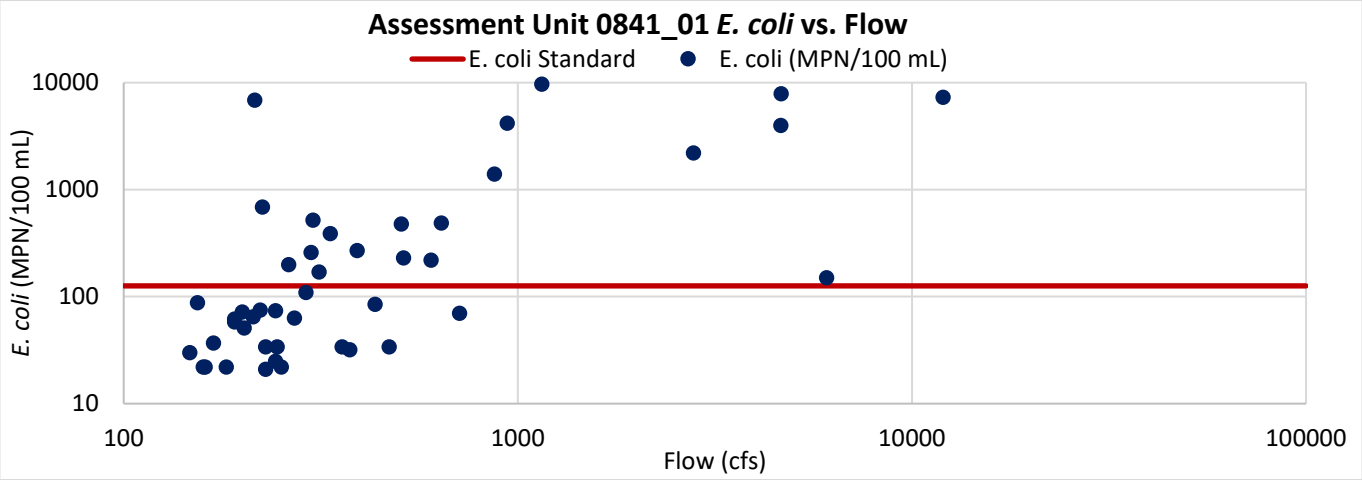

Figure 58: Assessment Unit 0841_01 E. coli vs. Flow

0841L Johnson Creek

This 13.4-mile stream runs from the headwaters near Arbrook Boulevard in Arlington to the confluence with the Lower West Fork Trinity River in Grand Prairie (see Figure 43). The watershed is heavily developed and flows through the Eastern Cross Timbers and Northern Blackland Prairie ecoregions.

Clean Rivers Program water quality monitoring is being conducted at one site within this segment as shown in Table 87. Monitoring is being conducted by the City of Arlington. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 87: FY2023 Monitoring stations in Segment 0841L

Assessment Unit	Station Description	Station ID	Collecting Entity
0841L_01	JOHNSON CREEK AT SH 360 IN ARLINGTON	10719	City of Arlington

A summary of the concerns and impairments identified in the TCEQ 2022 Texas Integrated Report is shown in Table 88.

Table 88: Findings of TCEQ 2022 Texas Integrated Report for Segment 0841L

Assessment Unit	Use	Parameter	Criteria	Finding
0841L_01	Recreation Use	*E. coli*	126 MPN/100 mL	NS

The impairment for *E. coli* in this segment may be somewhat related to runoff. As shown in Figure 59, *E. coli* were reported above the standard of 126 MPN/100 mL 56% of the time. Levels tended to be highest after recent precipitation, however, there were many values above the standard up to a month after precipitation. This indicates that there may be constant sources of bacteria. Flow data were available at Station 10719 and there was a moderate correlation between *E. coli* and Flow at this location (correlation coefficient = 0.56) which indicates that runoff related sources were also impacting this stream. This stream flows through a mix of land uses – single and multi-family residential, parks, commercial, industrial, and some wooded riparian areas. All of these likely have some impact on the impairment; from runoff carrying waste from pets and wildlife to failing wastewater infrastructure. Homeowner education and pet waste best management practices may help reduce bacteria levels to some degree. This segment is part of the North Central Texas Council of Governments Total Maximum Daily Load Implementation Plan for several waterbodies in the Dallas-Fort Worth Metroplex. The Implementation Plan describes practices that stakeholders may implement in order to reduce bacteria levels.

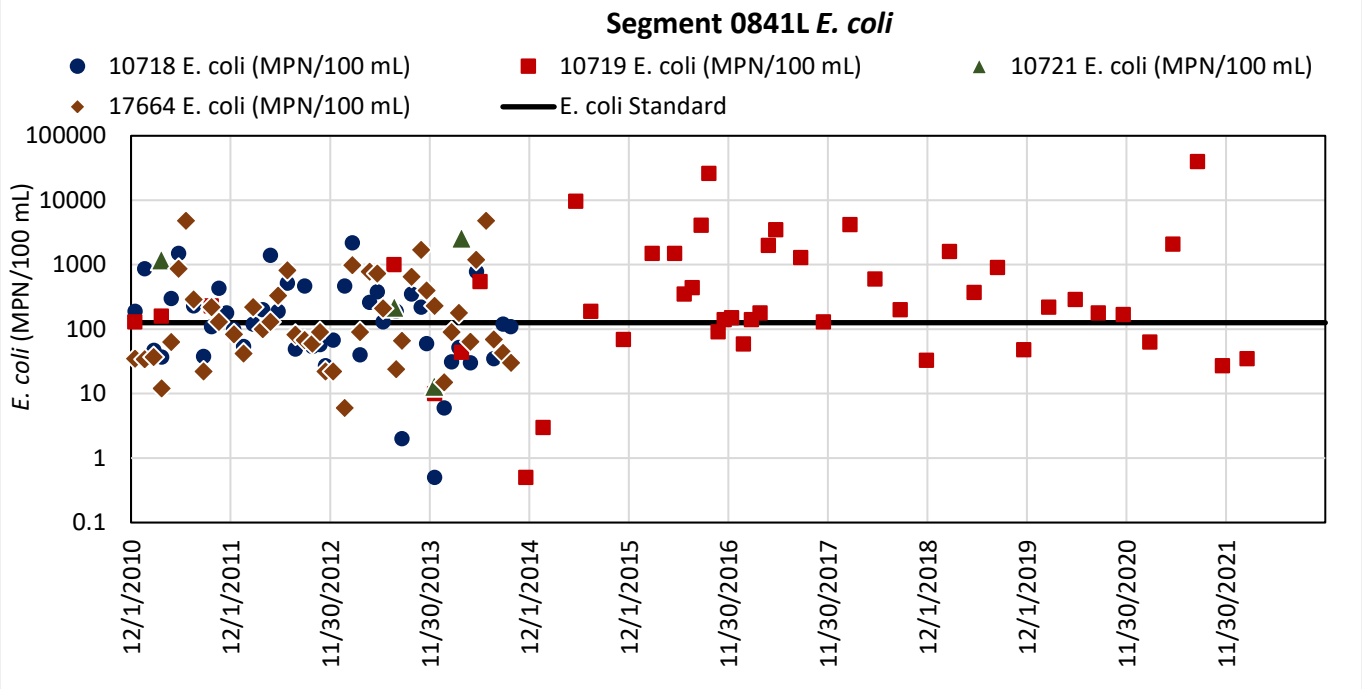

Figure 59: Segment 0841L E. coli

0841C Arbor Creek

This unclassified segment is a 2.2-mile stretch of Arbor Creek that runs from North Great Southwest Parkway in Grand Prairie to the confluence with Johnson Creek (see Figure 43). The watershed is heavily developed and lies within the Northern Blackland Prairie. There is no Clean Rivers Program monitoring scheduled in this segment for FY 2023.

No impairments or concerns for aquatic life, recreation, or general uses were identified in this segment.

0841G Dalworth Creek

This unclassified segment is a 2.2-mile stretch of Dalworth Creek running from County Line Road in Grand Prairie to the confluence with the Lower West Fork Trinity River (see Figure 43). The watershed is developed and lies within the Northern Blackland Prairie ecoregion.

Clean Rivers Program water quality monitoring is being conducted at one site within this segment as shown in Table 89. Monitoring is being conducted by TRA. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 89: FY2023 Monitoring stations in Segment 0841G

Assessment Unit	Station Description	Station ID	Collecting Entity
0841G_01	DALWORTH CREEK AT PRESIDENT GEORGE BUSH TURNPIKE/SH 161 IN GRAND PRAIRIE	21557	TRA

A summary of the concerns and impairments identified in the TCEQ 2022 Texas Integrated Report is shown in Table 90.

Table 90: Findings of TCEQ 2022 Texas Integrated Report for Segment 0841G

Assessment Unit	Use	Parameter	Criteria	Finding
0841G_01	Recreation Use	*E. coli*	126 MPN/100 mL	NS

This segment was found to be impaired due to elevated levels of *E. coli*. As shown in Figure 60, *E. coli* was generally reported above the standard of 126 MPN/100 mL. There is limited flow data available for the samples collected in this segment. High levels of *E. coli* were reported both after recent precipitation and up to two weeks after precipitation. Based on this information, a mix of point and runoff related sources may be impacting this stream. The watershed upstream of the monitoring station is residential with some small wooded riparian areas. It is likely that runoff carrying pet and wildlife waste may be contributing to the bacteria impairment. Failing wastewater infrastructure may also be contributing bacteria to the stream. This segment is part of the North Central Texas Council of Governments Total Maximum Daily Load Implementation Plan for several waterbodies in the Dallas-Fort Worth Metroplex. The Implementation Plan describes practices that stakeholders may implement in order to reduce bacteria levels.

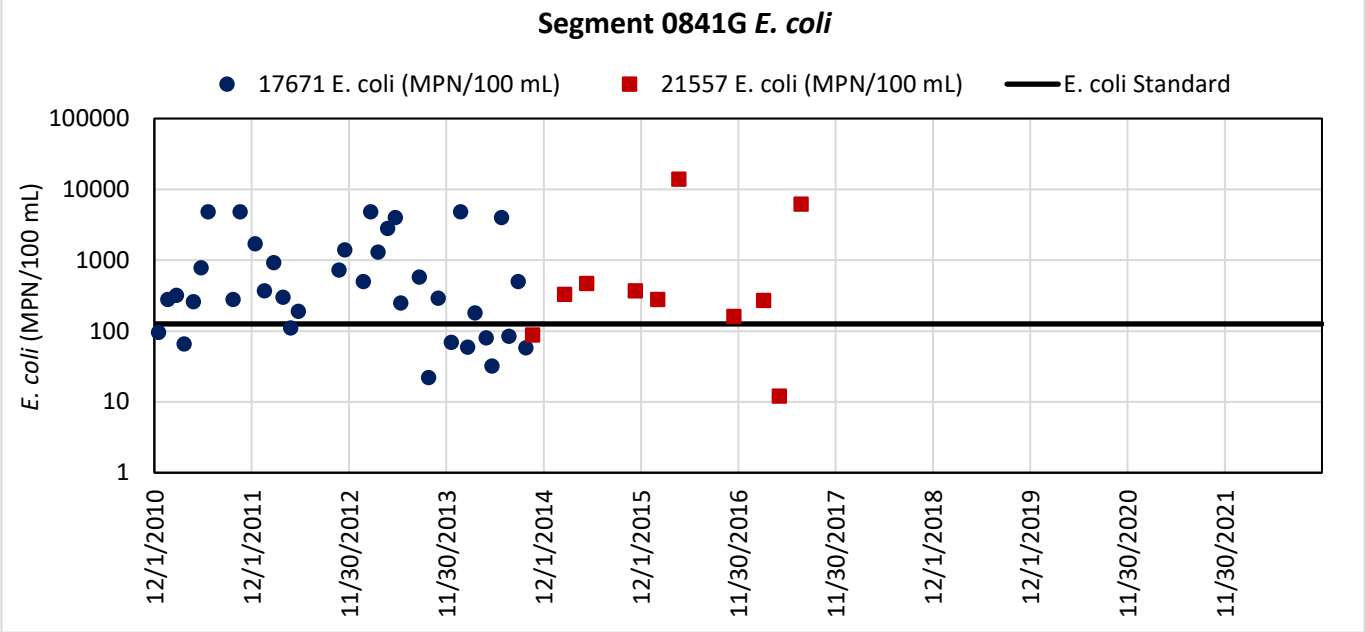

Figure 60: Segment 0841G E. coli

0841D Big Bear Creek

Figure 61: Big Bear Creek in Parr Park near Grapevine

This unclassified segment is a 7.7-mile stretch of Big Bear Creek running from SH 26 near Colleyville to the confluence with Little Bear Creek near the southern end of Dallas-Fort Worth International Airport (see Figure 43). The watershed is heavily developed but has some wooded riparian areas and flows through the Eastern Cross Timbers and Northern Blackland Prairie ecoregions.

Clean Rivers Program water quality monitoring is being conducted at one site within this segment as shown in Table 91. Monitoring is being conducted by the DFW Airport Environmental Affairs Department. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 91: FY2023 Monitoring stations in Segment 0841D

Assessment Unit	Station Description	Station ID	Collecting Entity
0841D_01	BIG BEAR CREEK IMMEDIATELY UPSTREAM OF EULESS-GRAPEVINE ROAD IN GRAPEVINE EAST OF HWY 360	17089	DFW Airport Environmental Affairs Department

No impairments or concerns for aquatic life, recreation, or general uses were identified in this segment.

0841B Bear Creek

This unclassified segment is a 12-mile stretch of Bear Creek running from the confluence with Little Bear Creek just upstream of HWY 183 in Euless to the confluence with the Lower West Fork Trinity River (see Figure 43). The watershed is heavily developed with a few small wooded areas and lies within the Northern Blackland Prairie ecoregion.

Clean Rivers Program water quality monitoring is being conducted at two sites within this segment as shown in Table 92. Monitoring is being conducted by the City of Irving and the DFW Airport Environmental Affairs Department. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 92: FY2023 Monitoring stations in Segment 0841B

Assessment Unit	Station Description	Station ID	Collecting Entity
0841B_01	BEAR CREEK 37 METERS DOWNSTREAM OF COUNTY LINE ROAD SOUTH OF SR 183 IN IRVING	10869	City of Irving
0841B_01	BEAR CREEK AT COUNTY LINE ROAD 487 M SOUTH OF SH 183 IN IRVING	18315	DFW Airport Environmental Affairs Department

No impairments or concerns for aquatic life, recreation, or general uses were identified in this segment.

0841J Estelle Creek

This unclassified segment is a 4-mile stretch of Estelle Creek running from Valley View Lane in Irving to the confluence with Bear Creek (see Figure 43). The watershed is heavily developed and lies within the Northern Blackland Prairie ecoregion.

Clean Rivers Program water quality monitoring is being conducted at one site within this segment as shown in Table 93. Monitoring is being conducted by the City of Irving. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 93: FY2023 Monitoring stations in Segment 0841J

Assessment Unit	Station Description	Station ID	Collecting Entity
0841J_01	ESTELLE CREEK 79 METERS UPSTREAM OF WEST PIONEER DRIVE IN IRVING	17174	City of Irving

No impairments or concerns for aquatic life, recreation, or general uses were identified in this segment.

0841I Dry Branch Creek

0841I is a 1.5-mile stretch of Dry Branch Creek running from Rock Island Road in Irving to the confluence with the Lower West Fork Trinity River (see Figure 43). The watershed is heavily developed with a small portion of pasture near the most downstream portion of the stream. It lies within Northern Blackland Prairie ecoregion.

Clean Rivers Program water quality monitoring is being conducted at one site within this segment as shown in Table 94. Monitoring is being conducted by the City of Irving. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 94: FY2023 Monitoring stations in Segment 0841I

Assessment Unit	Station Description	Station ID	Collecting Entity
0841I_01	DRY BRANCH IMMEDIATELY UPSTREAM OF SOUTH BELTLINE ROAD IN IRVING	17173	City of Irving

A summary of the concerns and impairments identified in the TCEQ 2022 Texas Integrated Report is shown in Table 95.

Table 95: Findings of TCEQ 2022 Texas Integrated Report for Segment 0841I

Assessment Unit	Use	Parameter	Criteria	Finding
0841I_01	Recreation Use	*E. coli*	126 MPN/100 mL	NS

This segment was found to be impaired for *E. coli*. As shown in Figure 62, *E. coli* was reported above the standard of 126 MPN/100 mL 72% of the time. *E. coli* was not correlated to flow and

was only moderately correlated to the number of days since precipitation (correlation coefficient = -0.43). Most of the elevated values were reported within a week of precipitation with the highest being reported within a day. This indicates that the impairment in this segment is partially related to runoff. The watershed drains a mostly residential area which indicates that pet waste may be contributing bacteria to the stream. Homeowner education and pet waste best management practices may help reduce bacteria levels.

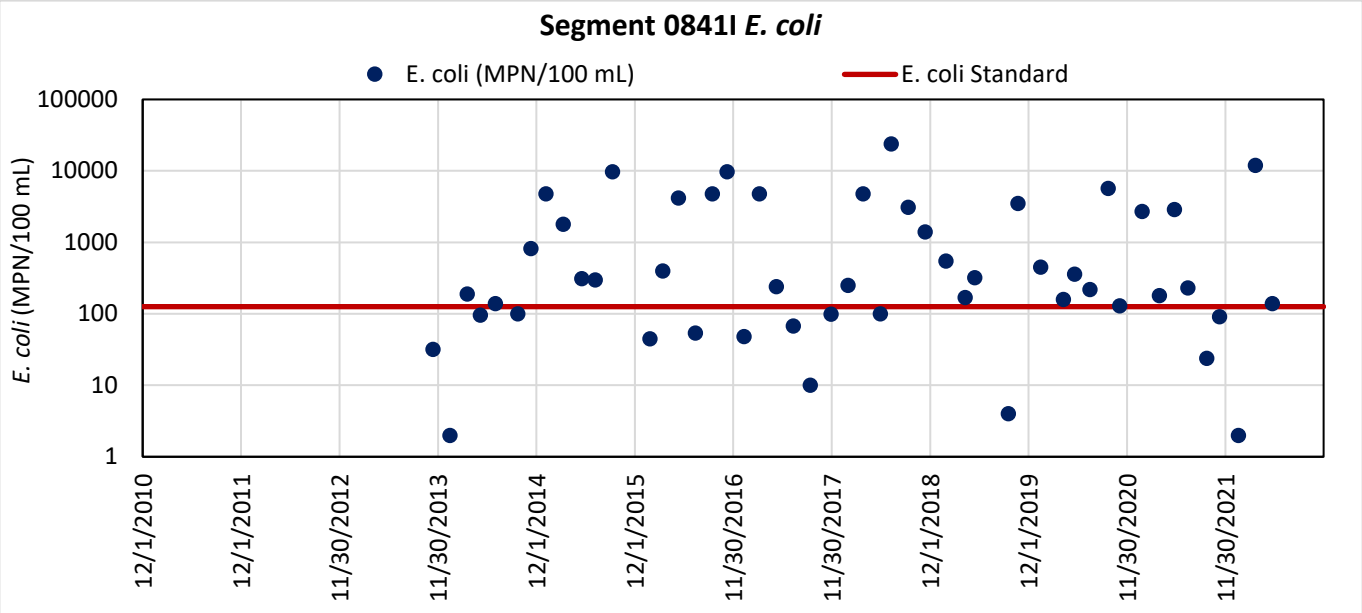

Figure 62: Segment 0841I E. coli

0841S Vilbig Lakes

Lake Vilbig is a 120-acre reservoir in Irving. 0841S is a 5-acre area of this reservoir in the northwest corner near the confluence with an unnamed creek approximately 100-meters south of intersection of Rusdell Road and Marvel Drive in Irving (see Figure 43). The watershed is developed and lies within the Northern Blackland Prairie ecoregion. There is no Clean Rivers Program monitoring scheduled in this segment for FY 2023.

No impairments or concerns for aquatic life, recreation, or general uses were identified in this segment.

0841U West Irving Creek

This unclassified segment is a 4-mile stretch of West Irving Branch running from near West Pioneer Drive in Irving to Oakdale Road (see Figure 43). The watershed is developed and lies within the Northern Blackland Prairie ecoregion.

Clean Rivers Program water quality monitoring is being conducted at one site within this segment as shown in Table 96. Monitoring is being conducted by the City of Irving. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 96: FY2023 Monitoring stations in Segment 0841U

Assessment Unit	Station Description	Station ID	Collecting Entity
0841U_01	WEST IRVING BRANCH AT WEST VILBIG STREET IN IRVING	17179	City of Irving

A summary of the concerns and impairments identified in the TCEQ 2022 Texas Integrated Report is shown in Table 97.

Table 97: Findings of TCEQ 2022 Texas Integrated Report for Segment 0841U

Assessment Unit	Use	Parameter	Criteria	Finding
0841U_01	Recreation Use	*E. coli*	126 MPN/100 mL	NS

This segment was found to be impaired for *E. coli*. As shown in Figure 63, 68% of the *E. coli* data was reported above the standard of 126 MPN/100 mL. There were no correlations with flow or the number of days since precipitation, although the highest values were reported within four days of precipitation. This indicates that a mix of point and runoff related sources were likely impacting *E. coli* levels in this stream. Much of this stream is channelized and drains mostly single and multi-family residential development. Runoff containing pet waste is likely the largest contributor of bacteria but failing wastewater infrastructure may also be impacting this stream. Homeowner education and pet waste best management practices may reduce bacteria levels in this segment. This segment is part of the North Central Texas Council of Governments Total Maximum Daily Load Implementation Plan for several waterbodies in the Dallas-Fort Worth Metroplex. The Implementation Plan describes practices that stakeholders may implement in order to reduce bacteria levels.

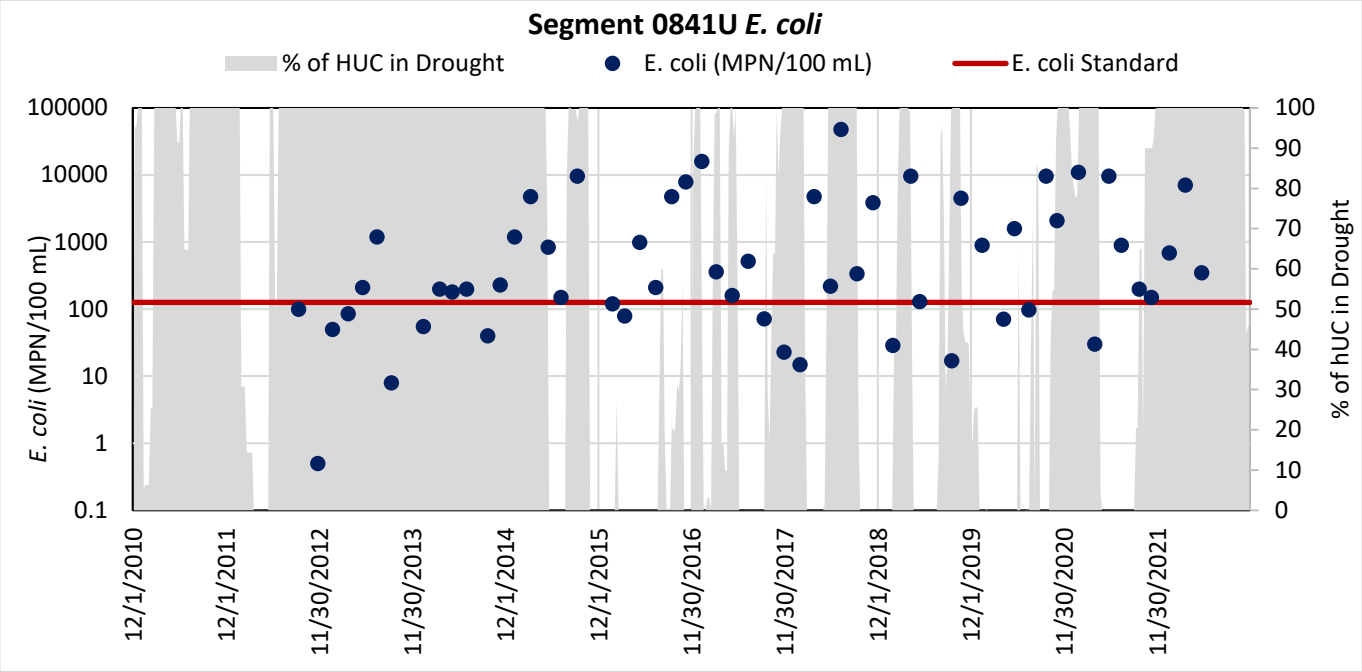

Figure 63: Segment 0841U E. coli

0841P North Fork Cottonwood Creek

This unclassified segment is a 4.4-mile stretch of North Fork Cottonwood Creek running from approximately 0.3-miles upstream of Carter Street in Arlington to the confluence with the South Fork Cottonwood Creek in Grand Prairie (see Figure 43). The watershed is developed and has a relatively large area of grassland just upstream of SH 161. It lies within the Northern Blackland Prairie.

Clean Rivers Program water quality monitoring is being conducted at one site within this segment as shown in Table 98. Monitoring is being conducted by the City of Arlington. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 98: FY2023 Monitoring stations in Segment 0841P

Assessment Unit	Station Description	Station ID	Collecting Entity
0841P_01	COTTONWOOD CREEK AT TIMBERLAKE DRIVE IN ARLINGTON	10722	City of Arlington

A summary of the concerns and impairments identified in the TCEQ 2022 Texas Integrated Report is shown in Table 99.

Table 99: Findings of TCEQ 2022 Texas Integrated Report for Segment 0841P

Assessment Unit	Use	Parameter	Criteria	Finding
0841P_01	Recreation Use	*E. coli*	126 MPN/100 mL	NS

An impairment for *E. coli* was identified in this segment. Sampling has been conducted at two stations in this segment. Both stations are in close proximity to each other with 10722 being upstream of 20836. There were no correlations between *E. coli* and other parameters such as flow or number of days since precipitation which indicates a mix of point and runoff related sources may be impacting the stream. As shown in Figure 64, data were regularly reported above the standard of 126 MPN/100 mL at both stations. The watershed above these stations is residential with a small wooded area directly upstream of Station 10722; runoff containing pet waste and to a lesser extent wildlife waste may be contributing bacteria to the stream. Landowner education and pet waste best management practices may help reduce bacterial loading from these sources. However, at station 10722, there appears to be a distinct increase in *E. coli* after 2015. TRA staff inspected this stream on January 20, 2023 and identified a cracked sewer line in a smaller tributary that was not actively leaking at the time of inspection and a major sanitary sewer overflow at the headwaters of the creek. These findings were reported to the appropriate authorities and repairs were made. Discussions with their staff indicate that sanitary sewer overflows are relatively common in this watershed due to the age of the infrastructure. Many of the homes in the watershed date to the early 1950's. Until a large-scale infrastructure rehabilitation project can be funded and completed in this watershed, continued monitoring and regular inspections of the stream channel will be needed to reduce overall bacterial loading as much as possible.

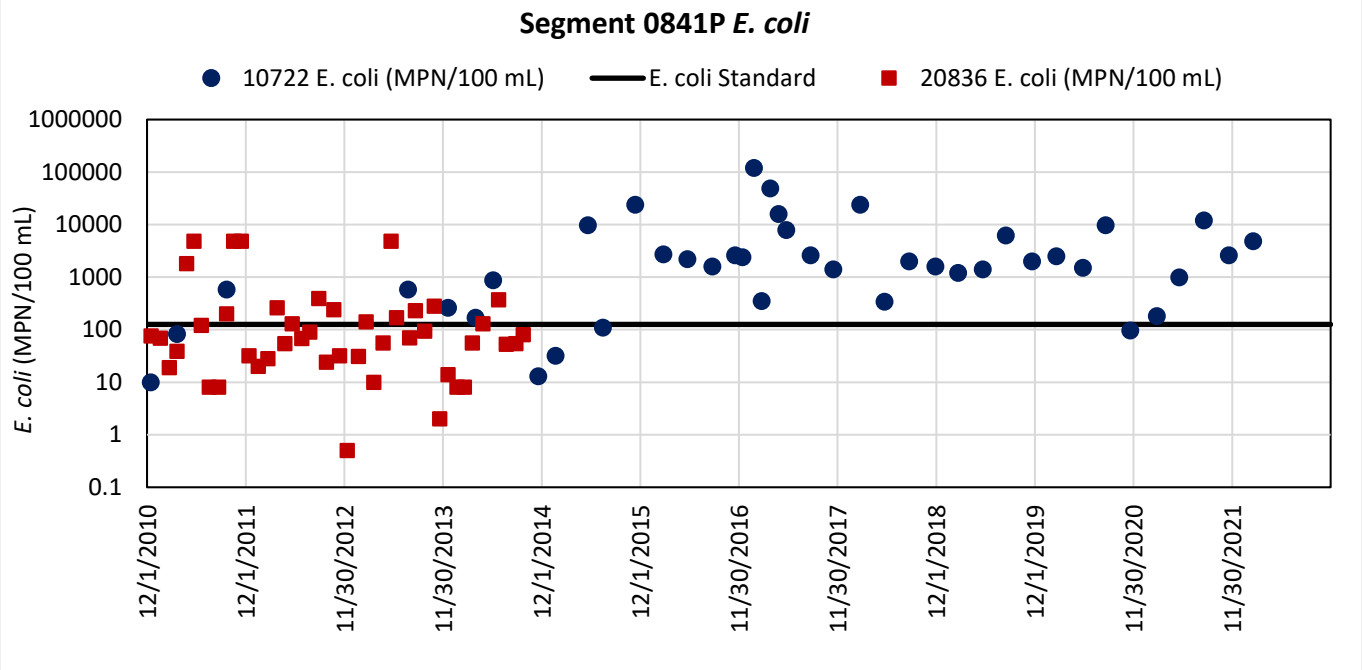

Figure 64: Segment 0841P E. coli

0841V Crockett Branch

Crockett Branch is a 1-mile stream running from the headwaters near East Jefferson Street in Grand Prairie to the confluence with Cottonwood Creek (see Figure 43). The watershed is developed and lies within the Northern Blackland Prairie ecoregion.

Clean Rivers Program water quality monitoring is being conducted at one site within this segment as shown in Table 100. Monitoring is being conducted by the City of Grand Prairie. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 100: FY2023 Monitoring stations in Segment 0841V

Assessment Unit	Station Description	Station ID	Collecting Entity
0841V_01	CROCKETT BRANCH COTTONWOOD CREEK 179 METERS DOWNSTREAM OF EAST GRAND PRAIRIE ROAD IN GRAND PRAIRIE (22)	17683	City of Grand Prairie

A summary of the concerns and impairments identified in the TCEQ 2022 Texas Integrated Report is shown in Table 101.

Table 101: Findings of TCEQ 2022 Texas Integrated Report for Segment 0841V

Assessment Unit	Use	Parameter	Criteria	Finding
0841V_01	Aquatic Life Use	Dissolved oxygen Grab	5 mg/L	CS
0841V_01	Recreation Use	*E. coli*	126 MPN/100 mL	NS

The *E. coli* impairment that was identified in this segment does not have correlations to either flow or the number of days since precipitation. As shown in Figure 65, 88% of the data were reported above the standard of 126 MPN/100 mL. Because the watershed above Station 17683 is very small and residential, the impairment could be due to failing wastewater infrastructure. It is recommended that upstream sampling or sewer line inspections be conducted to determine if this is the source of bacteria into this stream. This segment is part of the North Central Texas Council of Governments Total Maximum Daily Load Implementation Plan for several waterbodies in the Dallas-Fort Worth Metroplex. The Implementation Plan describes practices that stakeholders may implement in order to reduce bacteria levels.

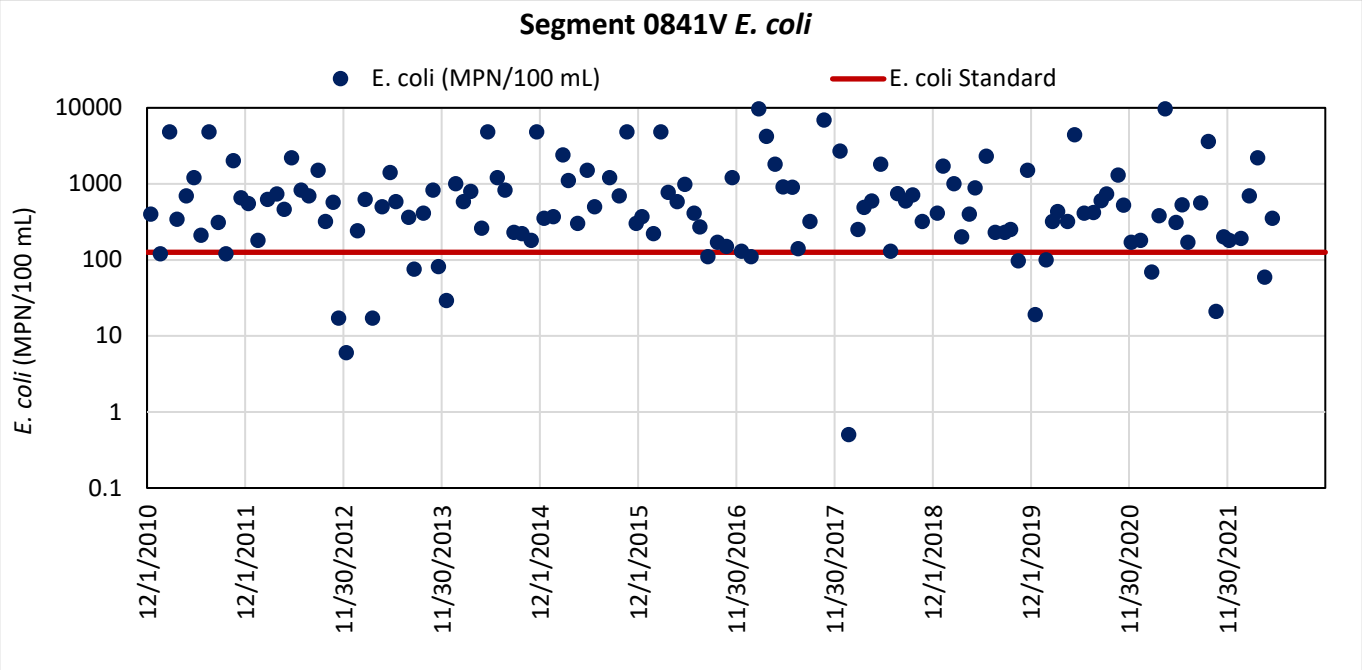

Figure 65: Segment 0841V E. coli

This portion of the stream appears to be a low flow system. The average flow was 0.16 cfs with a range of 0 to 2.6 cfs. Additionally, the correlation between Dissolved Oxygen and Water Temperature was -0.56. As Water Temperature increases, the solubility potential for Oxygen decreases. There was no correlation to Chlorophyll-*a*. Both the low flow system and Water Temperature may be partially responsible for the Dissolved Oxygen concern that was identified in the 2022 TCEQ Integrated Report. Figure 66 shows the Dissolved Oxygen levels observed in this segment. 25% of the data have been reported below the screening level of 5 mg/L. A majority of these exceedances were reported in the warm weather months of May to September. However, as noted above, there may be failing wastewater infrastructure impacting the stream which could affect Dissolved Oxygen levels as well.

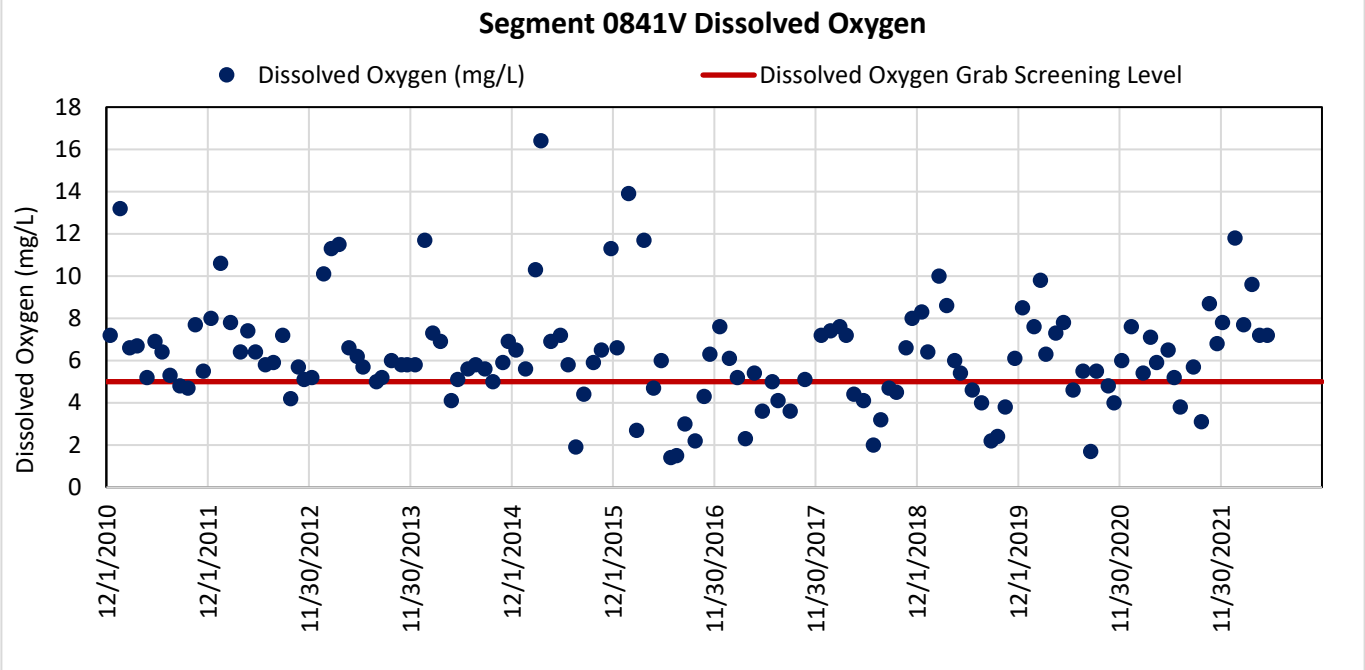

Figure 66: Segment 0841V Dissolved Oxygen

0841F Cottonwood Creek

This unclassified segment is a 6.5-mile stretch of Cottonwood Creek running from SH 360 in Arlington to approximately 0.1-miles upstream of Mountain Creek Reservoir in Grand Prairie (see Figure 43). The watershed is heavily developed and lies within the Northern Blackland Prairie ecoregion.

Clean Rivers Program water quality monitoring is being conducted at three sites within this segment as shown in Table 102. Monitoring is being conducted by the City of Arlington and the City of Grand Prairie. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 102: FY2023 Monitoring stations in Segment 0841F

Assessment Unit	Station Description	Station ID	Collecting Entity
0841F_01	UNNAMED TRIBUTARY OF COTTONWOOD CREEK AT NORTH BOUND DIRECTION OF FORUM DRIVE IN ARLINGTON	10723	City of Arlington
0841F_01	COTTONWOOD CREEK IMMEDIATELY UPSTREAM OF SOUTHWEST 3RD STREET IN GRAND PRAIRIE (11)	17674	City of Grand Prairie
0841F_01	SOUTH FORK COTTONWOOD CREEK AT ROBINSON ROAD IN GRAND PRAIRIE (9)	17676	City of Grand Prairie

A summary of the concerns and impairments identified in the TCEQ 2022 Texas Integrated Report is shown in Table 103.

Table 103: Findings of TCEQ 2022 Texas Integrated Report for Segment 0841F

Assessment Unit	Use	Parameter	Criteria	Finding
0841F_01	Aquatic Life Use	Dissolved oxygen Grab	5 mg/L	CS
0841F_01	Recreation Use	*E. coli*	126 MPN/100 mL	NS

An impairment for *E. coli* was identified in this segment. Sampling as been conducted at four stations along this stream but, as shown in Figure 67, at Stations 17676 and 17674 (above and below the confluence with Segment 0841P), *E. coli* levels were consistently reported above the standard of 126 MPN/100 mL. The geometric means at all four stations ranged from 168 to 263 MPN/100 mL. There were no correlations to flow at stations where this data was available or the number of days since precipitation. The watershed is heavily developed and mostly industrial with a narrow riparian zone running along most of the creek and some residential development concentrated toward the downstream end of the segment. Therefore, the impairment may be largely related to runoff carrying waste from wildlife in the riparian areas and pets from the residential areas. Homeowner education and pet waste best management practices may help reduce bacterial load from pets. There may have also been some influence from failing infrastructure such as broken sewer lines. This segment is part of the North Central Texas Council of Governments Total Maximum Daily Load Implementation Plan for several waterbodies in the Dallas-Fort Worth Metroplex. The Implementation Plan describes practices that stakeholders may implement in order to reduce bacteria levels.

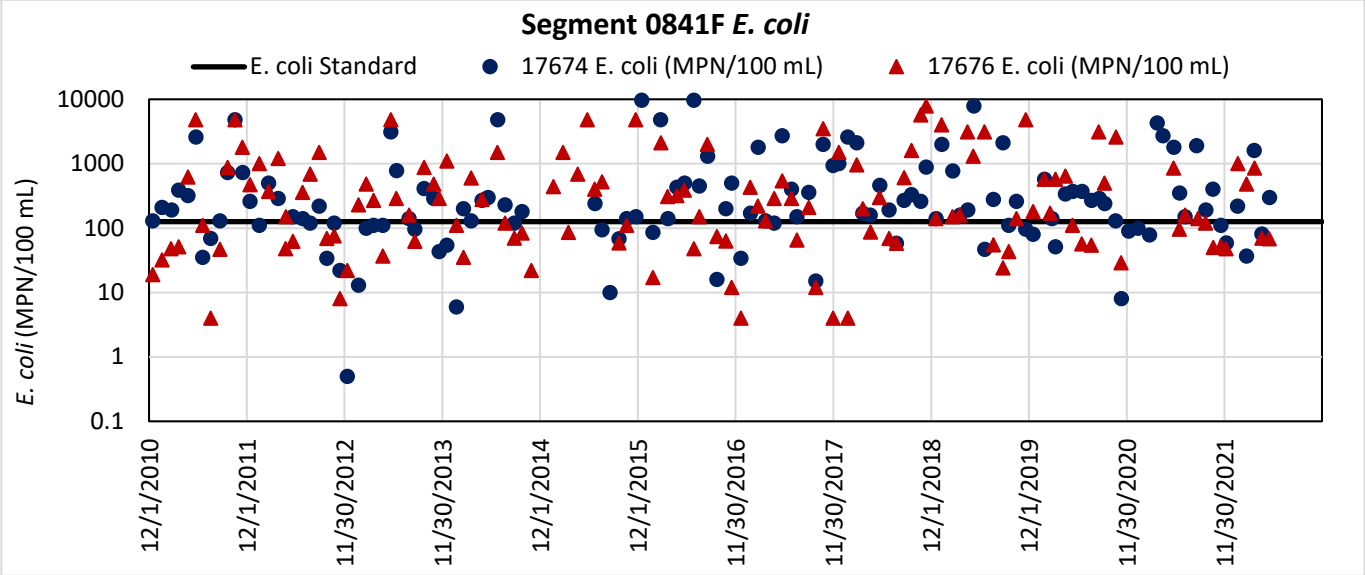

Figure 67: Segment 0841F E. coli

There was a concern identified for low Dissolved Oxygen. As shown in Figure 68, there were several exceedances of the 5 mg/L screening level especially during drought conditions. There was no correlation to Chlorophyll-*a* but the correlation to Water Temperature was -0.68. As Water Temperature increases, the solubility potential for Oxygen decreases. This stream is also a somewhat low flow system based on the available flow data. The average flow was 1.45 cfs

with a range of 0 to 13 cfs. Both the low flows and Water Temperature may be partially responsible for the Dissolved Oxygen concern.

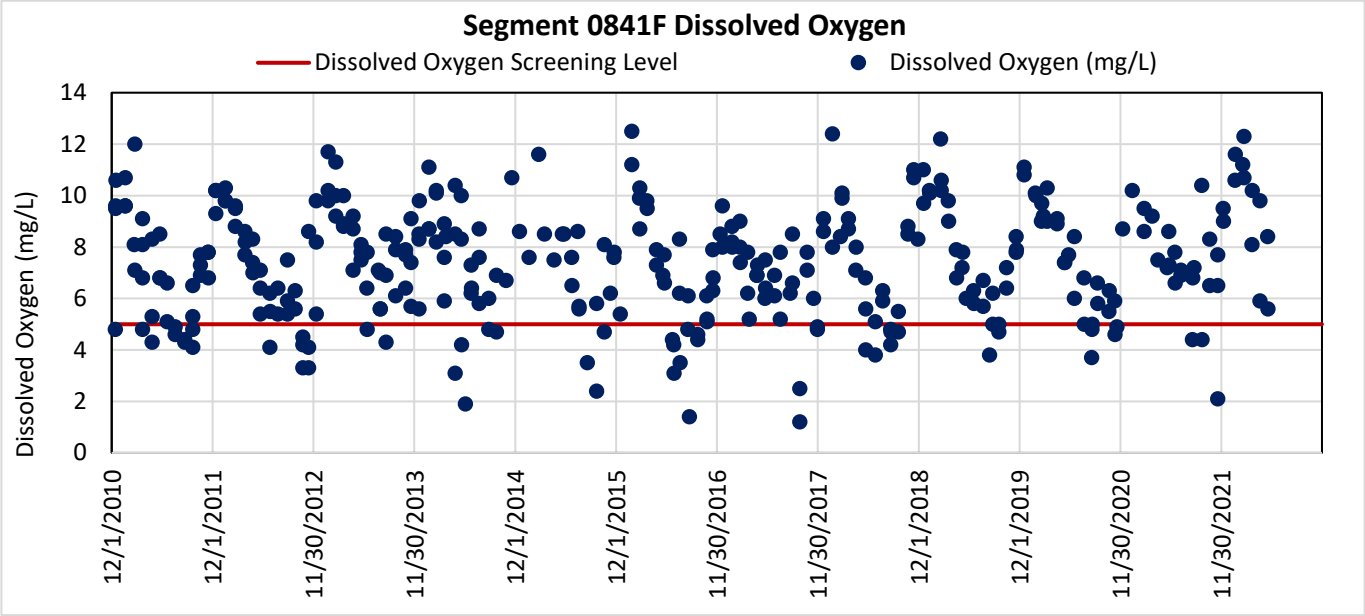

Figure 68: Segment 0841F Dissolved Oxygen

0841K Fish Creek

Figure 69: Fish Creek downstream of South Great Southwest Parkway in Grand Prairie

Fish Creek is a 15-mile stream running from the headwaters of the creek in Arlington to the confluence with Mountain Creek Reservoir in Grand Prairie (see Figure 43). The watershed is developed with some wooded riparian areas and lies within the Northern Blackland Prairie ecoregion.

Clean Rivers Program water quality monitoring is being conducted at three sites within this segment as shown in Table 104. Monitoring is being conducted by TRA, the City of Grand Prairie, and the City of Arlington. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 104: FY2023 Monitoring stations in Segment 0841K

Assessment Unit	Station Description	Station ID	Collecting Entity
0841K_01	FISH CREEK SOUTH BRANCH AT GREAT SOUTHWEST PARKWAY/LAKERIDGE PARKWAY IN GRAND PRAIRIE (28)	15294	City of Grand Prairie & TRA
0841K_01	FISH CREEK AT BELTLINE ROAD/FM1382 APPROXIMATELY 205 METERS SOUTH OF THE INTERSECTION OF SE 14TH STREET (15)	17679	City of Grand Prairie
0841K_01	FISH CREEK SOUTH BRANCH 433 METERS UPSTREAM OF SH 360 SOUTH BOUND SERVICE ROAD IN NATURAL CHANNEL IMMEDIATELY UPSTREAM OF CONCRETE LINED CHANNEL	21530	City of Arlington

A summary of the concerns and impairments identified in the TCEQ 2022 Texas Integrated Report is shown in Table 105.

Table 105: Findings of TCEQ 2022 Texas Integrated Report for Segment 0841K

Assessment Unit	Use	Parameter	Criteria	Finding
0841K_01	Aquatic Life Use	Dissolved oxygen Grab	5 mg/L	CS
0841K_01	Aquatic Life Use	Habitat	20	CS
0841K_01	Aquatic Life Use	Macrobenthic community	29	CN
0841K_01	Recreation Use	*E. coli*	126 MPN/100 mL	NS

Concerns for low Dissolved Oxygen in this segment may be related to low flows. As shown in Figure 70 for Stations 17679 and 21530, Dissolved Oxygen levels were reported below the grab screening level of 5 mg/L 17% of the time. Flow data was not available for all stations in this segment, however, based on the available data, this stream may be a low flow system. The average flow was 1.9 cfs with a range of 0.033 to 20 cfs. Of the Dissolved Oxygen exceedances, 51% were collected when the stream flow was categorized as “low”. 45% were collected with the stream was categorized as having “normal” flow. It is important to note that these categories cover a broad range of measured flows; the normal flow category for this stream had flows ranging from 0.043 to 8.3 cfs. There was a moderately strong correlation with water temperature (correlation coefficient = -0.62) which is also typical of low flow systems. As water temperature increases, the Oxygen saturation potential decreases. Additionally, there was

a weak correlation to Chlorophyll-*a* (correlation coefficient = -0.45) which indicates that low Dissolved Oxygen in this stream may be somewhat related to algal populations.

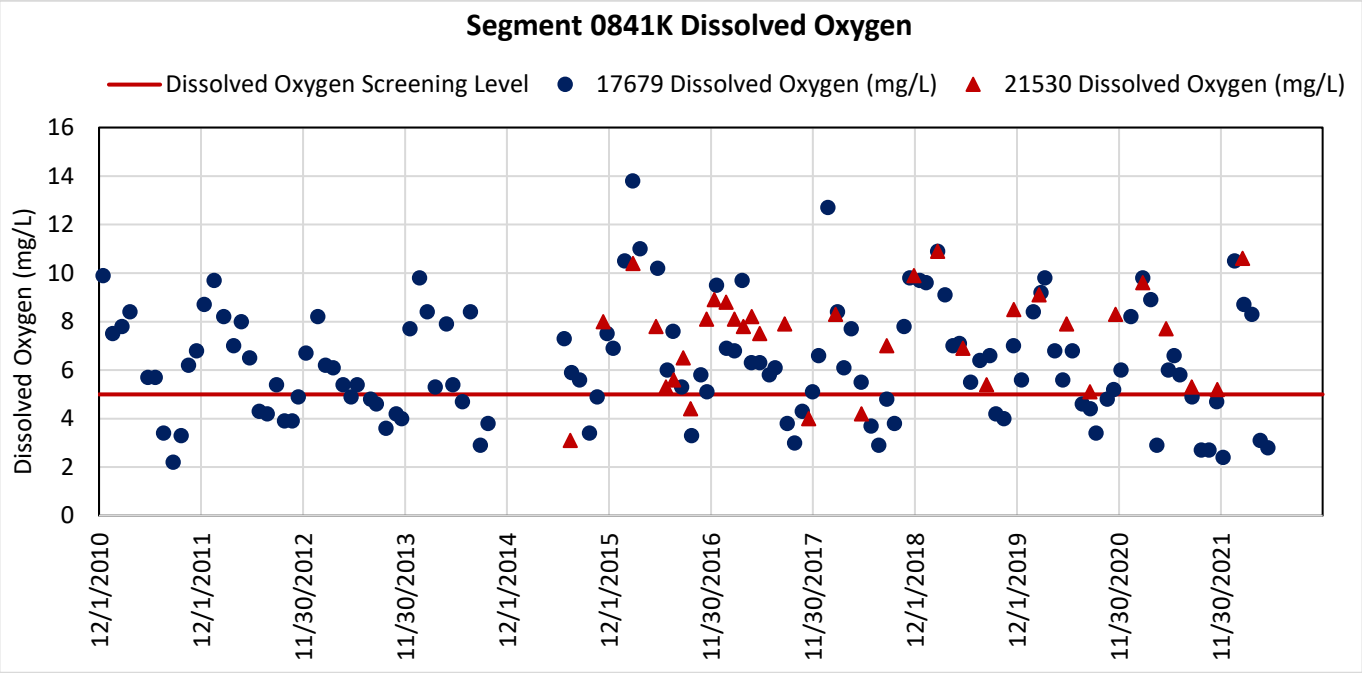

Figure 70: Segment 0841K Dissolved Oxygen

Habitat and macrobenthic community concerns are based on 2018. Aquatic life monitoring will be conducted in this segment in 2023 to further assess these concerns.

Impairments for *E. coli* were identified in this segment. As shown for Stations 17679 and 21530 in Figure 71, *E. coli* were regularly reported above the standard of 126 MPN/100 mL. *E. coli* was moderately correlated to Flow (correlation coefficient = 0.50) which indicates that the impairment may be related to runoff. The watershed for this stream is largely residential. There is a wooded riparian zone along much of the stream and a golf course upstream of station 17679. This indicates that waste from pets and wildlife were the most likely sources of bacteria. Homeowner education and pet waste best management practices may help reduce bacteria levels in this segment. This segment is part of the North Central Texas Council of Governments Total Maximum Daily Load Implementation Plan for several waterbodies in the Dallas-Fort Worth Metroplex. The Implementation Plan describes practices that stakeholders may implement in order to reduce bacteria levels.

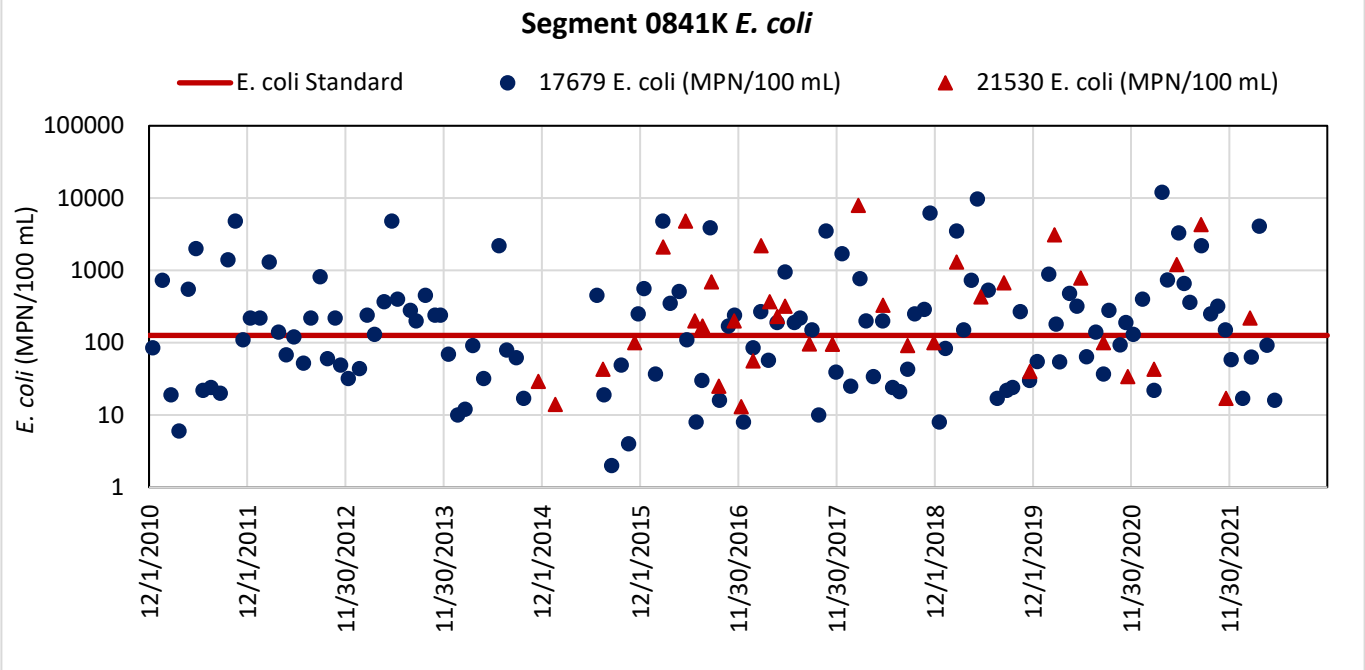

Figure 71: Segment 0841K E. coli

0841Q North Fork Fish Creek

This unclassified segment is a 4.9-mile stretch of North Fork Fish Creek running from SH 360 in Arlington to the confluence with Fish Creek in Grand Prairie (see Figure 43). The watershed is developed with some wooded riparian areas and lies within the Northern Blackland Prairie ecoregion. There is no Clean Rivers Program monitoring scheduled in this segment for FY 2023.

A summary of the concerns and impairments identified in the TCEQ 2022 Texas Integrated Report is shown in Table 106.

Table 106: Findings of TCEQ 2022 Texas Integrated Report for Segment 0841Q

Assessment Unit	Use	Parameter	Criteria	Finding
0841Q_01	Recreation Use	*E. coli*	126 MPN/100 mL	NS

This segment was found to be impaired due to elevated levels of *E. coli*. As shown in Figure 72, 47% of the data were reported above the standard of 126 MPN/100 mL. There were no correlations to the number of days since precipitation. However, the highest *E. coli* values were observed within two days of precipitation indicating that the impairment is at least partially runoff related. There is a wooded riparian area upstream of Station 20838. The remainder of the watershed is a mix of residential, commercial, and light industrial. It is likely that pets and wildlife were the main contributors to the *E. coli* impairment. Homeowner education and pet waste best management practices may decrease bacterial loading into the stream.

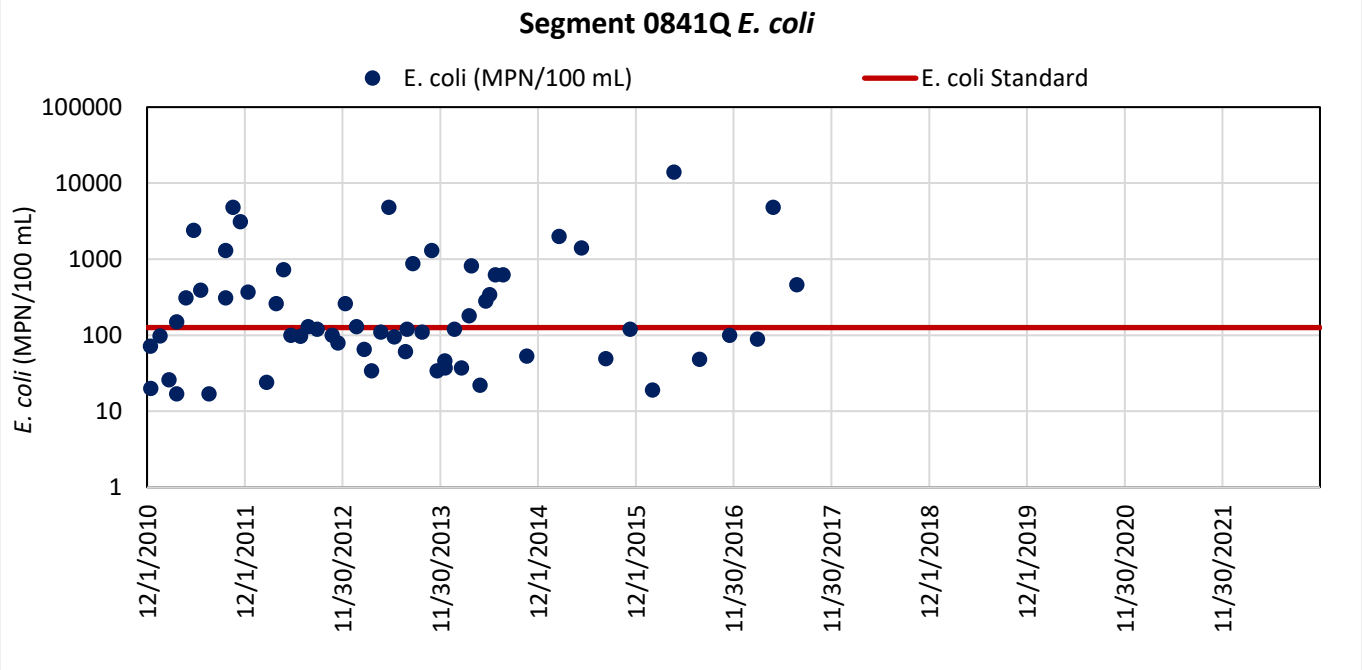

Figure 72: Segment 0841Q E. coli

0841N Kirby Creek

This unclassified segment is a 4-mile stretch of Kirby Creek running from just upstream of Great Southwest Parkway in Arlington to the confluence with Fish Creek in Grand Prairie (see Figure 43). The watershed is developed with some wooded riparian areas and crop land and lies within the Northern Blackland Prairie ecoregion.

Clean Rivers Program water quality monitoring is being conducted at one site within this segment as shown in Table 107. Monitoring is being conducted by the City of Grand Prairie. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 107: FY2023 Monitoring stations in Segment 0841N

Assessment Unit	Station Description	Station ID	Collecting Entity
0841N_01	KIRBY CREEK AT CORN VALLEY ROAD IN GRAND PRAIRIE (12)	17675	City of Grand Prairie

A summary of the concerns and impairments identified in the TCEQ 2022 Texas Integrated Report is shown in Table 108.

Table 108: Findings of TCEQ 2022 Texas Integrated Report for Segment 0841N

Assessment Unit	Use	Parameter	Criteria	Finding
0841N_01	Aquatic Life Use	Dissolved oxygen Grab	5 mg/L	CS
0841N_01	Recreation Use	*E. coli*	126 MPN/100 mL	NS

Concerns for low Dissolved Oxygen in this segment may be related to low flows. As shown in Figure 73, Dissolved Oxygen levels were reported below the grab screening level of 5 mg/L 14% of the time. Flow data was not available for the entire period of record in this segment, however, based on the available data, this stream may be a low flow system. The average flow was 0.82 cfs with a range of 0.03 to 8.5 cfs. Of the Dissolved Oxygen exceedances, 42% were collected when the stream flow was categorized as "low". 53% were collected with the stream was categorized as having "normal" flow. It is important to note that these categories cover a broad range of measured flows; the normal flow category for this stream had flows ranging from 0.051 to 7 cfs. There was a moderate correlation with water temperature (correlation coefficient = -0.5) which is also typical of low flow systems. As water temperature increases, the Oxygen saturation potential decreases. There were no correlations with Chlorophyll-*a* so it is unlikely that algal populations are affecting Dissolved Oxygen in this stream.

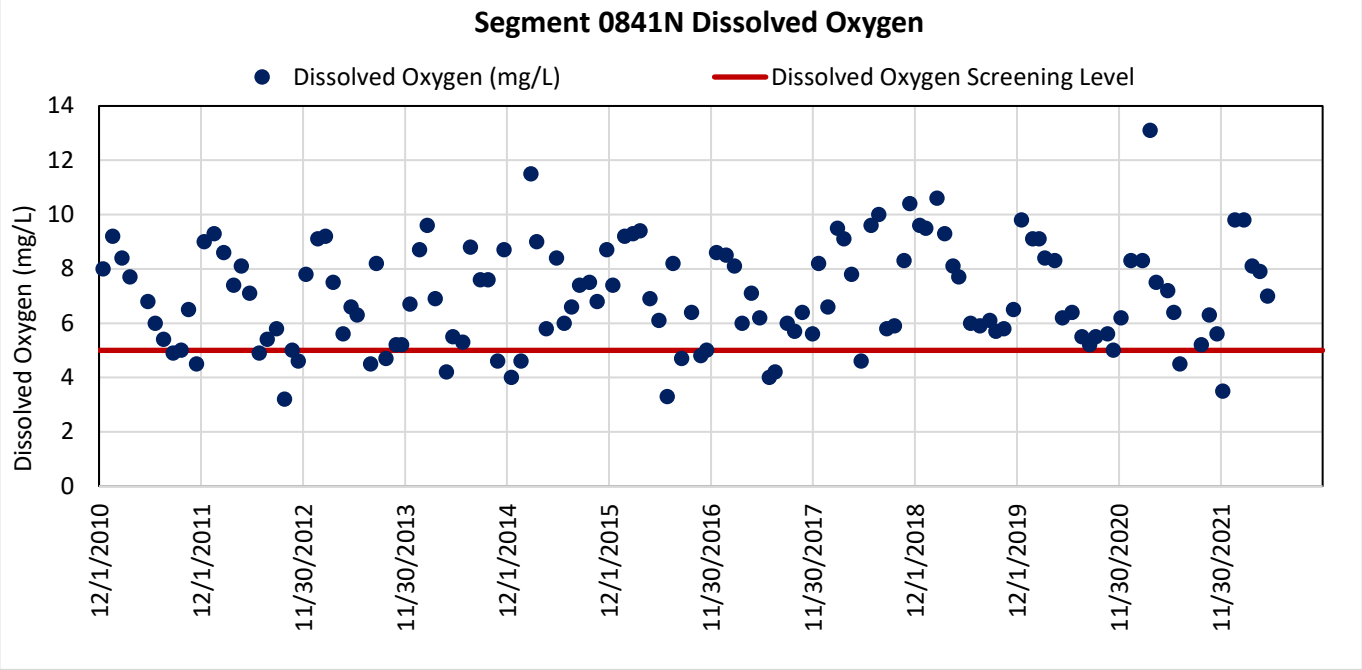

Figure 73: Segment 0841N Dissolved Oxygen

This segment was found to be impaired due to elevated levels of *E. coli*. As shown in Figure 74, *E. coli* was regularly reported above the standard of 126 MPN/100 mL and high levels were reported during both drought and recovery periods. There were no correlations to either flow or days since precipitation. This indicates that there were both point and runoff related sources contributing to this impairment. The watershed upstream of monitoring station 17675 is residential with a wooded riparian area. There are also some commercial areas in the upper portion of the watershed. Runoff containing pet and wildlife waste were likely contributing bacteria during wet weather. Homeowner education and pet waste best management practices may help reduce bacteria levels from these sources. However, as bacteria levels were reported at high levels during dry weather, bacteria from failing infrastructure was could be a major contributor to this impairment. It is recommended that upstream sampling be conducted during low flows to identify potential sources of bacteria and that the stream be inspected to determine if there is any damaged wastewater infrastructure. This segment is part of the North Central

Texas Council of Governments Total Maximum Daily Load Implementation Plan for several waterbodies in the Dallas-Fort Worth Metroplex. The Implementation Plan describes practices that stakeholders may implement in order to reduce bacteria levels.

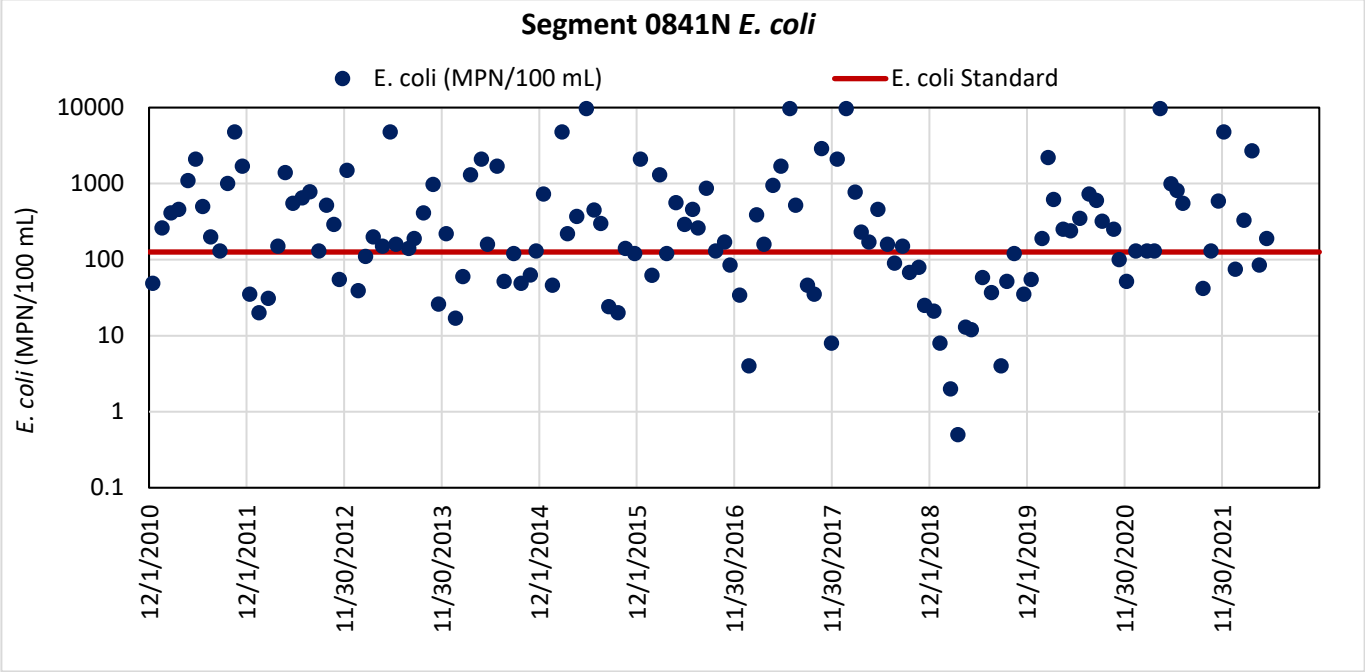

Figure 74: Segment 0841N E. coli

0841W Mountain Creek above Mountain Creek Lake

This unclassified segment is a 4.6-mile stretch of Mountain Creek running from the Joe Pool Lake dam in Grand Prairie to the confluence with Mountain Creek Lake (see Figure 43). The watershed immediately adjacent to the stream is undeveloped wetland and forest with residential and industrial areas outside of this. It lies within the Northern Blackland Prairie ecoregion. There is no Clean Rivers Program monitoring scheduled in this segment for FY 2023.

No impairments or concerns for aquatic life, recreation, or general uses were identified in this segment.

0841A Mountain Creek Lake

Mountain Creek Lake is a 2434-acre reservoir in Grand Prairie (see Figure 43). The watershed is a mix of heavy industrial and residential development and lies within the Northern Blackland Prairie. There is no Clean Rivers Program monitoring scheduled in this segment for FY 2023.

No impairments or concerns for aquatic life, recreation, or general uses were identified in this segment.

0841E Copart Branch Mountain Creek

This segment is a 2.8-mile stretch of Copart Branch running from approximately 0.3-miles upstream of Camden Road on the Dallas Naval Academy to the confluence with Mountain Creek (see Figure 43). The watershed is heavy industrial development with some wooded riparian areas immediately upstream of the confluence with Mountain Creek. It lies within the Northern Blackland Prairie ecoregion. There is no Clean Rivers Program monitoring scheduled in this segment for FY 2023.

No impairments or concerns for aquatic life, recreation, or general uses were identified in this segment.

0841O Mountain Creek

This unclassified segment is a 4-mile stretch of Mountain Creek running from approximately 0.3-miles downstream of Mountain Creek Lake in Grand Prairie to the confluence with the Lower West Fork Trinity River (see Figure 43). The watershed is heavily developed with some wooded and wetland riparian areas and lies within the Northern Blackland Prairie ecoregion.

Clean Rivers Program water quality monitoring is being conducted at one site within this segment as shown in Table 109. Monitoring is being conducted by TRA. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 109: FY2023 Monitoring stations in Segment 0841O

Assessment Unit	Station Description	Station ID	Collecting Entity
0841O_01	MOUNTAIN CREEK IMMEDIATELY DOWNSTREAM OF SINGLETON BLVD IN GRAND PRAIRIE	10815	TRA

A summary of the concerns and impairments identified in the TCEQ 2022 Texas Integrated Report is shown in Table 110.

Table 110: Findings of TCEQ 2022 Texas Integrated Report for Segment 0841O

Assessment Unit	Use	Parameter	Criteria	Finding
0841O_01	General Use	Chlorophyll-*a*	14.1 ug/L	CS
0841O_01	General Use	Ammonia	0.33 mg/L	CS (Carry Forward)

Concerns identified Ammonia (Figure 75) in this segment may be due to a previous long-term wastewater pipeline break that was identified and repaired in March 2015. The Chlorophyll-*a* concerns (Figure 76) may have been due to this pipeline as well with the excess of nutrients leading to algal blooms. TRA staff began sampling in this segment in 2020 and will continue through at least 2026 to further assess these concerns.

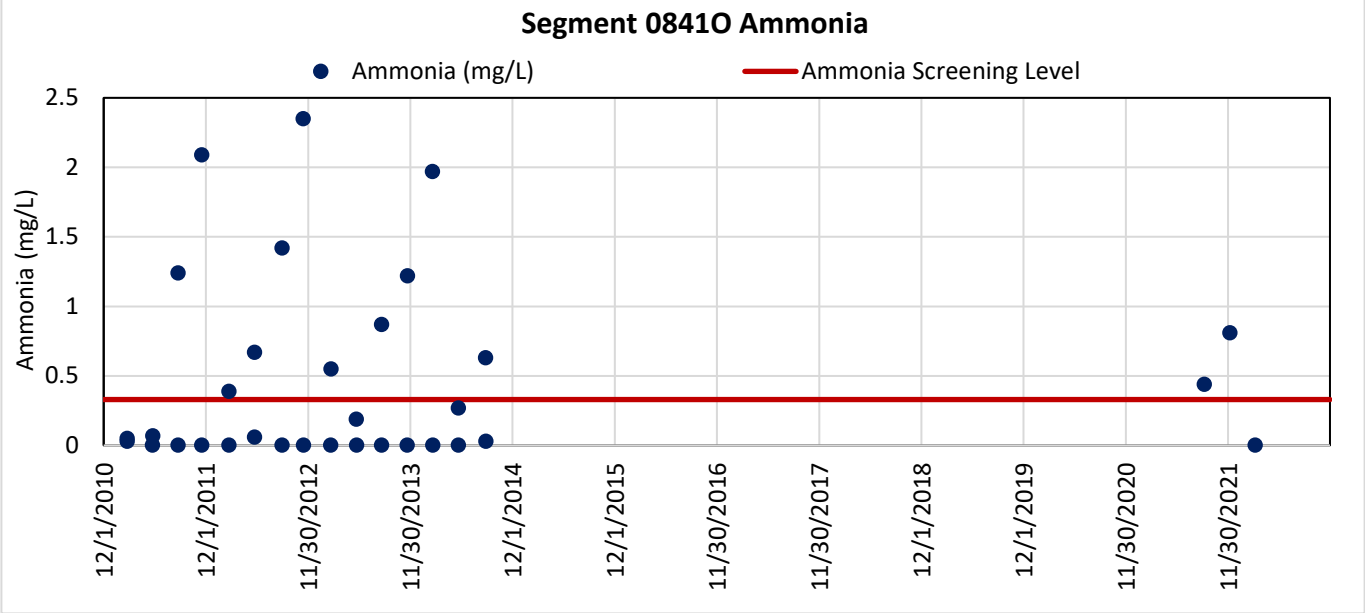

Figure 75: Segment 0841O Ammonia

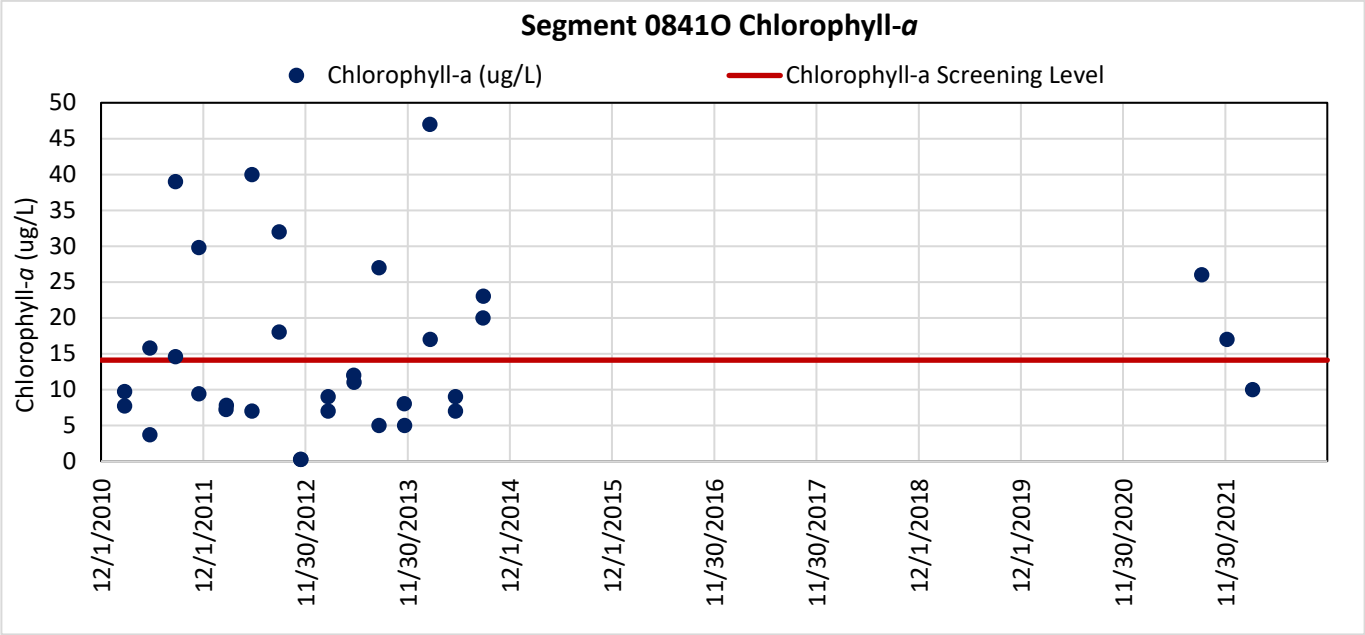

Figure 76: Segment 0841O Chlorophyll-a

0841H Delaware Creek

This unclassified segment is an 8.5-mile stretch of Delaware Creek running from Finley Road in Irving to the confluence with the Lower West Fork Trinity River (see Figure 43). The watershed is developed and lies within the Northern Blackland Prairie ecoregion.

Clean Rivers Program water quality monitoring is being conducted at one site within this segment as shown in Table 111. Monitoring is being conducted by the City of Irving. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 111: FY2023 Monitoring stations in Segment 0841H

Assessment Unit	Station Description	Station ID	Collecting Entity
0841H_01	DELAWARE CREEK IMMEDIATELY DOWNSTREAM OF EAST OAKDALE ROAD IN IRVING	17178	City of Irving

No impairments or concerns for aquatic life, recreation, or general uses were identified in this segment.

0805 Upper Trinity River

Figure 77: Trinity River at North Westmoreland Road in Dallas at flood stage

This 97-mile segment runs from the confluence of the Elm Fork Trinity River in Dallas County to the confluence of the Cedar Creek Reservoir discharge canal in Henderson/Navarro County (see Figure 44). The upper 15 miles of the watershed are highly urbanized and the lower 82 miles are mostly rural cropland and pasture. The flow in this section can be almost 100% wastewater effluent from the Dallas-Fort Worth Metroplex during the hot, dry summer months

and periods of drought. Prior to the development of the large regional wastewater treatment facilities found along this segment, the Trinity River was known to go dry in the summer. The wastewater treatment facilities release high quality effluent that has provided the flow necessary for downstream aquatic life. Water here is generally very turbid as it flows through the Northern Blackland Prairie and into Northern Post Oak Savanna.

Clean Rivers Program water quality monitoring is being conducted at nine sites within this segment as shown in Table 112. Monitoring is being conducted by TCEQ Region 4, TRA, and the City of Dallas. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 112: FY2023 Monitoring stations in Segment 0805

Assessment Unit	Station Description	Station ID	Collecting Entity
0805_02	TRINITY RIVER 50 METERS DOWNSTREAM OF SH 34 NORTHEAST OF ENNIS	10925	TRA
0805_03	TRINITY RIVER AT SOUTH LOOP SH 12 SOUTH OF DALLAS	10934	TRA
0805_03	UPPER TRINITY RIVER 190 METERS DOWNSTREAM OF SOUTH CENTRAL EXPRESSWAY/SH 310 AND 105 METERS UPSTREAM OF RAILROAD BRIDGE	20444	City of Dallas (DT)
0805_04	TRINITY RIVER 46 METERS UPSTREAM OF N WESTMORELAND ROAD IN DALLAS	10937	TRA
0805_04	UPPER TRINITY RIVER AT SYLVAN AVENUE IN DALLAS	20933	City of Dallas (DT)
0805_04	UPPER TRINITY RIVER AT SANTA FE AVENUE IN DALLAS UNDER DART RAIL BRIDGE	20934	City of Dallas (DT)
0805_06	TRINITY RIVER IMMEDIATELY DOWNSTREAM OF MALLOY BRIDGE ROAD EAST OF WILMER	10929	TRA
0805	TENMILE CREEK IMMEDIATELY DOWNSTREAM OF FERRIS ROAD NEAR FERRIS TEXAS	17840	TCEQ Region 4
0805	TEN MILE CREEK 30 METERS UPSTREAM OF PARKINSON RD AND THE TRA TMC WWTP OUTFALL ABOVE THE MIXING ZONE	21287	TRA

A summary of the concerns and impairments identified in the TCEQ 2022 Texas Integrated Report is shown in Table 113.

Table 113: Findings of TCEQ 2022 Texas Integrated Report for Segment 0805

Assessment Unit	Use	Parameter	Criteria	Finding
0805_01	General Use	Nitrate	1.95 mg/L	CS (Carry Forward)
0805_01	General Use	Chlorophyll-*a*	14.1 ug/L	CS (Carry Forward)
0805_01	General Use	Total Phosphorus	0.69 mg/L	CS (Carry Forward)
0805_02	General Use	Total Phosphorus	0.69 mg/L	CS
0805_02	General Use	Nitrate	1.95 mg/L	CS
0805_02	General Use	Chlorophyll-*a*	14.1 ug/L	CS
0805_03	General Use	Nitrate	1.95 mg/L	CS

Assessment Unit	Use	Parameter	Criteria	Finding
0805_03	Recreation Use	*E. coli*	126 MPN/100 mL	NS
0805_04	General Use	Nitrate	1.95 mg/L	CS
0805_04	Recreation Use	*E. coli*	126 MPN/100 mL	NS
0805_06	General Use	Total Phosphorus	0.69 mg/L	CS (Carry Forward)
0805_06	General Use	Nitrate	1.95 mg/L	CS (Carry Forward)

Concerns for Nitrate were identified in all assessment units of this segment with concerns for Total Phosphorus in Assessment Units 0805_01, 0805_02, and 0806_06. Concerns in 0805_01 and 0805_06 were carried forward from previous assessments. In order to provide recent data to further assess these carry forward concerns, monitoring was conducted in 0805_01 from 2020 to 2022. This monitoring was switched over to 0805_06 in 2023. Although some of the data from this recent sampling is not included in the period of record for this report, it appears that the concerns still exist in these assessment units. As shown in Figure 78 for Nitrate, these concerns are related to flow (correlation coefficients = -0.6 to -0.72). At lower flows, concentrations of these parameters were higher and decreased with increasing flow due to dilution from precipitation inflows. This pattern is common for effluent-dominated streams. There are several large wastewater treatment facilities upstream of and in this segment. Most wastewater treatment facilities do not have advanced nutrient removal technology at this time.

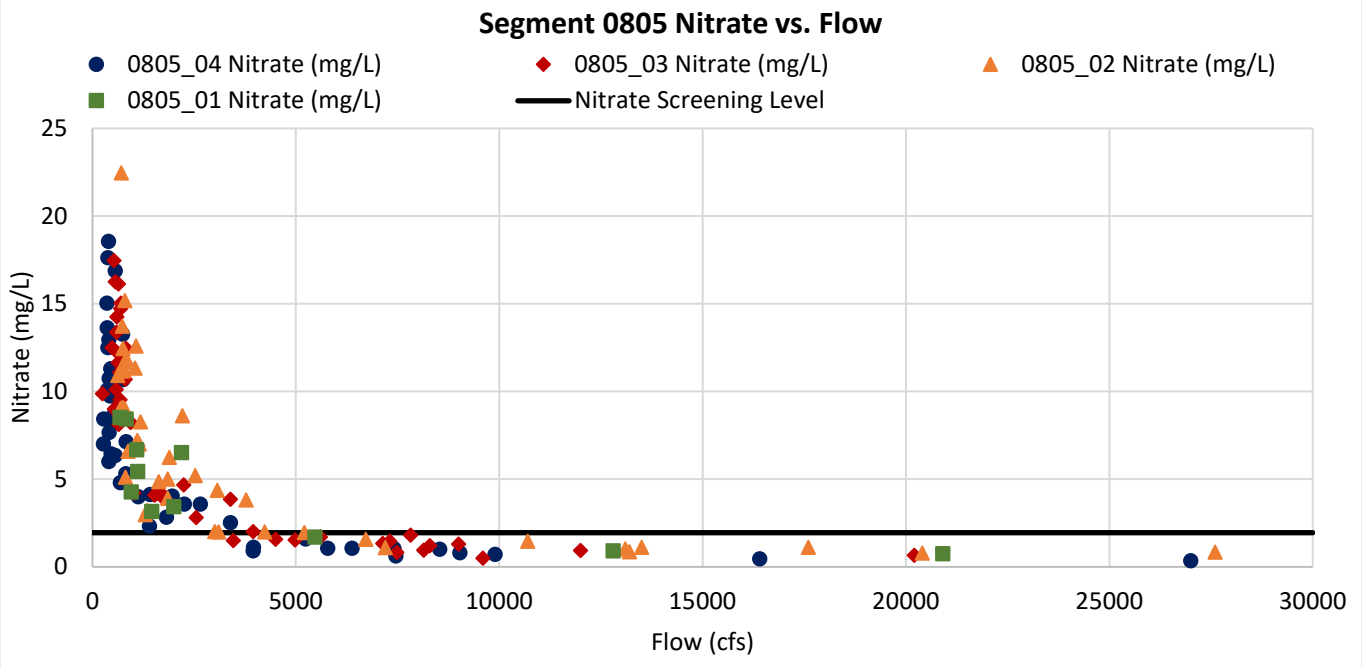

Figure 78: Segment 0805 Nitrate vs. Flow

Although there were concerns for Chlorophyll-*a* identified for assessment units 0805_01 and 0805_02, it does not appear that algal populations were excessively influencing Dissolved Oxygen levels in this portion of the river. Of 58 Dissolved Oxygen readings in these assessment units, there were no values reported below 3 mg/L and only one value reported below 5 mg/L. Chlorophyll-*a* was not correlated to nutrients in the upstream Assessment Units 0805_04 to

0805_02 but was moderately correlated to nutrients in the most downstream Assessment Unit 0805_01. This is expected because algal cells need time to utilize the available nutrients and increase their population. Similarly, there were no correlations between Chlorophyll-*a* and Dissolved Oxygen in the upstream assessment units while there was a moderate correlation of 0.52 in the downstream assessment unit.

Impairments for elevated levels of *E. coli* were identified in assessment units 0805_03 and 0805_04. There were no correlations between *E. coli* and flow or the number of days since precipitation. However, as shown in Figure 79, some of the highest *E. coli* levels were reported during elevated flows. Overall, the impairment is likely due to a mix of point and runoff related sources. Because the watershed upstream of these assessment units are a mix of land uses, sources could include runoff from pets, wildlife, livestock, and failing wastewater infrastructure. These assessment units are part of the North Central Texas Council of Governments Total Maximum Daily Load Implementation Plan for several waterbodies in the Dallas-Fort Worth Metroplex. The Implementation Plan describes practices that stakeholders may implement in order to reduce bacteria levels.

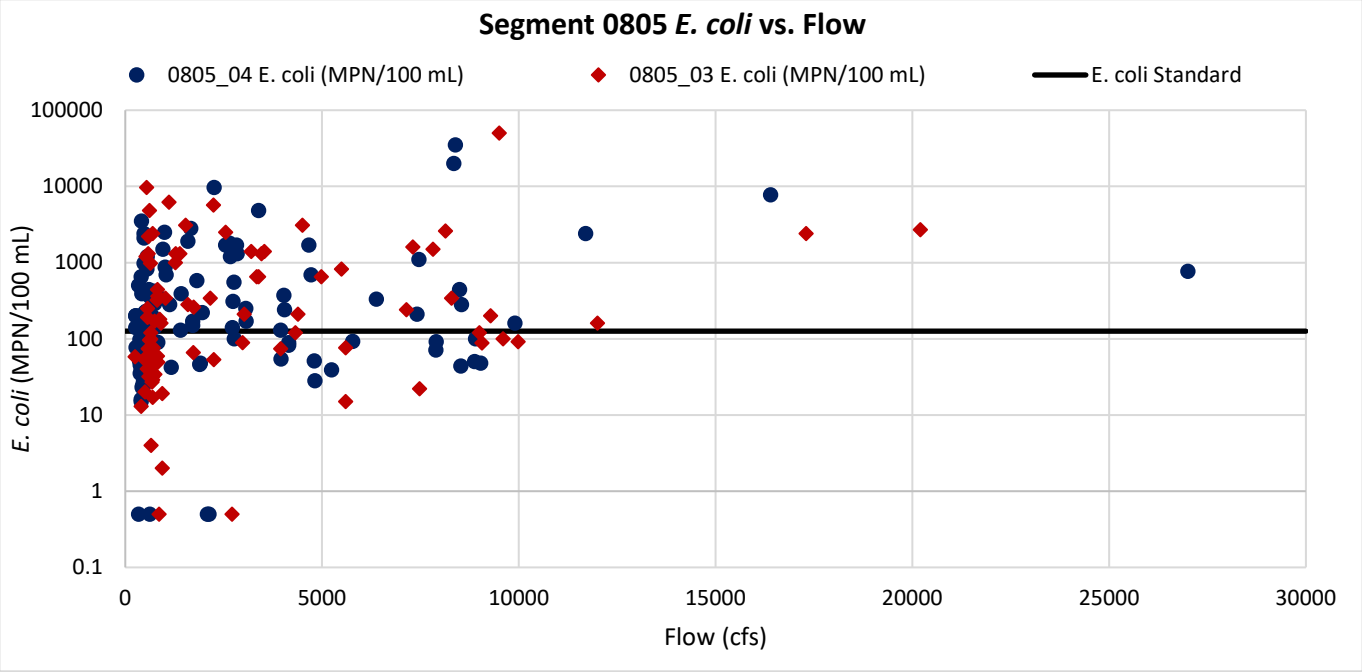

Figure 79: Segment 0805 E. coli vs. Flow

0827A White Rock Creek Above White Rock Lake

Figure 80: White Rock Creek upstream of IH 635 in north Dallas

This 27-mile portion of White Rock Creek runs from the headwaters at Hilcrest Road in Frisco to the headwaters of White Rock Lake (see Figure 44). The watershed is heavily developed with some small wooded riparian areas and lies within the Northern Blackland Prairie ecoregion.

Clean Rivers Program water quality monitoring is being conducted at three sites within this segment as shown in Table 114. Monitoring is being conducted by TRA and the City of Plano. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 114: FY2023 Monitoring stations in Segment 0827A

Assessment Unit	Station Description	Station ID	Collecting Entity
0827A_01	WHITE ROCK CREEK AT IH635 NORTH SERVICE ROAD IMMEDIATELY WEST OF PARK CENTRAL DRIVE	20289	TRA
0827A_02	WHITE ROCK CREEK AT WEST PLANO PARKWAY IN THE CITY OF PLANO	22256	City of Plano
0827A_02	WHITE ROCK CREEK 90 METERS DOWNSTREAM OF SAM RAYBURN TOLLWAY/SH 121	22257	City of Plano

A summary of the concerns and impairments identified in the TCEQ 2022 Texas Integrated Report is shown in Table 115.

Table 115: Findings of TCEQ 2022 Texas Integrated Report for Segment 0827A

Assessment Unit	Use	Parameter	Criteria	Finding
0827A_01	Recreation Use	*E. coli*	126 MPN/100 mL	NS

This segment was found to be impaired due to elevated levels of *E. coli*. Data collected at two locations, Station 21556 upstream and Station 20289 downstream, are shown in Figure 81. *E. coli* at Station 20289 was not correlated to flow or number of days since precipitation although some of the highest values were reported within two days of precipitation. There was a moderately strong correlation to flow at the upstream Station 21556 (correlation coefficient = 0.68). However, this was based on a limited dataset of eight observations and may not be reliable. The land use in this watershed is a largely a mix of residential, golf courses, parks, and commercial with some wooded riparian areas. Sources of *E. coli* are most likely a mix of runoff containing pet and wildlife waste and point sources such as failing wastewater infrastructure. A study was conducted in 2019 and 2020 to attempt to locate potential sources of *E. coli* into the stream. Dry weather sampling identified one location that was investigated by the proper authorities. Wet weather sampling was inconclusive as *E. coli* appears to be ubiquitous throughout the watershed.

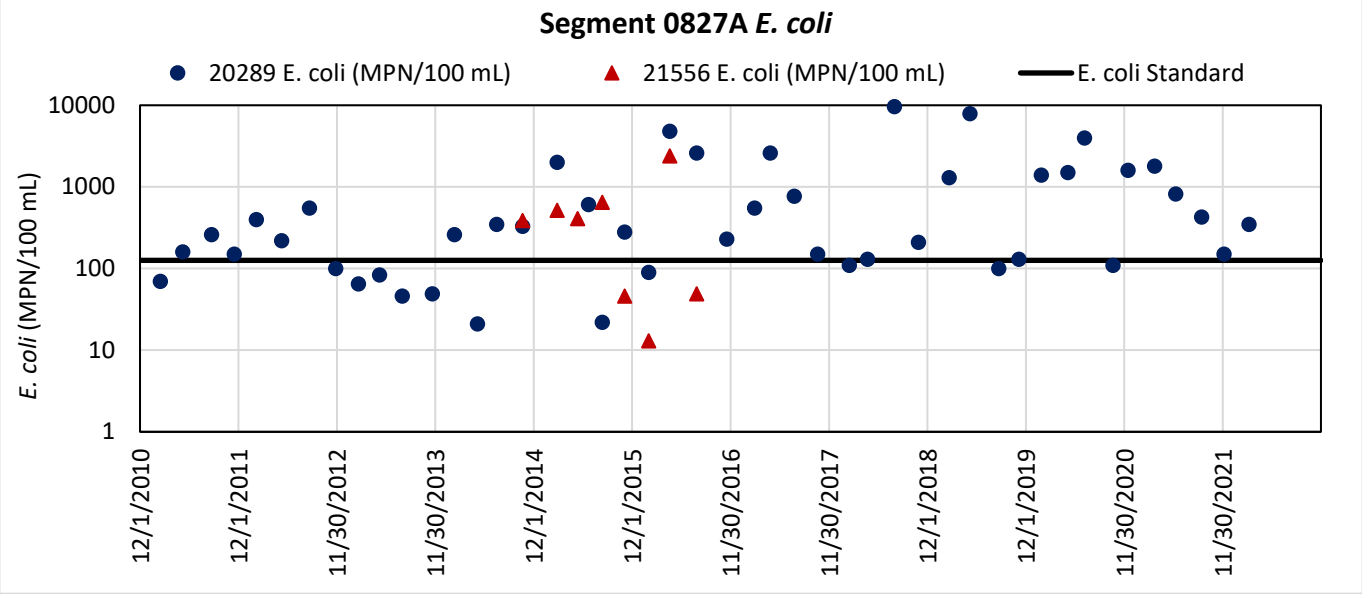

Figure 81: Segment 0827A E. coli

0827B Cottonwood Creek

This unclassified segment is a 6.2-mile stretch of Cottonwood Creek running from the confluence with an unnamed tributary approximately 200 meters upstream of Campbell road in the City of Richardson to the confluence with White Rock Creek (see Figure 44). The watershed is heavily developed and lies within the Northern Blackland Prairie ecoregion.

Clean Rivers Program water quality monitoring is being conducted at one site within this segment as shown in Table 116. Monitoring is being conducted by TCEQ Region 4. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 116: FY2023 Monitoring stations in Segment 0827B

Assessment Unit	Station Description	Station ID	Collecting Entity
0827B_01	COTTONWOOD CREEK IMMEDIATELY UPSTREAM OF FOREST LANE 1.0 MILES SOUTH OF THE INTERSECTION OF IH 635 AND US 75 IN DALLAS	17843	TCEQ Region 4

No impairments or concerns for aquatic life, recreation, or general uses were identified in this segment.

0827 White Rock Lake

This 1,100-acre urban lake in Dallas County impounds White Rock Creek up to a normal pool elevation of 458 feet (see Figure 44). Segment 0827 is located entirely within the Northern Blackland Prairie ecoregion and the watershed is nearly all developed with some wooded areas adjacent to the shores of the reservoir.

Clean Rivers Program water quality monitoring is being conducted at one site within this segment as shown in Table 117. Monitoring is being conducted by TCEQ Region 4. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 117: FY2023 Monitoring stations in Segment 0827

Assessment Unit	Station Description	Station ID	Collecting Entity
0827_01	WHITE ROCK LAKE MID LAKE NEAR DAM 79 METERS NORTH AND 597 METERS WEST OF INTERSECTION OF LAWTHER DRIVE AND GARLAND ROAD	11038	TCEQ Region 4

A summary of the concerns and impairments identified in the TCEQ 2022 Texas Integrated Report is shown in Table 118.

Table 118: Findings of TCEQ 2022 Texas Integrated Report for Segment 0827

Assessment Unit	Use	Parameter	Criteria	Finding
0827_01	Aquatic Life Use	Dissolved oxygen Grab	5 mg/L	CS
0827_01	General Use	Nutrients	Nutrient Reservoir Narrative Criteria	CS

A concern for Nutrients was identified in this segment. Nutrients in this reservoir are assessed against a narrative criteria based on lines of evidence that includes median Secchi Depth, Chlorophyll-*a*, Total Nitrogen, and Total Phosphorus levels as described in the TCEQ 2022 Guidance for Assessing and Reporting Surface Water Quality in Texas. 60% of the Chlorophyll-

a data were reported above the threshold of 29.73 µg/L. The median Chlorophyll-*a* was 33.35 ug/L. There were no strong positive correlations between Chlorophyll-*a* and nutrients. The median Total Nitrogen concentration was 1.03 mg/L which exceeded the threshold of 0.8 mg/L. Total Phosphorus did not exceed the threshold of 0.1 mg/L. It is likely that residence times in the reservoir were allowing algal populations to increase.

Dissolved Oxygen concerns were also identified in this segment. However, based on 44 data points in the period of record for this report, only one value fell below the screening level of 5 mg/L as shown in Figure 82. Dissolved Oxygen was not correlated to Chlorophyll-*a* (correlation coefficient = 0.26), therefore, algal populations may not be excessively impacting Dissolved Oxygen levels in this reservoir. It appears that Water Temperature was the strongest contributing factor to low Dissolved Oxygen. The correlation coefficient between the two parameters was -0.60. As Water Temperature increases, the Oxygen saturation potential decreases leading to lower Dissolved Oxygen levels.

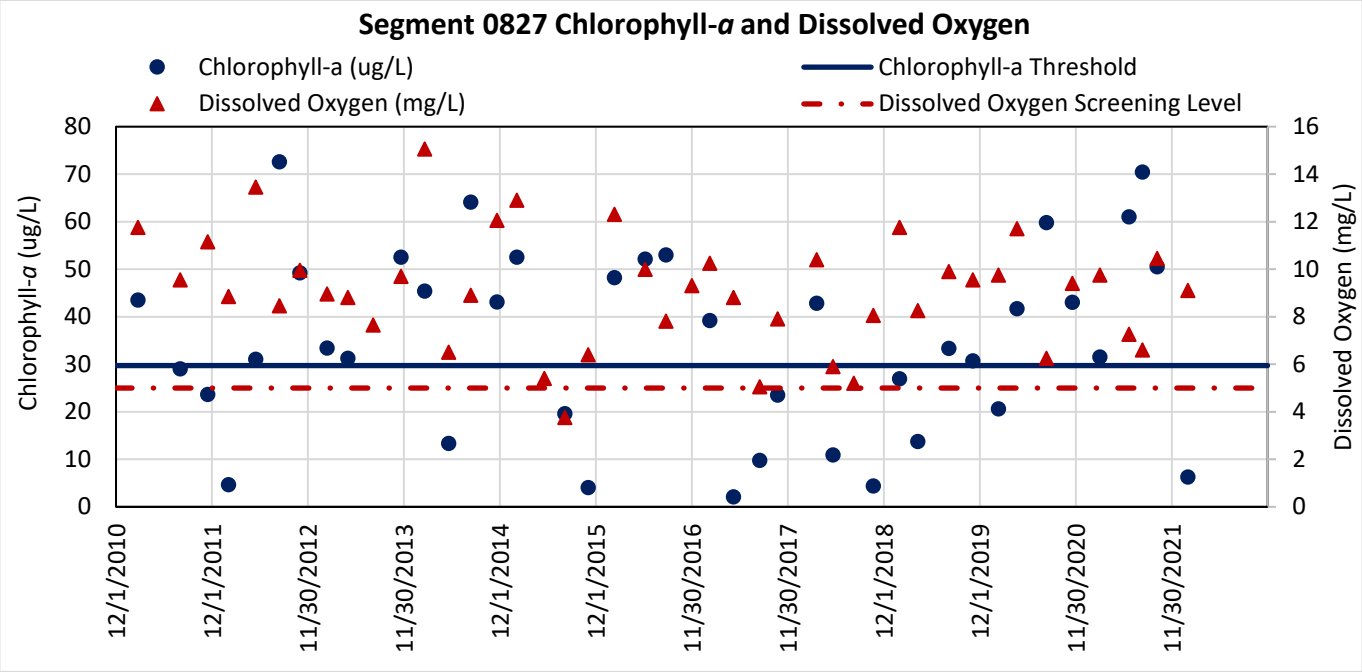

Figure 82: Segment 0827 Chlorophyll-a and Dissolved Oxygen

0805C White Rock Creek Below White Rock Lake

This unclassified segment is 9.5-mile stretch of White Rock Creek that runs from the White Rock Lake dam to the confluence with the Trinity River (see Figure 44). The upstream portion of the watershed is developed while the downstream portion is undeveloped forested wetland and lies within the Northern Blackland Prairie ecoregion. There is no Clean Rivers Program monitoring scheduled in this segment for FY 2023.

No impairments or concerns for aquatic life, recreation, or general uses were identified in this segment.

0805D Fivemile Creek

This unclassified segment is a 17-mile stretch of Fivemile Creek extending from the headwaters in Duncanville to the confluence with the Trinity River upstream (see Figure 44). The watershed is developed with wooded riparian areas and lies within the Northern Blackland Prairie ecoregion. There is no Clean Rivers Program monitoring scheduled in this segment for FY 2023.

No impairments or concerns for aquatic life, recreation, or general uses were identified in this segment.

0805B Parsons Slough

The unclassified segment is an 11-mile stretch of Parsons Slough running from Malloy Bridge Road in Dallas County to the confluence with the Trinity River in Kaufman County (see Figure 44). The watershed is rural with mostly pasture, hay, and crop land. It lies within the Northern Blackland Prairie ecoregion. There is no Clean Rivers Program monitoring scheduled in this segment for FY 2023.

No impairments or concerns for aquatic life, recreation, or general uses were identified in this segment.

0805A Red Oak Creek

Figure 83: Red Oak Creek downstream of SH 342 northwest of Rockett

Red Oak Creek runs 42-miles runs from just upstream of US 287 in Cedar Hill to the confluence with the Trinity River (see Figure 44). The most upstream portion of the watershed is developed but the remainder is rural with pasture, hay, and crop land. It lies within Northern Blackland Prairie ecoregion.

Clean Rivers Program water quality monitoring is being conducted at one site within this segment as shown in Table 119. Monitoring is being conducted by TRA. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 119: FY2023 Monitoring stations in Segment 0805A

Assessment Unit	Station Description	Station ID	Collecting Entity
0805A_01	RED OAK CREEK 111 METERS DOWNSTREAM OF SHAWNEE ROAD	10842	TRA

No impairments or concerns for aquatic life, recreation, or general uses were identified in this segment.

0804 Trinity River Above Lake Livingston

This 160-mile portion of the Trinity River begins at the confluence with the Cedar Creek Lake outfall canal and ends at the Lake Livingston headwaters southwest of Crockett (see Figure 45). This segment is generally considered the “Middle Trinity” and runs through the Northern and Southern Post Oak Savanna as well as the Tertiary Uplands ecoregions. The watershed is largely rural with some larger communities including Athens, Palestine, Fairfield, and Crockett. Land use in the watershed is largely hay and pasture land with some small pockets of crop land, grassland, and forest.

Clean Rivers Program water quality monitoring is being conducted at three sites within this segment as shown in Table 120. Monitoring is being conducted by TRA and the TRA Lake Livingston Project. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 120: FY2023 Monitoring stations in Segment 0804

Assessment Unit	Station Description	Station ID	Collecting Entity
0804_04	TRINITY RIVER IMMEDIATELY DOWNSTREAM OF US 79 NORTHEAST OF OAKWOOD	10919	TRA
0804_07	TRINITY RIVER AT SH 31 IN TRINIDAD	10922	TRA
0804_01	TRINITY RIVER 304 METERS UPSTREAM OF SH 7 11.9 MI WEST OF CROCKETT	13690	TRA Lake Livingston Project

A summary of the concerns and impairments identified in the TCEQ 2022 Texas Integrated Report is shown in Table 121.

Table 121: Findings of TCEQ 2022 Texas Integrated Report for Segment 0804

Assessment Unit	Use	Parameter	Criteria	Finding
0804_01	General Use	Total Phosphorus	0.69 mg/L	CS
0804_01	General Use	Nitrate	1.95 mg/L	CS
0804_01	General Use	Chlorophyll-*a*	14.1 ug/L	CS
0804_02	General Use	Total Phosphorus	0.69 mg/L	CS (Carry Forward)
0804_02	General Use	Nitrate	1.95 mg/L	CS (Carry Forward)
0804_02	General Use	Chlorophyll-*a*	14.1 ug/L	CS (Carry Forward)
0804_03	General Use	Nitrate	1.95 mg/L	CS (Carry Forward)
0804_04	General Use	Total Phosphorus	0.69 mg/L	CS
0804_04	General Use	Nitrate	1.95 mg/L	CS
0804_04	General Use	Chlorophyll-*a*	14.1 ug/L	CS
0804_07	General Use	Total Phosphorus	0.69 mg/L	CS
0804_07	General Use	Nitrate	1.95 mg/L	CS
0804_07	General Use	Chlorophyll-*a*	14.1 ug/L	CS

Concerns for Nitrate, Total Phosphorus, and Chlorophyll-*a* were identified for several assessment units in this segment. There are no bridge crossings in Assessment Units 0804_02 or 0804_03 at which to conduct routine monitoring, therefore, it is likely that carry forward concerns in these areas will continue for the foreseeable future. However, because both upstream and downstream assessment units also had concerns for these parameters, it is reasonable to assume that any monitoring in 0804_02 and 0804_03 would continue to have concerns identified. As shown for Nitrate in Figure 84 for Assessment Units 0804_01, 0804_04, and 0804_07, these concerns were related to flows. At lower flows, concentrations of these parameters were elevated then decreased with increasing flow as freshwater inflows from precipitation provide dilution. This pattern is common for effluent-dominated streams. There are several large wastewater treatment facilities upstream of and in this segment. Most wastewater treatment facilities do not have advanced nutrient removal technology at this time. 66% of Nitrate, 37% of Total Phosphorus, and 45% of Chlorophyll-*a* values exceeded their respective screening levels. Chlorophyll-*a* values were weakly to moderately correlated to Dissolved Oxygen levels (correlation coefficients = 0.37 to 0.55). However, it does not appear that algal populations were excessively influencing Dissolved Oxygen levels in this portion of the river. Of 224 Dissolved Oxygen readings, there were no values reported below 3 mg/L and only one value reported below 5 mg/L.

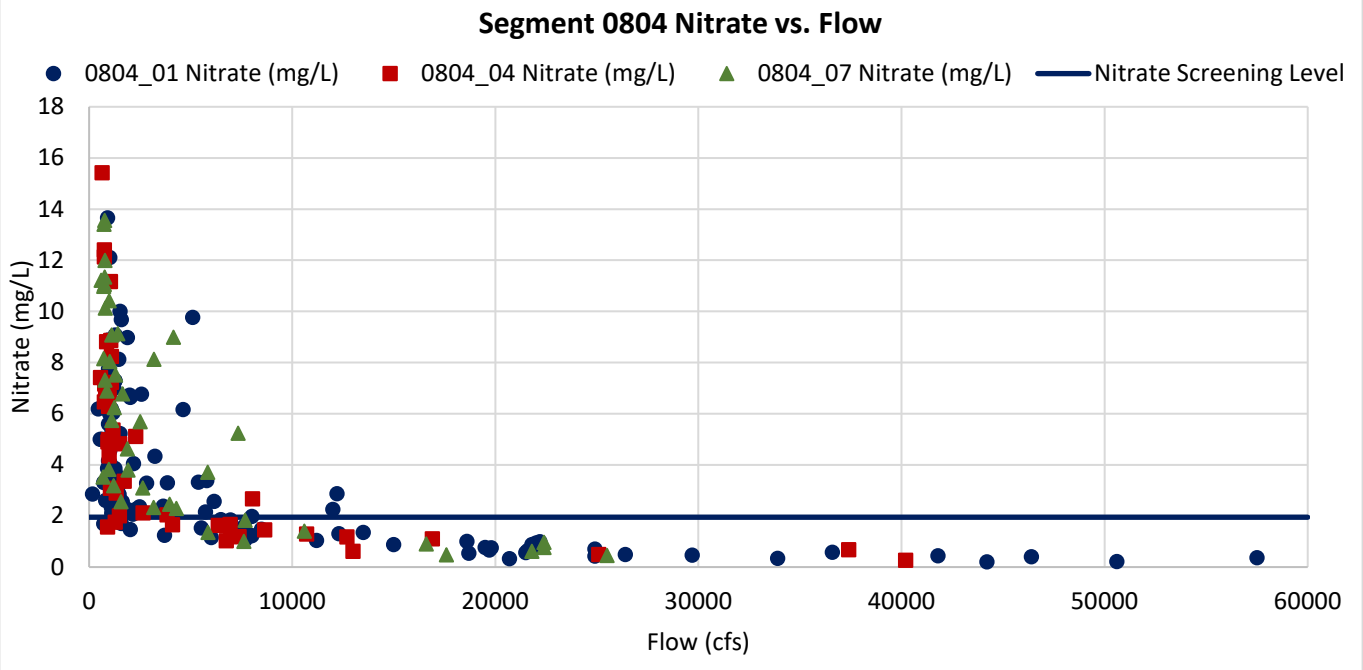

Figure 84: Segment 0804 Nitrate vs. Flow

0835 Richland Creek Below Richland-Chambers Reservoir

This 2.5-mile segment runs from the Richland-Chambers dam in Freestone County to the confluence of the Trinity River (see Figure 45). The watershed is undeveloped with grassland and wooded wetland and lies within the Southern Post Oak Savanna. There is no Clean Rivers Program monitoring scheduled in this segment for FY 2023.

No impairments or concerns for aquatic life, recreation, or general uses were identified in this segment.

0804I Big Brown Creek

This 11-mile unclassified segment runs from the headwaters near US 84 outside of Fairfield to the confluence with Tehuacana Creek (see Figure 45). Fairfield Lake, segment 0804J, lies in the middle of this segment. The watershed is rural and consists mainly of hay and pasture land with wooded wetlands around the lake and lies within the Southern Post Oak Savanna. There are several oil and gas drilling pads in the upstream portion of the watershed as well as a sand and gravel mine to the east of Fairfield Lake. There is no Clean Rivers Program monitoring scheduled in this segment for FY 2023.

No impairments or concerns for aquatic life, recreation, or general uses were identified in this segment.

0804J Fairfield Lake

Fairfield Lake is a 2172-acre reservoir that impounds Big Brown Creek outside of Fairfield (see Figure 45). The watershed is rural and consists mainly of hay and pasture land with wooded wetlands around the lake and lies within the Southern Post Oak Savanna. Big Brown Power Plant lies on the north shore of the reservoir. Fairfield Lake was constructed to provide cooling water for this plant. Operations at the plant ended in 2018.

Clean Rivers Program water quality monitoring is being conducted at one site within this segment as shown in Table 122. Monitoring is being conducted by TCEQ Region 9. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 122: FY2023 Monitoring stations in Segment 0804J

Assessment Unit	Station Description	Station ID	Collecting Entity
0804J_01	FAIRFIELD LAKE IN MAIN POOL 751 METERS SOUTH AND 503 METERS WEST OF NORTH END OF DAM 12.9 KM NORTHEAST OF FAIRFIELD	17951	TCEQ Region 9

A summary of the concerns and impairments identified in the TCEQ 2022 Texas Integrated Report is shown in Table 123.

Table 123: Findings of TCEQ 2022 Texas Integrated Report for Segment 0804J

Assessment Unit	Use	Parameter	Criteria	Finding
0804J_01	General Use	Fish Kill Reports	N/A	CN

Concerns for fish kills have been identified in Fairfield Lake. Several fish kills have been reported since 2003. The reports indicate that low dissolved oxygen due to algal blooms and water temperature were the cause of these fish kills. The correlations between Dissolved Oxygen and Chlorophyll-*a* or Water Temperature are not strong (correlation coefficients = -0.19 and -0.1, respectively). The average Dissolved Oxygen level in the reservoir was 8.78 mg/L with a range of 3.5 to 11.5 mg/L. The average Chlorophyll-*a* level was 39.5 ug/L with a range of 5.59 to 127 ug/L and 61% of the data reported above the screening level of 26.7 ug/L.

0804F Tehuacana Creek

This 61-mile unclassified segment runs from the headwaters northwest of Mexia to the confluence with the Trinity River northeast of Fairfield (see Figure 45). The watershed is largely rural with hay, pasture, and grassland and flows through the Northern Blackland Prairie and Southern Post Oak Savanna ecoregions.

Clean Rivers Program water quality monitoring is being conducted at one site within this segment as shown in Table 124. Monitoring is being conducted by Tarrant Regional Water District. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 124: FY2023 Monitoring stations in Segment 0804F

Assessment Unit	Station Description	Station ID	Collecting Entity
0804F_02	TEHUACANA CREEK 20 METERS DOWNSTREAM OF SH 75 SOUTHEAST OF STREETMAN	10705	Tarrant Regional Water District

A summary of the concerns and impairments identified in the TCEQ 2022 Texas Integrated Report is shown in Table 125.

Table 125: Findings of TCEQ 2022 Texas Integrated Report for Segment 0804F

Assessment Unit	Use	Parameter	Criteria	Finding
0804F_01	General Use	Chlorophyll-*a*	14.1 ug/L	CS (Carry Forward)
0804F_01	Recreation Use	*E. coli*	126 MPN/100 mL	CN (Carry Forward)
0804F_02	Recreation Use	*E. coli*	126 MPN/100 mL	CN

The concerns for Chlorophyll-*a* and *E. coli* in Assessment Unit 0804F_01 were carried forward from previous assessments. For the period of record for this report, data were limited to samples collected between 2011 and 2014. The average Chlorophyll-*a* was 26.6 ug/L with a range of 2.35 to 120 ug/L and 43% of the data exceeding the screening level of 14.1 ug/L. The geometric mean for *E. coli* was 85 MPN/100 mL with a range of 1 to 2000 MPN/100 mL and 54% of the data exceeding 126 MPN/100 mL. Additional monitoring is recommended to further address the concerns in this Assessment Unit.

Concerns for *E. coli* were identified in Assessment Unit 0804F_02. As shown in Figure 85, many of the higher *E. coli* levels were reported at elevated flows and had correlation coefficient of 0.7. This indicates that these concerns were largely runoff related. The geometric mean of the data was 893 MPN/100 mL with 87% of the data exceeding the standard of 126 MPN/100 mL. The watershed upstream of the monitoring stations in this segment is rural with mostly grassland and some forested areas. Therefore, livestock and wildlife were the most likely sources of bacteria. Landowner education and livestock best management practices may help reduce bacteria in this segment.

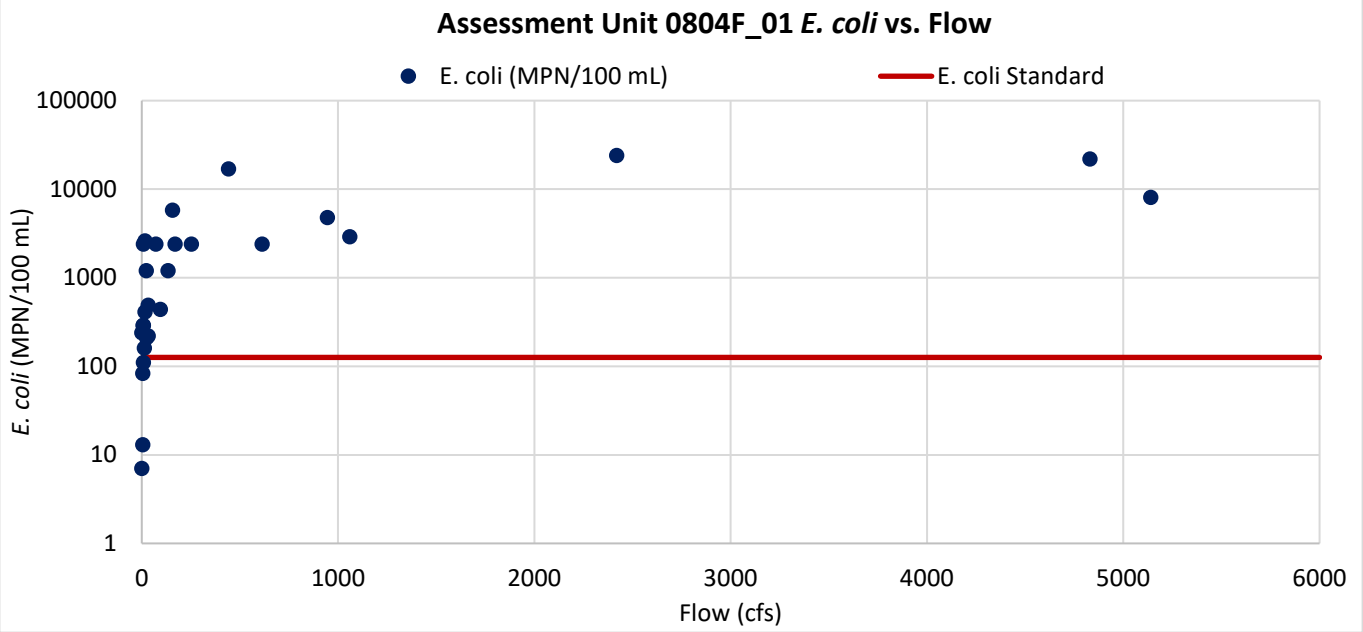

Figure 85: Assessment Unit 0804F_01 E. coli vs. Flow

0804G Catfish Creek

This unclassified segment is a 35-mile stretch of Catfish Creek running from Catfish Creek Ranch Lake just upstream of SH 19 in Henderson County to the confluence with the Trinity River (see Figure 45). The watershed is rural and is mainly hay and pasture land with some grassland and small areas of forest. It lies within the Northern Post Oak Savanna.

Clean Rivers Program water quality monitoring is being conducted at one site within this segment as shown in Table 126. Monitoring is being conducted by TCEQ Region 5. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 126: FY2023 Monitoring stations in Segment 0804G

Assessment Unit	Station Description	Station ID	Collecting Entity
0804G_01	CATFISH CK IMMEDIATELY DNSTM OF UNNAMED RD 1.70 KM DOWNSTREAM OF CONFLUENCE WITH LONG CREEK IN ENGLING WMA AT CAMP SITE 3 2.6 MILES E OF BETHEL	10717	TCEQ Region 5

A summary of the concerns and impairments identified in the TCEQ 2022 Texas Integrated Report is shown in Table 127.

Table 127: Findings of TCEQ 2022 Texas Integrated Report for Segment 0804G

Assessment Unit	Use	Parameter	Criteria	Finding
0804G_01	Aquatic Life Use	Dissolved oxygen 24hr Avg	5 mg/L	NS (Carry Forward)
0804G_01	Aquatic Life Use	Dissolved oxygen 24hr Min	3 mg/L	CN (Carry Forward)
0804G_01	Recreation Use	*E. coli*	126 MPN/100 mL	NS

The impairments for depressed Dissolved Oxygen were carried forward from previous assessments as there are no recent diel samples available. As shown in Figure 86, 38% of the Dissolved Oxygen measurements were reported below the 24-hour average standard of 5 mg/L and 6% was below the 24-hour minimum standard of 3 mg/L. The impairment may have been partially related to low stream flows; the correlation coefficient between Dissolved Oxygen and Flow was 0.0.53. Flow was not reported for all events; however, the average was 13 cfs with a range of 0.005 and 40 cfs. Dissolved Oxygen was well correlated to Water Temperature (correlation coefficient = -0.84). As Water Temperature increases, the Oxygen saturation potential decreases and can lead to low Dissolved Oxygen levels. All Dissolved Oxygen values below 5 mg/L were reported between April and September. There was no correlation between Dissolved Oxygen and Chlorophyll-*a*; it is unlikely that algal populations are affecting Dissolved Oxygen in this stream.

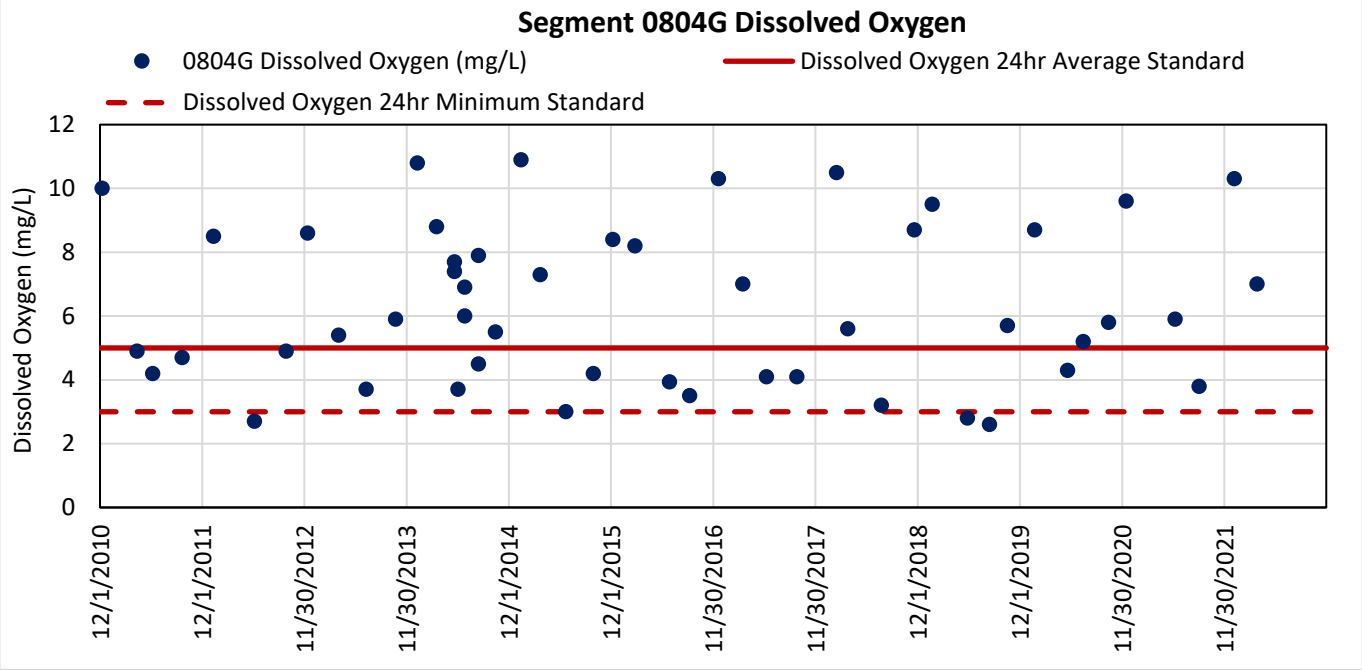

Figure 86: Segment 0804G Dissolved Oxygen

The *E. coli* impairment appears to have been somewhat related to flows. As shown in Figure 87, 59% of the *E. coli* values were reported above the standard of 126 MPN/100 mL; the geometric mean was 221 MPN/100 mL. *E. coli* was moderately correlated to Flow (correlation coefficient =0.69) indicating that the impairment may be due to runoff related sources. The watershed upstream of the monitoring station 10717 is a mix of forest, crop, and grassland. Runoff containing waste from wildlife and livestock may likely be introducing bacteria to the stream. Landowner education and livestock best management practices may help reduce bacteria levels in this segment.

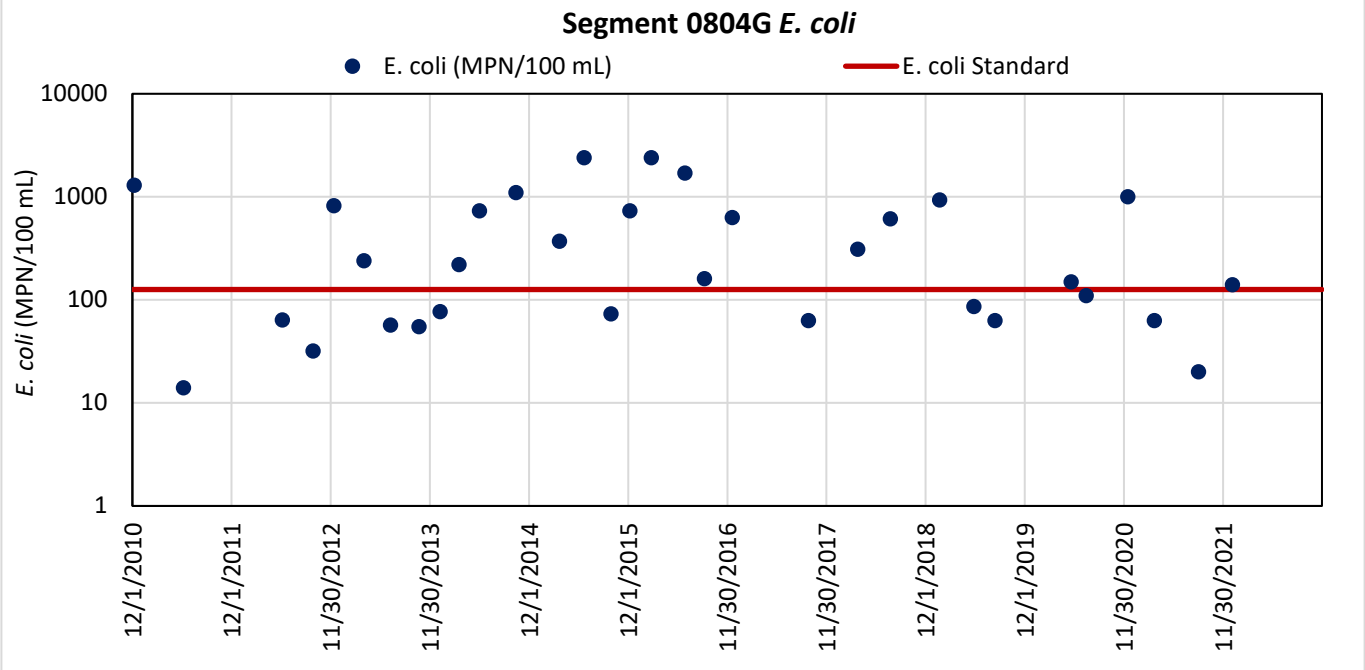

Figure 87: Segment 0804G E. coli

0804M Bassett Creek

This 4.8-mile unclassified segment runs from Blue Lake in Palestine to the confluence with Town Creek (see Figure 45). The northwest portion of the watershed is largely rural with hay and pasture land while the southeast portion of the watershed is developed. It flows through the Tertiary Uplands ecoregion. There is no Clean Rivers Program monitoring scheduled in this segment for FY 2023.

A summary of the concerns and impairments identified in the TCEQ 2022 Texas Integrated Report is shown in Table 128.

Table 128: Findings of TCEQ 2022 Texas Integrated Report for Segment 0804M

Assessment Unit	Use	Parameter	Criteria	Finding
0804M_01	Aquatic Life Use	Fish community	42	NS
0804M_01	Aquatic Life Use	Macrobenthic community	30	NS
0804M_02	Aquatic Life Use	Macrobenthic community	30	CN

This segment was found to have impairments and concerns for fish and macrobenthic communities. This stream has had aquatic life monitoring conducted in the past by the Texas Parks and Wildlife Department due to receiving effluent from a chicken processing facility. TRA conducts routine water quality monitoring downstream of this facility on Town Creek (segment 0804L).

0804L Town Creek

This 16-mile unclassified segment runs from SH 256 in Palestine to the confluence with Keechi Creek (see Figure 45). The watershed is developed to the north and rural to the south with pasture, hay, and grassland with some forested areas. It flows through the Tertiary Uplands and Northern Post Oak Savanna ecoregions.

Clean Rivers Program water quality monitoring is being conducted at one site within this segment as shown in Table 129. Monitoring is being conducted by TRA. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 129: FY2023 Monitoring stations in Segment 0804L

Assessment Unit	Station Description	Station ID	Collecting Entity
0804L_01	TOWN CREEK 73 METERS UPSTREAM OF FM 645 SOUTHWEST OF PALESTINE	10706	TRA

A summary of the concerns and impairments identified in the TCEQ 2022 Texas Integrated Report is shown in Table 130.

Table 130: Findings of TCEQ 2022 Texas Integrated Report for Segment 0804L

Assessment Unit	Use	Parameter	Criteria	Finding
0804L_01	General Use	Total Phosphorus	0.69 mg/L	CS
0804L_01	General Use	Nitrate	1.95 mg/L	CS
0804L_01	Recreation Use	*E. coli*	126 MPN/100 mL	NS

Concerns for Nitrate and Total Phosphorus were related to upstream wastewater treatment facilities. As shown in Figure 88, these parameters were reported at higher concentrations at lower flows and decreased with increasing flow. This pattern is common in streams that are effluent-dominated as many wastewater treatment facilities do not have advanced nutrient removal. Correlations for these nutrients and flow were not strong, however, this is expected because the wastewater treatment facilities are relatively small and are located several miles upstream from the monitoring station.

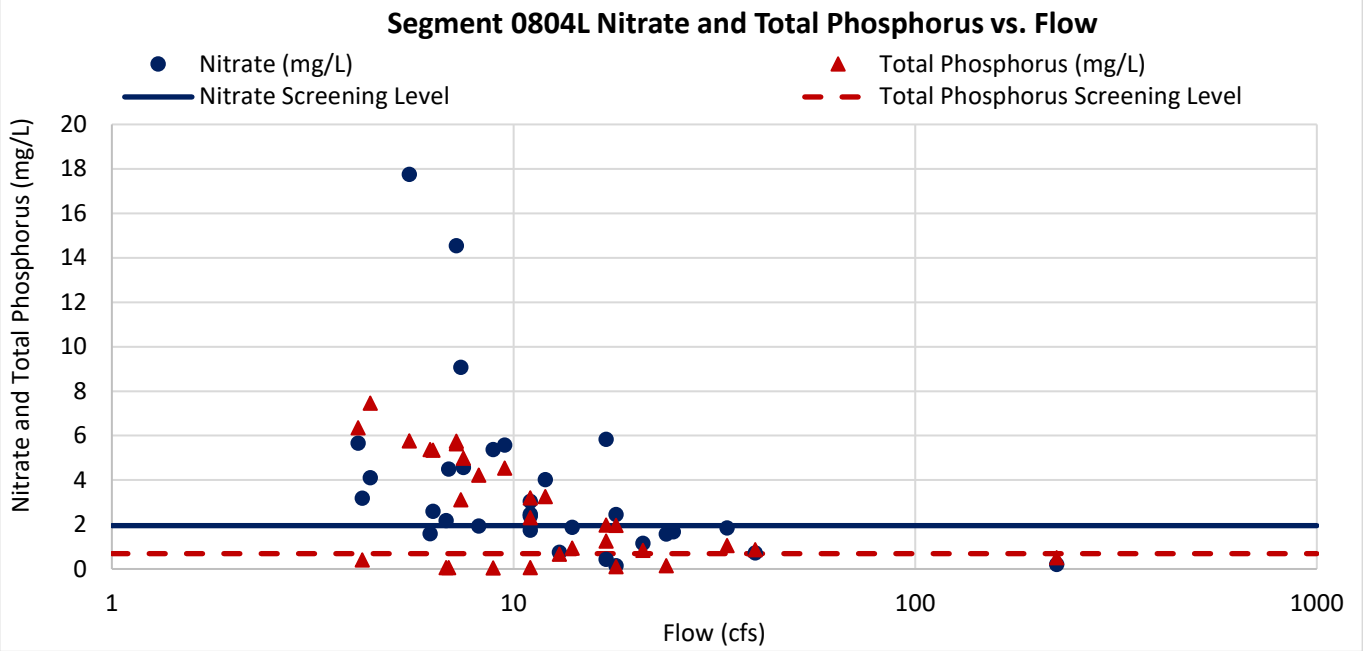

Figure 88: Segment 0804L Nitrate and Total Phosphorus vs. Flow

This segment was found to impaired due to elevated levels of *E. coli*. As shown in Figure 89, 98% of the data was reported above the standard of 126 MPN/100 mL. The correlation to flow is very strong (correlation coefficient = 0.95). There were some extremely high values reported at elevated flows indicating that runoff carrying wildlife and livestock waste may be contributing to the impairment. However, because levels were elevated at all flows, there may be consistent point sources of bacteria. Based on Google Earth imagery, there are livestock trails in pastures directly upstream of the monitoring station. It is likely that livestock were visiting the stream for watering. Landowner education and livestock best management practices may help reduce bacteria levels in this segment.

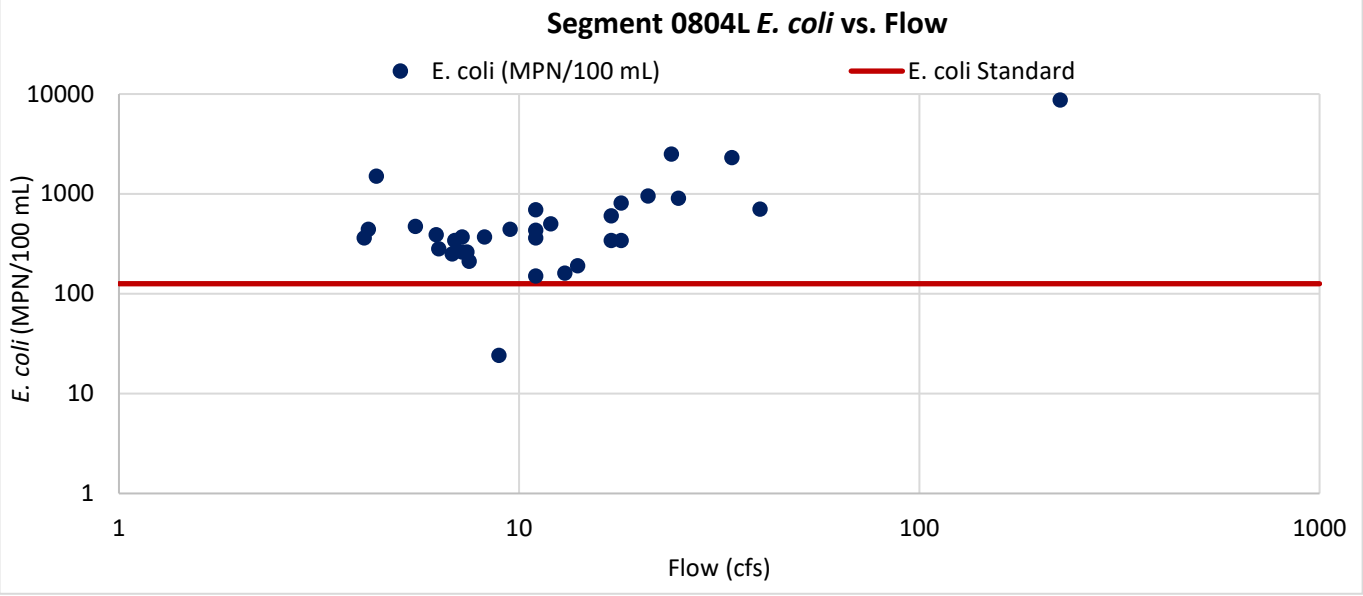

Figure 89: Segment 0804L E. coli vs. Flow

0804B Keechi Creek

This 7-mile unclassified segment runs from a point 0.05 km upstream of FM 645 outside of Palestine to the confluence with the Trinity River (see Figure 45). The watershed is largely rural with hay and pasture land and flows through the Northern Post Oak Savanna ecoregion. There is no Clean Rivers Program monitoring scheduled in this segment for FY 2023.

No impairments or concerns for aquatic life, recreation, or general uses were identified in this segment.

0804A Box Creek

This 24-mile unclassified segment runs from Elkhart Creek to the Elkhart Lake dam northeast of the City of Elkhart to the confluence with the Trinity River (see Figure 45). A majority of the watershed is rural with hay, pasture, and grassland interspersed with some forested areas. It lies within the Tertiary Uplands ecoregion. There is no Clean Rivers Program monitoring scheduled in this segment for FY 2023.

No impairments or concerns for aquatic life, recreation, or general uses were identified in this segment.

0804E Northwest Branch

This 0.6-mile unclassified segment runs from a point 0.3 km upstream of FM 831 in Oakwood to the confluence with Toms Creek (see Figure 45). The watershed is developed by the Town of Oakwood and lies within the Southern Post Oak Savanna. There is no Clean Rivers Program monitoring scheduled in this segment for FY 2023.

No impairments or concerns for aquatic life, recreation, or general uses were identified in this segment.

0804D Toms Creek

This 12-mile unclassified segment runs from the Missouri-Pacific Railroad crossing near Oakwood to the confluence with the Trinity River (see Figure 45). The most upstream portion of the watershed is developed by the Town of Oakwood with the remainder flowing through hay and pasture land. It lies within the Southern Post Oak Savanna. There is no Clean Rivers Program monitoring scheduled in this segment for FY 2023.

No impairments or concerns for aquatic life, recreation, or general uses were identified in this segment.

0804C Mims Creek

This 7-mile unclassified segment runs from the confluence of an unnamed tributary approximately 2.1 km upstream of FM 1580 near the City of Fairfield to the confluence with

Upper Keechi Creek (see Figure 45). The most upstream portion of the watershed is developed and the remainder flows through hay and pasture land. There are several oil and gas drilling pads throughout the watershed. It lies within the Southern Post Oak Savanna. There is no Clean Rivers Program monitoring scheduled in this segment for FY 2023.

No impairments or concerns for aquatic life, recreation, or general uses were identified in this segment.

0804H Upper Keechi Creek

This 66-mile unclassified segment runs from the headwaters upstream of Route 179 southwest of Fairfield to the confluence with the Trinity River (see Figure 45). The watershed is largely rural with mostly hay and pasture land and some forested areas. There are several oil and gas drilling pads throughout the watershed. It lies within the Southern Post Oak Savanna.

Clean Rivers Program water quality monitoring is being conducted at one site within this segment as shown in Table 131. Monitoring is being conducted by TCEQ Region 9 and the TRA Lake Livingston Project. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 131: FY2023 Monitoring stations in Segment 0804H

Assessment Unit	Station Description	Station ID	Collecting Entity
0804H_01	UPPER KEECHI CREEK IMMEDIATELY UPSTREAM OF FM 542 IN LEON COUNTY	20771	TCEQ Region 9 & TRA Lake Livingston Project

A summary of the concerns and impairments identified in the TCEQ 2022 Texas Integrated Report is shown in Table 132.

Table 132: Findings of TCEQ 2022 Texas Integrated Report for Segment 0804H

Assessment Unit	Use	Parameter	Criteria	Finding
0804H_01	Recreation Use	*E. coli*	126 MPN/100 mL	NS
0804H_01	Aquatic Life Use	Dissolved oxygen 24hr Avg	5 mg/L	NS (Carry Forward)
0804H_01	Aquatic Life Use	Dissolved oxygen 24hr Min	3 mg/L	NS (Carry Forward)

An impairment for elevated *E. coli* was identified in this segment. As shown in Figure 90, *E. coli* were frequently reported above the standard of 126 MPN/100 mL. Although the geometric mean of the data for the period of record for this report was 110 MPN/100 mL, 62% of the data was reported above the standard. *E. coli* was moderately correlated to Flow (correlation coefficient = 0.59). Because of the correlation to Flow and the elevated levels of *E. coli* at low flows, this impairment appears to be due to a mix of point and runoff related sources. The watershed upstream of monitoring station 20771 is wooded with crop, pasture, and grassland. Based on Google Earth imagery, there are livestock trails leading to the stream in several of the pastures upstream of the monitoring station. This may be the cause of the elevated concentrations seen at low flows. Runoff containing waste from pastures may be introducing additional bacteria during precipitation events.

Based in this information, livestock were the likely source of the bacteria leading to this concern. Landowner education and livestock best management practices may reduce bacteria in this segment.

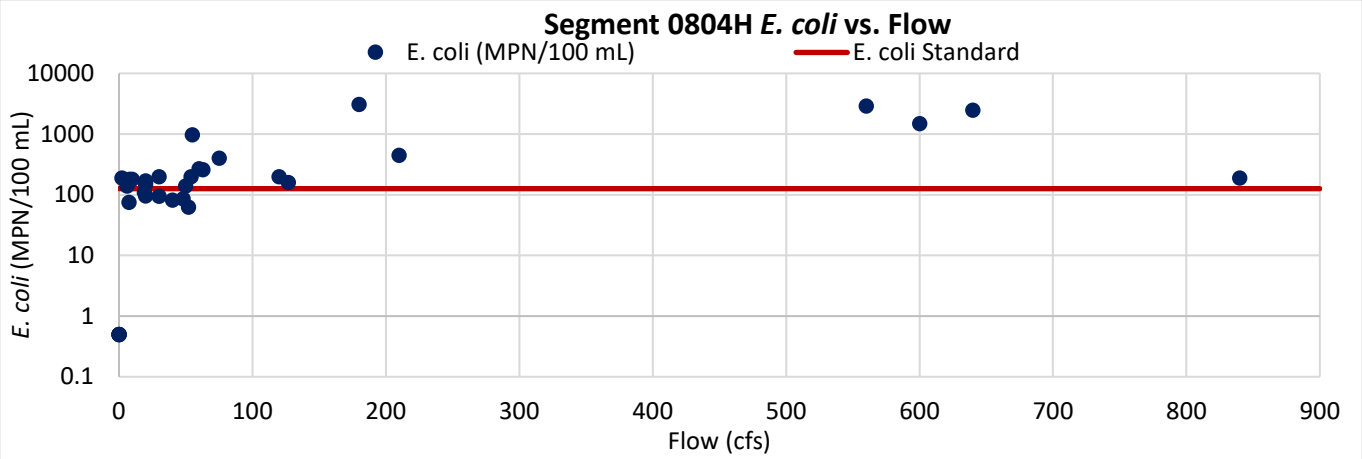

Figure 90: Segment 0804H E. coli vs. Flow

An impairment for depressed dissolved oxygen was carried forward from previous assessments. Based on the period of record for this report, only one data point out of 43 samples was reported below the 24-hour average standard of 5 mg/L. It is recommended that 24-hour monitoring be conducted in this segment in order to fully assess the current status of the impairment in this segment.

0813 Houston County Lake

This 1,300-acre segment impounds Little Elkhart Creek in Houston County up to a normal pool elevation of 260 feet (see Figure 45). Portions of the watershed on the southwest side of the reservoir are developed but the vast majority of the watershed is rural with forest and hay and pasture land. The watershed lies within the Tertiary Uplands ecoregion.

Clean Rivers Program water quality monitoring is being conducted at one site within this segment as shown in Table 133. Monitoring is being conducted by TCEQ Region 10. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 133: FY2023 Monitoring stations in Segment 0813

Assessment Unit	Station Description	Station ID	Collecting Entity
0813_01	HOUSTON COUNTY LAKE NEAR DAM OVERFLOW	10973	TCEQ Region 10

A summary of the concerns and impairments identified in the TCEQ 2022 Texas Integrated Report is shown in Table 134.

Table 134: Findings of TCEQ 2022 Texas Integrated Report for Segment 0813

Assessment Unit	Use	Parameter	Criteria	Finding
0813_01	General Use	Nutrients	Nutrient Reservoir Criteria	NS

An impairment for Nutrients was identified in this segment. Nutrients in this reservoir are assessed against a criteria based on lines of evidence that includes median Secchi Depth, Chlorophyll-*a*, Total Nitrogen, and Total Phosphorus levels as described in the TCEQ 2022 Guidance for Assessing and Reporting Surface Water Quality in Texas. As shown in Figure 91, 76% of the Chlorophyll-*a* data were reported above the criteria of 11.1 µg/L. The median values for Total Nitrogen, Total Phosphorus, and Secchi Depth did not exceed the thresholds for these parameters. However, the median Chlorophyll-*a* was 15.6 ug/L, which was sufficient to list this reservoir. Chlorophyll-*a* was moderately correlated to Total Kjeldahl Nitrogen (correlation coefficient = 0.58) but there were no correlations to Nitrate or Total Phosphorus. The watershed is largely undeveloped with a mix of forest and pasture land. The area directly adjacent to much of the shoreline has residential developments. This source of Nitrogen that could be affecting Chlorophyll-*a* levels may be from residential fertilizers. Homeowner education and best management practices may reduce Nitrogen and Chlorophyll-*a* levels in this reservoir.

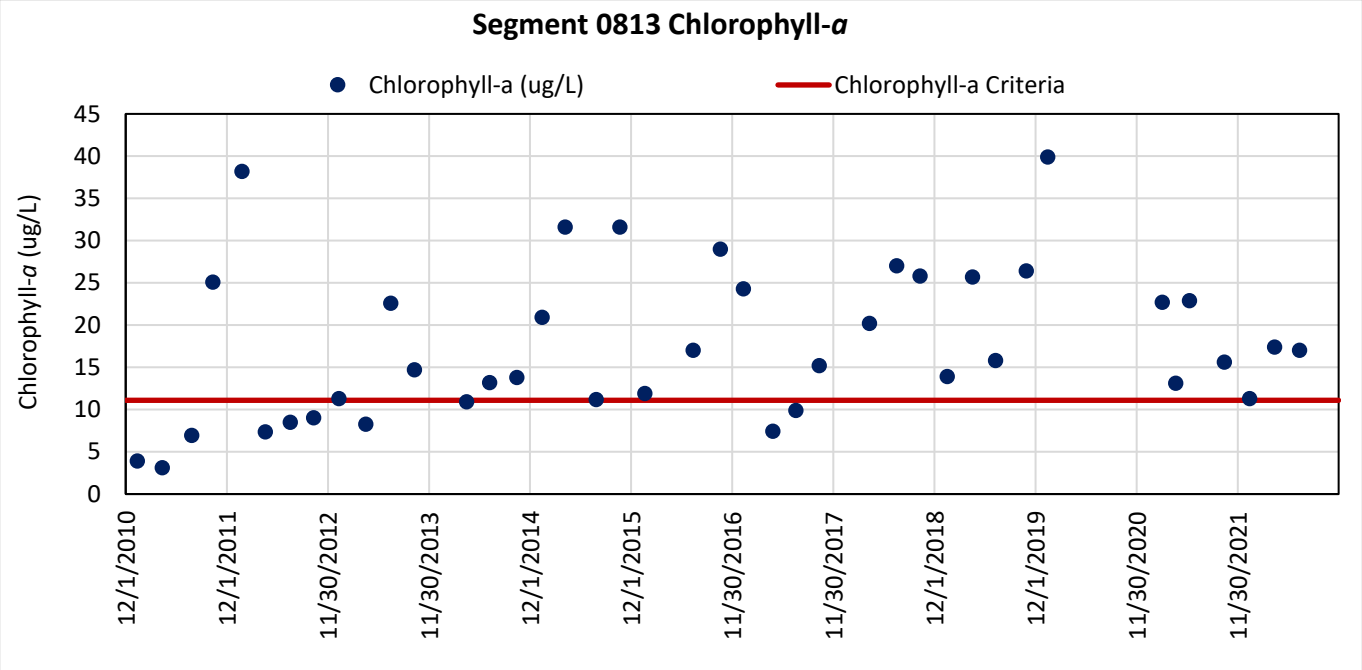

Figure 91: Segment 0813 Chlorophyll-a

0804K Lower Keechi Creek

This 44-mile unclassified segment runs from the headwaters in the Town of Jewett to the confluence with the Trinity River upstream (see Figure 45). A majority of the watershed is rural with forested, hay, and pasture land. There are several oil and gas drilling pads in the middle and lower portion of the watershed. It lies within the Southern Post Oak Savanna.

Clean Rivers Program water quality monitoring is being conducted at one site within this segment as shown in Table 135. Monitoring is being conducted by TCEQ Region 9. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 135: FY2023 Monitoring stations in Segment 0804K

Assessment Unit	Station Description	Station ID	Collecting Entity
0804K_01	LOWER KEECHI CREEK 110 METERS UPSTREAM OF FM 811 IN LEON COUNTY	20382	TCEQ Region 9

A summary of the concerns and impairments identified in the TCEQ 2022 Texas Integrated Report is shown in Table 136.

Table 136: Findings of TCEQ 2022 Texas Integrated Report for Segment 0804K

Assessment Unit	Use	Parameter	Criteria	Finding
0804K_01	Recreation Use	*E. coli*	126 MPN/100 mL	NS

This segment was found to be impaired due to elevated levels of *E. coli*. As shown in Figure 92, *E. coli* levels were moderately well correlated to flows (correlation coefficient = 0.64). This indicates that the impairment was due to runoff related sources. The watershed upstream of the Station 20382 is largely undeveloped with grassland and some forested areas. Based on Google Earth imagery, there is evidence of livestock trails in many of the upstream grasslands which indicates that livestock are the most likely source of bacteria in this segment. Landowner education and livestock best management practices may help reduce bacteria levels.

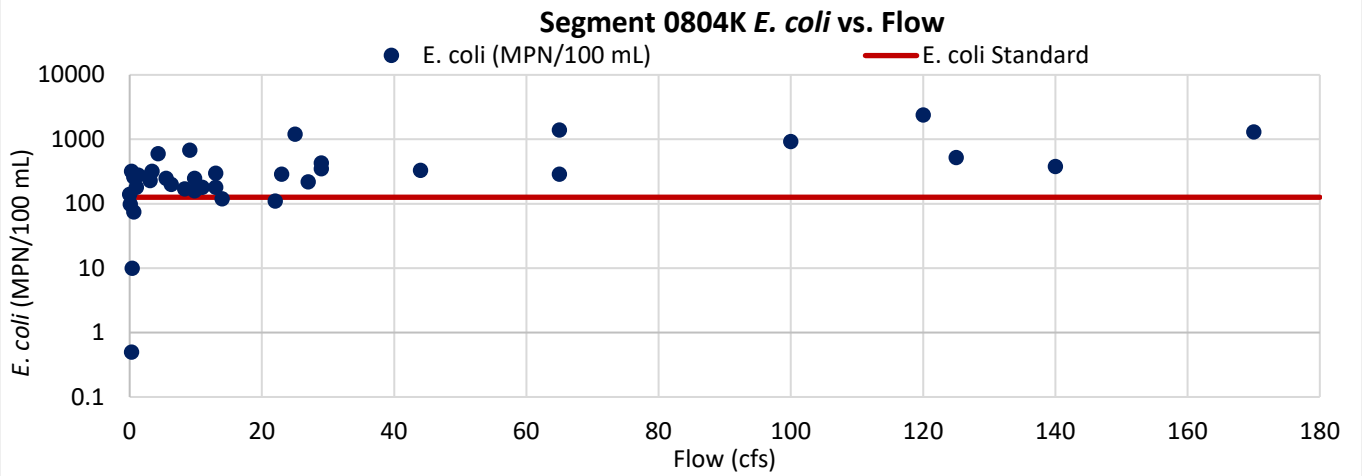

Figure 92: Segment 0804K E. coli vs. Flow

0803G Lake Madisonville

This 62-acre reservoir impounds Town Branch and lies just outside of Madisonville (see Figure 46). The upstream portion of the watershed is developed by the City of Madisonville while the downstream portion is largely hay and pasture land. It lies within the Southern Post Oak Savanna. There is no Clean Rivers Program monitoring scheduled in this segment for FY 2023.

No impairments or concerns for aquatic life, recreation, or general uses were identified in this segment.

0803 Lake Livingston

Figure 93: Upper end of Lake Livingston

This 82,600-acre segment impounds 1,750,000 acre-feet of water along the Trinity River. It stretches from a point 1.1 miles upstream of Boggy Creek in Houston/Leon County to the Livingston Dam in Polk/San Jacinto County, up to a normal pool elevation of 131 feet (see Figure 46). This segment begins in the Southern Post Oak Savanna where the land use is hay and pasture land and transitions to the forested Southern Tertiary Uplands ecoregion. There are several developed areas in the communities around the reservoir.

Clean Rivers Program water quality monitoring is being conducted at six sites within this segment as shown in Table 137. Monitoring is being conducted by TRA Lake Livingston Project. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 137: FY2023 Monitoring stations in Segment 0803

Assessment Unit	Station Description	Station ID	Collecting Entity
0803_01	LAKE LIVINGSTON IN MAIN POOL NEAR DAM AT TRA BOUY #2 4.25 KM WEST OF INTERSECTION OF FM 1988 AND FM 3128	10899	TRA Lake Livingston Project
0803_05	LAKE LIVINGSTON AT US 190 IN KICKAPOO CREEK BAY CHANNEL EAST OF ONALASKA TRA #12	21562	TRA Lake Livingston Project
0803_06	LAKE LIVINGSTON MAIN BODY AT US 190 WEST OF ONALASKA	21563	TRA Lake Livingston Project
0803_07	LK LIVINGSTON 1.8 KM S & 496 METERS E OF INTERSECTION OF FM 356 & DAVIS RDIN MAIN CHANNEL NEAR MOUTH OF WHITE ROCK CREEK BAY TRA 6	10913	TRA Lake Livingston Project
0803_10	LAKE LIVINGSTON AT SH 19 SOUTH OF TRINITY USGS SITE JC	10914	TRA Lake Livingston Project

Assessment Unit	Station Description	Station ID	Collecting Entity
0803_11	LAKE LIVINGSTON HEADWATERS AT SH 21 NORTHEAST OF MID WAY TRA 97	10917	TRA Lake Livingston Project

A summary of the concerns and impairments identified in the TCEQ 2022 Texas Integrated Report is shown in Table 138.

Table 138: Findings of TCEQ 2022 Texas Integrated Report for Segment 0803

Assessment Unit	Use	Parameter	Criteria	Finding
0803_09	Aquatic Life Use	Dissolved oxygen Grab	5 mg/L	CS (Carry Forward)

There are no current data available to address the carry forward concern for Dissolved Oxygen in Assessment Unit 0803_09. The most recent data collected in this area was in 2004. It is recommended that monitoring be added in this Assessment Unit to further assess this concern. This assessment unit is in the upper riverine portion of the reservoir and is represented by Station 14011. For comparison, Station 10914 is approximately six miles upstream in Assessment Unit 0803_10. The average Dissolved Oxygen level at this site was 8.3 mg/L and only 3 of the 146 data points were reported below the grab screening level of 5 mg/L. Station 10913 is approximately 5.5 miles downstream in Assessment Unit 0803_07. This is the transition zone from the riverine portion to the main body of the reservoir and the station is near the mouth of the White Rock Creek cove. The average Dissolved Oxygen level at this site was 8.9 mg/L and only one of the 43 data points were reported below the grab screening level of 5 mg/L.

0803F Bedias Creek

This 54-mile unclassified segment runs from the headwaters near Route 39 southwest of Madisonville to the confluence with Lake Livingston (see Figure 46). The watershed is largely hay and pasture land with forested areas near the downstream end. It lies within the Southern Post Oak Savanna ecoregion.

Clean Rivers Program water quality monitoring is being conducted at one site within this segment as shown in Table 139. Monitoring is being conducted by TRA Lake Livingston Project. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 139: FY2023 Monitoring stations in Segment 0803F

Assessment Unit	Station Description	Station ID	Collecting Entity
0803F_02	BEDIAS CREEK IMMEDIATELY DOWNSTREAM OF US 75 SOUTHEAST OF MADISONVILLE	10703	TRA Lake Livingston Project

A summary of the concerns and impairments identified in the TCEQ 2022 Texas Integrated Report is shown in Table 140.

Table 140: Findings of TCEQ 2022 Texas Integrated Report for Segment 0803F

Assessment Unit	Use	Parameter	Criteria	Finding
0803F_01	General Use	Chlorophyll-*a*	14.1 ug/L	CS (Carry Forward)
0803F_01	Recreation Use	*E. coli*	126 MPN/100 mL	CN (Carry Forward)
0803F_02	Recreation Use	*E. coli*	126 MPN/100 mL	CN

Concerns for Chlorophyll-*a* and *E. coli* in Assessment Unit 0803F_01 were carried forward from previous assessments. The most recent monitoring in this assessment unit was in 2014. There is not enough data available for the period of record of this report to make any meaningful conclusions, however, as this is the downstream portion of the stream, water quality conditions could be expected to be similar to those in Assessment Unit 0803F_02. It is recommended that monitoring take place in this assessment unit to further assess this reach.

A concern for *E. coli* was identified in Assessment Unit 0803F_02. The geometric mean of the data was 233 MPN/100 mL. Although this dataset is limited, there was a moderately strong correlation between *E. coli* and Flow (correlation coefficient = 0.69). As shown in Figure 94, *E. coli* was generally reported above the standard of 126 MPN/100 mL. Because of the correlation to flow and the elevated levels of *E. coli* were reported even at low flows, it is likely that bacteria concerns were largely due to runoff related sources with some possible contributions from point sources. The watershed upstream of Station 10703 contains pastures and wooded areas. Runoff carrying was from livestock and wildlife in these areas may be introducing bacteria to the stream. Landowner education and livestock best management practices may help reduce bacteria levels in this segment.

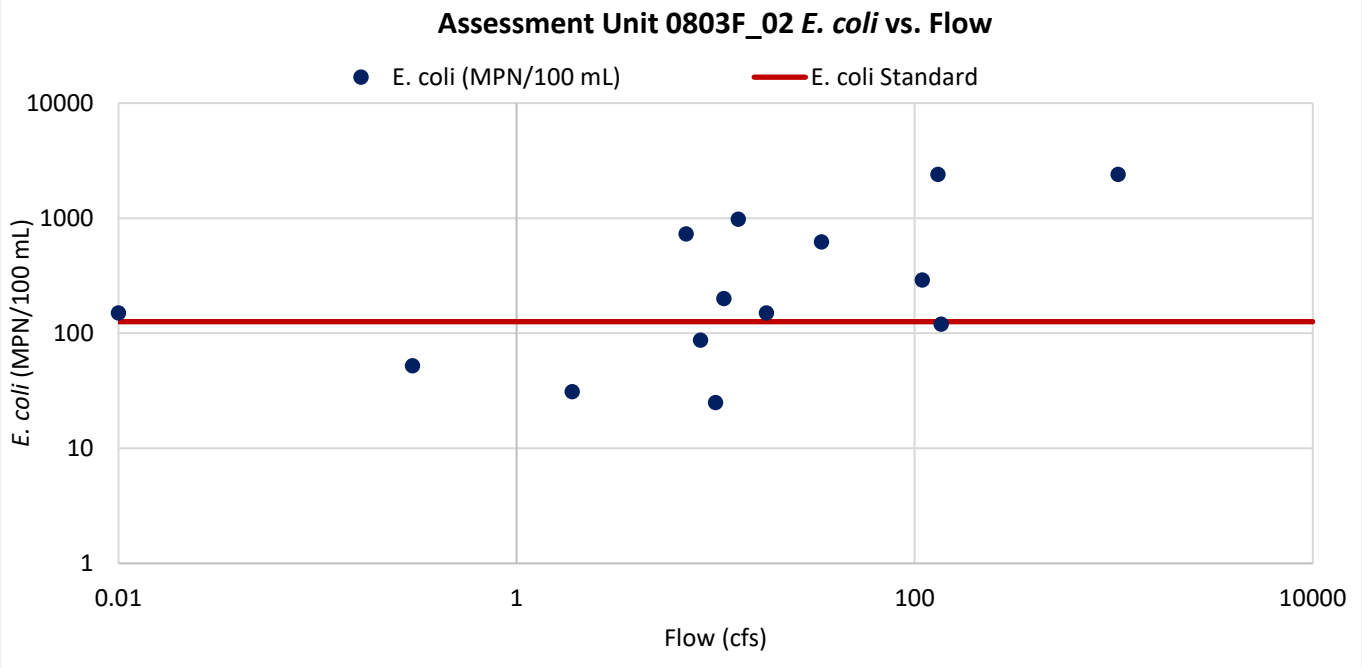

Figure 94: Assessment Unit 0803F_02 E. coli vs. Flow

0803E Nelson Creek

This 27-mile unclassified segment runs from the headwaters of the stream near FM 1696 west of Huntsville to the confluence with Lake Livingston (see Figure 46). The watershed is mostly forest to the north of the stream and a mix of forest, hay, and pasture land to the south. It lies within the Southern Tertiary Uplands ecoregion.

Clean Rivers Program water quality monitoring is being conducted at one site within this segment as shown in Table 141. Monitoring is being conducted by TRA Lake Livingston Project. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 141: Findings of TCEQ 2022 Texas Integrated Report for Segment 0803E

Assessment Unit	Station Description	Station ID	Collecting Entity
0803E_01	NELSON CREEK AT FM 3478 NEAR MOUNT OLIVE TRA #20	10700	TRA Lake Livingston Project

No impairments or concerns for aquatic life, recreation, or general uses were identified in this segment.

0803C Turkey Creek

This 4.7-mile unclassified segment runs from the confluence with an unnamed tributary 2.85 km downstream of FM 980 west of Riverside to the confluence with Lake Livingston (see Figure 46). The watershed is largely rural with hay, pasture, and crop land. It lies within the Southern Tertiary Uplands ecoregion. There is no Clean Rivers Program monitoring scheduled in this segment for FY 2023.

No impairments or concerns for aquatic life, recreation, or general uses were identified in this segment.

0803D Parker Creek

This 6-mile unclassified segment runs from the confluence with Town Branch north of Huntsville to the confluence with Harmon Creek (see Figure 46). The watershed is a mix of forest and hay and pasture land with some light development. It lies within the Southern Tertiary Uplands ecoregion. There is no Clean Rivers Program monitoring scheduled in this segment for FY 2023.

No impairments or concerns for aquatic life, recreation, or general uses were identified in this segment.

Figure 95: Harmon Creek at SR 19 northeast of Huntsville

This 13.8-mile unclassified segment runs from the confluence of East Fork Harmon Creek east of Huntsville to the confluence with Lake Livingston (see Figure 46). The watershed is a mix of forest and hay and pasture land with some light development. It lies within the Southern Tertiary Uplands ecoregion.

Clean Rivers Program water quality monitoring is being conducted at one site within this segment as shown in Table 142. Monitoring is being conducted by TRA Lake Livingston Project. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 142: FY2023 Monitoring stations in Segment 0803A

Assessment Unit	Station Description	Station ID	Collecting Entity
0803A_01	HARMON CREEK 509 METERS UPSTREAM FROM INTERSECTION WITH OTTER RD EAST OF FM 980 AND 7.6 MILES NORTHEAST OF HUNTSVILLE	10698	TRA Lake Livingston Project

A summary of the concerns and impairments identified in the TCEQ 2022 Texas Integrated Report is shown in Table 143.

Table 143: Findings of TCEQ 2022 Texas Integrated Report for Segment 0803A

Assessment Unit	Use	Parameter	Criteria	Finding
0803A_01	General Use	Total Phosphorus	0.69 mg/L	CS
0803A_01	General Use	Nitrate	1.95 mg/L	CS

Concerns for Nitrate and Total Phosphorus appear to be related to upstream wastewater treatment facilities. Data were limited; however, Figure 96 shows that concentrations of these parameters were generally reported at higher levels during periods of low flows. This pattern is commonly seen in waterbodies downstream of wastewater treatment facilities.

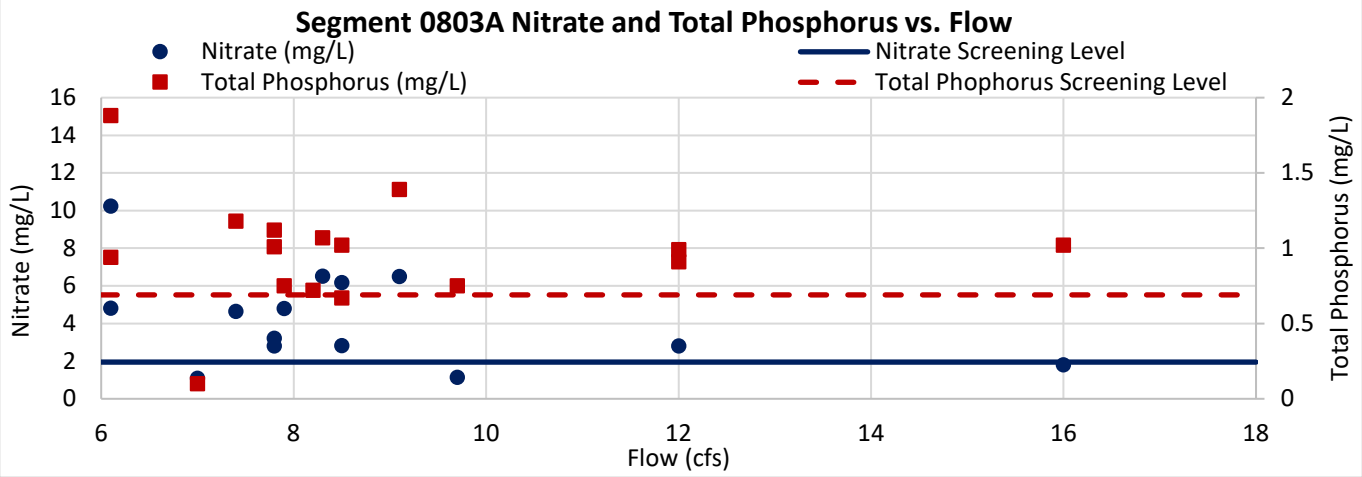

Figure 96: Segment 0803A Nitrate and Total Phosphorus vs. Flow

0803B White Rock Creek

This 42-mile unclassified segment runs from upstream of Highway 7 east of Crockett to the confluence of Lake Livingston (see Figure 46). Much of the watershed is forested but there is quite a bit of hay and pasture land. There is some development around the City of Crockett. The watershed flows though the Southern Tertiary Uplands ecoregion.

Clean Rivers Program water quality monitoring is being conducted at one site within this segment as shown in Table 144. Monitoring is being conducted by the TRA Lake Livingston Project. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 144: FY2023 Monitoring stations in Segment 0803B

Assessment Unit	Station Description	Station ID	Collecting Entity
0803B_01	WHITE ROCK CREEK AT SH 94 NORTHEAST OF TRINITY TRA #21	10696	TRA Lake Livingston Project

A summary of the concerns and impairments identified in the TCEQ 2022 Texas Integrated Report is shown in Table 145.

Table 145: Findings of TCEQ 2022 Texas Integrated Report for Segment 0803B

Assessment Unit	Use	Parameter	Criteria	Finding
0803B_01	General Use	Chlorophyll-*a*	14.1 ug/L	CS

The Chlorophyll-*a* concern in this segment did not appear to be related to nutrients as there were no positive correlations between Chlorophyll-*a* and either Nitrogen or Phosphorus. As shown in Figure 97, 68% of the data was reported above the screening level of 14.1 µg/L. The monitoring station in this segment, Station 10696, is located in a backwater area of Lake Livingston and was likely influenced by both algal populations in the reservoir as well as low stream flows as increased residence times can allow algal populations to increase. It does not appear that algal populations were having a negative effect on Dissolved Oxygen. The average Dissolved Oxygen level was 8.1 mg/L with a range of 4.6 to 11.3 mg/L. The single Dissolved Oxygen value below the 5 mg/L screening level was reported in late August when the water temperature when the Water Temperature was at 83°F. This is expected because warmer water has a lower Oxygen saturation potential which generally results in lower Dissolved Oxygen levels.

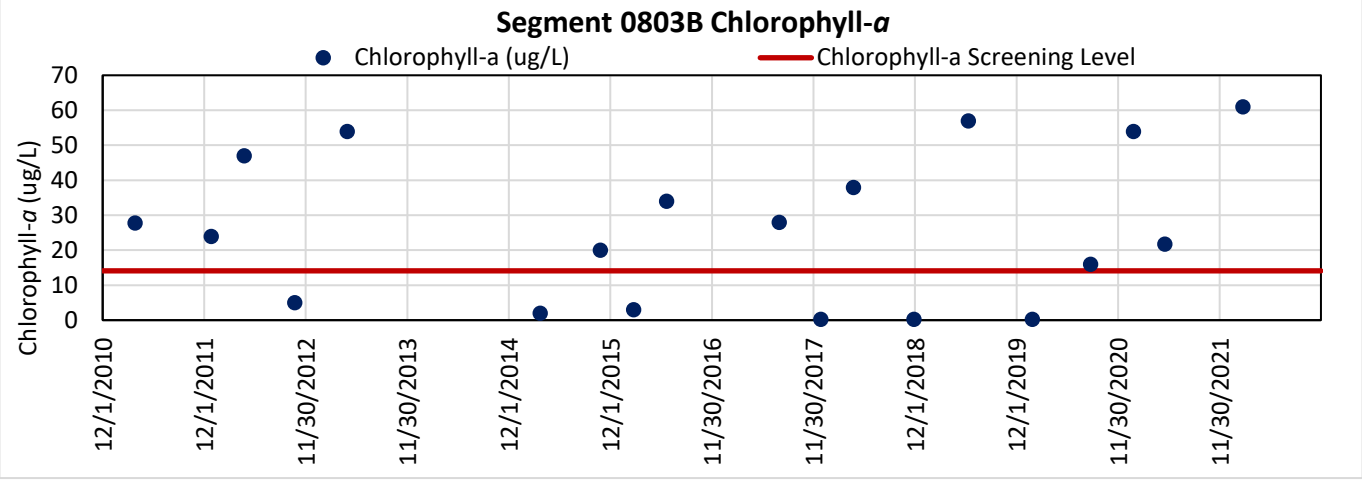

Figure 97: Segment 0803B Chlorophyll-a

Village Creek

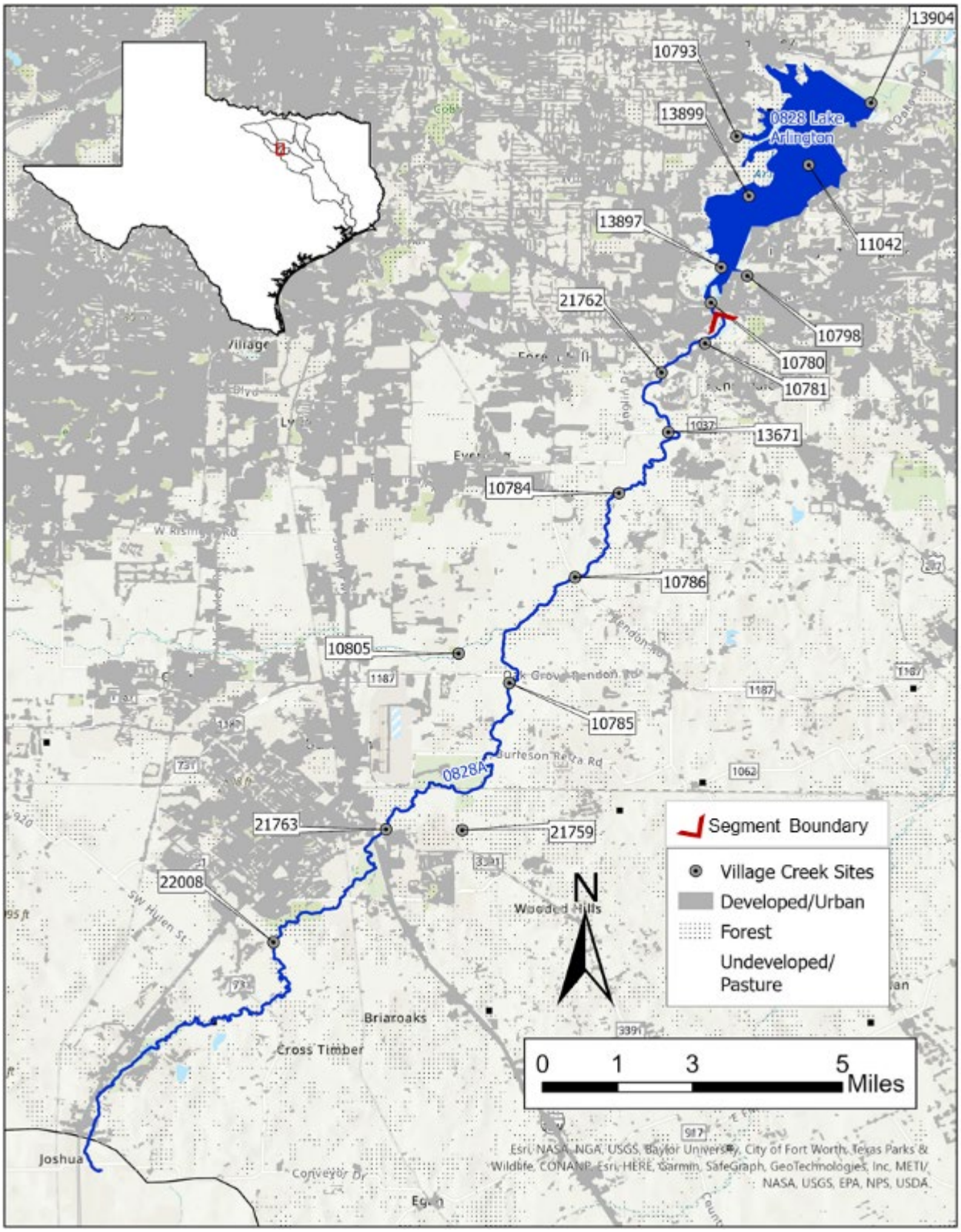

Figure 98: Map of segments and stations of the Village Creek subwatershed

0828A Village Creek

Figure 99: Village Creek upstream of Shelby Road near Everman

This 24-mile unclassified segment runs from the headwaters east of Joshua in Johnson County to the confluence with Lake Arlington in Tarrant County (see Figure 98). Development surrounds the cities of Burleson in the middle of the watershed and Forest Hill and Kennedale at the lower end of the watershed. The remainder of the watershed is largely pasture, hay, and grassland. There are some pockets of forested land throughout the watershed. The watershed flows through the Grand Prairie ecoregion to the west and the Eastern Cross Timbers to the east.

Clean Rivers Program water quality monitoring is being conducted at two sites within this segment as shown in Table 146. Monitoring is being conducted by TRA and Tarrant Regional Water District. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 146: FY2023 Monitoring stations in Segment 0828A

Assessment Unit	Station Description	Station ID	Collecting Entity
0828A_01	VILLAGE CREEK 200 METERS DOWNSTREAM OF US BUS 287P SW OF ARLINGTON	10781	TRA
0828A_01	VILLAGE CREEK IMMEDIATELY DOWNSTREAM OF RENDON ROAD SW OF ARLINGTON	10786	Tarrant Regional Water District

A summary of the concerns and impairments identified in the TCEQ 2022 Texas Integrated Report is shown in Table 147.

Table 147: Findings of TCEQ 2022 Texas Integrated Report for Segment 0828A

Assessment Unit	Use	Parameter	Criteria	Finding
0828A_01	Recreation Use	*E. coli*	126 MPN/100 mL	NS

An impairment was identified for *E. coli* in this segment. Sampling has been conducted at several stations along the segment over the years for both routine and watershed protection plan development monitoring. The geometric mean for the segment was 186 MPN/100 mL. As shown in Figure 100, 49% of the data was reported above the standard of 126 MPN/100 mL. There were no correlations to flow or days since precipitation for the segment as a whole, however, 66% of the exceedances were reported at flows greater than 10 cfs which indicates that the impairment may be largely runoff related. Much of the watershed upstream of Rendon Road is rural with pastures and paddocks with some wooded riparian areas. There is evidence of livestock trails in these areas and entering the stream. Therefore, livestock and, to a lesser extent, wildlife are the likely contributors to the bacterial loading in this stream. This segment is part of the Village Creek-Lake Arlington Watershed Protection Plan.

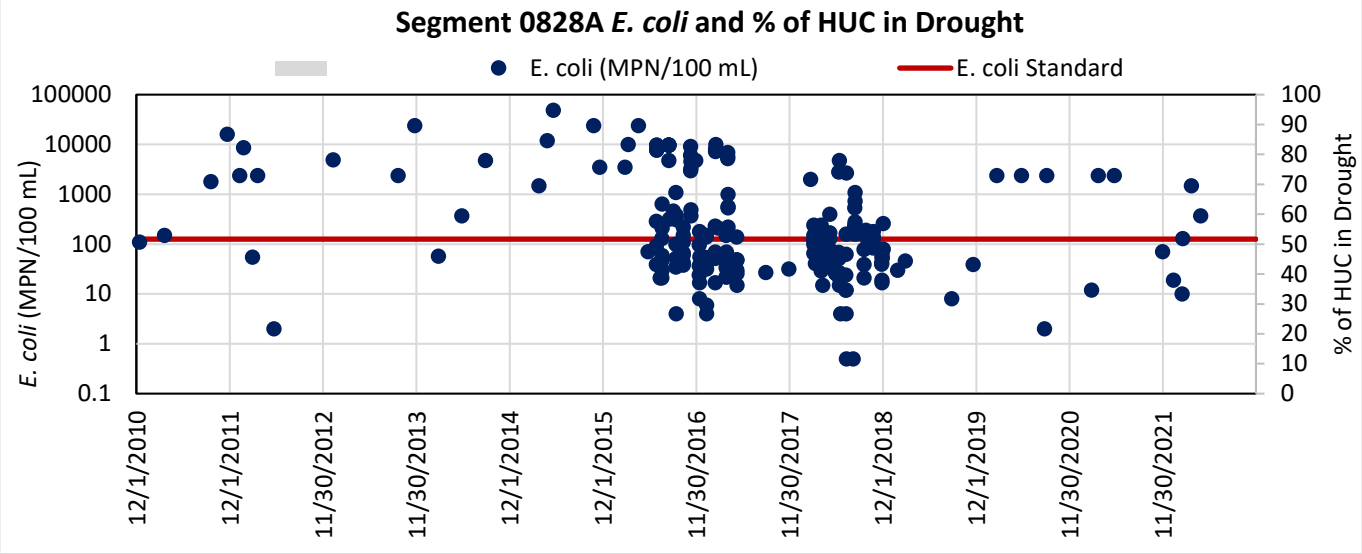

Figure 100: Segment 0828A E. coli and % of HUC in Drought

0828 Lake Arlington

This segment covers 1,943 acres and impounds Village Creek from the Arlington dam in Tarrant County up to a normal pool elevation of 550 feet (see Figure 98). The land around the reservoir is developed with the heaviest development on the west side with some wooded areas directly adjacent to the west side of the reservoir. The watershed lies mostly in the Eastern Cross Timbers ecoregion with some tributaries to the west beginning in the Grand Prairie ecoregion.

Clean Rivers Program water quality monitoring is being conducted at four sites within this segment as shown in Table 148. Monitoring is being conducted by Tarrant Regional Water District. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 148: FY2023 Monitoring stations in Segment 0828

Assessment Unit	Station Description	Station ID	Collecting Entity
0828_02	LK ARLINGTON USGS SITE AC ID 324304097113601 LOCATION MATCHES SITE MAP 518 M N AND 507 M W INTERSECT OF LK ARLINGTON BLVD AND GREEN OAK	13904	Tarrant Regional Water District
0828_05	LAKE ARLINGTON USGS SITE EC 254 METERS SOUTH AND 493 METERS EAST OF INTERSECTION OF CRAVENS ROAD AND WILBARGER STREET	13899	Tarrant Regional Water District
0828_06	LAKE ARLINGTON MID LAKE 177 METERS NORTH AND 865 METERS WEST OF INTERSECTION OF ARBOR VALLEY DRIVE AND PERKINS ROAD	11042	Tarrant Regional Water District
0828_07	LAKE ARLINGTON USGS SITE FC 570 METERS EAST OF INTERSECTION OF KAY DRIVE AND KALTENBRUN ROAD	13897	Tarrant Regional Water District

A summary of the concerns and impairments identified in the TCEQ 2022 Texas Integrated Report is shown in Table 149.

Table 149: Findings of TCEQ 2022 Texas Integrated Report for Segment 0828

Assessment Unit	Use	Parameter	Criteria	Finding
0828_07	Recreation Use	*E. coli*	126 MPN/100 mL	CN

A concern for *E. coli* was identified in Assessment Unit 0828_07. This assessment unit is at the headwaters of the reservoir immediately downstream of Segment 0828A. As shown in Figure 101, 35% of the data were reported above the standard of 126 MPN/100 mL and there was no correlation to reservoir elevation. The concern in 0828_07 is most likely related to the impairment in 0828A. This segment is part of the Village Creek-Lake Arlington Watershed Protection Plan.

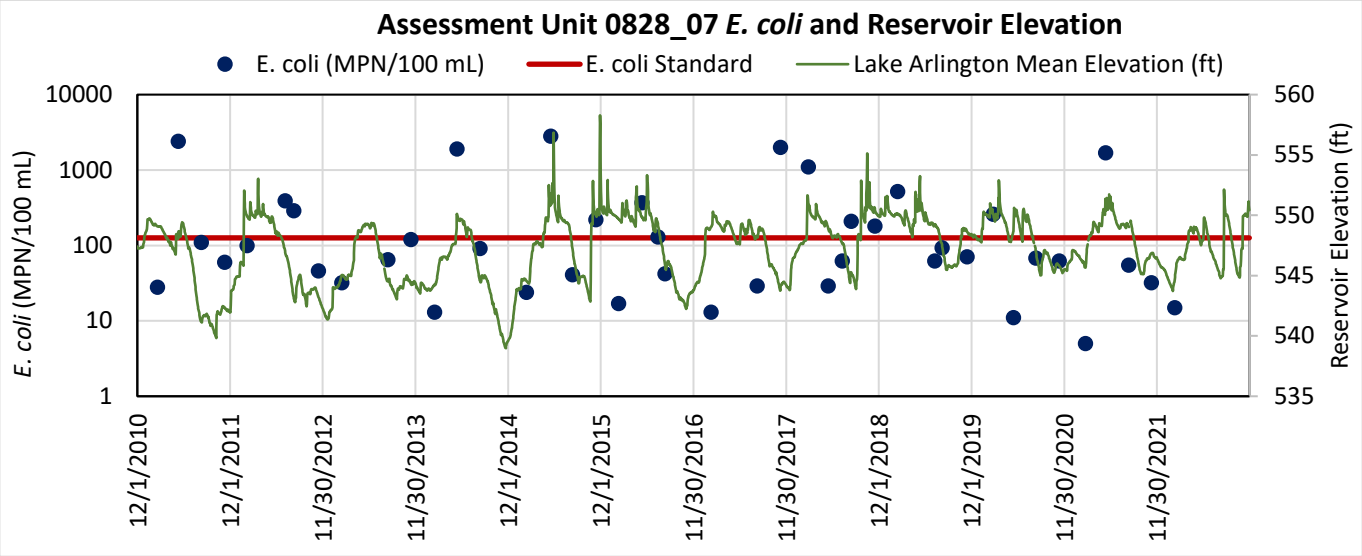

Figure 101: Assessment Unit 0828_07 E. coli and Reservoir Elevation

Mountain Creek

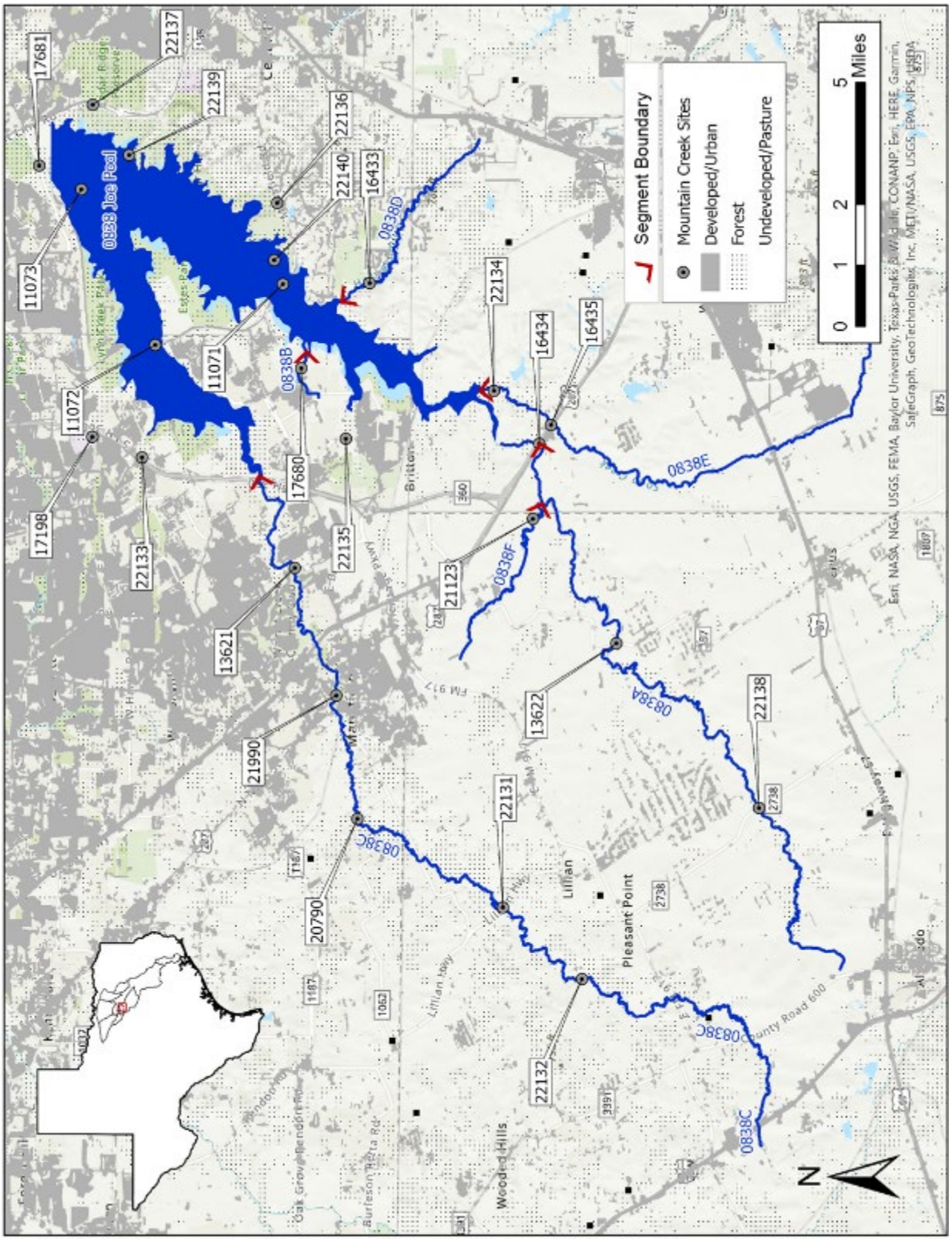

Figure 102: Map of segments and stations of the Mountain Creek subwatershed

0838C Walnut Creek

Figure 103: Electrofishing in Walnut Creek in Katherine Rose Memorial Park in Mansfield

This 24.6-mile unclassified segment runs from the headwaters at Spring Street in Burleson to the confluence with Joe Pool Lake (see Figure 102). The upstream portion of the watershed is rural with a mix of hay, pasture, and crop land with some forested areas adjacent to the stream. The downstream half of the watershed becomes more developed as it approaches Joe Pool Lake. This development includes the City of Mansfield and several large residential communities near the reservoir. The watershed flows through both the Eastern Cross Timbers and Northern Blackland Prairie ecoregions.

Clean Rivers Program water quality monitoring is being conducted at one site within this segment as shown in Table 150. Monitoring is being conducted by TRA. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 150: FY2023 Monitoring stations in Segment 0838C

Assessment Unit	Station Description	Station ID	Collecting Entity
0838C_01	WALNUT CREEK AT MATLOCK ROAD 2.6 MI NORTHEAST OF MANSFIELD	13621	TRA

A summary of the concerns and impairments identified in the TCEQ 2022 Texas Integrated Report is shown in Table 151.

Table 151: Findings of TCEQ 2022 Texas Integrated Report for Segment 0838C

Assessment Unit	Use	Parameter	Criteria	Finding
0838C_01	Recreation Use	*E. coli*	126 MPN/100 mL	CN

A concern was identified for *E. coli* in this segment. Sampling has been conducted at several stations along the segment over the years for both routine and special projects. Additionally, TRA has access to data that was not collected under a QAPP and was not submitted to TRA. Based on all this data, the geometric mean for the segment was 211 MPN/100 mL and *E. coli* was moderately well correlated to flow (correlation coefficient = 0.67) as shown in Figure 104. This indicates that the *E. coli* concern may have been largely due to runoff related sources. However, *E. coli* was frequently reported above the standard of 126 MPN/100 mL at low flows which indicates that point sources may also be impacting this stream. Much of the watershed is rural with pastures and paddocks with some wooded riparian areas. There is evidence of livestock trails in these areas and entering the stream. Therefore, livestock and, to a lesser extent, wildlife are the likely contributors to the bacterial loading in this stream. This segment is part of the Joe Pool Lake Watershed Protection Plan that has recently been accepted by EPA.

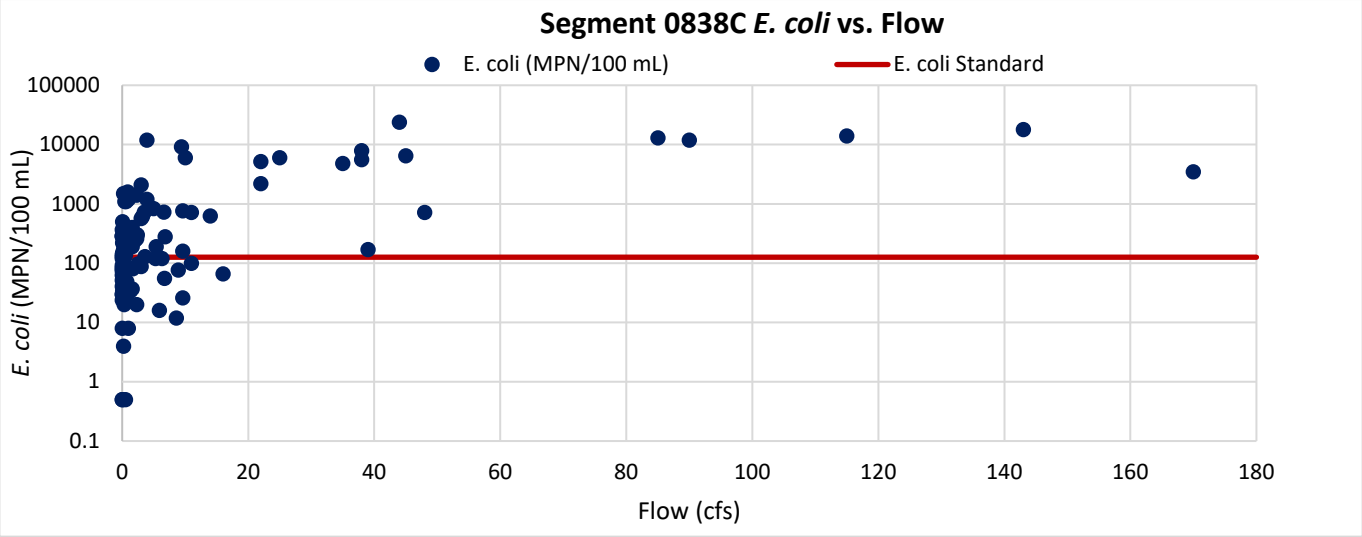

Figure 104: Segment 0838C E. coli vs. Flow

0838F Unnamed tributary of Mountain Creek

This 5-mile unclassified segment runs from the headwaters approximately 2.0 km upstream of FM 157 in Mansfield the confluence with Mountain Creek south of Mansfield (see Figure 102). Much of to the watershed is rural and predominantly crop land. However, there are some industrial complexes and a residential development in the middle of the watershed. It lies within the Northern Blackland Prairie ecoregion.

There is no Clean Rivers Program monitoring scheduled in this segment for FY 2023. No impairments or concerns for aquatic life, recreation, or general uses were identified in this segment.

0838A Mountain Creek

This unclassified segment is a 17.7-mile stretch of Mountain Creek running from the headwaters north of Alvarado in Johnson County to the confluence with Joe Pool Lake (see Figure 102). The watershed is largely comprised of hay, pasture, and crop land with some residential development and some small wooded areas adjacent to the stream. This segment flows through the Northern Blackland Prairie ecoregion.

Clean Rivers Program water quality monitoring is being conducted at one site within this segment as shown in Table 152. Monitoring is being conducted by TRA. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 152: FY2023 Monitoring stations in Segment 0838A

Assessment Unit	Station Description	Station ID	Collecting Entity
0838A	REECE BRANCH AT FM 511 SE OF MANSFIELD APPROX 908 M UPSTREAM OF CONFLUENCE WITH MOUNTAIN CREEK	22394	TRA

No impairments or concerns for aquatic life, recreation, or general uses were identified in this segment.

0838E Soap Creek

Figure 105: Soap Creek upstream of confluence with Mountain Creek arm of Joe Pool Lake northwest of Midlothian

This 12-mile unclassified segment runs from the headwaters 3.98 miles upstream of US 67 in Midlothian to the confluence of the Mountain Creek arm of Joe Pool Lake upstream (see Figure 102). Much of the watershed is grass and crop land. There is a concentrated area along US 67 that is heavily developed with several industrial complexes that include cement production. This watershed lies within the Northern Blackland Prairie ecoregion.

Clean Rivers Program water quality monitoring is being conducted at one site within this segment as shown in Table 153. Monitoring is being conducted by TRA. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule. No impairments or concerns for aquatic life, recreation, or general uses were identified in this segment.

Table 153: FY2023 Monitoring stations in Segment 0838E

Assessment Unit	Station Description	Station ID	Collecting Entity
0838E_01	SOAP CREEK 1.1 KILOMETERS UPSTREAM OF THE CONFLUENCE WITH MOUNTAIN CREEK IN ELLIS COUNTY	22134	TRA

0838 Joe Pool Lake

Figure 106: Joe Pool Lake in Cedar Hill State Park

This unclassified segment covers 6,562 acres and impounds Mountain Creek from the Joe Pool dam in Dallas County up to the normal pool elevation of 522 feet (see Figure 102). The majority of the immediate watershed has been heavily developed with mostly residential communities on the west side of the reservoir and between the two arms. The east side of the reservoir remains largely undeveloped and forested in the Cedar Hill State Park and Cedar Ridge Reserve. The reservoir lies within the Northern Blackland Prairie ecoregion.

Clean Rivers Program water quality monitoring is being conducted at five sites within this segment as shown in Table 154. Monitoring is being conducted by TRA. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule. No impairments or concerns for aquatic life, recreation, or general uses were identified in this segment.

Table 154: FY2023 Monitoring stations in Segment 0838

Assessment Unit	Station Description	Station ID	Collecting Entity
0838_01	JOE POOL LAKE MID LAKE AT DAM 48 METERS SOUTH AND 2.24 KM WEST OF INTERSECTION OF MANSFIELD ROAD & FM 1382	11073	TRA
0838_02	JOE POOL LAKE MOUNTAIN CREEK ARM AT LAKE RIDGE PKWY/MANSFIELD ROAD 251 M N AND 1.19 KM W OF INTERSECTION OF ANDERSON RD & LK RIDGE USGS SITE DC	11071	TRA

Assessment Unit	Station Description	Station ID	Collecting Entity
0838_02	MOUNTAIN CREEK AT US287 1.6KM NORTHWEST OF INTERSECTION OF US 287 AND FM 661	16434	TRA
0838_03	JOE POOL LAKE WALNUT CREEK ARM AT LAKE RIDGE PARKWAY 1.43 KM NORTH & 503 M WEST OF INTERSECTION OF LAKE RIDGE PKWY AND HANGER LOWE RD	11072	TRA
0838	BOWMAN BRANCH AT SOUTH SH 360 IN THE CITY OF GRAND PRAIRE IN TARRANT COUNTY	22133	TRA

0838B Sugar Creek

This 1.6-mile stretch of Sugar Creek runs from just upstream of Britton Road in Mansfield to the Tarrant/Dallas County line (see Figure 102). The entirety of the stream flows through residential developments with some wooded riparian areas just upstream from Joe Pool Lake. There are a few remaining agricultural fields at the upper end of the stream. It flows through the Northern Blackland Prairie ecoregion.

There is no Clean Rivers Program monitoring scheduled in this segment for FY 2023. No impairments or concerns for aquatic life, recreation, or general uses were identified in this segment.

0838D Hollings Branch

This 5.8-mile unclassified segment runs from the headwaters 500 m downstream of US 67 in Midlothian to the confluence of the Mountain Creek arm of Joe Pool Lake (see Figure 102). Much of the watershed is forested and grassland with residential communities throughout. There is also industrial development for cement production near US 67. The watershed flows through the Northern Blackland Prairie ecoregion.

Clean Rivers Program water quality monitoring is being conducted at one site within this segment as shown in Table 155. Monitoring is being conducted by TRA. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule. No impairments or concerns for aquatic life, recreation, or general uses were identified in this segment.

Table 155: FY2023 Monitoring stations in Segment 0838D

Assessment Unit	Station Description	Station ID	Collecting Entity
0838D_01	HOLLINGS BRANCH AT TANGLE RIDGE ROAD 1KM UPSTREAM OF CONFLUENCE OF HOLLINGS BRANCH WITH JOE POOL LAKE	16433	TRA

East Fork Trinity River

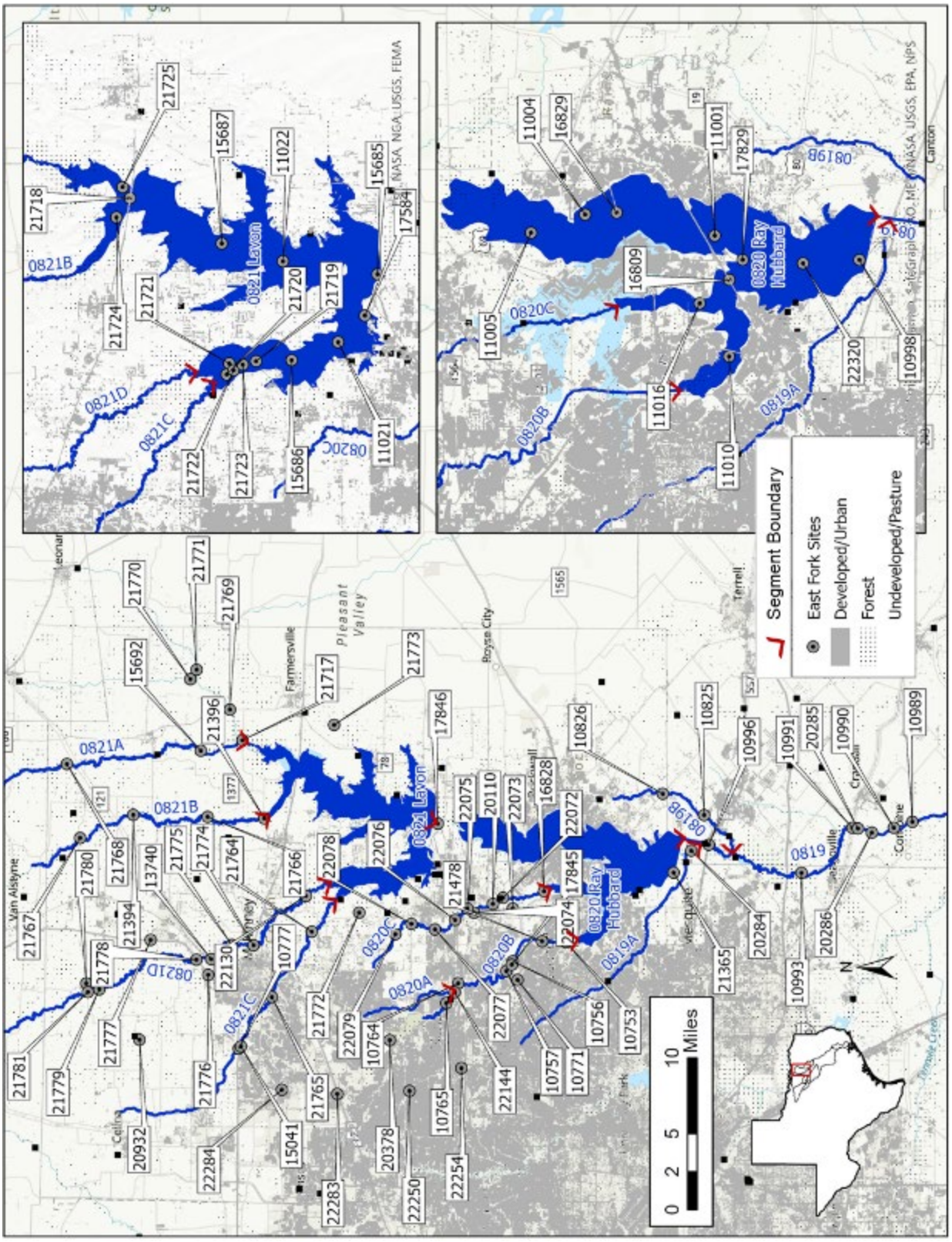

Figure 107: Map of segments and stations of the East Fork Trinity River subwatershed

0821C Wilson Creek

This 31-mile unclassified segment runs from West FM 455 just east of Celina in Collin County to the confluence with Lake Lavon (see Figure 107). The extreme upper and lower ends of the watershed are rural while the middle of the watershed is heavily developed. The upper portion of the stream drains crop, pasture, hay, and grassland. There is some light to medium development around the City of Prosper and transitions into heavy development as the stream flows through the City of McKinney. Just before the stream flows into Lake Lavon, there are several agricultural fields and grasslands as well as some forested riparian areas. The watershed drains the Northern Blackland Prairie ecoregion.

Clean Rivers Program water quality monitoring is being conducted at two sites within this segment as shown in Table 156. Monitoring is being conducted by TCEQ Region 4 and North Texas Municipal Water District. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 156: FY2023 Monitoring stations in Segment 0821C

Assessment Unit	Station Description	Station ID	Collecting Entity
0821C_01	WILSON CREEK 67 METERS UPSTREAM OF COLLIN CR 158	15041	TCEQ Region 4
0821C_01	WILSON CREEK 22.3 METERS WEST OF CR 317 52 METERS EAST OF CR 317	21764	North Texas Municipal Water District

A summary of the concerns and impairments identified in the TCEQ 2022 Texas Integrated Report is shown in Table 157.

Table 157: Findings of TCEQ 2022 Texas Integrated Report for Segment 0821C

Assessment Unit	Use	Parameter	Criteria	Finding
0821C_01	Recreation Use	*E. coli*	126 MPN/100 mL	NS

The 2022 TCEQ Integrated Report identified impairments for *E. coli* in Assessment Unit 0821_C. 72% of the *E. coli* data collected throughout this Assessment Unit was above the standard of 126 MPN/100ML. While Figure 108 shows no relationship between *E. coli* and drought conditions, analysis of the data showed a strong correlation between stream flow and *E. coli*. This would suggest that the impairment for *E. coli* is related to non-point sources. Through the Assessment Unit, there is no evidence of livestock, but there is wooded riparian zone throughout, which can indicate wildlife as a potential non-point source. The area is also heavily populated with residential zones and fields for agricultural use, so the best strategy for reducing *E. coli* loads would be land owner education and inclusion of better pet waste management practices throughout the Assessment Unit.

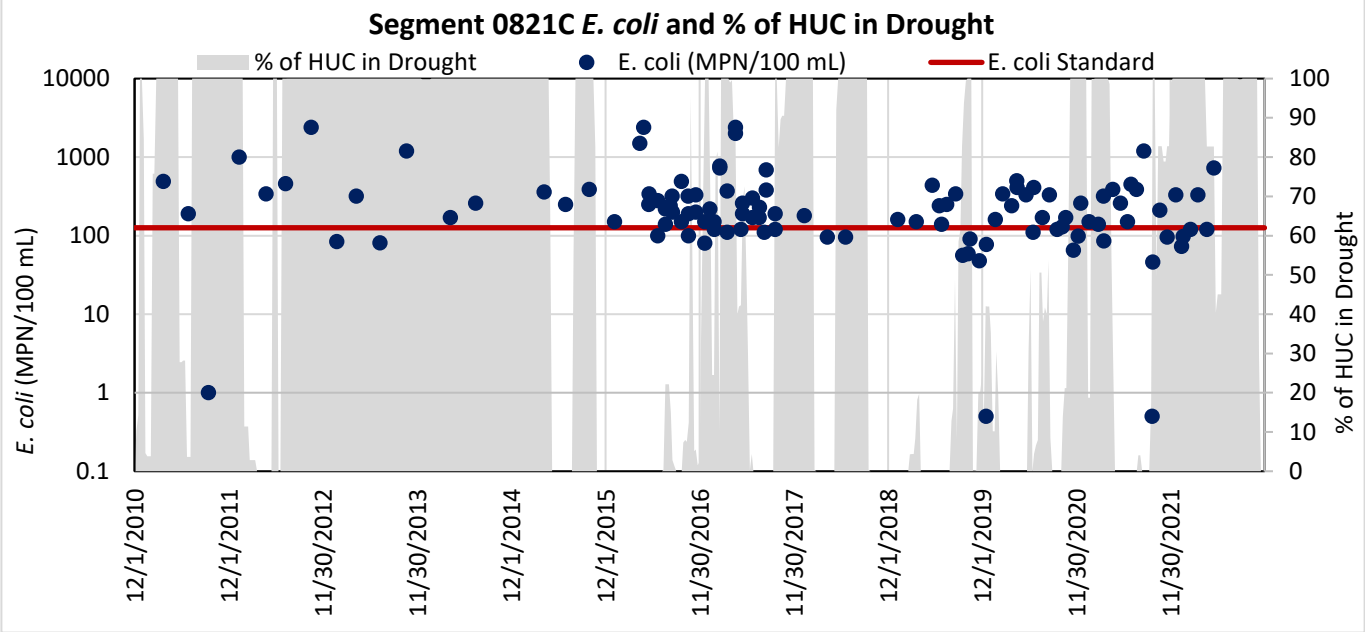

Figure 108: Segment 0821C E. coli and % of HUC in Drought

0821D East Fork Trinity River above Lake Lavon

This 49-mile unclassified segment extends from the headwaters of the East Fork Trinity River upstream of FM 902 in Grayson County to the confluence with Lake Lavon (see Figure 107). Much of the watershed is rural with grass, hay, and pasture land predominating. There are some areas of crop land increasing further downstream and forested riparian areas. Most of the development in this portion of the watershed is confined to the area between I-75 and SH 5 near the cities of Anna and Melissa and south of I-75 as the river flows past the outlying areas of the City of McKinney. This watershed lies within the Northern Blackland Prairie ecoregion.

Clean Rivers Program water quality monitoring is being conducted at seven sites within this segment as shown in Table 158. Monitoring is being conducted by TCEQ Region 4 and North Texas Municipal Water District. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 158: FY2023 Monitoring stations in Segment 0821D

Assessment Unit	Station Description	Station ID	Collecting Entity
0821D_01	EAST FORK TRINITY RIVER AT SH 5 3.3 MI NORTH OF MCKINNEY 1.7 MI UPSTREAM OF CLEMONS CREEK 750 FT DOWNSTREAM OF HONEY CREEK	13740	TCEQ Region 4
0821D_01	EAST FORK TRINITY RIVER AT US 75 ;6.6 KILOMETERS NORTH AND 2.5 KLOMETERS EAST OF MCKINNEY	21778	North Texas Municipal Water District
0821D_01	EAST FORK TRINITY RIVER AT CR 210; 2.92 KILOMATERS EAST OF WESTON	21779	North Texas Municipal Water District
0821D_01	EAST FORK TRINITY RIVER AT FM 546 IN THE CITY OF LOWRY CROSSING	22130	North Texas Municipal Water District

Assessment Unit	Station Description	Station ID	Collecting Entity
0821D	HONEY CREEK 40 M UPSTREAM OF COLLIN CR 170 4.3 KM SW OF WESTON AND 2.3 KM NORTHWEST OF INTERSECTION OF FM 543 AND COLLIN CR 170	20932	North Texas Municipal Water District
0821D	HONEY CREEK AT US 75; 5.43 KILOMETERS NORTH AND 1.31 KILOMETERS EAST OF MCKINNEY	21776	North Texas Municipal Water District
0821D	THROCKMORTON CREEK AT US 75; 1.67 KILOMETERS NORTH AND 1.71 KILOMETERS WEST OF MELISSA	21777	North Texas Municipal Water District

A summary of the concerns and impairments identified in the TCEQ 2022 Texas Integrated Report is shown in Table 159.

Table 159: Findings of TCEQ 2022 Texas Integrated Report for Segment 0821D

Assessment Unit	Use	Parameter	Criteria	Finding
0821D_01	Recreation Use	*E. coli*	126 MPN/100 mL	NS

Assessment Unit 0821D_01 was identified in the 2022 TCEQ Integrated Report as impaired for *E. coli*. 59% of the collected data for *E. coli* was identified as above the standard of 126 MPN/100ML for the entire Assessment Unit. Of the 7 sampling stations in this Assessment Unit, Station 21778 had the lowest percentage of *E. coli* data above the standard with 52% of data being so. Figure 109 shows that drought had no discernable impact on *E. coli*, but there was a correlation between an increase of stream flow and *E. coli*, which could indicate a non-point source runoff problem. The Assessment Unit has a dense riparian zone throughout which could indicate wildlife as a potential non-point source. It also runs through large sections of agricultural fields that show signs of livestock use as well. This would suggest that land owner education in best management practices could be an option in addressing the concern.

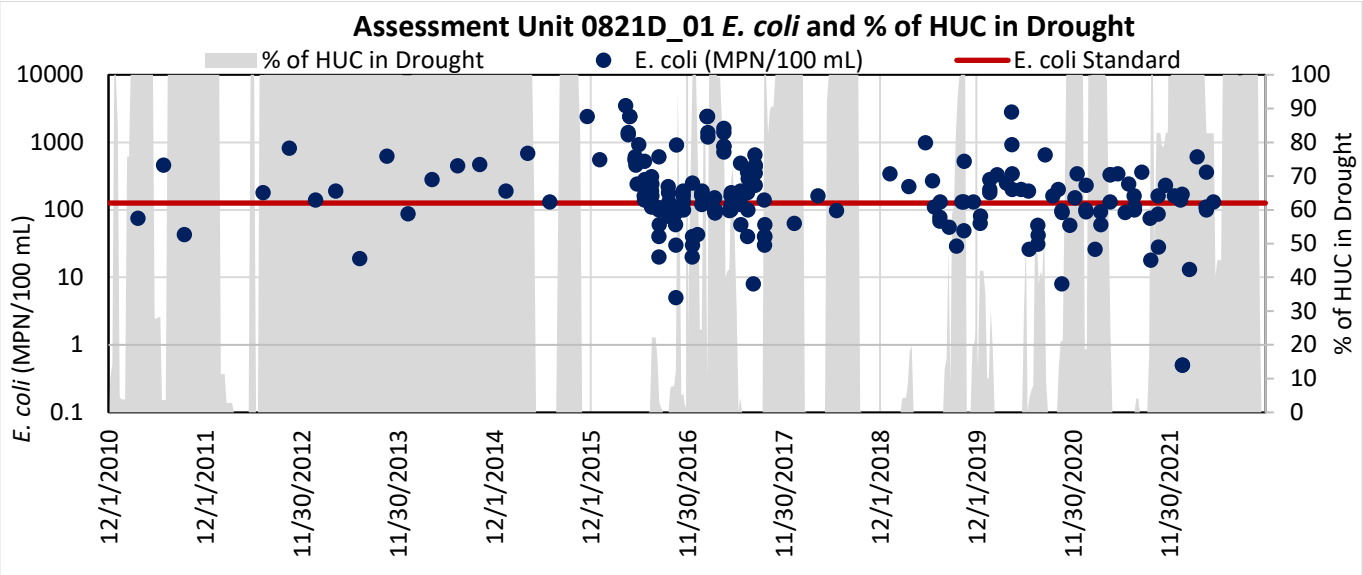

Figure 109: Assessment Unit 0821D_01 E. coli and % of HUC in Drought

0821B Sister Grove Creek

This 27-mile unclassified segment runs from the confluence of West Prong Sister Grove Creek/East Prong Sister Grove Creek east of Van Alstyne in Grayson County to the confluence with Lake Lavon in Collin County (see Figure 107). The watershed is rural with a mix of pasture, hay, and grassland with some small areas of crop land and forest throughout. It flows through the Northern Blackland Prairie ecoregion.

Clean Rivers Program water quality monitoring is being conducted at two sites within this segment as shown in Table 160. Monitoring is being conducted by North Texas Municipal Water District. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 160: FY2023 Monitoring stations in Segment 0821B

Assessment Unit	Station Description	Station ID	Collecting Entity
0821B_01	SISTER GROVE CREEK DOWNSTREAM FM 1377/MONTE CARLO BLVD 1.6 K EAST OF INTERSECTION OF 6TH STREET AND FM 1377 NEAR PRINCETON TX	21396	North Texas Municipal Water District
0821B_01	SISTER GROVE CREEK AT CR 2862; 2 KILOMETERS NORTH AND 5 KILOMETERS EAST OF ANNA	21767	North Texas Municipal Water District

A summary of the concerns and impairments identified in the TCEQ 2022 Texas Integrated Report is shown in Table 161.

Table 161: Findings of TCEQ 2022 Texas Integrated Report for Segment 0821B

Assessment Unit	Use	Parameter	Criteria	Finding
0821B_01	Aquatic Life Use	Dissolved oxygen Grab	5 mg/L	CS
0821B_01	Recreation Use	*E. coli*	126 MPN/100 mL	CN

Assessment Unit 0821B_01 was identified in the 2022 TCEQ Integrated Report as having concerns for both Dissolved oxygen and *E. coli*. For the assessment unit, 61% of reported *E. coli* data was above the standard of 126 MPN/100ML. As shown in Figure 110, there is no shown correlation between *E. coli* and drought periods. There is however, a correlation between higher flows and *E. coli* values. This indicates that the problem could be stemming from non-point sources. There is a large, heavily wooded riparian zone that could indicate wildlife as a potential contributor. The assessment unit also flows through several fields that show signs of livestock use, including livestock trails leading to the creek, hay bales next to the water, and aerial photos of livestock. Landowner education in best management practices for livestock would be an option for mitigating this issue.

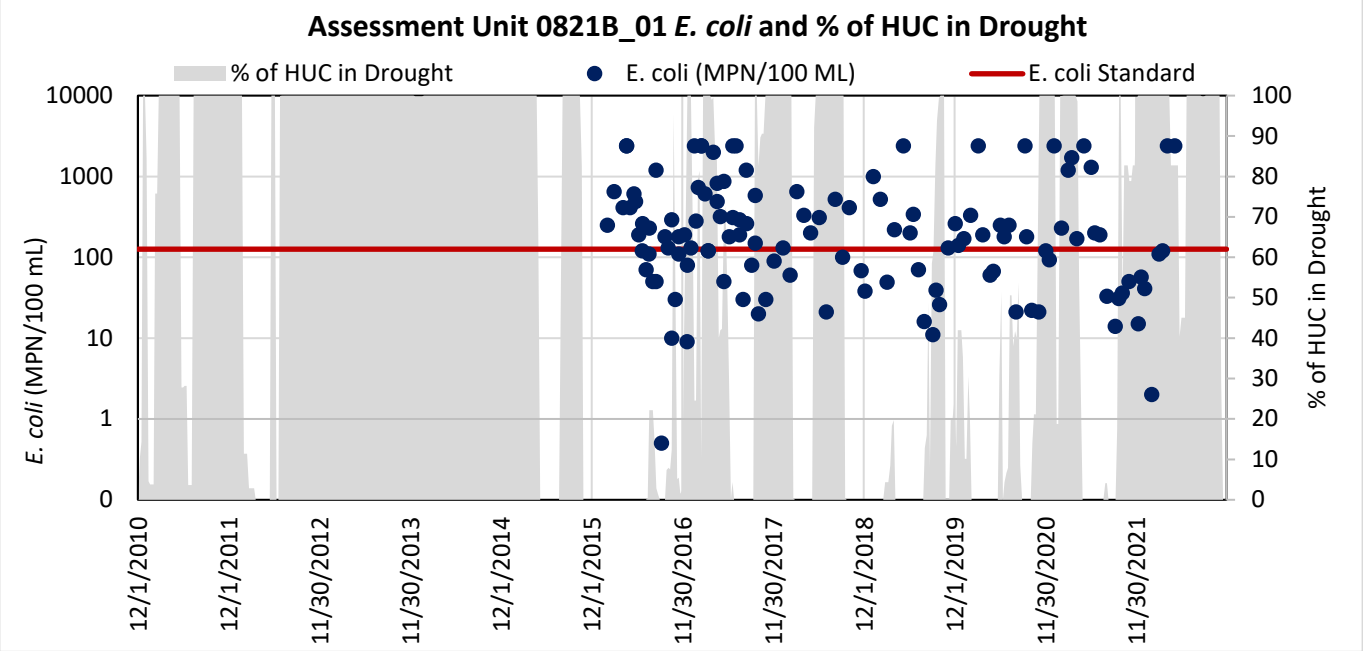

Figure 110: Assessment Unit 0821B_01 E. coli and % of HUC in Drought

As shown in Figure 111, Assessment Unit 0821B_01 had 29% of Dissolved Oxygen grab data below the standard of 5 MG/L across its entirety, with no correlation to drought periods. A correlation between Instantaneous Flow and Flow Severity Recategorized is present, however. The highest flow throughout the assessment unit taken with a Dissolved Oxygen sample that was below the standard was only 3.6 cfs. This suggests that the assessment unit is a low flow stream, which could contribute to the lower values for Dissolved Oxygen. If this continues to be a concern, the standard should be re-evaluated for this assessment unit through a Use Attainability Analysis.

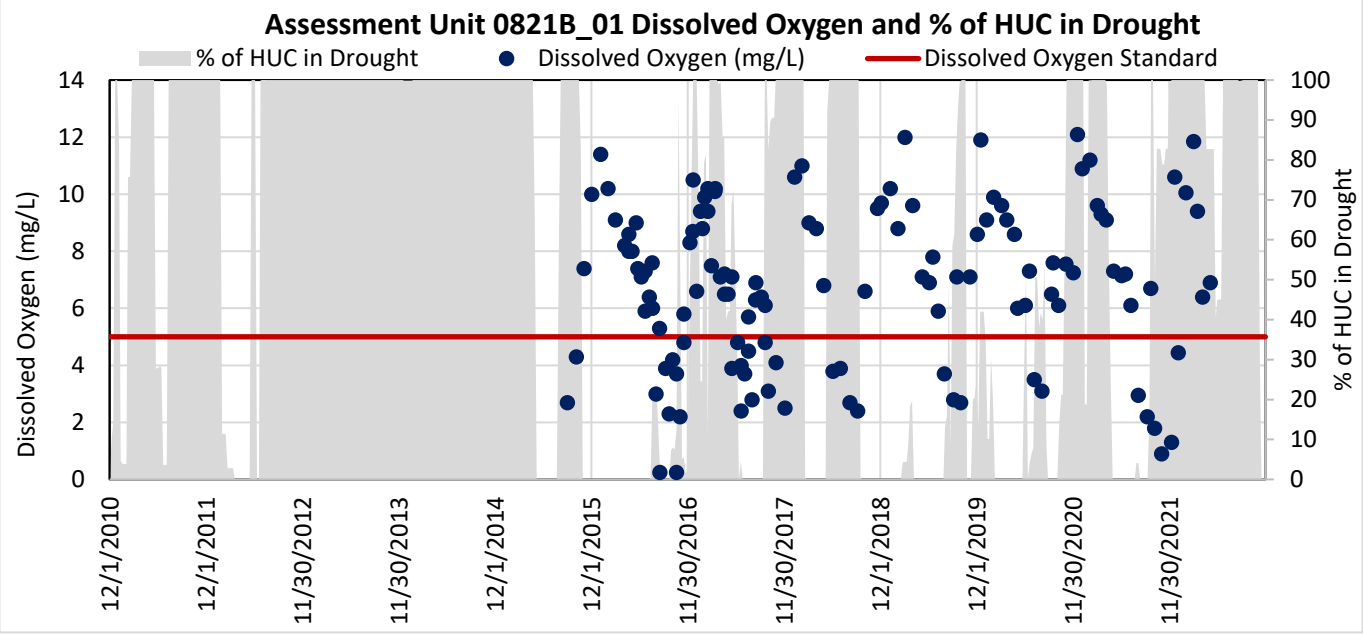

Figure 111: Assessment Unit 0821B_01 Dissolved Oxygen and % of HUC in Drought

0821A Pilot Grove Creek

This 25.7-mile unclassified segment runs from the headwaters approximately 0.28 miles south of SH 11 west of Whitewright to the confluence with Lake Lavon in Collin county (see Figure 107). The watershed is rural with a mix of pasture, hay, and grassland with some small areas of crop land and forest throughout. It flows through the Northern Blackland Prairie ecoregion.

Clean Rivers Program water quality monitoring is being conducted at four sites within this segment as shown in Table 162. Monitoring is being conducted by North Texas Municipal Water District. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 162: FY2023 Monitoring stations in Segment 0821A

Assessment Unit	Station Description	Station ID	Collecting Entity
0821A_02	PILOT GROVE CREEK IMMEDIATELY DOWNSTREAM OF COLLIN CR 574 AND 3.2 MI SOUTH OF FM 545 NEAR BLUE RIDGE	15692	North Texas Municipal Water District
0821A_02	PILOT GROVE CREEK AT FM 2756 UPSTREAM OF LAKE LAVON	21717	North Texas Municipal Water District
0821A_04	PILOT GROVE CREEK AT CR 584; 1.9 KILOMETERS NORTH AND 3.4 KILOMETERS EAST OF WESTMINSTER	21768	North Texas Municipal Water District
0821A	INDIAN CREEK AT SR 78 LOCATED 6.95 KILOMETERS NORTH AND 1.12 KILOMETERS WEST OF FARMERSVILLE	21769	North Texas Municipal Water District

A summary of the concerns and impairments identified in the TCEQ 2022 Texas Integrated Report is shown in Table 163.

Table 163: Findings of TCEQ 2022 Texas Integrated Report for Segment 0821A

Assessment Unit	Use	Parameter	Criteria	Finding
0821A_02	Recreation Use	*E. coli*	126 MPN/100 mL	NS

Assessment Unit 0821A_02 was identified as having a concern for *E. coli* in the 2022 TCEQ Integrated report. As seen in Figure 112, there is no apparent relationship between drought parameters and *E. coli* values.

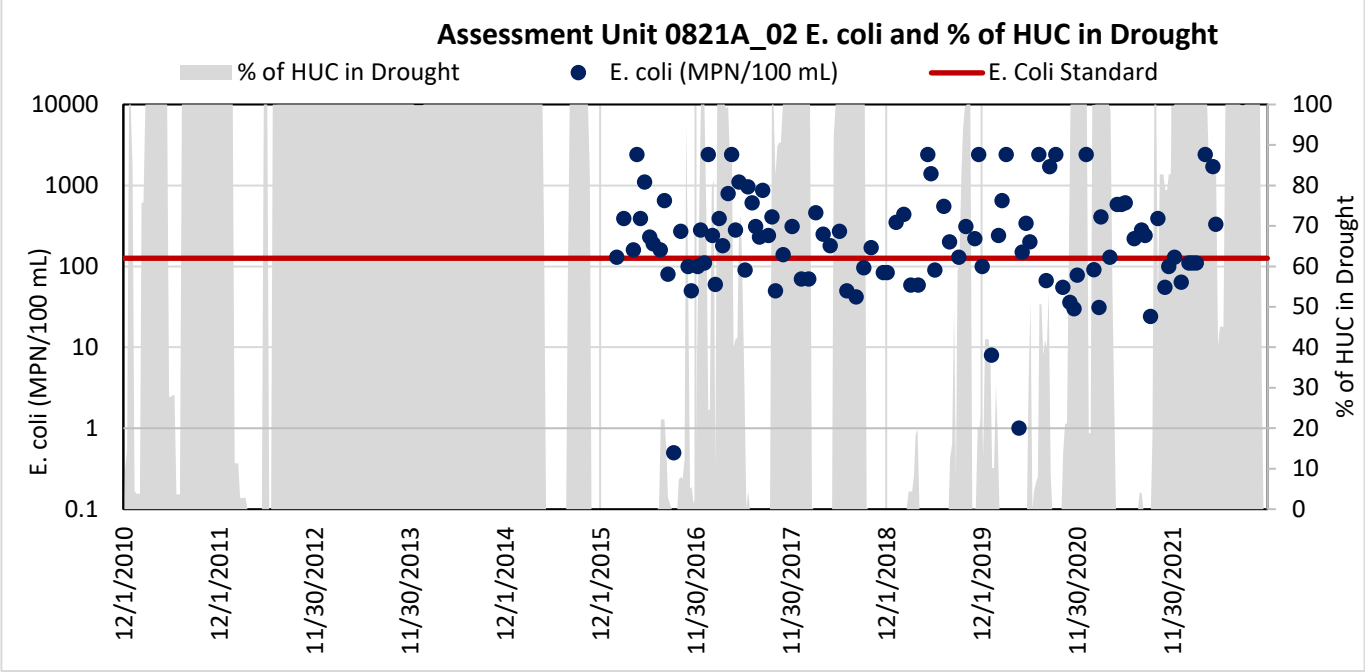

Figure 112: Assessment Unit 0821A_02 E. coli and % of HUC in Drought

There was some correlation between flow measurement and *E. coli* values (correlation factor = 0.414). These would indicate non-point source as a possible cause. The assessment unit flows through heavily wooded riparian zone, so wildlife could be a contributing factor as well. The most upstream station, Sampling Station 15692, has an average *E. coli* value of 745 MPN/100ML, and the lowest average flow of 29.06 cfs, while the downstream Sampling Station, station 21717, has an average *E. coli* of 404 MPN/100ML and an average flow value of 81.9 cfs. A possible reason for the lower *E. coli* value and higher flows is the confluence of Pot Rack and Indian Creek just upstream of the sampling station. The additional flow could dilute the *E. coli* values to be lower than upstream. Sampling in Indian Creek is ongoing, so additional data gathered in the future can be used to address this concern at that time in future reports.

0821 Lake Lavon

This 20,609-acre segment impounds the East Fork Trinity River up to a normal pool elevation of 492 feet (see Figure 107). Much of the watershed is rural with grassland, hay and pasture being the predominate land use. Some smaller areas of crop land exist mostly in the middle of the watershed. Development increases toward the west of the reservoir with cities of McKinney, Princeton, Fairview, and Lucas. The watershed lies within the Northern Blackland Prairie ecoregion.

Clean Rivers Program water quality monitoring is being conducted at fifteen sites within this segment as shown in Table 164. Monitoring is being conducted by North Texas Municipal Water District. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 164: FY2023 Monitoring stations in Segment 0821

Assessment Unit	Station Description	Station ID	Collecting Entity
0821_01	LAVON LAKE USGS SITE AC 1.01 KM NORTH AND 927 METERS EAST OF INTERSECTION OF SH 78 AND SKYVIEW DRIVE NEAR DAM (7)	15685	North Texas Municipal Water District
0821_01	LAKE LAVON WEST OF EASTFORK PARK AND EAST OF INTAKE #3 467 M N & 456 M W OF INTERSECTION OF SKYVIEW DR & PRIVATE RD 5313 (8)	17584	North Texas Municipal Water District
0821_02	LAKE LAVON EAST FORK ARM 273 METERS NORTH AND 1.04 KM WEST OF INTERSECTION OF SUNNY LANE AND LAVON LAKE ROAD (RAW 3)	11021	North Texas Municipal Water District
0821_02	LAVON LAKE USGS SITE EC 1.69 KM EAST OF INTERSECTION BROCKDALE PARK & COLLIN CR 967	15686	North Texas Municipal Water District
0821_02	LAKE LAVON EAST FORK ARM 130 METERS NORTH OF EAST LUCAS ROAD AND 1.6 KILOMETERS WEST AND 340 METERS SOUTH OF THE INTERSECTION OF EAST LUCAS ROAD AND OF FM 546	21719	North Texas Municipal Water District
0821_02	LAKE LAVON EAST FORK ARM 1.37 KILOMETERS NORTH AND 2.33 KILOMETERS WEST OF THE INTERSECTION OF EAST LUCAS ROAD AND FM 546	21720	North Texas Municipal Water District
0821_02	LAKE LAVON EAST FORK ARM 1.20 KILOMETERS NORTH AND 1.72 KILOMETERS WEST OF THE INTERSECTION OF EAST LUCAS ROAD AND FM 546	21721	North Texas Municipal Water District
0821_02	LAKE LAVON EAST FORK ARM 970 METERS NORTH AND 2.10 KILOMETERS WEST OF THE INTERSECTION OF EAST LUCAS ROAD AND FM 546	21722	North Texas Municipal Water District
0821_02	LAKE LAVON EAST FORK ARM 430 METERS NORTH AND 1.81 KILOMETERS WEST OF THE INTERSECTION OF EAST LUCAS ROAD AND FM 546	21723	North Texas Municipal Water District
0821_03	LAVON LAKE USGS SITE BC 194 METERS NORTH AND 719 METERS WEST OF INTERSECTION OF COLLIN CR 1047 AND COLLIN CR 1055 (2)	15687	North Texas Municipal Water District
0821_04	LAKE LAVON PILOT GROVE ARM 207 METERS N AND 1.82 KM W OF INTERSECTION OF CR 761 & CR 546 (6)	11022	North Texas Municipal Water District
0821_04	LAKE LAVON AT HWY 380 AT THE CONFLUENCE OF SISTER GROVE CREEK ARM AND PILOT GROVE CREEK ARM APPROX 250 METERS EAST OF THE INTERSECTION OF FM 559 AND HWY 380	21718	North Texas Municipal Water District
0821_04	LAKE LAVON AT THE MOUTH OF SISTER GROVE CREEK ARM 735 METERS NORTH & 860 METERS WEST OF THE INTERSECTION OF HWY 380 & FM 559	21724	North Texas Municipal Water District
0821_04	LAKE LAVON AT THE MOUTH OF PILOT GROVE CREEK ARM 320 METERS NORTH & 890 METERS EAST OF THE INTERSECTION OF HWY 380 & FM 559	21725	North Texas Municipal Water District
0821	ELM CREEK AT CR 605; 4 KILOMETERS SOUTH AND 2.55 KILOMETERS WEST OF FARMERSVILLE	21773	North Texas Municipal Water District

No impairments or concerns for aquatic life, recreation, domestic water supply, or general uses were identified in this segment.

0820 Lake Ray Hubbard

This 21,834-acre segment impounds the East Fork Trinity River from Rockwall-Forney Dam to Lavon Dam in Collin County up to a normal pool elevation of 435.5 feet (see Figure 107). The watershed to the northeast is largely rural with crop land being the predominate land use. Much of the land directly around the reservoir is developed by the cities of Rowlett, Sachse, Rockwall, and Garland. The watershed lies within the Northern Blackland Prairie ecoregion.

Clean Rivers Program water quality monitoring is being conducted at ten sites within this segment as shown in Table 165. Monitoring is being conducted by TRA, the City of Dallas, and TCEQ Region 4. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 165: FY2023 Monitoring stations in Segment 0820

Assessment Unit	Station Description	Station ID	Collecting Entity
0820_01	LAKE RAY HUBBARD ROWLETT CREEK ARM 523 METERS SOUTH AND 374 METERS WEST OF INTERSECTION OF THORNHILL WAY AND ROWLETT ROAD	11010	TRA
0820_01	LAKE RAY HUBBARD MUDDY CREEK ARM 104 METERS SOUTH AND 241 METERS WEST OF INTERSECTION OF GARNER ROAD AND C A ROAN DRIVE	11016	TRA
0820_01	LAKE RAY HUBBARD AT I 30 BRIDGE 766 METERS NORTH AND 1.26 KM EAST OF INTERSECTION OF CHAHA ROAD AND I 30 (H3)	16809	City of Dallas (DA)
0820_02	LAKE RAY HUBBARD 173 METERS N AND 1.31 KM E OF INTERSECTION OF DALROCK RD AND I 30 CONFLUENCE OF EAST FORK ARM WITH MAIN BODY OF LAKE	11001	TCEQ Region 4
0820_02	LAKE RAY HUBBARD EAST FORK ARM 80 METERS NORTH AND 843 METERS WEST OF INTERSECTION OF SUNSET HILL DR AND BAYHILL DR	11004	TRA
0820_02	LAKE RAY HUBBARD EAST FORK ARM AT US 66 494 M NORTH AND 1.83 KM EAST OF INTERSECTION OF US 66 AND SCENIC DRIVE WEST OF ROCKWALL (H4)	16829	City of Dallas (DA)
0820_04	LAKE RAY HUBBARD 1.79 KM E AND 193 METERS S OF INTERSECT GLORIA RD AND E FORK RD NEAR DALLAS WATER INTAKE STRUCTURE AT WEST END OF DAM	10998	TCEQ Region 4
0820_04	LAKE RAY HUBBARD AT THE WEST END OF THE ROCKWALL-FORNEY DAM NEAR FORNEY (H1)	21365	City of Dallas (DA)
0820_05	LAKE RAY HUBBARD AT MIDLAKE 1.28 KM WEST OF THE END OF PENINSULA COURT (H2)	22320	City of Dallas (DA)
0820_06	LAKE RAY HUBBARD/EAST FORK TRINITY RIVER 200 METERS DOWNSTREAM OF LAKE LAVON OUTFALL AT COLLIN CR 384 (V1)	17846	City of Dallas (DA)

No impairments or concerns for aquatic life, recreation, domestic water supply, or general uses were identified in this segment.

0820C Muddy Creek

This 18.3-mile unclassified segment runs from the headwaters east of Allen in Collin County to the confluence with Lake Ray Hubbard in Dallas County (see Figure 107). Much of the watershed is heavily developed near the cities of Murphy and Sachse with some less densely developed areas around the headwaters and just before the stream enters the reservoir. The watershed flows through the Northern Blackland Prairie ecoregion.

Clean Rivers Program water quality monitoring is being conducted at one site within this segment as shown in Table 166. Monitoring is being conducted by the City of Dallas. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 166: FY2023 Monitoring stations in Segment 0820C

Assessment Unit	Station Description	Station ID	Collecting Entity
0820C_01	MUDDY CREEK AT LIBERTY GROVE ROAD 0.65KM UPSTREAM OF LAKE RAY HUBBARD (H5)	16828	City of Dallas (DA)

A summary of the concerns and impairments identified in the TCEQ 2022 Texas Integrated Report is shown in Table 167.

Table 167: Findings of TCEQ 2022 Texas Integrated Report for Segment 0820C

Assessment Unit	Use	Parameter	Criteria	Finding
0820C_01	General Use	Nitrate	1.95 mg/L	CS (Carry Forward)

In the 2022 TCEQ Integrated Report, Assessment Unit 0820C_01 was identified as having concerns for Nitrate, with 85% of reported data for Nitrate being over the standard of 1.95 MG/L. There was no strong correlation between Nitrate values and drought conditions. However, Figure 113 shows there was correlation between Nitrate values and flow in the stream (correlation factor = 0.525).

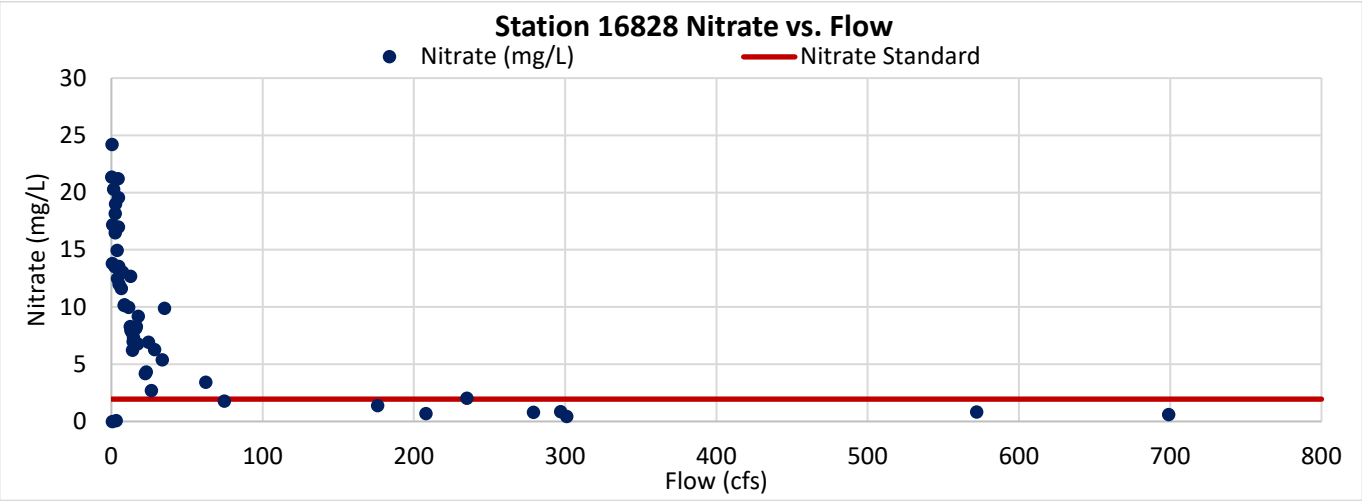

Figure 113: Station 16828 Nitrate vs. Flow

As Station 16828 is downstream of a wastewater treatment plant (see Figure 114), this indicates that Assessment Unit 0820C_01 is an effluent dominated stream, which can result in high Nitrate values. At this time, there are no advanced nutrient removal systems able to be used, but could be made available in the future. Additional sampling could also be done throughout the assessment unit as well. There is a landfill located upstream of Station 16828, which could be contributing to the concern, along with agriculture fields and dense housing development upstream. Modification of the standard for Nitrate in this assessment unit should also be considered.

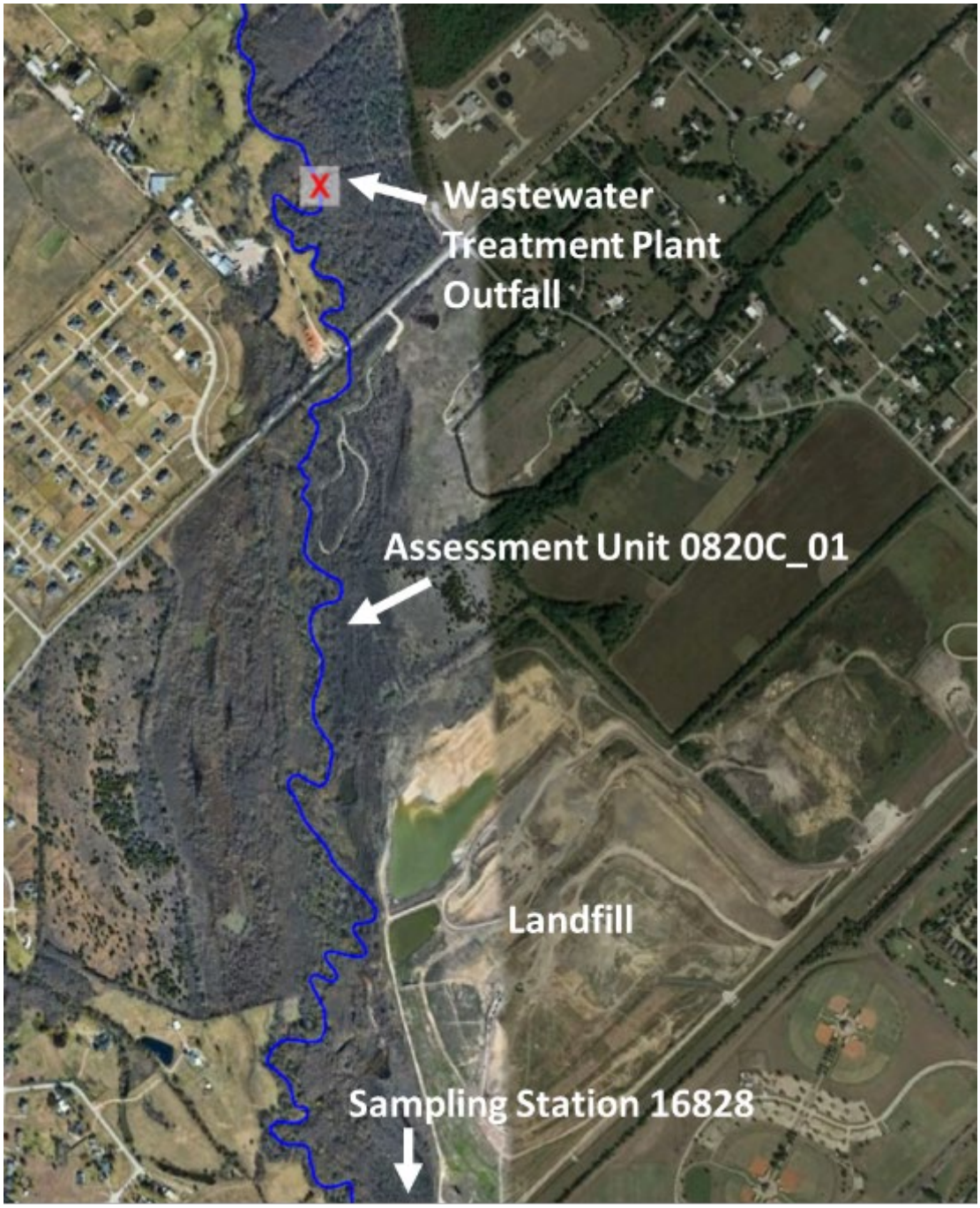

Figure 114: Station 16828 downstream of wastewater treatment plant outfall

0820A Cottonwood Creek

This 7.6-mile stretch of Cottonwood Creek runs from SH 5 in Allen to the confluence with Rowlett Creek (see Figure 107). The upper portion of the watershed is heavily developed around the City of Allen. The lower portion of the watershed is developed to the west near the City of Plano but less densely developed to the east near Parker. There are some hay, pasture, and crop lands on the east side of the stream. The watershed flows through the Northern Blackland Prairie ecoregion.

There is no Clean Rivers Program monitoring scheduled in this segment for FY 2023.

No impairments or concerns for aquatic life, recreation, or general uses were identified in this segment.

0820B Rowlett Creek

This 17.3-mile segment runs from the Parker Road crossing to the confluence with Lake Ray Hubbard upstream (see Figure 107). A majority of the watershed is heavily developed by the cities of Allen, Plano, Sachse, Garland, and Rowlett. There are some forested riparian areas throughout the watershed. The stream flows through the Northern Blackland Prairie ecoregion. A watershed protection plan is under development for this segment.

Clean Rivers Program water quality monitoring is being conducted at seven within this segment as shown in Table 168. Monitoring is being conducted by the City of Dallas, City of Plano, City of Frisco, and TRA. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 168: FY2023 Monitoring stations in Segment 0820B

Assessment Unit	Station Description	Station ID	Collecting Entity
0820B_01	ROWLETT CREEK 45 METERS DOWNSTREAM OF BEN DAVIS/DAMASCUS RD RIVER KM 8.5 (H6)	10756	City of Dallas (DA) & TRA
0820B_01	ROWLETT CREEK IMMEDIATELY DOWNSTREAM OF 14TH ST/SH 544 RIVER KM 19.2	10764	City of Plano
0820B	ROWLETT CREEK 100 METERS DOWNSTREAM OF US 75 IN ALLEN/PLANO	20378	City of Plano
0820B	ROWLETT CREEK 20 METERS DOWNSTREAM OF CUSTER ROAD/FM 2478 IN THE CITY OF FRISCO	22284	City of Frisco
0820B	WEST ROWLETT CREEK AT HIGHWAY 121 WESTBOUND ACCESS ROAD IN THE CITY OF FRISCO	22283	City of Frisco
0820B	SPRING CREEK AT CUSTER ROAD IN PLANO VETERANS MEMORIAL PARK WITHIN THE CITY OF PLANO	22250	City of Plano
0820B	SPRING CREEK 190 METERS DOWNSTREAM OF WEST PLANO PARKWAY IN THE CITY OF PLANO	22254	City of Plano

A summary of the concerns and impairments identified in the TCEQ 2022 Texas Integrated Report is shown in Table 169.

Table 169: Findings of TCEQ 2022 Texas Integrated Report for Segment 0820B

Assessment Unit	Use	Parameter	Criteria	Finding
0820B_01	General Use	Nitrate	1.95 mg/L	CS
0820B_01	Recreation Use	*E. coli*	126 MPN/100 mL	NS

The 2022 TCEQ Integrated Report identified Assessment Unit 0820B_01 as having concerns in both *E. coli* and Nitrate. 69% of reported data for *E. coli* was over the standard. As shown in Figure 115, there is no apparent correlation between drought parameters and *E. coli*.

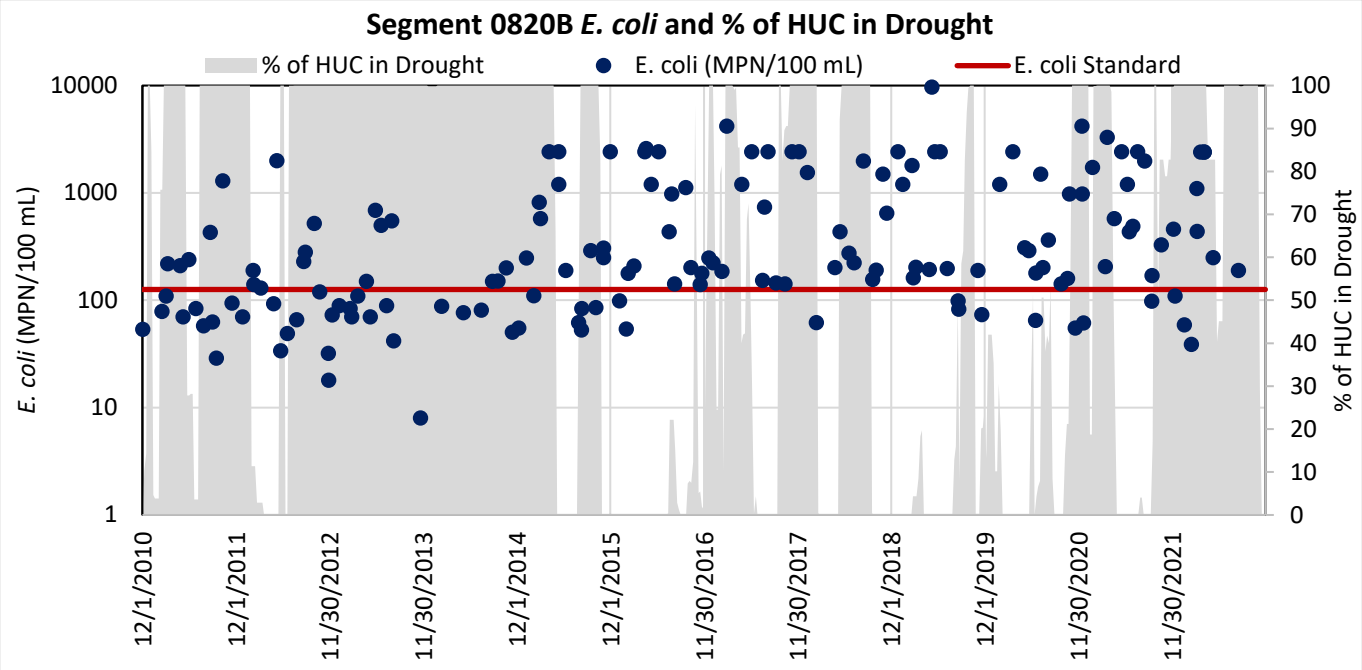

Figure 115: Segment 0820B E. coli and % of HUC in Drought

There is, however, a correlation between *E. coli* and flow throughout the entire assessment unit (correlation factor = 0.823) This would suggest non-point sources as the primary concern driver. The assessment unit flows through several golf courses and heavy residential areas. There is also wooded riparian zone throughout much of the assessment unit, indicating wildlife as a contributing factor. Land owner and golf course education and implementation of pet waste best management practices would be suggested courses of action to help address the concern.

83% of reported Nitrate data for Assessment Unit 0820B_01 was reported to be over the standard. When graphed against flow in the assessment unit as seen in Figure 116, there was a negative correlation between the two parameters (correlation factor = -0.407).

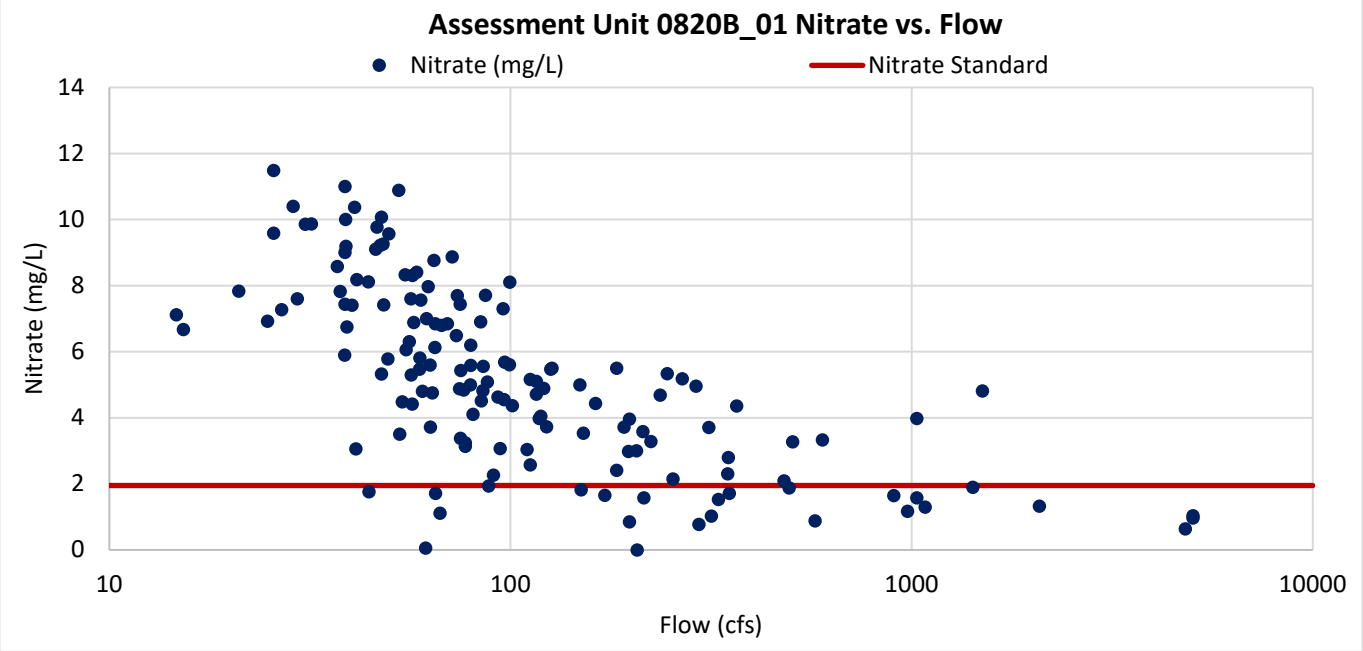

Figure 116: Assessment Unit 0820B_01 Nitrate vs. Flow

This, along with the presence of a wastewater treatment plant outfall upstream of the sampling stations, is indictive of an effluent dominated stream system, which can result in the high Nitrate levels seen in this assessment unit. Advanced nutrient removal systems are not available to wastewater treatment plants at this time, but could be made possible in the future. In the interim, the value of the standard for Nitrate should be evaluated to assess its continued applicability.

0819A Duck Creek

This 19.5-mile unclassified segment runs from the confluence of an unnamed tributary 0.6 km upstream of Jupiter Road in Dallas County to the confluence with the East Fork Trinity River in Kaufman County upstream (see Figure 107). The upstream portion of the watershed is heavily developed in the cities of Garland and Centerville. Downstream of North Beltline Road, the watershed becomes less densely developed in Sunnyvale. This portion of the watershed is mostly hay and pasture land with some forested areas. The watershed drains the Northern Blackland Prairie ecoregion.

There is no Clean Rivers Program monitoring scheduled in this segment for FY 2023.

No impairments or concerns for aquatic life, recreation, or general uses were identified in this segment.

0819B Buffalo Creek

This 13.2-mile unclassified segment runs from 0.6 km above the confluence of Little Buffalo Creek to the confluence with the East Fork Trinity River (see Figure 107). The watershed is mostly hay, pasture, and grassland with some small areas of development around the cities of Heath and Forney. This stream flows through the Northern Blackland Prairie ecoregion.

Clean Rivers Program water quality monitoring is being conducted at one site within this segment as shown in Table 170. Monitoring is being conducted by TRA. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 170: FY2023 Monitoring stations in Segment 0819B

Assessment Unit	Station Description	Station ID	Collecting Entity
0819B_01	BUFFALO CREEK AT KING STREET	10826	TRA

A summary of the concerns and impairments identified in the TCEQ 2022 Texas Integrated Report is shown in Table 171.

Table 171: Findings of TCEQ 2022 Texas Integrated Report for Segment 0819B

Assessment Unit	Use	Parameter	Criteria	Finding
0819B_01	General Use	Total Phosphorus	0.69 mg/L	CS (Carry Forward)
0819B_01	General Use	Nitrate	1.95 mg/L	CS (Carry Forward)

At the time of this report, there is insufficient data collected from Assessment Unit 0819B_01 to appropriately address the concerns listed in the 2022 TCEQ Integrated Report. However, there is a wastewater treatment plant located upstream of Station 10825 which could be assessed as a possible source of the concerns in the future when more data is made available for analysis.

0819 East Fork Trinity River

This 30-mile segment stretches from the Rockwall-Forney Dam in Kaufman County to the confluence of the Main Stem Trinity River in Kaufman County (see Figure 107). Hay, pasture, and crop land make up most of the land use in the watershed. There are also woody wetlands adjacent to the river. There are some areas of development by the cities of Mesquite, Balch Springs, Forney, Seagoville, Crandall, and Combine. The Floodplains and Low Terraces ecoregion makes up the immediate watershed around the river while the tributaries flow through the Northern Blackland Prairie.

Clean Rivers Program water quality monitoring is being conducted at two sites within this segment as shown in Table 172. Monitoring is being conducted by TCEQ Region 4. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 172: FY2023 Monitoring stations in Segment 0819

Assessment Unit	Station Description	Station ID	Collecting Entity
0819_01	EAST FORK TRINITY RIVER AT US 175 NW OF CRANDALL RIVER KM 20.3	10991	TCEQ Region 4
0819_01	EAST FORK TRINITY RIVER AT US 80 NORTHWEST OF FORNEY	10996	TCEQ Region 4

A summary of the concerns and impairments identified in the TCEQ 2022 Texas Integrated Report is shown in Table 173.

Table 173: Findings of TCEQ 2022 Texas Integrated Report for Segment 0819

Assessment Unit	Use	Parameter	Criteria	Finding
0819_01	General Use	Nitrate	1.95 mg/L	CS
0819_01	General Use	Total Phosphorus	0.69 mg/L	CS
0819_01	General Use	Chlorophyll-*a*	14.1 ug/L	CS
0819_01	Recreation Use	*E. coli*	126 MPN/100 mL	NS

An impairment was identified in this segment due to elevated levels of *E. coli*. Monitoring has been conducted at two stations in this segment; 10996 is in the upstream portion of the segment and 10991 is located near the middle of the segment. As shown in Figure 117, *E. coli* levels were regularly reported above the standard of 126 MPN/100 mL. However, there has been a downward trend in overall *E. coli* values. When evaluated throughout the entire data set, Figure 117 could indicate that there is a relationship between drought conditions and *E. coli* values. As the drought intensifies, there is a drop in *E. coli* values, and inversely when the drought breaks. This could indicate that there is dilution coming from reservoir releases during wetter conditions. There was no correlation between flow and *E. coli* at these stations. This indicates that there were constant sources of bacteria into the stream. There is no evidence of livestock trails leading to the river. Therefore, livestock were likely not a primary source of bacteria. There is a heavily wooded wetland riparian area along the river. This indicates that wildlife may have been contributing to the impairment.

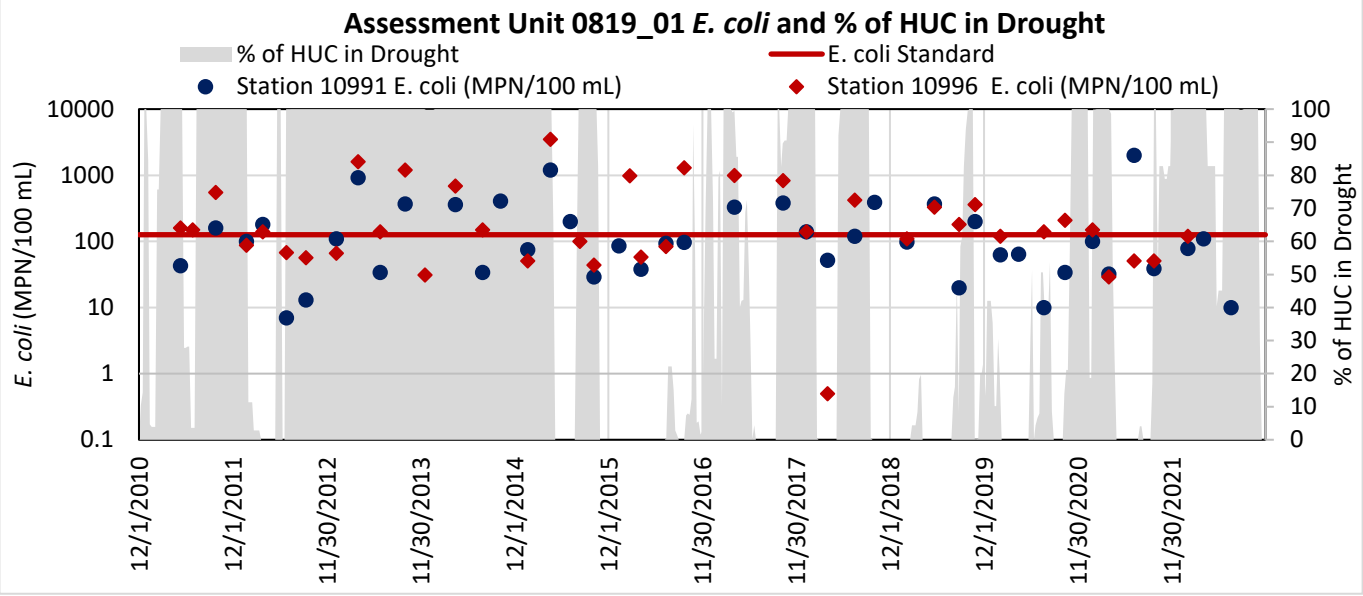

Figure 117: Assessment Unit 0819_01 E. coli and % of HUC in Drought

Concerns were identified for Nitrate and Total Phosphorus for this assessment unit as well. As shown in Figure 118, levels of these parameters were reported at higher levels when flows were low and decreased with increasing flows. As discussed for other segments, this pattern is commonly seen in effluent-dominated streams as many wastewater treatment facilities do not have advanced nutrient removal. There are several wastewater treatment facilities upstream of both stations that are contributing to these concerns. Trend analysis identified decreasing trends

for both of these parameters as well. Based on the presumption that the wastewater treatment facilities are the source of nutrients in this segment, the decreases may be due to upgrades and better treatment technology at these facilities.

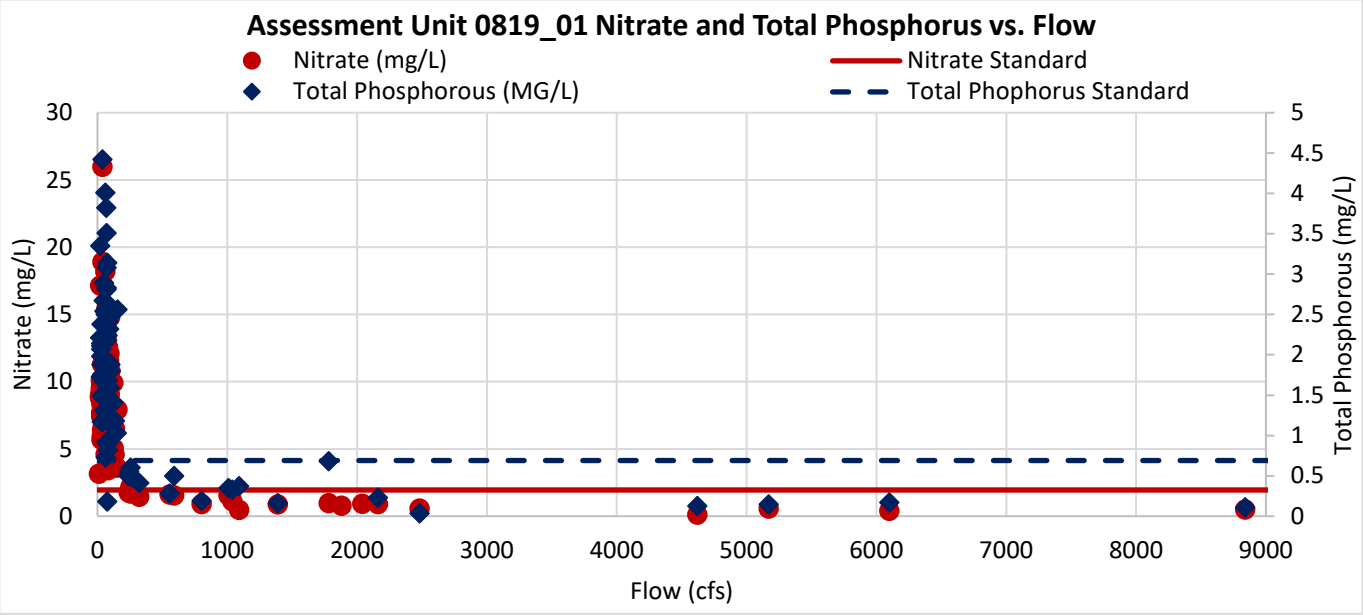

Figure 118: Assessment Unit 0819_01 Nitrate and Total Phosphorus vs. Flow

A concern was identified for Chlorophyll-*a* in this segment. However, there were no strong correlations between Chlorophyll-*a* and nutrients for either of the stations in this segment. As shown in Figure 119, 39% of Chlorophyll-*a* data was reported over the screening level of 14.1 ug/L before 2018. Since 2018 however, only 20% of Chlorophyll-*a* data was reported over the screening level. At this time, the cause for the decrease is unknown, but ongoing monitoring may provide additional insight in the future.

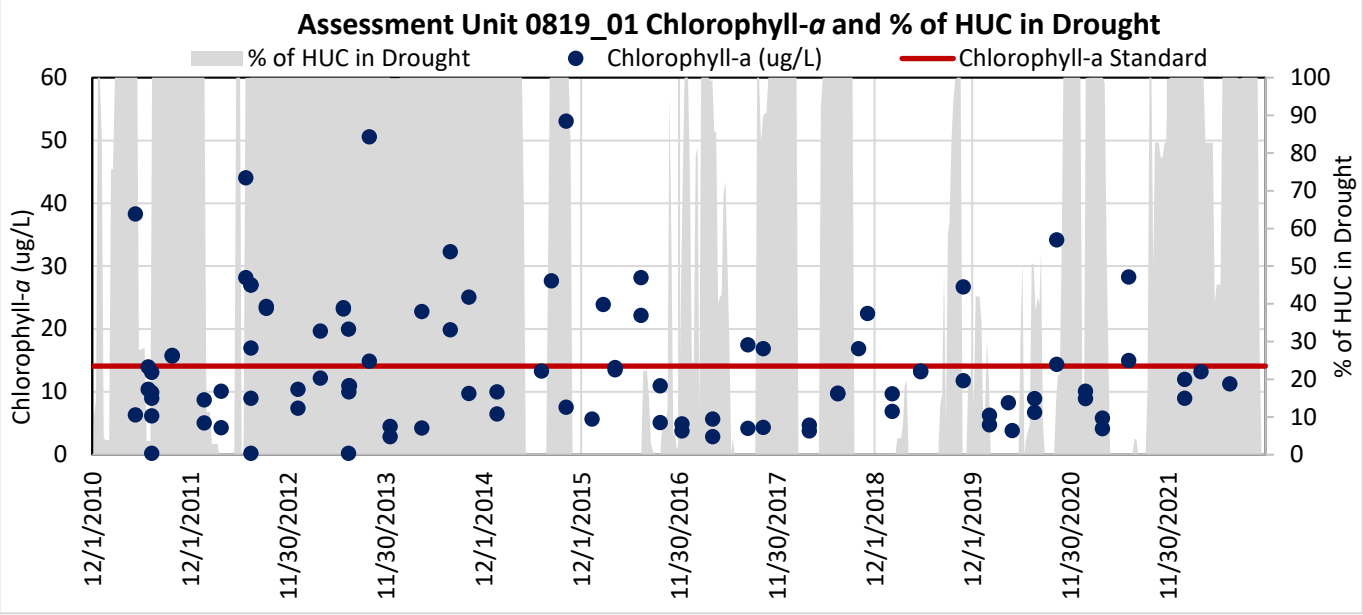

Figure 119: Assessment Unit 0819_01 Chlorophyll-a and % of HUC in Drought

Cedar Creek

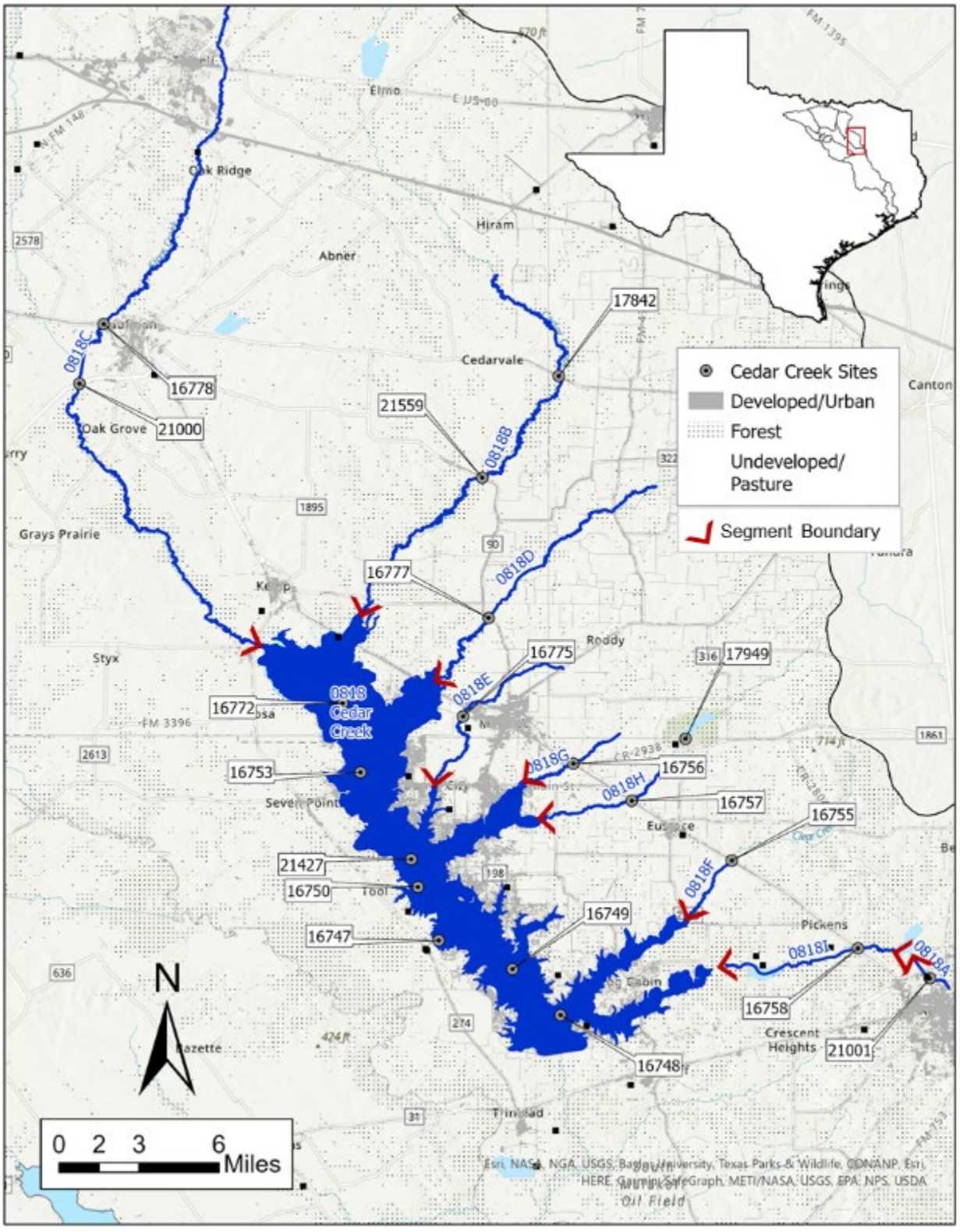

Figure 120: Map of segments and stations of the Cedar Creek subwatershed

0818C Kings Creek

This 46.5-mile unclassified segment runs from the headwaters adjacent to FM 986 approximately 5 km north of Terrell in Kaufman County to the confluence with Cedar Creek Reservoir at normal pool elevation upstream (see Figure 120). A majority of the watershed is rural with pasture and hay land being the predominate land use. There are a few crop fields located toward the middle of the watershed and some development around the cities of Terrell, Kaufman, and Kemp. The stream flows through the Northern Blackland Prairie ecoregion.

Clean Rivers Program water quality monitoring is being conducted at one site within this segment as shown in Table 174. Monitoring is being conducted by Tarrant Regional Water District. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 174: FY2023 Monitoring stations in Segment 0818C

Assessment Unit	Station Description	Station ID	Collecting Entity
0818C_01	KINGS CREEK AT SH34 UPSTREAM OF CEDAR CREEK RESERVOIR SOUTHWEST OF KAUFMAN 3.44 KM SOUTHWEST ON SH34 FROM US175	21000	Tarrant Regional Water District

A summary of the concerns and impairments identified in the TCEQ 2022 Texas Integrated Report is shown in Table 175.

Table 175: Findings of TCEQ 2022 Texas Integrated Report for Segment 0818C

Assessment Unit	Use	Parameter	Criteria	Finding
0818C_01	General Use	Total Phosphorus	0.69 mg/L	CS
0818C_01	General Use	Nitrate	1.95 mg/L	CS
0818C_01	Recreation Use	*E. coli*	126 MPN/100 mL	NS

An impairment due to elevated levels of *E. coli* was identified in this segment. As seen in Figure 121, 79% of data collected were above the *E. coli* Standard of 126. *E. coli* values were also unaffected by drought conditions throughout the sampling period for this report.

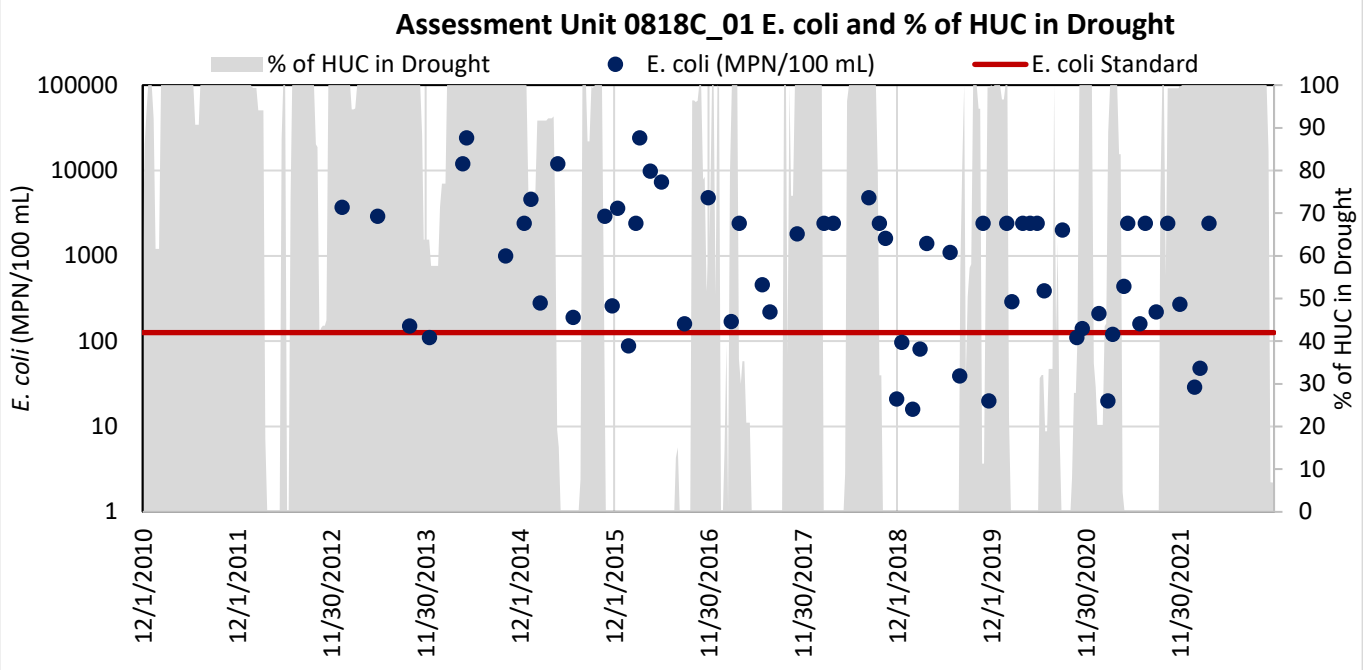

Figure 121: Assessment Unit 0818C_01 E. coli and % of HUC in Drought

This indicates that there were both constant sources of *E. coli* into the stream during all weather conditions and when flows were low and runoff related inputs during wet weather when flows increased. There is a relatively dense riparian zone upstream of both of these stations. Based on Google Earth imagery, there did not appear to be evidence of livestock trails leading directly to the stream but this may have been masked by tree cover. Therefore, it is likely that wildlife and potentially livestock were visiting the stream for watering and contributing to the bacterial load during dry weather. There was evidence of livestock trails in the pastures of the watershed which points to runoff containing waste from both livestock and wildlife being washed into the stream. Improperly functioning septic systems in the watershed may have also contributed to the impairment. It is recommended that upstream sampling be conducted to determine if a source can be identified. Landowner education and livestock best management practices may help reduce bacterial loads from livestock sources.

Concerns for elevated levels of Nitrate and Total Phosphorus were identified in this stream. The data was collected at Station 21000 and were accompanied by USGS flow data. Figure 122 shows that Nitrate and Phosphorus levels were generally higher during low flows. This pattern is commonly seen in waterbodies downstream of wastewater treatment facilities as effluent can be nutrient rich and most facilities do not have advanced nutrient removal systems. There are at least six wastewater treatment facilities on the tributaries upstream of monitoring station 21000. The correlation between Nitrate and flow was much better than for Total Phosphorus and flow. This seems to imply that Nitrate sources were largely from the wastewater treatment facilities but that there were other sources for Total Phosphorus. Because there were some slightly elevated Total Phosphorus levels reported during higher flows, there may be runoff related sources contributing to this concern. Based on land use, those sources could be Phosphorus fertilizers. Landowner education and fertilizer best management practices may help address the Total Phosphorus concern in this stream.

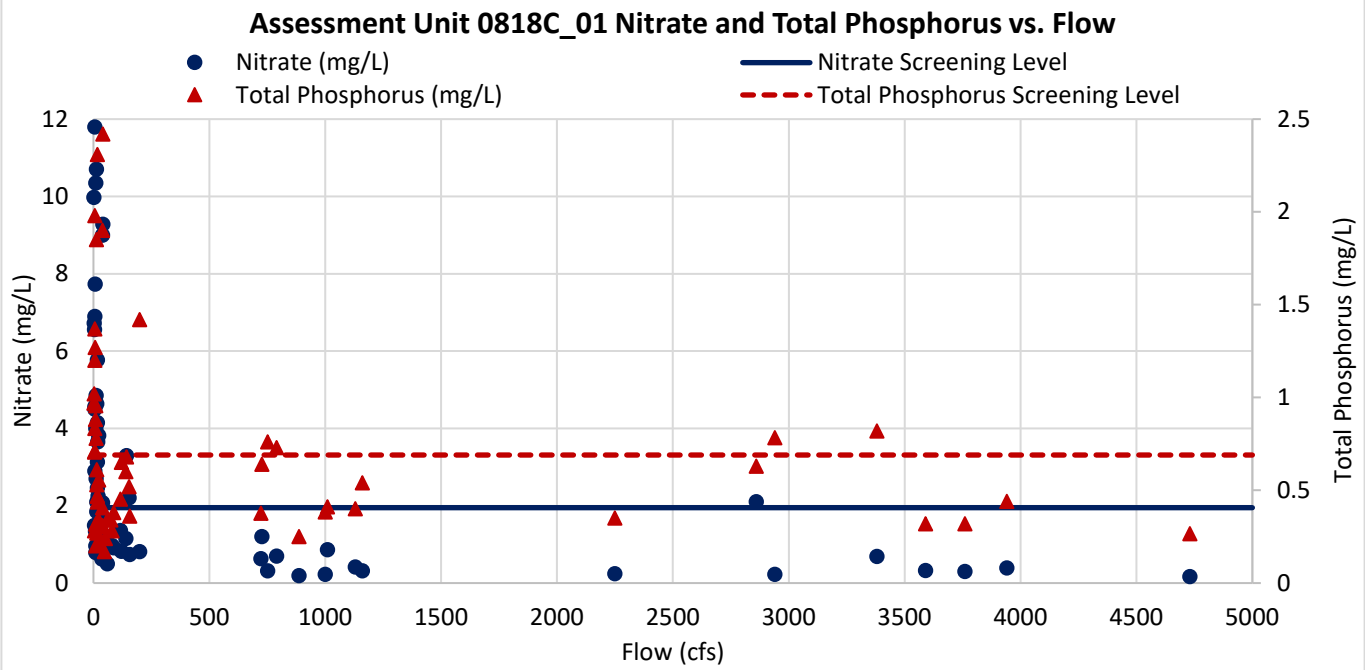

Figure 122: Assessment Unit 0818C_01 Nitrate and Total Phosphorus vs. Flow

0818B Cedar Creek above Cedar Creek Reservoir

This 32.4-mile unclassified segment runs from the confluence of Muddy Cedar Creek and Rocky Cedar Creek in Kaufman County to the confluence with Cedar Creek Reservoir at normal pool elevation upstream (see Figure 120). A majority of the watershed contains hay and pasture land with woody wetland riparian areas along the stream. It drains the Northern Post Oak Savanna ecoregion.

Clean Rivers Program water quality monitoring is being conducted at one site within this segment as shown in Table 176. Monitoring is being conducted by Tarrant Regional Water District. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 176: FY2023 Monitoring stations in Segment 0818B

Assessment Unit	Station Description	Station ID	Collecting Entity
0818B_01	CEDAR CREEK AT FM 1836 NORTHEAST OF KEMP	21559	Tarrant Regional Water District

A summary of the concerns and impairments identified in the TCEQ 2022 Texas Integrated Report is shown in Table 177.

Table 177: Findings of TCEQ 2022 Texas Integrated Report for Segment 0818B

Assessment Unit	Use	Parameter	Criteria	Finding
0818B_01	Recreation Use	*E. coli*	126 MPN/100 mL	NS

E. coli had been identified as a concern for this Assessment Unit. 94% of reported data was over the standard of 126 MPN/ML, as seen in Figure 123. There was no strong correlation between *E. coli* and drought, nor was there a strong correlation between *E. coli* and flow. This would suggest that run off is not a significant contributing factor and indicates that there were constant sources of bacteria into the stream. There are wooded riparian areas upstream of both stations. In addition, based on Google Earth imagery, there is evidence of livestock trails entering the stream. It is likely that wildlife and livestock visiting the stream for watering were contributing to this impairment. Landowner education and livestock best management practices may help reduce bacteria levels in this stream.

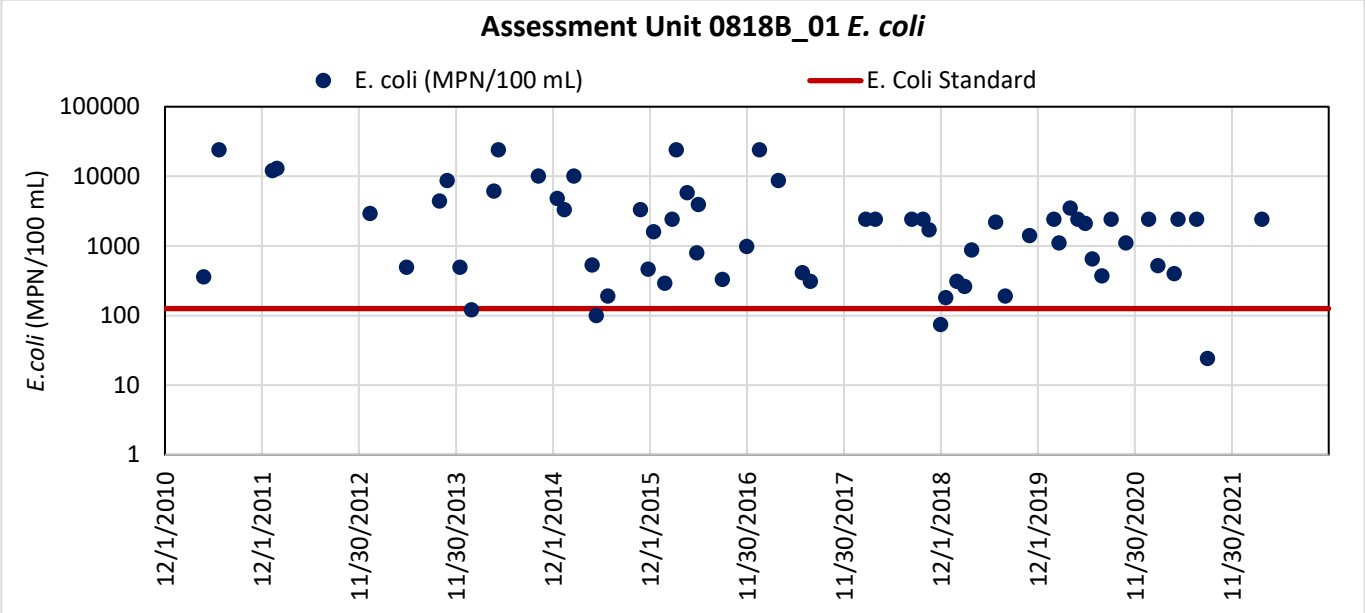

Figure 123: Assessment Unit 0818B_01 E. coli

0818D Lacy Fork

This 18.2-mile unclassified segment runs from the confluence of Dry Lacy Fork and Wet Lacy Fork in Van Zandt County to the confluence with Cedar Creek Reservoir at normal pool elevation (see Figure 120). A majority of the watershed contains hay and pasture land with woody wetland riparian areas along portions of the stream. It drains the Northern Post Oak Savanna ecoregion.

Clean Rivers Program water quality monitoring is being conducted at one site within this segment as shown in Table 178. Monitoring is being conducted by Tarrant Regional Water District. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 178: FY2023 Monitoring stations in Segment 0818D

Assessment Unit	Station Description	Station ID	Collecting Entity
0818D_01	LACY FORK CREEK 25 METERS UPSTREAM OF FM 90 5.9KM UPSTREAM OF CEDAR CREEK RESERVOIR	16777	Tarrant Regional Water District

A summary of the concerns and impairments identified in the TCEQ 2022 Texas Integrated Report is shown in Table 179.

Table 179: Findings of TCEQ 2022 Texas Integrated Report for Segment 0818D

Assessment Unit	Use	Parameter	Criteria	Finding
0818D_01	Recreation Use	*E. coli*	126 MPN/100 mL	NS

The Integrated Report identified a concern due to elevated levels of *E. coli*. There was no measured flow data available at this station however there was a correlation between *E. coli* and flow severity as shown in Figure 124 with some higher concentrations being reported at higher flow severities. Please note that flow severity data has been recategorized to reflect incremental increases in flow from dry to flood. As with previous segments in this watershed, *E. coli* levels were almost always reported above the standard of 126 MPN/100 mL indicating that there were constant sources of *E. coli* into the stream. Based on Google Earth imagery, there was evidence of livestock trails entering the stream directly upstream of monitoring station 16777 at FM 90 as well as many other locations upstream. It is likely that livestock entering the stream for watering were contributing bacteria at lower flows and runoff containing livestock waste from the pastures were washing bacteria into the stream at higher flows. Landowner education and livestock best management practices may reduce bacteria levels in this segment. It is recommended that flow be measured at this station in order to further clarify this concern in the future.

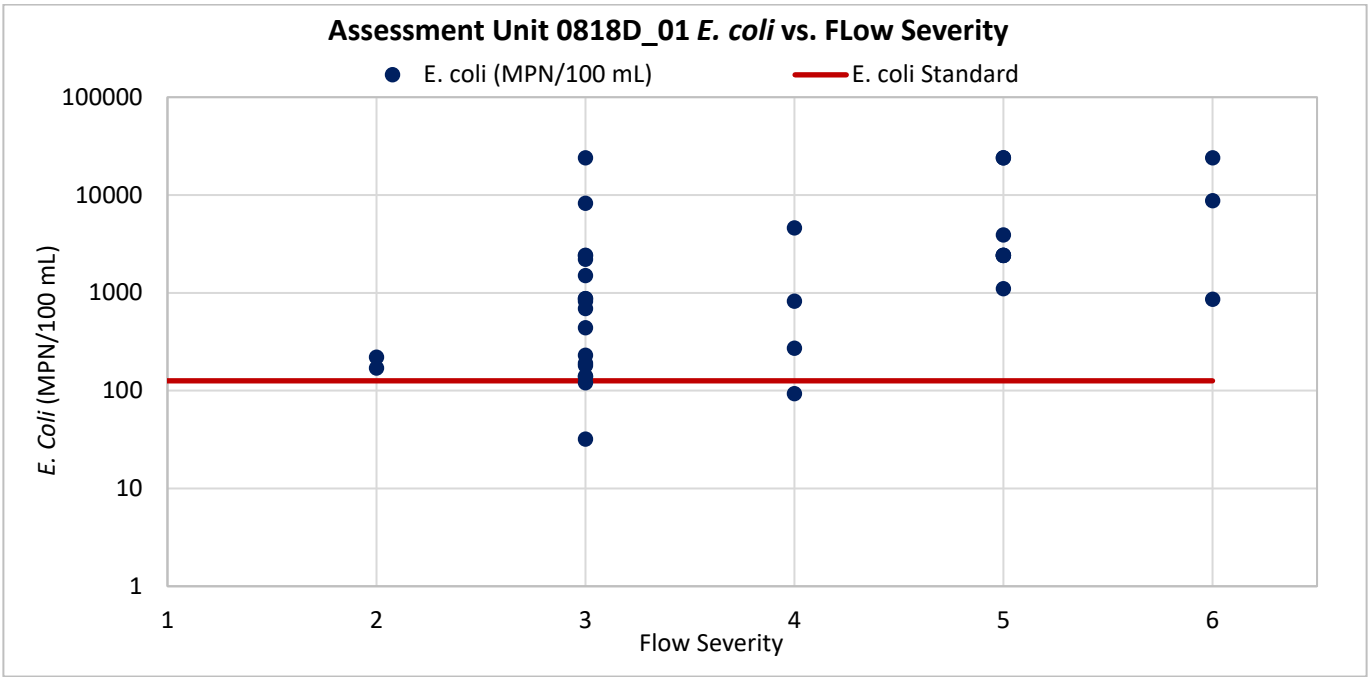

Figure 124: Assessment Unit 0818D_01 E. coli vs. Flow Severity

0818E Prairie Creek

This 10.4-mile stream runs from the headwaters adjacent to SH 198 in Van Zandt County to the confluence with Cedar Creek Reservoir at normal pool elevation (see Figure 120). A majority of the watershed contains hay and pasture land with woody wetland riparian areas along the

stream. There is development around the cities of Mabank and Gun Barrel City. The stream drains the Northern Post Oak Savanna ecoregion.

Clean Rivers Program water quality monitoring is being conducted at one site within this segment as shown in Table 180. Monitoring is being conducted by Tarrant Regional Water District. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 180: FY2023 Monitoring stations in Segment 0818E

Assessment Unit	Station Description	Station ID	Collecting Entity
0818E_01	PRAIRIE CREEK AT KAUFMAN CR 4006/RODEO ROAD 5.7 KM UPSTREAM OF CEDAR CREEK RESERVOIR WEST OF MABANK	16775	Tarrant Regional Water District

No impairments or concerns for aquatic life, recreation, or general uses were identified in this segment.

0818G North Twin Creek

This 5.9-mile segment runs from 3 km northeast of the intersection of highway 175 to the confluence with Twin Creeks cove (see Figure 120). A majority of the watershed contains hay and pasture land with woody wetland riparian areas along portions of the stream. It drains the Northern Post Oak Savanna ecoregion.

Clean Rivers Program water quality monitoring is being conducted at one site within this segment as shown in Table 181. Monitoring is being conducted by Tarrant Regional Water District. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 181: FY2023 Monitoring stations in Segment 0818G

Assessment Unit	Station Description	Station ID	Collecting Entity
0818G_01	NORTH TWIN CREEK AT US 175 3.3KM UPSTREAM OF CEDAR CREEK RESERVOIR	16756	Tarrant Regional Water District

A summary of the concerns and impairments identified in the TCEQ 2022 Texas Integrated Report is shown in Table 182.

Table 182: Findings of TCEQ 2022 Texas Integrated Report for Segment 0818G

Assessment Unit	Use	Parameter	Criteria	Finding
0818G_01	Recreation Use	*E. coli*	126 MPN/100 mL	NS

A concern due to elevated levels of *E. coli* was identified in this segment. There was no measured flow data available at this station, with little correlation between drought data and flow

severity in the assessment unit. As with previous segments in this watershed, *E. coli* levels were almost always reported above the standard of 126 MPN/100 mL, as shown in Figure 125, indicating that there were constant sources of *E. coli* into the stream. Based on Google Earth imagery, there was evidence of livestock trails entering the stream just upstream of monitoring station 16756 at US 175. It is likely that livestock entering the stream for watering were contributing bacteria at lower flows and runoff containing livestock waste from the pastures were washing bacteria into the stream at higher flows. Landowner education and livestock best management practices may reduce bacteria levels in this segment. It is recommended that flow be measured at this station in order to further clarify this concern in the future.

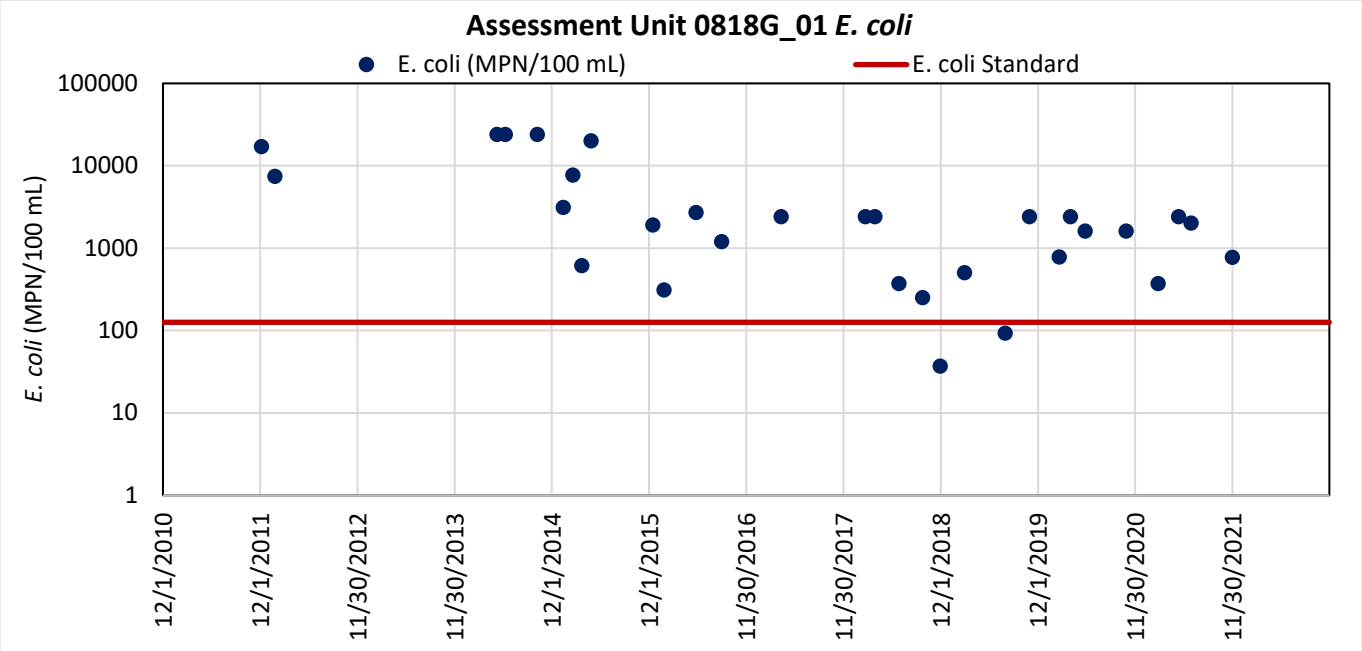

Figure 125: Assessment Unit 0818G_01 E. coli

0818J Purtis Creek State Park Lake

This 356-acre reservoir impounds Purtis Creek and lies 3-miles north of Eustace in Henderson County and Van Zandt County (see Figure 120). A majority of the watershed contains hay and pasture land with mixed forest and woody wetland around the reservoir. It drains the Northern Post Oak Savanna ecoregion.

Clean Rivers Program water quality monitoring is being conducted at one site within this segment as shown in Table 183. Monitoring is being conducted by TCEQ Region 5. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 183: FY2023 Monitoring stations in Segment 0818

Assessment Unit	Station Description	Station ID	Collecting Entity
0818	PURTIS CREEK LAKE IN MAIN POOL 590 METERS NORTH AND 300 METERS W OF INTERSECTION OF CR 2938 AND FM 316 5.4 KM N OF EUSTACE	17949	TCEQ Region 5

No impairments or concerns for aquatic life, recreation, or general uses were identified in this segment.

0818H South Twin Creek

This 6.9-mile unclassified segment runs from 3.15 km northeast of where the waterbody intersects highway 175 to the confluence with Twin Creeks cove upstream (see Figure 120). A majority of the watershed contains hay and pasture land with woody wetland riparian areas along portions of the stream. It drains the Northern Post Oak Savanna ecoregion.

Clean Rivers Program water quality monitoring is being conducted at one site within this segment as shown in Table 184. Monitoring is being conducted by Tarrant Regional Water District. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 184: FY2023 Monitoring stations in Segment 0818H

Assessment Unit	Station Description	Station ID	Collecting Entity
0818H_01	SOUTH TWIN CREEK AT US 175 5.0KM UPSTREAM OF CEDAR CREEK RESERVOIR	16757	Tarrant Regional Water District

A summary of the concerns and impairments identified in the TCEQ 2022 Texas Integrated Report is shown in Table 185.

Table 185: Findings of TCEQ 2022 Texas Integrated Report for Segment 0818H

Assessment Unit	Use	Parameter	Criteria	Finding
0818H_01	Recreation Use	*E. coli*	126 MPN/100 mL	CN

A concern due to elevated levels of *E. coli* was identified in this segment. There was no measured flow data available at this station. *E. coli* levels were almost always reported above the standard of 126 MPN/100 mL, as shown in Figure 126, but there appeared to be decreases in concentrations at higher flow severities. This may have been caused by timing of sample collection in relation to the hydrograph. Concentrations of pollutants are generally higher on the rising limb of the hydrograph than at corresponding flows on the falling limb of the hydrograph. It is likely that the same mechanisms influencing *E. coli* levels in the other segments in this subwatershed were influencing levels in this stream. Based on Google Earth imagery, there was evidence of livestock trails entering the stream just upstream of monitoring station 16757 at US 175. It is likely that livestock entering the stream for watering were contributing bacteria at lower flows and runoff containing livestock waste from the pastures were washing bacteria into the stream at higher flows. Landowner education and livestock best management practices may reduce bacteria levels in this segment. It is recommended that flow be measured at this station in order to further clarify this concern in the future.

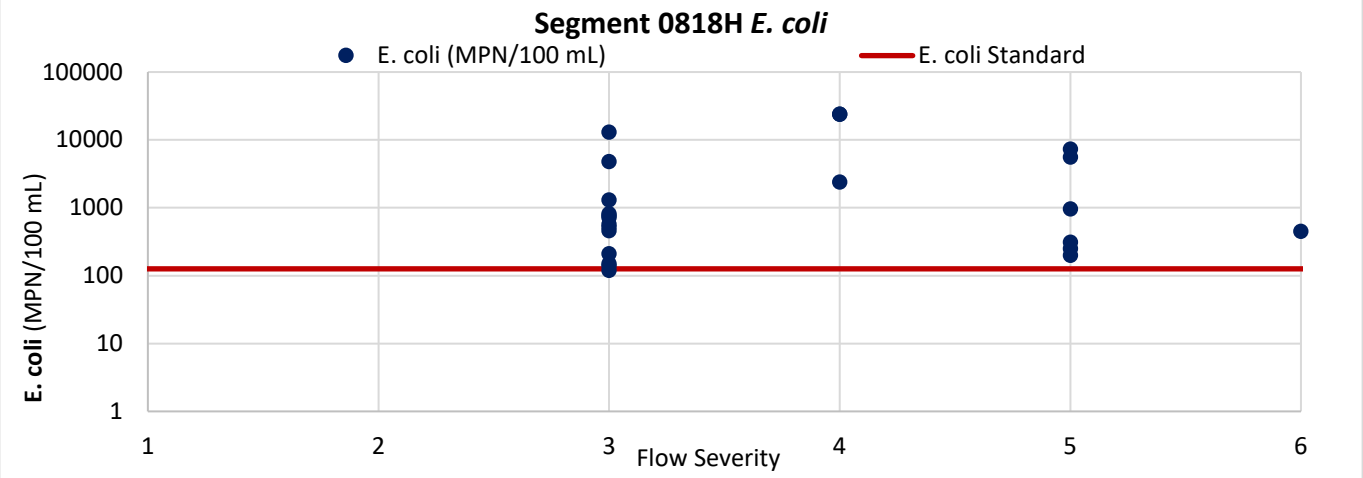

Figure 126: Segment 0818H E. coli

0818F Clear Creek

This 3.4-mile unclassified segment runs from US 175 to the confluence with Clear Creek Cove (see Figure 120). A majority of the watershed contains hay and pasture land with woody wetland riparian areas along portions of the stream. It drains the Northern Post Oak Savanna ecoregion.

Clean Rivers Program water quality monitoring is being conducted at one site within this segment as shown in Table 186. Monitoring is being conducted by Tarrant Regional Water District. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 186: FY2023 Monitoring stations in Segment 0818F

Assessment Unit	Station Description	Station ID	Collecting Entity
0818F_01	CLEAR CREEK AT US 175 4.3 KM UPSTREAM OF CEDAR CREEK RESERVOIR	16755	Tarrant Regional Water District

A summary of the concerns and impairments identified in the TCEQ 2022 Texas Integrated Report is shown in Table 187.

Table 187: Findings of TCEQ 2022 Texas Integrated Report for Segment 0818F

Assessment Unit	Use	Parameter	Criteria	Finding
0818F_01	Recreation Use	*E. coli*	126 MPN/100 mL	CN

The Integrated Report identified a concern due to elevated levels of *E. coli*. There was no measured flow data available at this station however there was a correlation between *E. coli* and flow severity (correlation coefficient = 0.405) as shown in Figure 127 with some higher concentrations being reported at higher flow severities. As with previous segments in this watershed, *E. coli* levels were routinely reported above the standard of 126 MPN/100 mL indicating that there were constant sources of *E. coli* into the stream. Based on Google Earth

imagery, there were wooded riparian areas upstream of monitoring station 16755 at US 175. There was also evidence of several livestock trails entering the stream in the wooded area just upstream of the monitoring station. It is likely that livestock entering the stream for watering were contributing bacteria at lower flows and runoff containing livestock waste from the pastures were washing bacteria into the stream at higher flows. Landowner education and livestock best management practices may reduce bacteria levels in this segment. It is recommended that flow be measured at this station in order to further clarify this concern in the future.

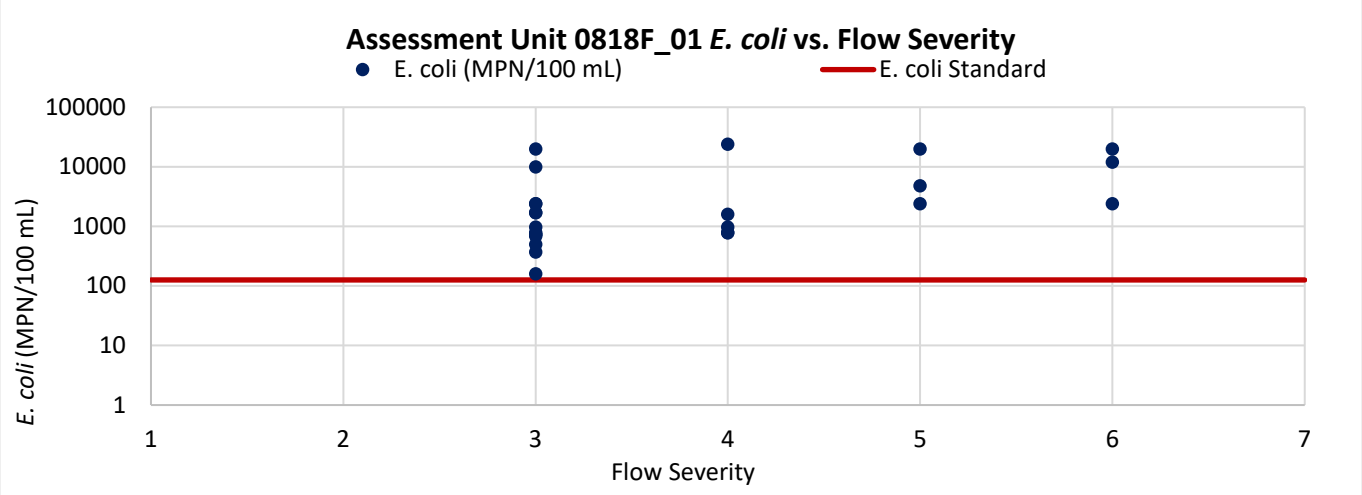

Figure 127: Assessment Unit 0818F_01 E. coli vs. Flow Severity

0818I Caney Creek

This 7.4-mile unclassified segment runs from the dam on Third Caney Creek approximately 1.8 km north of the intersection of SH 7 and US 175 in Athens to the confluence with Cedar Creek Reservoir (see Figure 120). A majority of the watershed contains hay and pasture land with woody wetland riparian areas along portions of the stream. There is some development along the outskirts of the City of Athens. Its watershed flows through the Northern Post Oak Savanna ecoregion.

Clean Rivers Program water quality monitoring is being conducted at one site within this segment as shown in Table 188. Monitoring is being conducted by Tarrant Regional Water District. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 188: FY2023 Monitoring stations in Segment 0818I

Assessment Unit	Station Description	Station ID	Collecting Entity
0818I_01	CANEY CREEK AT US 175 8.4KM UPSTREAM OF CEDAR CREEK RESERVOIR NORTHWEST OF ATHENS	16758	Tarrant Regional Water District

A summary of the concerns and impairments identified in the TCEQ 2022 Texas Integrated Report is shown in Table 189.

Table 189: Findings of TCEQ 2022 Texas Integrated Report for Segment 0818I

Assessment Unit	Use	Parameter	Criteria	Finding
0818I_01	Recreation Use	*E. coli*	126 MPN/100 mL	CN

A concern due to elevated levels of *E. coli* was identified in this segment. There was no measured flow data available at this station however there was a weak correlation between *E. coli* and flow severity (correlation coefficient = 0.373) as shown in Figure 128. *E. coli* levels were regularly reported above the standard of 126 MPN/100 mL. Based on this information, it is likely that there were both constant and runoff related sources of bacteria into the stream. There is small densely wooded riparian area just upstream of monitoring station 16758 at US 175 and a fairly large pond less than two miles upstream. There is evidence of livestock trails along the periphery of the riparian area immediately upstream of the monitoring station in Google Earth imagery. Although the tree cover is too dense to determine if livestock trails lead to the stream, it is almost certain that livestock were visiting the stream in this area for watering and contributing to the bacterial load. There is evidence of livestock trails leading into the upstream pond as well as several houses along the shores. Both livestock and improperly functioning septic systems may be introducing bacteria into the pond which then drains to the stream. Landowner and homeowner education as well as livestock best management practices may help reduce bacteria levels in this stream. It is also recommended that flow be measured at station 16758 in order to further clarify this concern in the future.

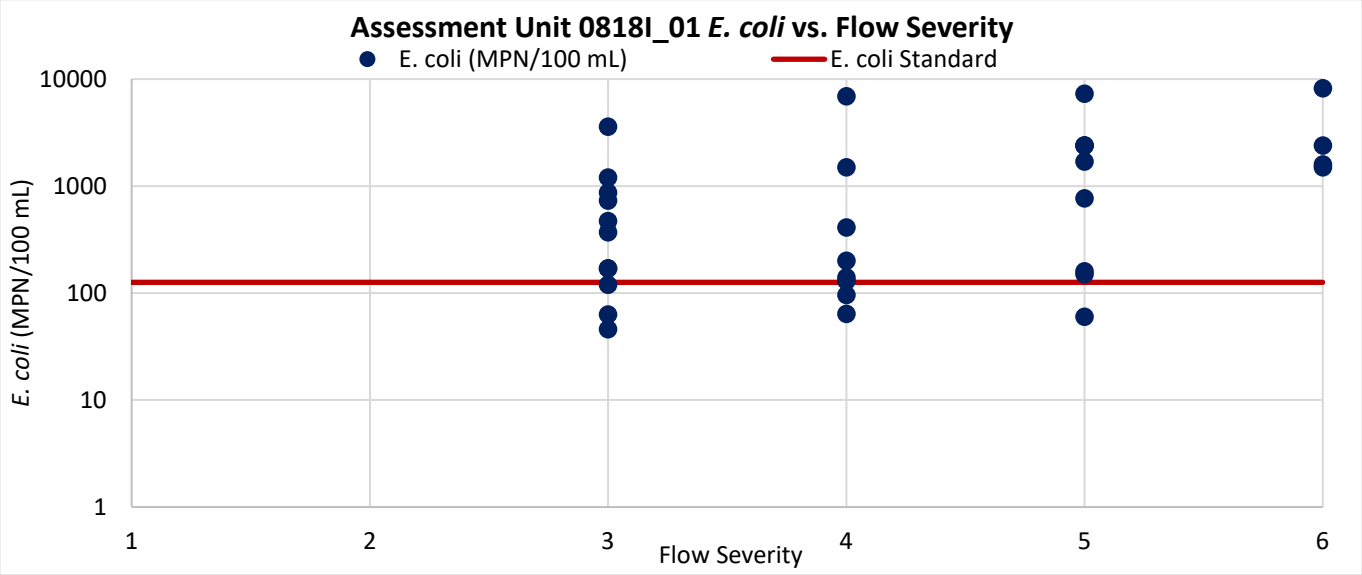

Figure 128: Assessment Unit 0818I_01 E. coli vs. Flow Severity

0818A One Mile Creek

This 2-mile unclassified segment runs from the confluence with an unnamed tributary 0.8 km upstream of SH 19 near Athens to the confluence with Valley View Reservoir (see Figure 120). The upstream end of the stream drains the developed City of Athens while the downstream

portion drains hay and pasture land. The watershed lies within the Northern Post Oak Savanna ecoregion.

There is no Clean Rivers Program monitoring scheduled in this segment for FY 2023.

No impairments or concerns for aquatic life, recreation, or general uses were identified in this segment.

0818 Cedar Creek Reservoir

This 32,900-acres reservoir impounds Cedar Creek from the Joe B. Hoggsett Dam in Henderson County up to a normal pool elevation of 322 feet (see Figure 120). The watershed is largely rural with hay and pasture land being the predominate land use especially to the east of the reservoir. To the west of the reservoir, there are some grasslands and small patches of forest. The shores of the reservoir are developed and contain mostly residential communities around the cities of Kemp, Mabank, Gun Barrel City, Seven Points, Tool, Enchanted Oaks, Log Cabin, and Star Harbor. The reservoir lies within the Northern Post Oak Savanna ecoregion.

Clean Rivers Program water quality monitoring is being conducted at six sites within this segment as shown in Table 190. Monitoring is being conducted by Tarrant Regional Water District. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 190: FY2023 Monitoring stations in Segment 0818

Assessment Unit	Station Description	Station ID	Collecting Entity
0818_01	CEDAR CREEK RESERVOIR 710 M W AND 1.01 M W OF INTERSECTION OF WOODLAWN WAY AND SUNSET BLVD AT CONFLUENCE OF CANEY CK AND CLEAR CK COVES	16748	Tarrant Regional Water District
0818_04	CEDAR CREEK RESERVOIR 1.01 KM S & 1.34 KM WEST OF INTERSECTION OF CAROLYNN ROAD & OAKVIEW TRAIL	16749	Tarrant Regional Water District
0818_06	CEDAR CREEK RESERVOIR 12 M N AND 586 METERS EAST OF INTERSECTION OF ASHBY LANE AND BURLEY LOOP	16747	Tarrant Regional Water District
0818_09	CEDAR CREEK RESERVOIR 1.42 KM NORTH AND 1.37 KM EAST OF INTERSECTION OF NOB HILL ROAD AND SH 334	16753	Tarrant Regional Water District
0818_11	CEDAR CREEK RESERVOIR NORTH MID LAKE 800 M NORTH AND 2.59 KM EAST OF INTERSECTION OF KAUFMAN CR 4042 AND KAUFMAN CR 4043	16772	Tarrant Regional Water District
0818_14	CEDAR CREEK RESERVOIR 1.07 KM EAST AND 40 METERS NORTH OF THE INNER CIRCLE UPPER CHANNEL NEAR INTERSECTION OF HEATHER WOODS DRIVE AND LEISA PLACE IN THE CITY OF TOOL	21427	Tarrant Regional Water District

A summary of the concerns and impairments identified in the TCEQ 2022 Texas Integrated Report is shown in Table 191.

Table 191: Findings of TCEQ 2022 Texas Integrated Report for Segment 0818

Assessment Unit	Use	Parameter	Criteria	Finding
0818_02	General Use	pH	8.5	NS (Carry Forward)
0818_03	General Use	pH	8.5	NS (Carry Forward)
0818_04	General Use	pH	8.5	NS (Carry Forward)
0818_05	General Use	pH	8.5	NS (Carry Forward)
0818_06	Aquatic Life Use	Dissolved oxygen Grab	5 mg/L	CS
0818_07	General Use	pH	8.5	NS (Carry Forward)
0818_08	General Use	pH	8.5	NS (Carry Forward)
0818_09	General Use	pH	8.5	NS
0818_11	General Use	pH	8.5	NS
0818_12	General Use	pH	8.5	NS (Carry Forward)
0818_13	Aquatic Life Use	Dissolved oxygen Grab	5 mg/L	CS (Carry Forward)

Impairments for elevated pH was identified for several assessment units in this reservoir, several of which were carried forward from previous assessments. Overall, pH data in this reservoir ranged from 6.8 to 9.4 S.U. with 19% of the data being reported above the high pH standard of 8.5 S.U. For all stations in all assessment units, pH is moderately correlated to Chlorophyll-*a* (correlation coefficient = 0.49) which indicated that algal populations are affecting pH levels in this reservoir. However, Chlorophyll-*a* was not well correlated to nutrients; with the exception of Total Phosphorus in Assessment Unit 0818_06 near the outlet (correlation coefficient = 0.44). This is not unexpected as long residence times in reservoirs allow algal populations to increase and there are several wastewater treatment facilities in the watershed. It is interesting to note that pH was moderately correlated to drought conditions and reservoir elevations in Assessment Units 0818_09 and 0818_11 which are at the upper end of the reservoir and receive inputs from the three largest tributaries to the reservoir; Kings Creek, Cedar Creek, and Lacy Fork. There were positive correlations with drought conditions (correlation coefficients = 0.42 for both assessment units) and negative correlations with reservoir elevation (correlation coefficient = -0.48 and -0.49, respectively). This indicates that pH levels increased as drought conditions increased and reservoir levels decreased. Again, this is not unexpected as, under these conditions, released from the reservoir are reduced and residence times are increased.

There were concerns for low Dissolved Oxygen identified in Assessment Units 0818_06 and 0818_13. The concern for 0818_13 was carried forward from previous assessments as there is no current monitoring in this assessment unit. However, in 0818_06, Dissolved Oxygen was correlated to both Water Temperature and Chlorophyll-*a* (correlation coefficients = -0.76 and 0.43, respectively). Twelve of the 15 Dissolved Oxygen values reported below the screening level of 5 mg/L for the entire reservoir were recorded in 0818_06. As this assessment unit is located near the outlet, the water in this portion of the reservoir could reasonably be expected to have been affected by algal populations and water temperatures for the longest period of time, therefore having the lowest Dissolved Oxygen levels.

Richland-Chambers

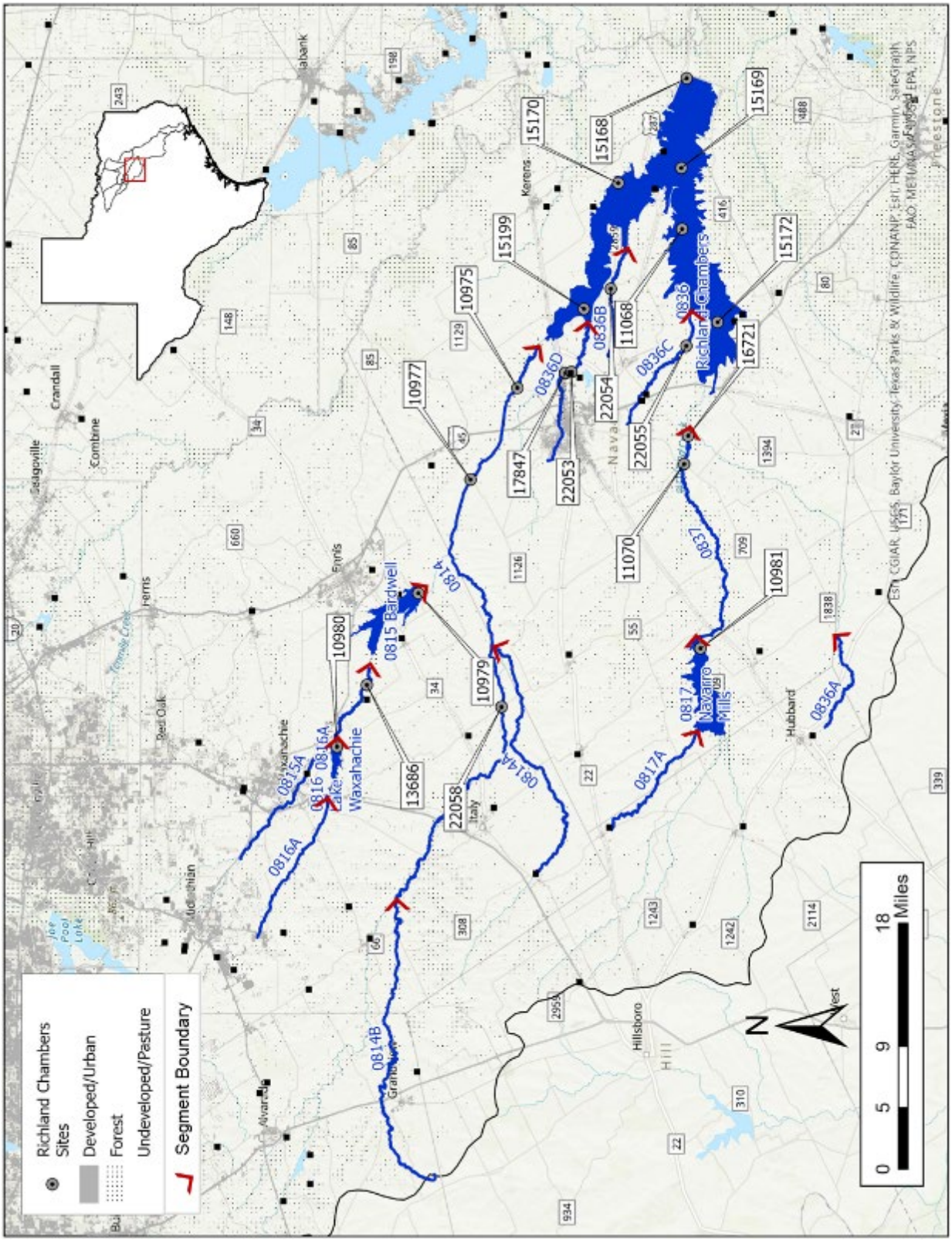

Figure 129: Map of segments and stations of the Richland-Chambers subwatershed

0816A South Prong Creek

This 12.2-mile stream runs from the upper end of the creek in Midlothian to the confluence with Lake Waxahachie (see Figure 129). The most upstream portion of the stream drains the developed areas on the outskirts of the City of Midlothian. The remainder of the watershed is rural with a mix of grass, hay, pasture, and crop land. There are some wooded areas near the middle of the watershed. The stream drains the Northern Blackland Prairie ecoregion.

There is no Clean Rivers Program monitoring scheduled in this segment for FY 2023.

No impairments or concerns for aquatic life, recreation, or general uses were identified in this segment.

0816 Lake Waxahachie

This 669.9-acre segment impounds South Prong Creek in Ellis County up to a normal pool elevation of 531.5 feet (see Figure 129). The reservoir is surrounded by grass and crop land with some smaller areas of hay and pasture land, forest, and development along the shores of the reservoir. It lies within the Northern Blackland Prairie ecoregion.

Clean Rivers Program water quality monitoring is being conducted at one site within this segment as shown in Table 192. Monitoring is being conducted by TRA. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 192: FY2023 Monitoring stations in Segment 0816

Assessment Unit	Station Description	Station ID	Collecting Entity
0816_01	LAKE WAXAHACHIE 474 METERS NORTH AND 143 METERS EAST OF INTERSECTION OF OLD HOWARD LANE AND PENN ROAD MID LAKE NEAR DAM	10980	TRA

No impairments or concerns for aquatic life, recreation, domestic water supply, or general uses were identified in this segment.

0815A Waxahachie Creek

This 24.2-mile unclassified segment runs from the confluence with North Prong Creek to the confluence with the normal pool elevation of Bardwell Reservoir (see Figure 129). The upper portion of the stream drains the developed areas in the cities of Midlothian and Waxahachie. Between these two cities, the watershed is a mix of grass, hay, pasture, and crop land. Downstream of Waxahachie, the watershed is largely crop land. The stream flows through the Northern Blackland Prairie ecoregion.

Clean Rivers Program water quality monitoring is being conducted at one site within this segment as shown in Table 193. Monitoring is being conducted by TRA. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 193: FY2023 Monitoring stations in Segment 0815A

Assessment Unit	Station Description	Station ID	Collecting Entity
0815A_01	WAXAHACHIE CREEK AT GELZENDANER ROAD	13686	TRA

A summary of the concerns and impairments identified in the TCEQ 2022 Texas Integrated Report is shown in Table 194.

Table 194: Findings of TCEQ 2022 Texas Integrated Report for Segment 0815A

Assessment Unit	Use	Parameter	Criteria	Finding
0815A_01	General Use	Nitrate	1.95 mg/L	CS
0815A_01	Recreation Use	*E. coli*	126 MPN/100 mL	CN (Carry Forward)

The 2022 TCEQ Integrated Report identified an impairment for *E. coli* in Assessment Unit 0815A_01. 56% of the reported data for *E. coli* was over the standard of 126 MPN/100ML, as shown in Figure 130. There was no correlation between drought conditions and *E. coli* values, nor were there any other relevant correlations found during analysis. This would indicate that there are constant sources of sources of bacteria into the stream. There is a wooded riparian area directly upstream of monitoring station 13686 at Getzendaner Road and there is evidence of livestock trails entering the stream near the confluence with the Lake Waxahachie outfall based on Google Earth imagery. There is also a tributary entering Waxahachie Creek immediately upstream of the monitoring station and there is evidence of livestock trails entering this tributary. Therefore, the most likely sources of bacteria in this segment are livestock and wildlife. Landowner education and livestock best management practices may help reduce bacteria levels in Waxahachie Creek. There was a sudden drop and then subsequent increase of *E. coli* values at the most recent sampling dates. The cause for this is not currently know, but further sampling may provide an answer in the future.

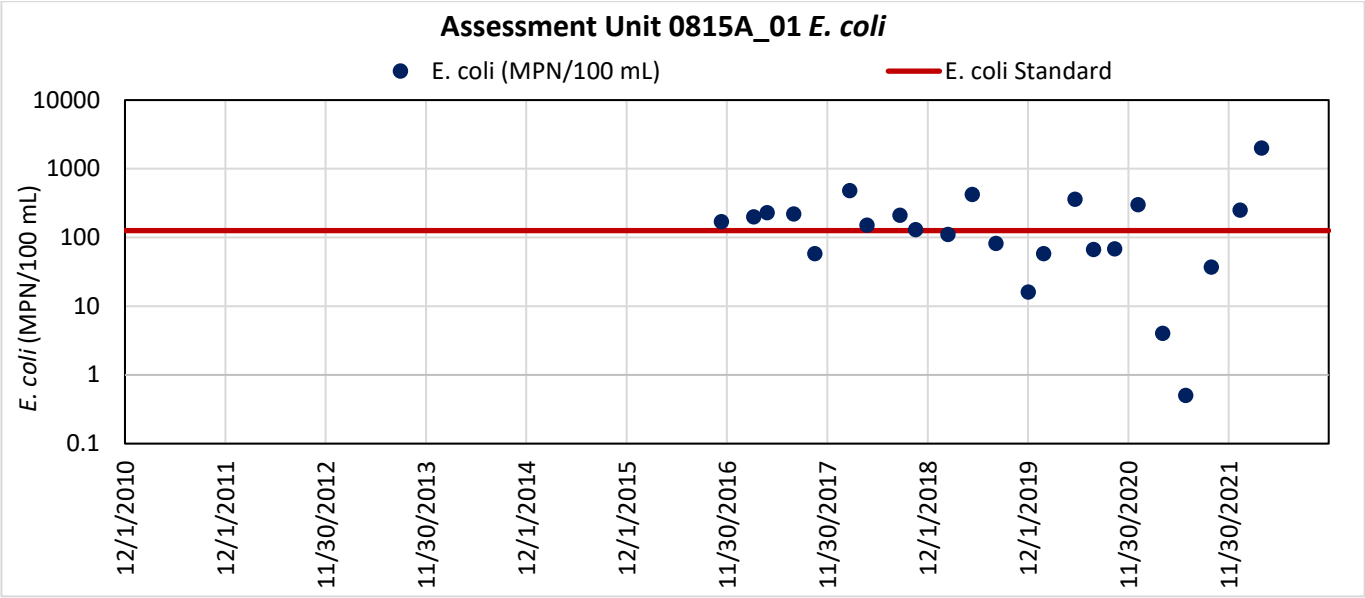

Figure 130: Assessment Unit 0815A_01 E. coli

There was also an impairment for Nitrate identified in the assessment. There was a weak correlation between Nitrate and flow (correlation coefficient = -0.398), shown in Figure 131. This is indicative of sampling sites downstream of wastewater outfalls, as previously discussed.

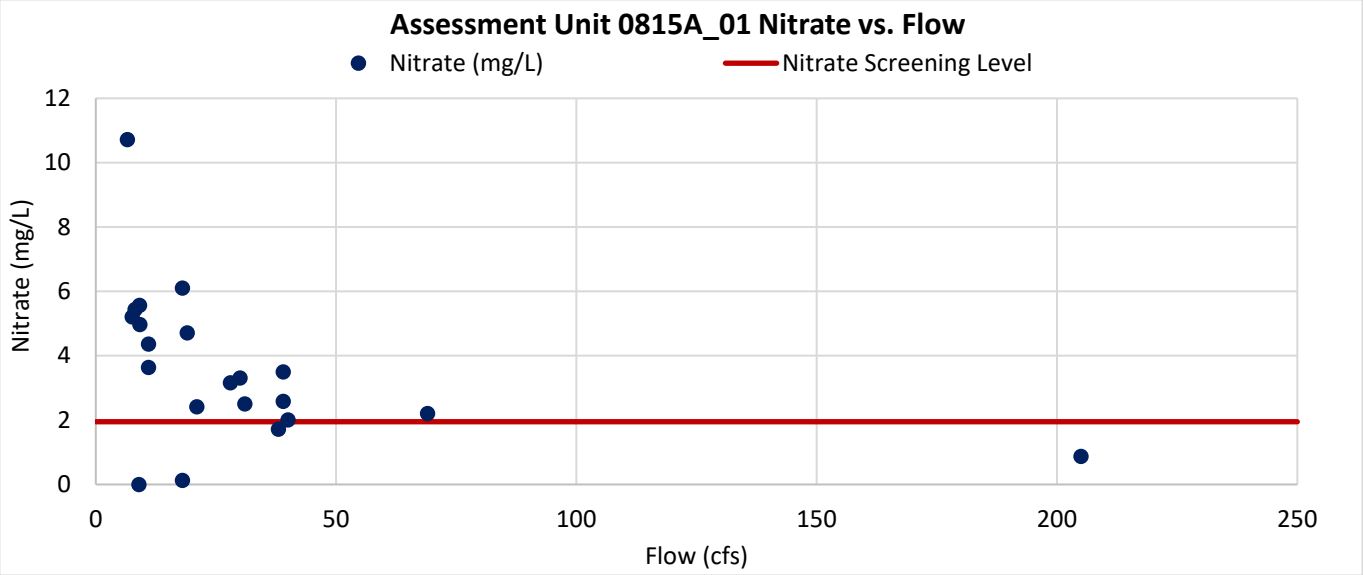

Figure 131: Assessment Unit 0815A_01 Nitrate vs. Flow

0815 Bardwell Reservoir

This 3280.6-acre reservoir impounds Waxahachie Creek from Bardwell Dam in Ellis County up to the normal pool elevation of 421 feet (see Figure 129). Along the west side of the reservoir, the watershed is largely crop land while the east side is mostly hay, pasture, and grassland. The east side of the watershed is also developed by the City of Ennis. The reservoir lies within the Northern Blackland Prairie ecoregion.

Clean Rivers Program water quality monitoring is being conducted at one site within this segment as shown in Table 195. Monitoring is being conducted by TRA. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 195: FY2023 Monitoring stations in Segment 0815

Assessment Unit	Station Description	Station ID	Collecting Entity
0815_01	BARDWELL RESERVOIR 1.91 KM EAST AND 787 METERS NORTH OF INTERSECTION OF BARDWELL DAM RD AND FM 985 MID LAKE NEAR DAM USGS SITE AC	10979	TRA

A summary of the concerns and impairments identified in the TCEQ 2022 Texas Integrated Report is shown in Table 196.

Table 196: Findings of TCEQ 2022 Texas Integrated Report for Segment 0815

Assessment Unit	Use	Parameter	Criteria	Finding
0815_01	General Use	Sulfate	50 mg/L	NS

An impairment due to elevated levels of Sulfate was identified in this segment. 42% of reported Sulfate data were above the standard. As shown in Figure 132, this impairment appears to have been related to drought conditions. Many of the observations that were above the standard of 50 mg/L were seen during periods of drought, which aligns with the strong correlation between Sulfate and drought conditions (correlation factor = 0.661). During drought conditions, as water in the streams and reservoirs evaporate, the remaining constituents in the water begin to concentrate. Then these concentrations will decrease due to dilution from precipitation during the drought recovery periods. There were increasing trends identified for Total Organic Carbon, Chloride, Sulfate, and Fluoride. These all followed the same pattern as see in Figure 132, being weighted by the recent prolonged drought.

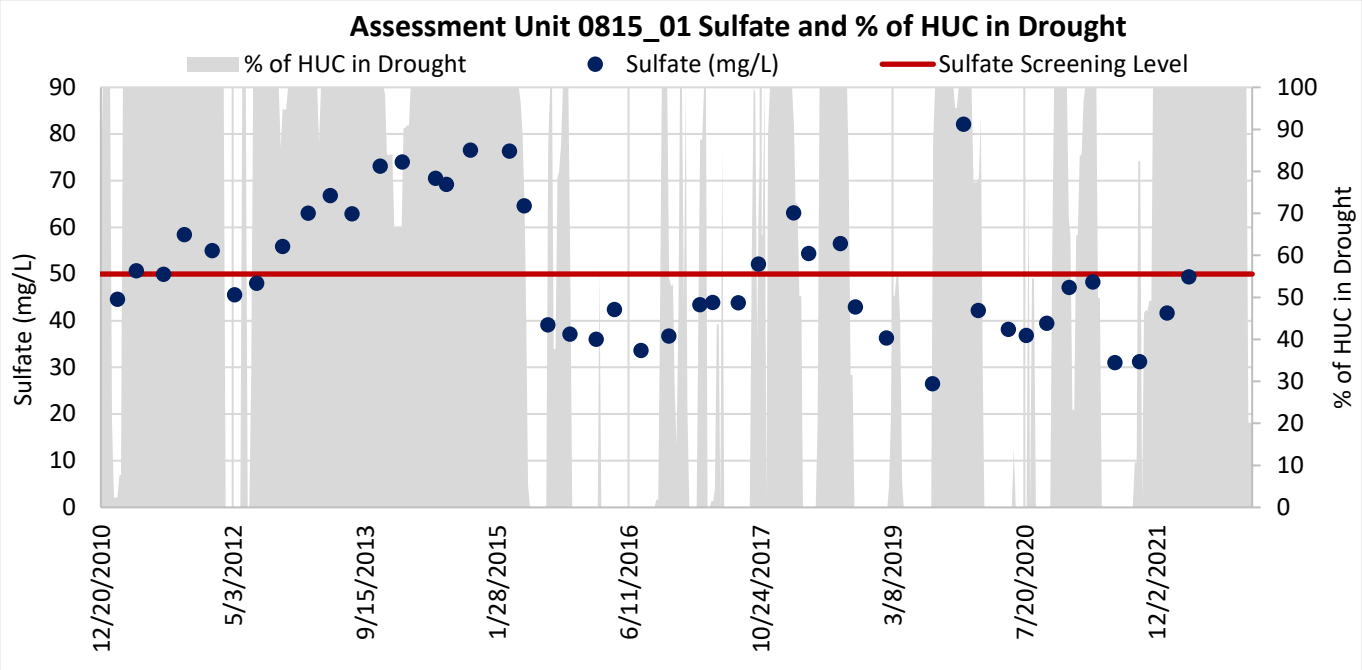

Figure 132: Assessment Unit 0815_01 Sulfate and % of HUC in Drought

0814B South Fork Chambers Creek

This 29-mile stream runs from the upper end of South Fork Chambers Creek to the confluence with Chambers Creek (see Figure 129). Much of the watershed contains crop, grass, hay and pasture land with some development around the City of Grandview. The watershed lies within the Northern Blackland Prairie with a small portion in the Eastern Cross Timbers ecoregion.

There is no Clean Rivers Program monitoring scheduled in this segment for FY 2023.

No impairments or concerns for aquatic life, recreation, or general uses were identified in this segment.

0814A Mill Creek

This 25.5-mile unclassified segment runs from the Union Pacific Railroad in Milford to the confluence with Chambers Creek in Navarro County (see Figure 129). The upstream portion of the stream drains grasslands. The land use transitions to crop land along the middle portion of the stream and then hay and pasture land along the downstream end. The stream flows through the Northern Blackland Prairie ecoregion.

There is no Clean Rivers Program monitoring scheduled in this segment for FY 2023.

No impairments or concerns for aquatic life, recreation, or general uses were identified in this segment.

0814 Chambers Creek Above Richland-Chambers Reservoir

This 50-mile segment runs from the confluence of the North Fork Chambers Creek and South Fork Chambers Creek to a point 2.5 miles downstream of Tupelo Branch in Navarro County (see Figure 129). The upper portion of the stream drains mostly grassland and forest to the south and grass and crop lands to the north. The lower portion of the stream flows through mostly crop land to the north, and hay, pasture, and grassland to the south. It flows through the Northern Blackland Prairie ecoregion.

Clean Rivers Program water quality monitoring is being conducted at three sites within this segment as shown in Table 197. Monitoring is being conducted by TCEQ Region 4 and Tarrant Regional Water District. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 197: FY2023 Monitoring stations in Segment 0814

Assessment Unit	Station Description	Station ID	Collecting Entity
0814_01	CHAMBERS CREEK AT FM 3041	10975	TCEQ Region 4
0814_02	CHAMBERS CREEK AT FM 1126	10977	Tarrant Regional Water District
0814_03	CHAMBERS CREEK AT ELLIS COUNTY ROAD 55 EAST OF ITALY	22058	Tarrant Regional Water District

A summary of the concerns and impairments identified in the TCEQ 2022 Texas Integrated Report is shown in Table 198.

Table 198: Findings of TCEQ 2022 Texas Integrated Report for Segment 0814

Assessment Unit	Use	Parameter	Criteria	Finding
0814_01	General Use	Chlorophyll-*a*	14.1 ug/L	CS
0814_02	Recreation Use	*E. coli*	126 MPN/100 mL	NS

Assessment Unit 0814_01 was identified as having an impairment in Chlorophyll-a. There are no strong correlations between Chlorophyll-*a* and nutrients or drought conditions. There is no

strong correlation between Chlorophyll-*a* and flow, but as shown in Figure 133, there appears to be some relationship, with higher flows seemingly leading to higher levels of Chlorophyll-*a*. This sampling station is at the downstream end of the assessment unit, with the upstream sampling station having no Chlorophyll-*a* data. Collection of said data at the upstream sampling site could help identify if reservoir releases are having any impact on the impairment.

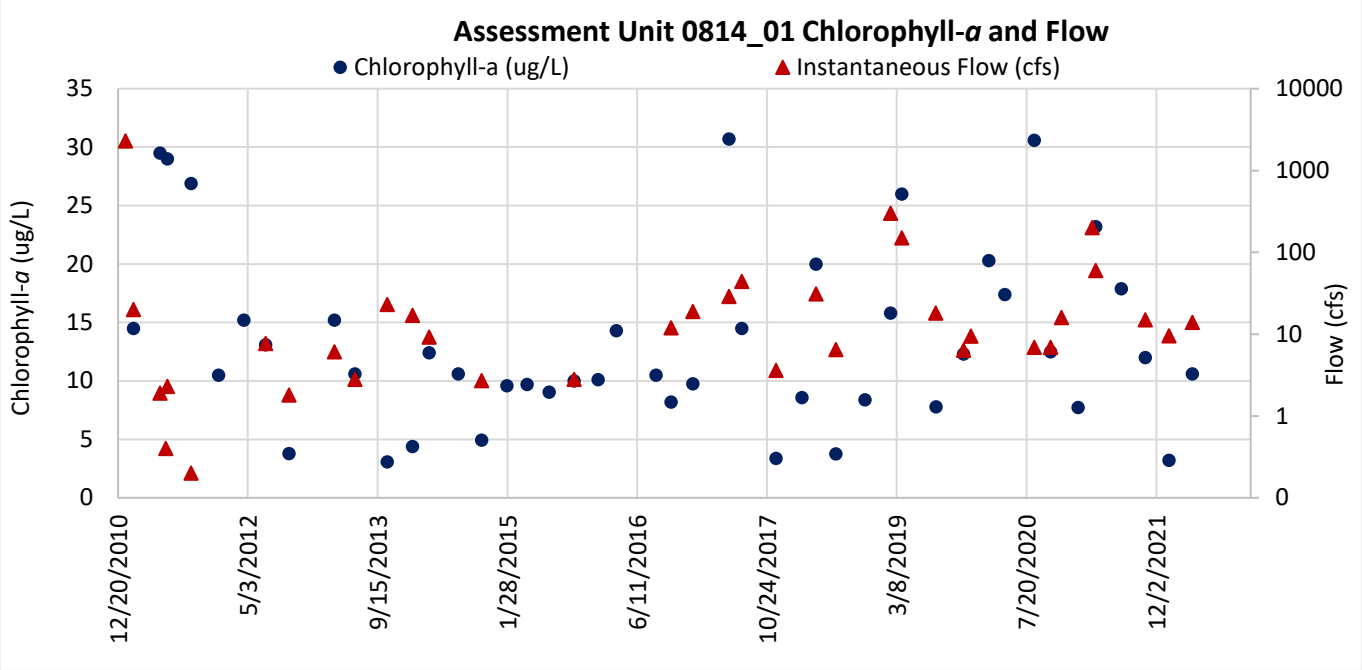

Figure 133: Assessment Unit 0814_01 Chlorophyll-a and Flow

Assessment Unit 0814_02 was identified as having a concern for *E. coli*, with 58% of reported data being over the standard for *E. coli* of 126 MPN/100ML, as seen in Figure 134. There was little correlation between *E. coli* and drought conditions. While there was also no correlation between *E. coli* and flow, there was a strong correlation between *E. coli* and the revised Flow Severity category (correlation factor = 0.551) The higher *E. coli* values occurred when Flow Severity was at category 5 and 6, High and Flood. This would suggest that there is some runoff contributing to the impairment, but that constant sources are also most likely present. There are small wooded riparian areas upstream of the monitoring stations in both assessment units. In addition, there is evidence of livestock trails entering the tributaries of Chambers Creek in several locations. It is likely that much of the bacteria load in the stream was contributed by wildlife and livestock visiting the streams for watering. Landowner education and livestock best management practices may help reduce levels in this segment. There are several small wastewater treatment facilities and residential areas that are most likely using septic systems. If these facilities or septic systems were not functioning properly they may have been contributing bacteria as well. It is recommended that upstream sampling on Chambers Creek and the tributaries be conducted in order to determine if a potential source can be identified. Additionally, bacteria source tracking studies could be conducted to identify if the bacteria impairment may have been caused by humans, livestock, or wildlife.

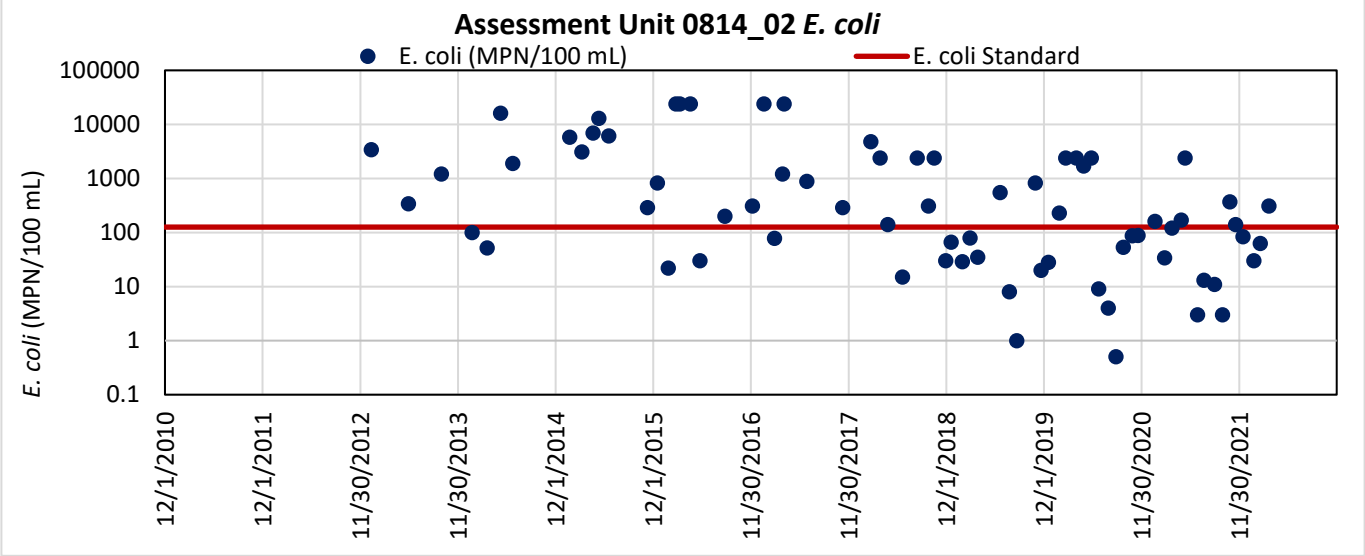

Figure 134: Assessment Unit 0814_02 E. coli

0836D Post Oak Creek

This 14.8-mile stream runs from the upper end of the creek to the confluence with Richland Chambers Reservoir (see Figure 129). The upper portion of the stream flows through the developed lands of the City of Corsicana. The lower portion of the stream flows through largely hay and pasture land with some grass and crop lands. The watershed lies within the Northern Blackland Prairie ecoregion.

Clean Rivers Program water quality monitoring is being conducted at one site within this segment as shown in Table 199. Monitoring is being conducted by Tarrant Regional Water District. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 199: FY2023 Monitoring stations in Segment 0836D

Assessment Unit	Station Description	Station ID	Collecting Entity
0836D_01	POST OAK CREEK 109 METERS DOWNSTREAM OF POWELL PIKE EAST OF CORSICANA	17847	Tarrant Regional Water District

A summary of the concerns and impairments identified in the TCEQ 2022 Texas Integrated Report is shown in Table 200.

Table 200: Findings of TCEQ 2022 Texas Integrated Report for Segment 0836D

Assessment Unit	Use	Parameter	Criteria	Finding
0836D_01	Recreation Use	*E. coli*	126 MPN/100 mL	CN

A concern for elevated levels of *E. coli* was identified in this segment. There was very little measured flow data available, however, there was some weak correlation between *E. coli* and

flow severity (correlation coefficient = 0.332) as shown in Figure 135. *E. coli* levels were routinely above the standard of 126 MPN/100 mL but also increased with increasing flow severity. The stream flows through several park and residential areas in the City of Corsicana. Downstream of IH 45 there are some wooded riparian areas and evidence of livestock trails entering the stream. Sources of bacteria may include runoff from pets, wildlife, and livestock during wet weather and livestock and wildlife visiting the stream for watering during dry weather. Homeowner and landowner education as well as pet and livestock best management practices may help decrease bacteria levels in this segment.

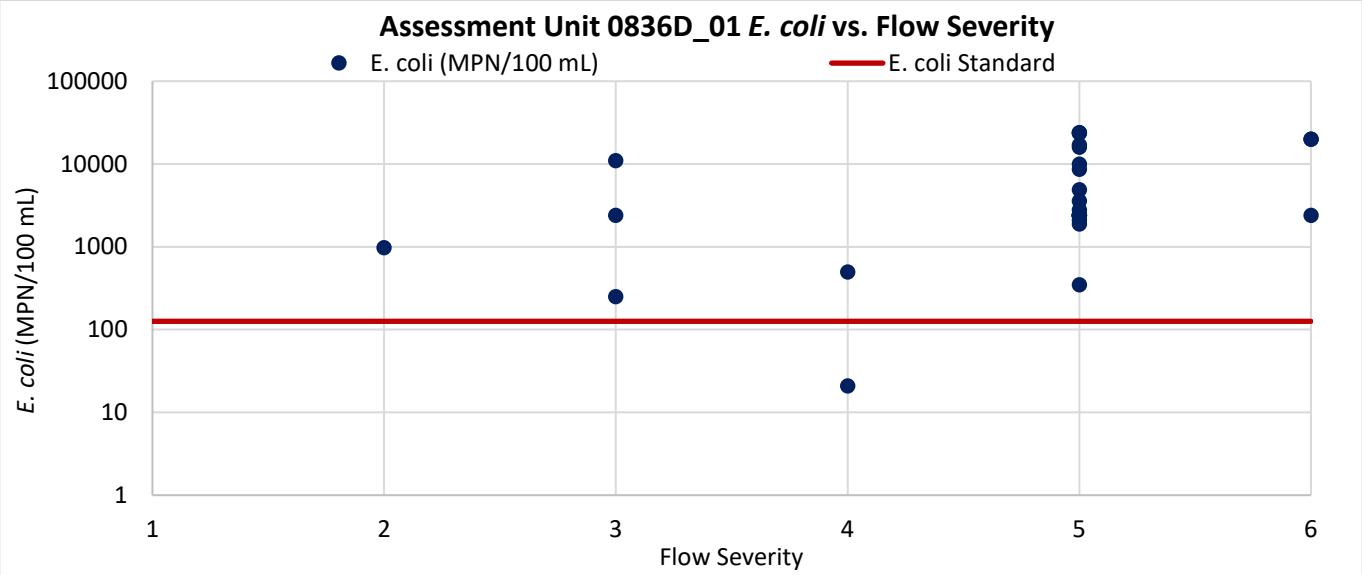

Figure 135: Assessment Unit 0836D_01 E. coli vs. Flow Severity

0836B Cedar Creek

This 11-mile stream runs from the upper end of the creek to the confluence with Richland Chambers Reservoir (see Figure 129). The land use within this watershed is largely hay, pasture, and grassland. It lies within the Northern Blackland Prairie ecoregion.

There is no Clean Rivers Program monitoring scheduled in this segment for FY 2023.

A summary of the concerns and impairments identified in the TCEQ 2022 Texas Integrated Report is shown in Table 201.

Table 201: Findings of TCEQ 2022 Texas Integrated Report for Segment 0836B

Assessment Unit	Use	Parameter	Criteria	Finding
0836B_01	Aquatic Life Use	Dissolved oxygen 24hr Avg	3 mg/L	NS (Carry Forward)
0836B_01	Aquatic Life Use	Dissolved oxygen 24hr Min	2 mg/L	CN

At the time of this report, there is insufficient data collected from Assessment Unit 0836B_01 to appropriately address the concerns listed in the 2022 TCEQ Integrated Report. Sampling should be continued at this site in order to analyze the impairment properly in the future.

0836C Grape Creek

Figure 136: Grape Creek at SE CR 1080 near Corsicana

This 12.8-mile stream runs from the upper end of the creek southwest of Corsicana to the confluence with Richland Chambers Reservoir (see Figure 129). The land use within this watershed is largely hay, pasture, and grassland. It lies within the Northern Blackland Prairie ecoregion.

There is no Clean Rivers Program monitoring scheduled in this segment for FY 2023.

A summary of the concerns and impairments identified in the TCEQ 2022 Texas Integrated Report is shown in Table 202.

Table 202: Findings of TCEQ 2022 Texas Integrated Report for Segment 0836C

Assessment Unit	Use	Parameter	Criteria	Finding
0836C_01	Aquatic Life Use	Dissolved oxygen 24hr Avg	3 mg/L	NS
0836C_01	Aquatic Life Use	Dissolved oxygen 24hr Min	2 mg/L	NS

There is currently insufficient data for this Assessment Unit in order to address the concern listed in the 2022 TCEQ Integrated Report. Ongoing sampling will provide more insight as to the nature of the listed impairments.

0817A Richland Creek

This 10-mile segment runs upstream from FM 308 south of Mertens in Hill County to 0.5 miles downstream of FM 744 in Navarro County (see Figure 129). Must of the land use around this stream is crop land with some small areas of grass, hay, and pasture land. The stream drains the Northern Blackland Prairie ecoregion.

There is no Clean Rivers Program monitoring scheduled in this segment for FY 2023. No impairments or concerns for aquatic life, recreation, or general uses were identified in this segment.

0817 Navarro Mills Lake

This 4752.9-acre reservoir impounds Richland Creek from Navarro Mills Dam in Navarro County up to normal pool elevation of 424.5 feet (see Figure 129). The land use to the west of the reservoir is largely crop land. To the north and south of the reservoir the land use is a mix of hay, pasture, and grassland. The reservoir lies within the Northern Blackland Prairie ecoregion.

Clean Rivers Program water quality monitoring is being conducted at one site within this segment as shown in Table 203. Monitoring is being conducted by TCEQ Region 4. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule. No impairments or concerns for aquatic life, recreation, domestic water supply, or general uses were identified in this segment.

Table 203: FY2023 Monitoring stations in Segment 0817

Assessment Unit	Station Description	Station ID	Collecting Entity
0817_01	NAVARRO MILLS RESERVOIR 1.94 KM WEST AND 202 METERS SOUTH OF INTERSECTION OF NW 3050 RD AND FM 667 MID LAKE NEAR DAM USGS SITE AR	10981	TCEQ Region 4

0837 Richland Creek Above Richland-Chambers Reservoir

This 22.7-mile segment runs from Navarro Mills Dam to the confluence of Pin Oak Creek (see Figure 129). Much of the watershed is a mix of hay, pasture, and grassland. There are some areas of crop land to the south of the stream and woody wetland riparian areas. The stream flows through the Northern Blackland Prairie ecoregion.

Clean Rivers Program water quality monitoring is being conducted at one site within this segment as shown in Table 204. Monitoring is being conducted by TCEQ Region 4. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 204: FY2023 Monitoring stations in Segment 0837

Assessment Unit	Station Description	Station ID	Collecting Entity
0837_01	RICHLAND CREEK 60 METERS DOWNSTREAM OF FM 709 2.8 KM UPSTREAM OF RICHLAND CHAMBERS RESERVOIR	11070	TCEQ Region 4

A summary of the concerns and impairments identified in the TCEQ 2022 Texas Integrated Report is shown in Table 205.

Table 205: Findings of TCEQ 2022 Texas Integrated Report for Segment 0837

Assessment Unit	Use	Parameter	Criteria	Finding
0837_01	Aquatic Life Use	Dissolved oxygen Grab	5 mg/L	CS
0837_01	Recreation Use	*E. coli*	126 MPN/100 mL	NS

An impairment for *E. coli* in this assessment unit was identified in the 2022 TCEQ Integrated Report. As seen in Figure 137, 56% of reported data was over the standard for *E. coli* of 126 MPN/100ML. There was no apparent relationship with drought conditions, but there was a strong positive correlation between *E. coli* and the instantaneous flow (correlation value = 0.799). This would suggest that runoff plays a strong role in the higher amounts of *E. coli* in the assessment unit. The assessment unit flows through heavily wooded riparian zone which would suggest that wildlife could be contributing to the impairment. There are also a multitude of agricultural fields that show signs of livestock trails on Google Earth. Livestock traversing through and across the water body can also contribute to the impairment. Landowner education in livestock best management practices would be one option for addressing the impairment.

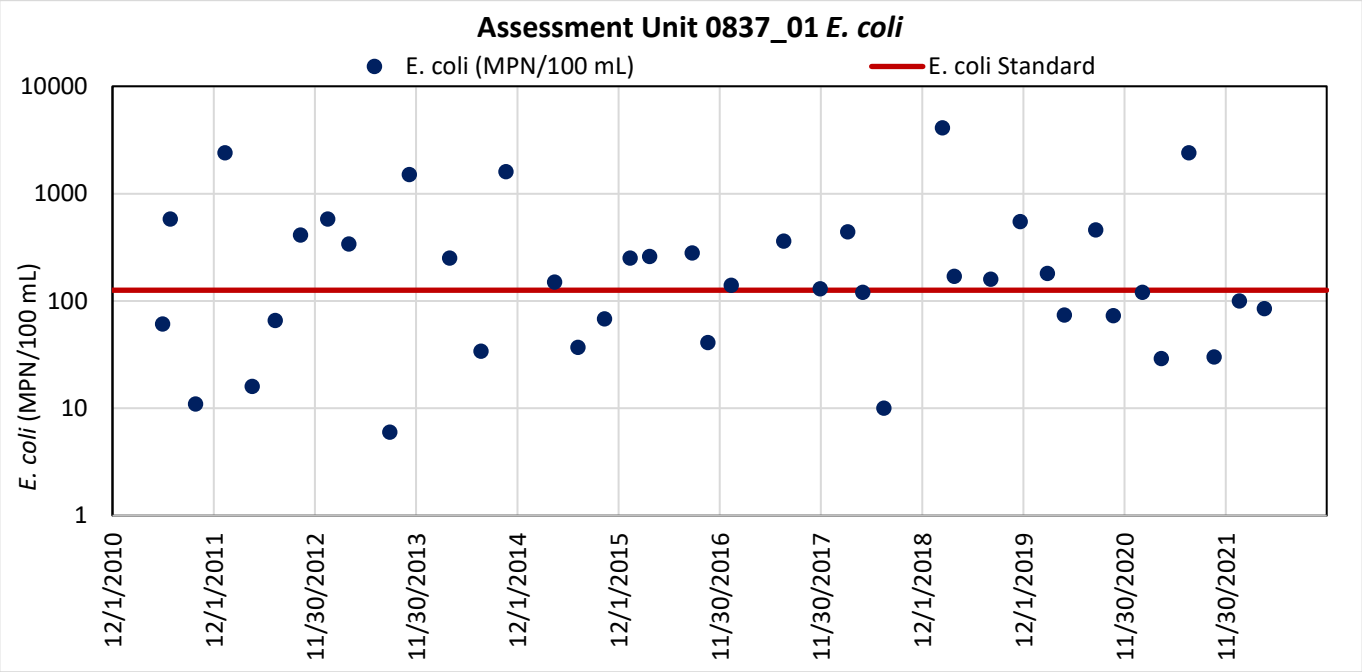

Figure 137: Assessment Unit 0837_01 E. coli

0836A Pin Oak Creek

This 10-mile unclassified segment runs from the confluence with Pin Oak Creek and an unnamed tributary flowing from the west approximately 2.8 km downstream of SH 171 near the City of Hubbard to the confluence with the North Fork of Pin Oak Creek in Limestone County

(see Figure 129). Much of the watershed is hay and pasture land with some small areas of crop land. The stream flows through the Northern Blackland Prairie ecoregion.

There is no Clean Rivers Program monitoring scheduled in this segment for FY 2023. No impairments or concerns for aquatic life, recreation, or general uses were identified in this segment.

0836 Richland-Chambers Reservoir

This 42,978-*a*cre reservoir runs from a point immediately upstream of the confluence of Pin Oak Creek on the Richland Creek Arm and from a point 2.5 miles downstream of Tupelo Branch on the Chambers Creek Arm to the Richland-Chambers Dam. It impounds Richland and Chambers Creeks up to the normal pool elevation of 315 feet (see Figure 129). A majority of the watershed is hay and pasture land. There are some areas of crop land to the north of the Chambers Creek arm and forest to the south of the Richland Creek arm. The City of Corsicana lies upstream of the Chambers Creek arm. The reservoir lies within the Northern Blackland Prairie ecoregion with a small portion of the downstream end of the reservoir in the Floodplains and Low Terraces.

Clean Rivers Program water quality monitoring is being conducted at seven sites within this segment as shown in Table 206. Monitoring is being conducted by Tarrant Regional Water District. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 206: FY2023 Monitoring stations in Segment 0836

Assessment Unit	Station Description	Station ID	Collecting Entity
0836_01	RICHLAND-CHAMBERS RESERVOIR AT NORTH END OF DAM 332 METERS SOUTH AND 555 METERS WEST OF INTERSECTION OF US 287 AND RR 488	15168	Tarrant Regional Water District
0836_02	RICHLAND-CHAMBERS RESERVOIR 1.95 KM NORTH AND 2.26 KM WEST OF INTERSECTION OF SE 3190 ROAD AND OLD HIGHWAY 287	15169	Tarrant Regional Water District
0836_03	RICHLAND-CHAMBERS RESERVOIR CHAMBERS CREEK ARM NEAR TCWCID 1 PUMP STATION 570 M S AND 1.16 KM W OF INTERSECT OF SE 3240 AND SE 3250	15170	Tarrant Regional Water District
0836_04	RICHLAND-CHAMBERS RESERVOIR UPPER END OF CHAMBERS CREEK ARM 2.52 KM NORTH AND 329 METERS WEST OF INTERSECTION OF WICHITA TRL AND FM 637	15199	Tarrant Regional Water District
0836_05	RICHLAND-CHAMBERS RESERVOIR RICHLAND CREEK ARM MID LAKE 2.24 KM SOUTH AND 276 METERS EAST OF INTERSECTION OF PETTY RD AND SE 2230 RD	11068	Tarrant Regional Water District
0836_06	RICHLAND-CHAMBERS RESERVOIR IN UPPER END OF RICHLAND CREEK ARM 2.01 KM S AND 150 METERS E OF INTERSECTION OF NAVARRO SLAB AND SE 1095	15172	Tarrant Regional Water District
0836_07	RICHLAND CREEK AT SW 0030 RD UPSTREAM OF RICHLAND-CHAMBERS RESERVOIR	16721	Tarrant Regional Water District

A summary of the concerns and impairments identified in the TCEQ 2022 Texas Integrated Report is shown in Table 207.

Table 207: Findings of TCEQ 2022 Texas Integrated Report for Segment 0836

Assessment Unit	Use	Parameter	Criteria	Finding
0836_07	Aquatic Life Use	Dissolved oxygen Grab	5 mg/L	CS
0836_07	Recreation Use	*E. coli*	126 MPN/100 mL	NS

An impairment due to elevated levels of *E. coli* was identified in assessment unit 0836_07 which is located in the riverine portion of the Richland Creek arm at SW County Road 0030. As shown in Figure 138, 65% of *E. coli* values were reported above the standard of 126 MPN/100 mL. There was some correlation between *E. coli* values and flow severity recategorized (correlation factor = 0.433). This could indicate there was some runoff contributing to the impairment, but the main contributor being constant sources. Monitoring station 16721 in this assessment unit is approximately 3 miles downstream of station 11070 in segment 0837 that had similar correlations and likely similar causes for the impairment. There is also a wooded area upstream of monitoring station 16721 and evidence of livestock trails entering the tributaries that confluence with the reservoir immediately upstream of 16721. Wildlife and livestock visiting the stream for watering were the most likely source of bacteria in this assessment unit. Landowner education and livestock best management practices may help reduce bacteria levels in this portion of the reservoir.

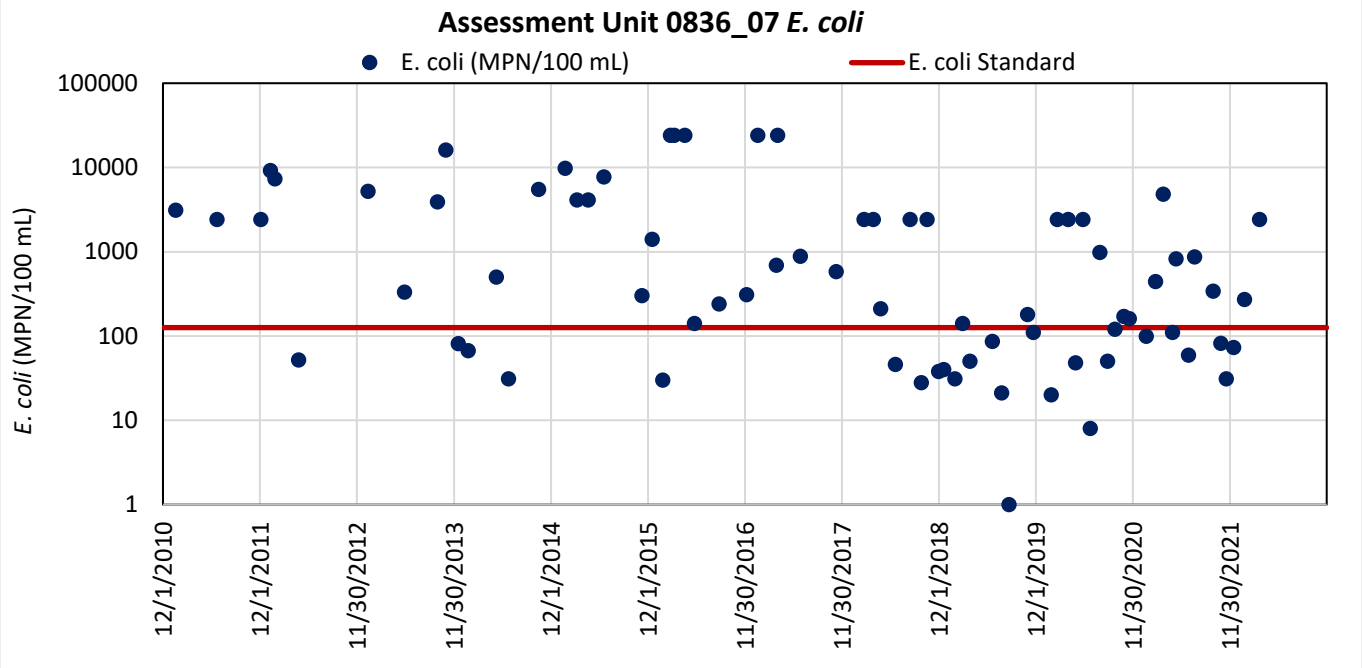

Figure 138: Assessment Unit 0836_07 E. coli

There was a concern for depressed dissolved oxygen identified in assessment unit 0836_07. As shown in Figure 139, dissolved oxygen levels were generally reported below the screening level and standard during periods of drought. There was a weak correlation between dissolved

oxygen and flow severity (correlation coefficient = 0.311). Based on that correlation and the drought relationship, it is likely that low flows were the main factor influencing dissolved oxygen in this portion of the reservoir. However, there was no Chlorophyll-*a* data available to determine if there may have been a relationship between dissolved oxygen and algal populations. It is recommended that Chlorophyll-*a* be collected in order to more fully address this concern.

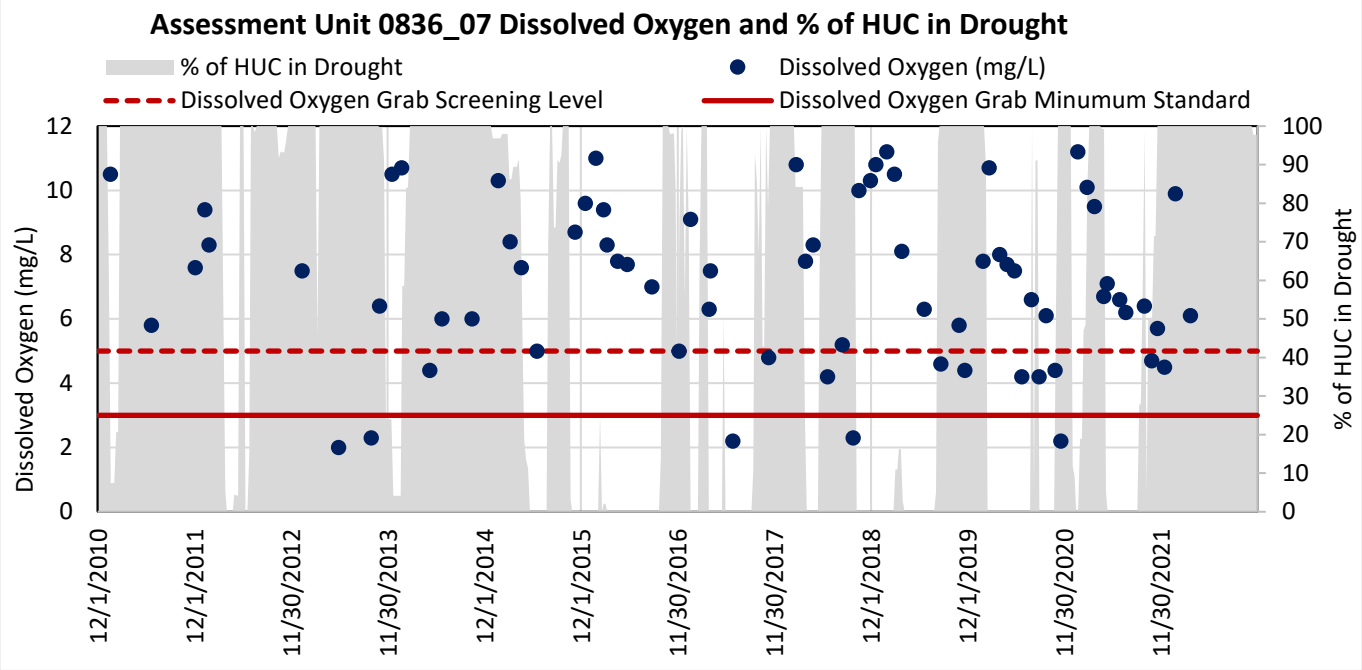

Figure 139: Assessment Unit 0836_07 Dissolved Oxygen and % of HUC in Drought

Lower Trinity River

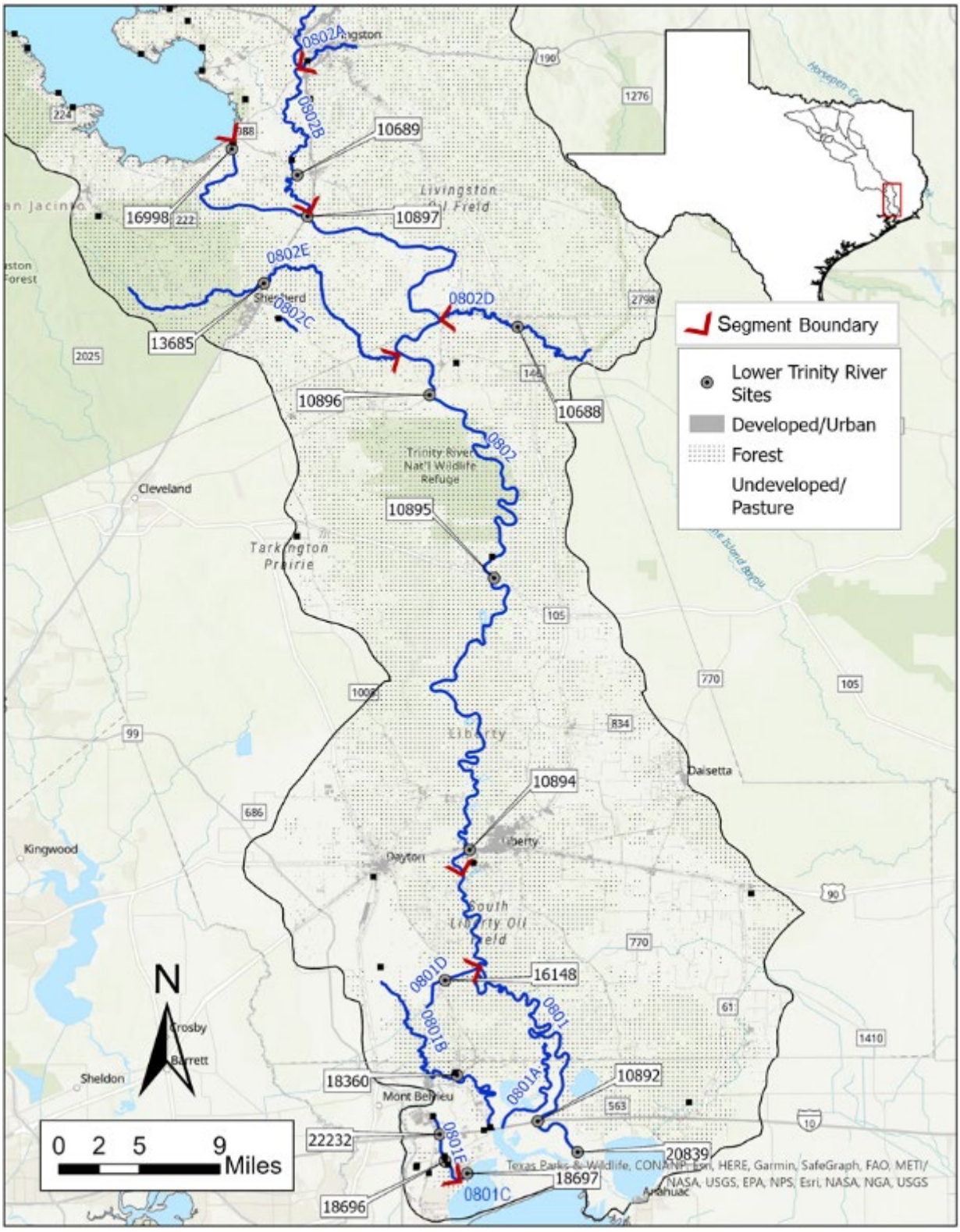

Figure 140: Map of segments and stations of the Lower Trinity River subwatershed

0802 Trinity River Below Lake Livingston

This 76-mile segment runs from the Livingston Dam on the border of Polk and San Jacinto counties to a point 1.9 miles downstream of US 90 in Liberty County (see Figure 140). This watershed is largely rural with a mix of hay and pasture lands, woody wetlands, and forest. There is some development around the cities of Goodrich, Romayor, and Liberty. The river flows through the Floodplains and Low Terraces ecoregion.

Clean Rivers Program water quality monitoring is being conducted at four sites within this segment as shown in Table 208. Monitoring is being conducted by the Unites States Geological Survey, TCEQ Region 12, and TRA Lake Livingston Project. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 208: FY2023 Monitoring stations in Segment 0802

Assessment Unit	Station Description	Station ID	Collecting Entity
0802_01	TRINITY RIVER AT US 90 IN LIBERTY TRA #33	10894	United States Geological Survey & TCEQ Region 12
0802_03	TRINITY RIVER 125 METERS UPSTREAM OF FM 787 NEAR ROMAYOR	10896	TCEQ Region 12
0802_04	TRINITY RIVER AT US 59 SOUTH OF GOODRICH TRA #30	10897	TRA Lake Livingston Project
0802_05	TRINITY RIVER AT FM 3278 775 METERS DOWNSTREAM OF LAKE LIVINGSTON AND 8MI EAST OF COLDSPRING	16998	TRA Lake Livingston Project

A summary of the concerns and impairments identified in the TCEQ 2022 Texas Integrated Report is shown in Table 209.

Table 209: Findings of TCEQ 2022 Texas Integrated Report for Segment 0802

Assessment Unit	Use	Parameter	Criteria	Finding
0802_01	General Use	Chlorophyll-*a*	14.1 ug/L	CS
0802_03	General Use	Chlorophyll-*a*	14.1 ug/L	CS
0802_04	General Use	Chlorophyll-*a*	14.1 ug/L	CS
0802_05	General Use	Chlorophyll-*a*	14.1 ug/L	CS

Concerns for elevated levels of Chlorophyll-*a* were identified in several assessment units. As shown in Figure 141 for the most upstream (0802_05) and most downstream (0802_01) assessment units, Chlorophyll-*a* was frequently reported above the screening level of 14.1 µg/L, with 59% of reported values being above. The Lake Livingston dam is operated as a run of the river dam; releases match the flow coming in to the reservoir. At low flows, the algal populations in the river were likely seeded by the populations in the reservoir. The river along this segment is wide with little change in elevation and no shading from overarching tree canopy. These slow meandering flows with plenty of sunlight are ideal conditions for algal populations to increase and this appears to be the cause of the concerns. This conclusion is further supported by the

pattern of decreasing Chlorophyll-*a* levels with increasing flows. This is best illustrated for assessment unit 0802_05 as shown in Figure 142 (correlation coefficient = -0.577). There was also a weak correlation between Chlorophyll-*a* and Nitrate (correlation coefficient = -0.447) for the three most upstream assessment units. This would suggest that the impairment is being seeded from the reservoir.

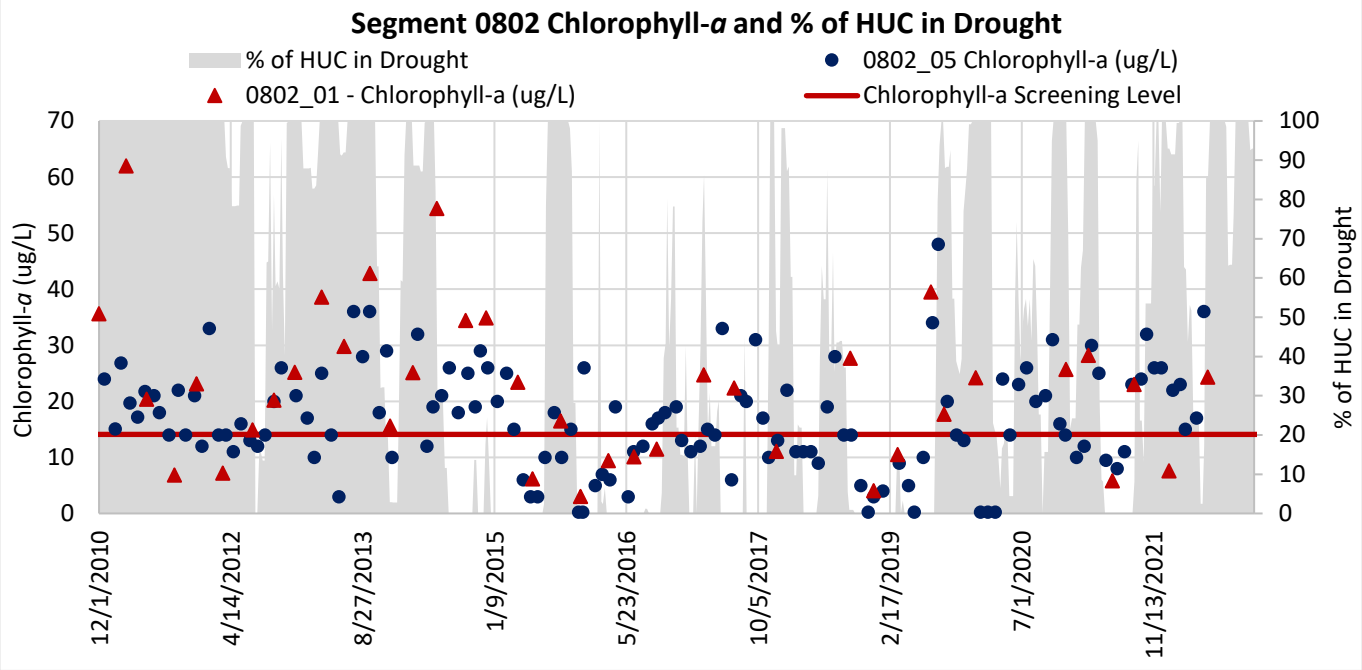

Figure 141: Segment 0802 Chlorophyll-a and % of HUC in Drought

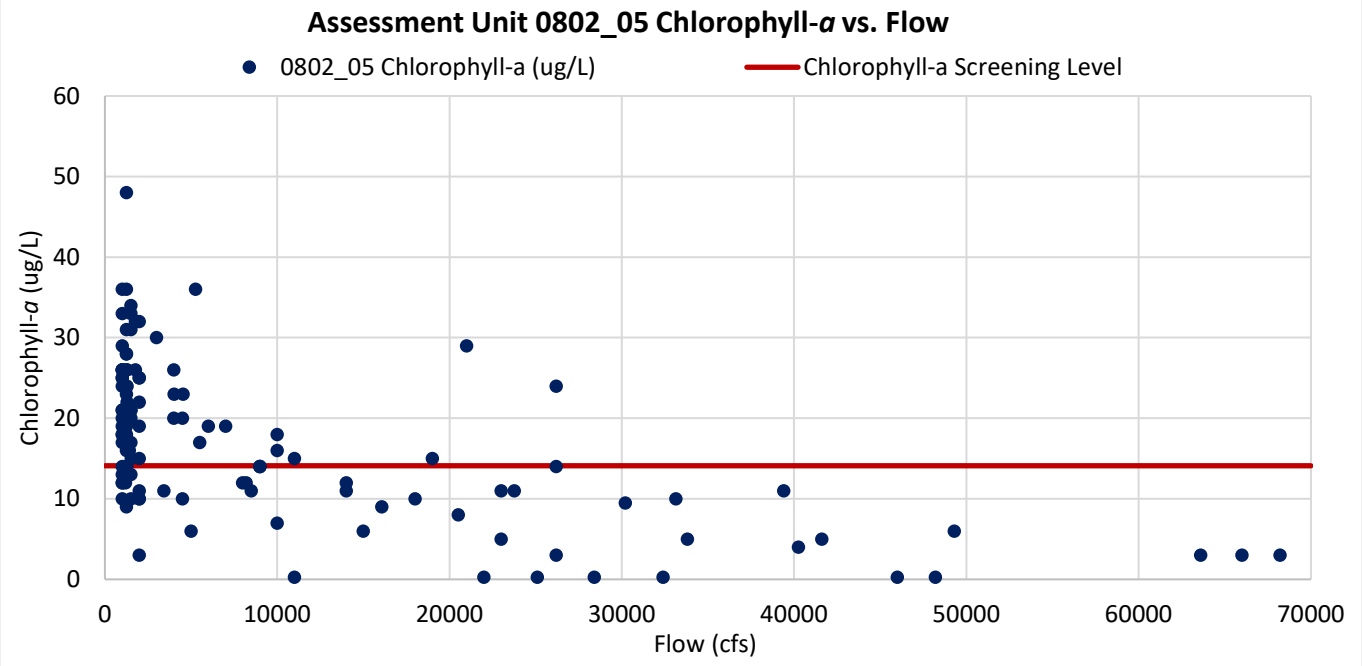

Figure 142: Assessment Unit 0802_05 Chlorophyll-a vs. Flow

0802B Long King Creek

This 37.7-mile unclassified segment runs from the confluence with an unnamed tributary approximately 1.2 km upstream of FM 350 near the City of Livingston to the confluence with the Trinity River (see Figure 140). The watershed is largely rural outside the developed lands of the City of Livingston. Much of the remaining land use are a mix of hay and pasture land and forest. The stream flows through the Southern Tertiary Uplands with the lower portion flowing through the Flatwoods before entering the Floodplains and Low Terraces ecoregion just before the confluence with the river.

Clean Rivers Program water quality monitoring is being conducted at one site within this segment as shown in Table 210. Monitoring is being conducted by TRA Lake Livingston Project. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 210: FY2023 Monitoring stations in Segment 0802B

Assessment Unit	Station Description	Station ID	Collecting Entity
0802B_02	LONG KING CREEK 80 METERS UPSTREAM OF FM 1988 WEST OF GOODRICH TRA #36	10689	TRA Lake Livingston Project

A summary of the concerns and impairments identified in the TCEQ 2022 Texas Integrated Report is shown in Table 211.

Table 211: Findings of TCEQ 2022 Texas Integrated Report for Segment 0802B

Assessment Unit	Use	Parameter	Criteria	Finding
0802B_02	Recreation Use	*E. coli*	126 MPN/100 mL	CN (Carry Forward)

A concern due to elevated levels of *E. coli* was identified in this segment. 40% of the twenty data points recorded were over the *E. coli* Standard of 126 (MPN/100ML). While there was no correlation between drought conditions and *E. coli*, there was a correlation between Flow Severity Recategorized and *E. coli* (correlation factor = 0.520) as shown in Figure 143. This would suggest that the impairment is tied to non-point sources throughout the assessment unit. The stream flows through large areas of agriculture fields which show heavy livestock movement to and near the stream. There is also densely wooded riparian zones which would indicate wildlife could be contributing to the impairment. Sampling is only currently conducted at one sampling station for the entire assessment unit, so additional sampling could be done to help identify any other potential sources. Landowner management would be a beneficial start to help address the concern.

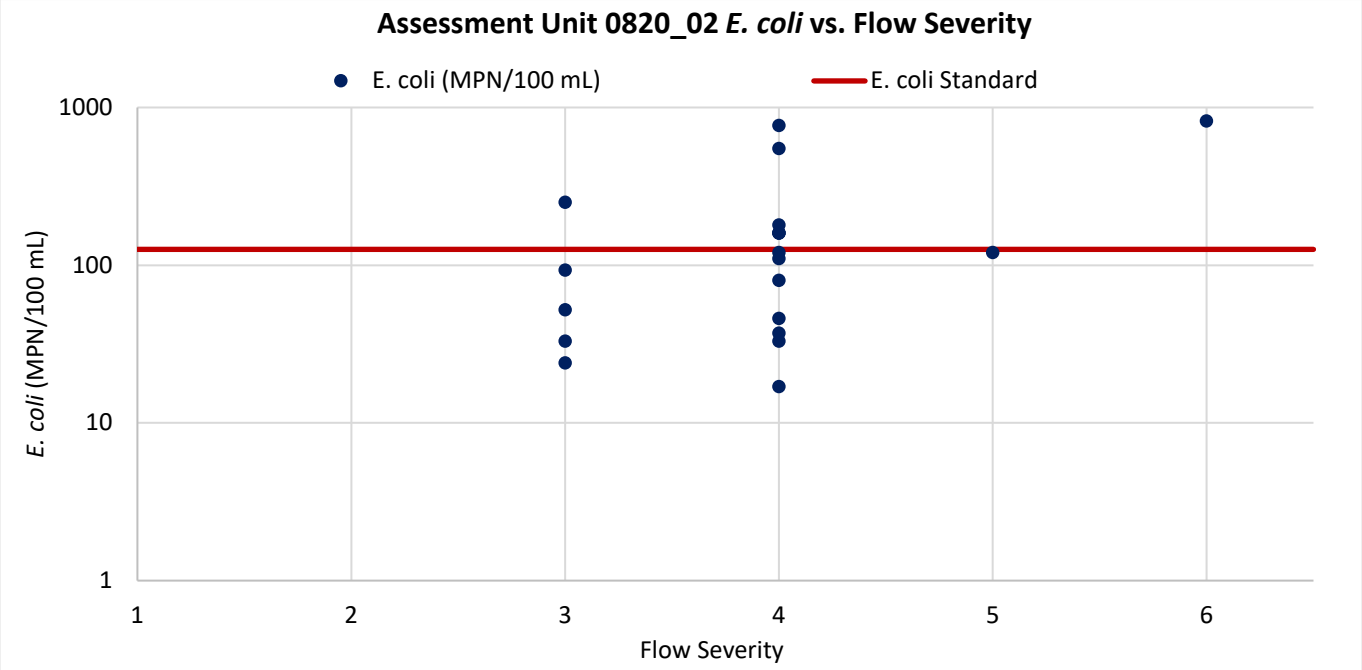

Figure 143: Assessment Unit 0820_02 E. coli vs. Flow Severity

0802A Choates Creek

This 4.9-mile unclassified segment runs from the confluence with an unnamed tributary approximately 3.0 km upstream of SH 146 near the City of Livingston to the confluence with Long King Creek (see Figure 140). The upper portion of the stream drains mostly forested land while the lower portion flows through the developed lands in the City of Livingston. It flows through the Southern Tertiary Uplands ecoregion.

There is no Clean Rivers Program monitoring scheduled in this segment for FY 2023.

No impairments or concerns for aquatic life, recreation, or general uses were identified in this segment.

0802D Menard Creek

This 12.9-mile unclassified segment runs from the confluence with Meetinghouse Creek to the confluence with the Trinity River (see Figure 140). Much of the watershed is forested with some woody wetland riparian areas. The stream flows through the Flatwoods and Floodplains and Low Terraces ecoregion just before the confluence with the river.

Clean Rivers Program water quality monitoring is being conducted at one site within this segment as shown in Table 212. Monitoring is being conducted by TRA Lake Livingston Project. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 212: FY2023 Monitoring stations in Segment 0802D

Assessment Unit	Station Description	Station ID	Collecting Entity
0802D_01	MENARD CREEK AT SH 146 SOUTHEAST OF LIVINGSTON TRA #37	10688	TRA Lake Livingston Project

A summary of the concerns and impairments identified in the TCEQ 2022 Texas Integrated Report is shown in Table 213.

Table 213: Findings of TCEQ 2022 Texas Integrated Report for Segment 0802D

Assessment Unit	Use	Parameter	Criteria	Finding
0802D_01	Recreation Use	*E. coli*	126 MPN/100 mL	CN

This assessment unit was identified as having a concern in *E. coli*. 33% of the reported data for *E. coli* was over the standard of 126 (MPN/100ML), as shown in Figure 144. There was no correlation between the concern and drought conditions, but there was a strong correlation to stream flow (correlation factor = 0.745). This would indicate that run off from the surrounding area would be a major contributor to the impairment. The stream flows through dense, heavily wooded riparian zone for the entirety of the assessment unit, so wildlife could potentially be a contributing factor for the impairment.

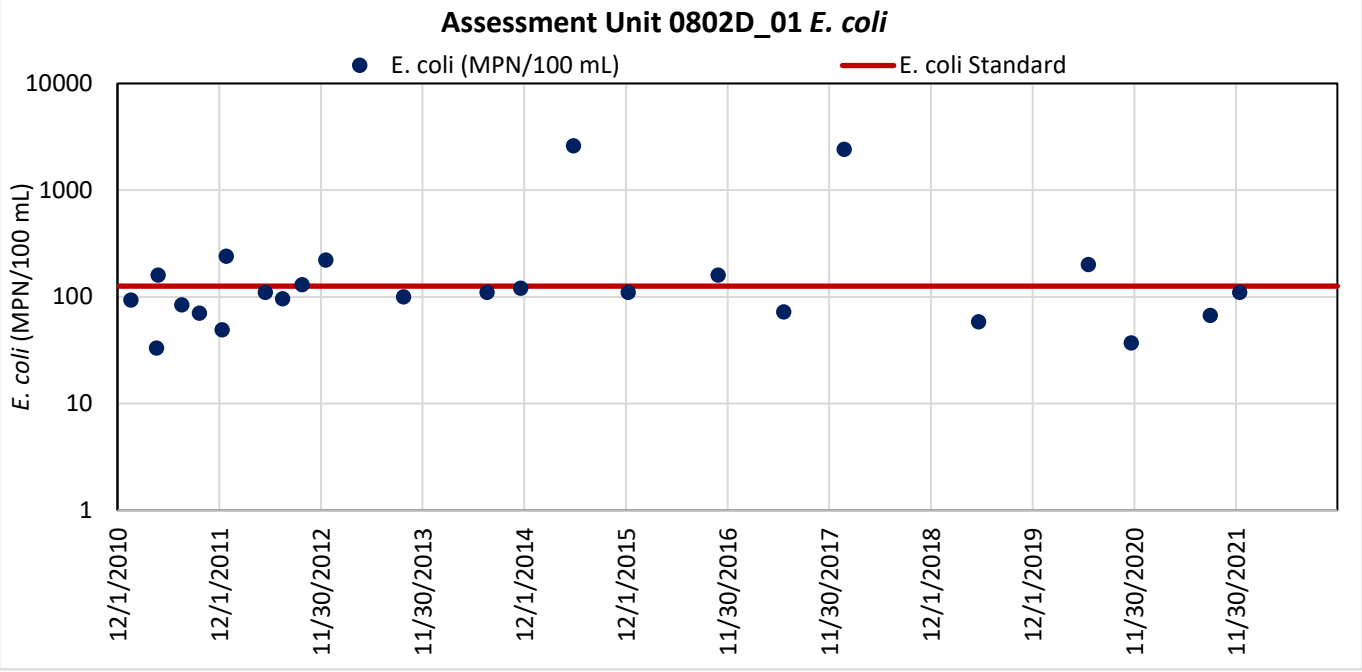

Figure 144: Assessment Unit 0802D_01 E. coli

0802E Big Creek

Figure 145: Big Creek at SR 150 west of Shepherd

This 23.2-mile unclassified segment runs from the confluence of Double Lake Branch and Henry Lake Branch in San Jacinto County to the confluence with the Trinity River in Liberty County (see Figure 140). The upstream portion of the watershed is largely forested. The stream flows by the developed lands outside the City of Shepherd. The downstream portion of the watershed is a mix of hay, pasture, and woody wetlands. It drains the Southern Tertiary Uplands and Flatwoods ecoregion.

Clean Rivers Program water quality monitoring is being conducted at one site within this segment as shown in Table 214. Monitoring is being conducted by TRA Lake Livingston Project. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 214: FY2023 Monitoring stations in Segment 0802E

Assessment Unit	Station Description	Station ID	Collecting Entity
0802E_01	BIG CREEK AT US 59 NORTH 1.5 MI NE OF SHEPHERD 11.6 MI UPSTREAM FROM MOUTH	13685	TRA Lake Livingston Project

A summary of the concerns and impairments identified in the TCEQ 2022 Texas Integrated Report is shown in Table 215.

Table 215: Findings of TCEQ 2022 Texas Integrated Report for Segment 0802E

Assessment Unit	Use	Parameter	Criteria	Finding
0802E_01	Recreation Use	*E. coli*	126 MPN/100 mL	CN

A concern due to elevated levels of *E. coli* was identified for this assessment unit. 82% of reported *E. coli* data was over the standard of 126 (MPN/100ML), as shown in Figure 146. There was little correlation between drought conditions and *E. coli*, but there was some correlation between flow and *E. coli* levels (correlation coefficient = 0.462) which indicates that the concern may be somewhat runoff related. The watershed upstream of monitoring station 13685 at US 59 is forested and has some residential developments around the City of Shepherd. Runoff containing waste from pets and wildlife may be contributing to bacteria in the stream. Homeowner education may help reduce bacteria levels from pet sources. There was also evidence of livestock trails entering the stream in the upper portion of the watershed. Bacteria may be introduced via livestock visiting the stream for watering and also from runoff containing livestock waste. Landowner education and livestock best management practices may help reduce bacteria from these sources.

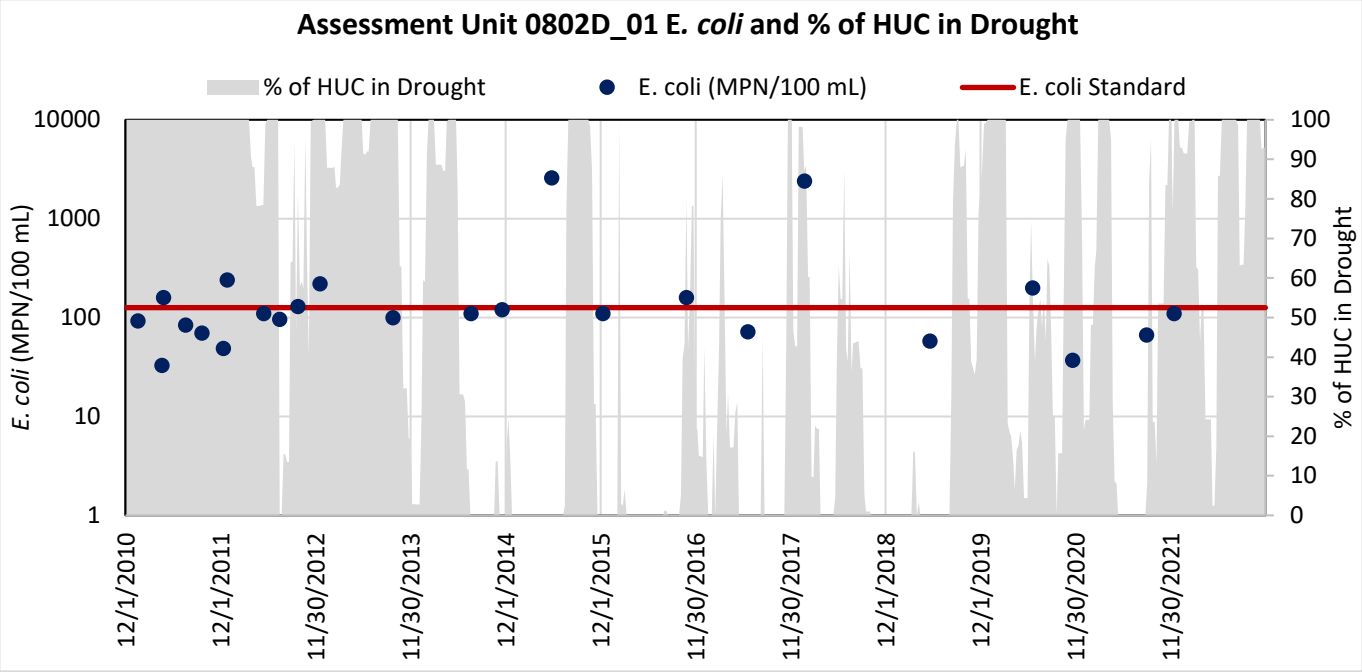

Figure 146: Assessment Unit 0802D_01 E. coli and % of HUC in Drought

0802C Unnamed Tributary of Coley Creek

This 1.6-mile unclassified segment runs from its origin at the culvert leading from Lake Run-Amuck at Wright Road to the confluence with Coley Creek (see Figure 140). The segment flows through the developed lands of the City of Shepherd and lies within the Flatwoods ecoregion.

There is no Clean Rivers Program monitoring scheduled in this segment for FY 2023.

No impairments or concerns for aquatic life, recreation, or general uses were identified in this segment.

0801 Trinity River Tidal

Figure 147: Trinity River upstream of Wallisville Saltwater Barrier

This 31.3-mile segment is tidally influenced and runs from a point 1.9 miles downstream of US 90 in Liberty County to the Wallisville Saltwater Barrier 3.4 miles downstream of IH 10 in Chambers County (see Figure 140). Much of the immediate watershed is woody wetland with hay, pasture, and crop lands lying outside the wetlands. There is some development near the

upstream end of the segment around the cities of Dayton and Liberty. The river flows through the Floodplains and Low Terraces and the Texas-Louisiana Coastal Marshes ecoregions.

Clean Rivers Program water quality monitoring is being conducted at one site within this segment as shown in Table 216. Monitoring is being conducted by TCEQ Region 12. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 216: FY2023 Monitoring stations in Segment 0801

Assessment Unit	Station Description	Station ID	Collecting Entity
0801_01	TRINITY RIVER TIDAL AT IH 10 NEAR LIBERTY TRA #35	10892	TCEQ Region 12

A summary of the concerns and impairments identified in the TCEQ 2022 Texas Integrated Report is shown in Table 217.

Table 217: Findings of TCEQ 2022 Texas Integrated Report for Segment 0801

Assessment Unit	Use	Parameter	Criteria	Finding
0801_01	General Use	Chlorophyll-*a*	21 ug/L	CS

Concerns for Chlorophyll-*a* were identified in this segment. As shown in Figure 148, 48% of Chlorophyll-*a* levels were reported above the screening level of 21 µg/L and had little correlation with drought conditions. There was some correlation between Chlorophyll-a and water temperature (correlation factor = 0.433), which would line up with the morphology of this assessment unit, as it is wide, flat, meandering and unshaded, which would allow for algal populations to increase during warmer conditions.

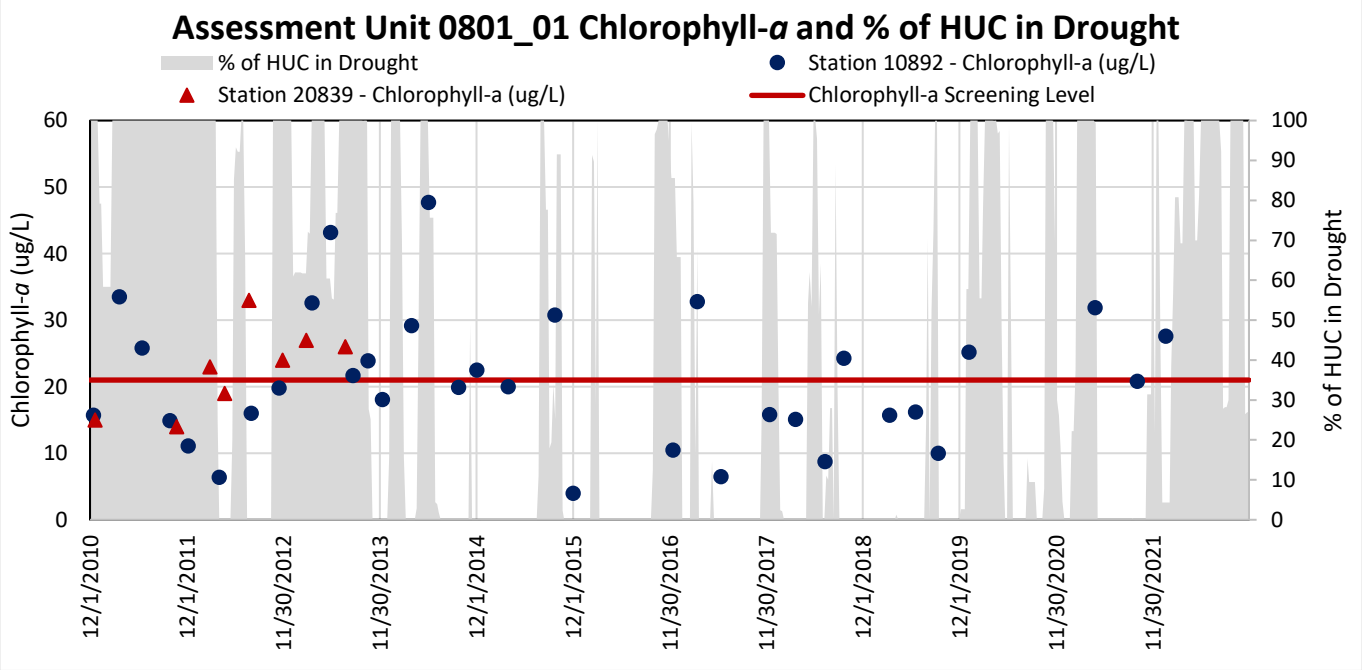

Figure 148: Assessment Unit 0801_01 Chlorophyll-a and % of HUC in Drought

0801D Lynchburg Canal

The 3.9-mile unclassified segment runs from the confluence with Big Caney Creek to the confluence with the Trinity River Tidal (see Figure 140). The watershed is largely woody wetland with some crop, hay, and pasture land to the west. The canal flows through the Northern Humid Gulf Coastal Prairies and the Floodplains and Low Terraces ecoregion just before the confluence with the river. However, the canal flows between levees and receives water pumped from segment 0801 and flows toward Houston.

Clean Rivers Program water quality monitoring is being conducted at one site within this segment as shown in Table 218. Monitoring is being conducted by TRA Lake Livingston Project. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 218: FY2023 Monitoring stations in Segment 0801D

Assessment Unit	Station Description	Station ID	Collecting Entity
0801D_01	COASTAL WATER AUTHORITY CANAL/LYNCHBURG CANAL 533 METERS UPSTREAM OF FM 1409 3.6KM DOWNSTREAM OF CONFLUENCE WITH TRINITY RIVER SOUTH OF LIBERTY	16148	TRA Lake Livingston Project

A summary of the concerns and impairments identified in the TCEQ 2022 Texas Integrated Report is shown in Table 219.

Table 219: Findings of TCEQ 2022 Texas Integrated Report for Segment 0801D

Assessment Unit	Use	Parameter	Criteria	Finding
0801D_01	General Use	Chlorophyll-*a*	14.1 ug/L	CS

A concern due to elevated levels of Chlorophyll-*a* was identified in this segment. As shown in Figure 149, 60% of Chlorophyll-*a* data was reported above the screening level of 14.1 µg/L. These elevated values generally occurred during periods of drought. As stated in the description for this segment, water in the canal is pumped directly from the Trinity River. Therefore, the Chlorophyll-*a* levels in the river were the source of this concern. However, Chlorophyll-*a* did not appear to be having a negative influence on dissolved oxygen; the lowest dissolved oxygen values was still reported at 6.3 mg/L. It is important to note that samples are collected twice a year so any conclusions made about this data set may be questionable. More frequent sampling could be done to more accurately address the listed impairment.

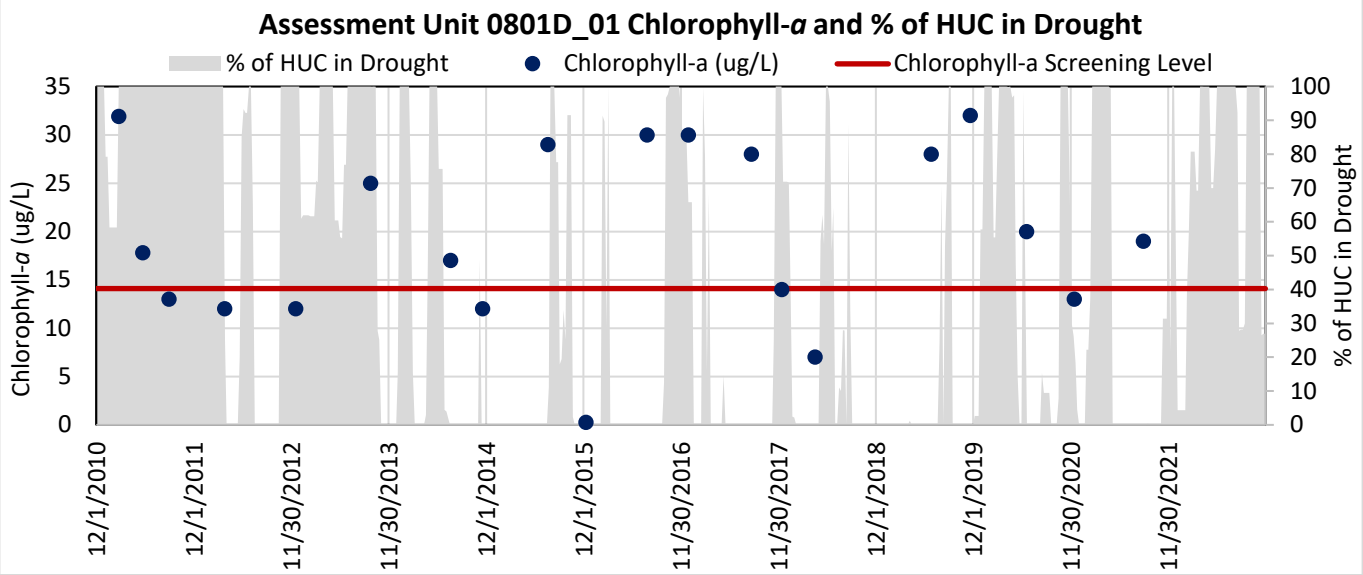

Figure 149: Assessment Unit 0801D_01 Chlorophyll-a and % of HUC in Drought

0801B Old River

This 17.3-mile unclassified segment runs from the confluence with East Prong Old River and West Prong Old River approximately 4.4 miles north of Mont Belvieu to IH 10 in Chambers County (see Figure 140). Much of the watershed is woody and herbaceous wetland to the east and hay, pasture, and crop land to the west with development around the City of Mont Belvieu. The watershed lies within the Northern Humid Gulf Coastal Prairies and Texas-Louisiana Coastal Marches ecoregions.

Clean Rivers Program water quality monitoring is being conducted at one site within this segment as shown in Table 220. Monitoring is being conducted by TRA Lake Livingston Project. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 220: FY2023 Monitoring stations in Segment 0801B

Assessment Unit	Station Description	Station ID	Collecting Entity
0801B_01	OLD RIVER AT FM 1409 SW OF WINFREE	18360	TRA Lake Livingston Project

A summary of the concerns and impairments identified in the TCEQ 2022 Texas Integrated Report is shown in Table 221.

Table 221: Findings of TCEQ 2022 Texas Integrated Report for Segment 0801B

Assessment Unit	Use	Parameter	Criteria	Finding
0801B_01	General Use	Chlorophyll-*a*	14.1 ug/L	CS

A concern due to elevated levels of Chlorophyll-*a* was identified in this segment. As shown in Figure 150, 72% of Chlorophyll-*a* levels were reported above the screening level of 14.1 µg/L. Chlorophyll-*a* was not strongly correlated to nutrients and does not seem to have been

negatively influencing dissolved oxygen levels. Of 27 dissolved oxygen readings, only 2 were reported below the grab sample screening level of 5 mg/L with no samples below the grab sampling minimum standard of 3 mg/L.

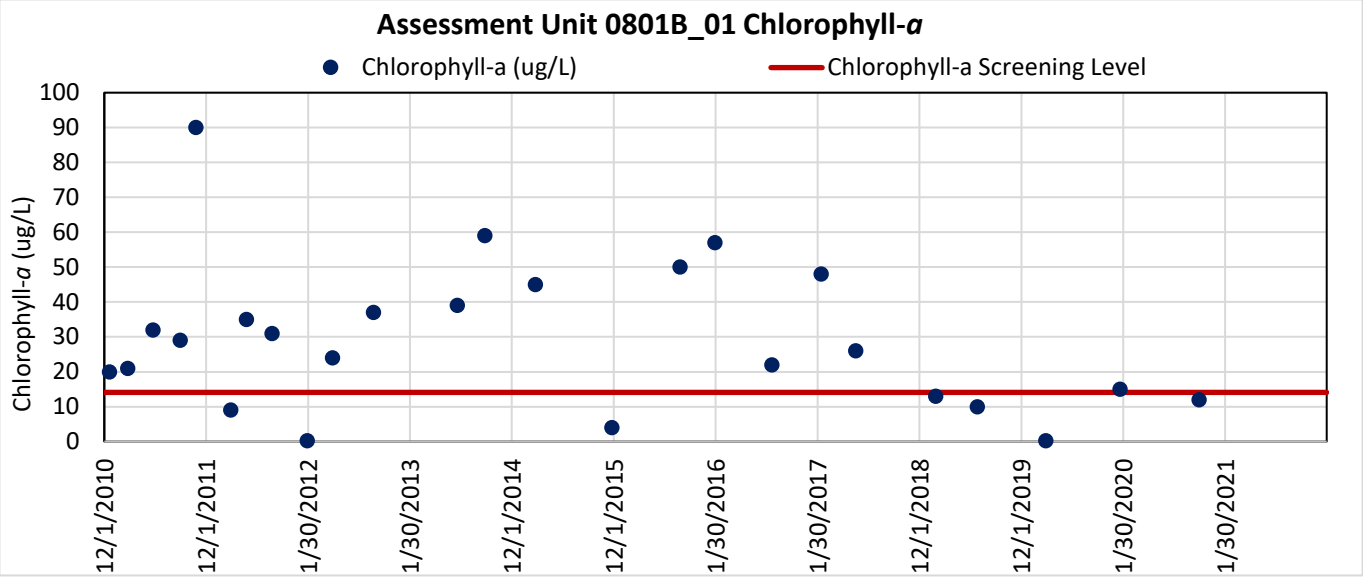

Figure 150: Assessment Unit 0801B_01 Chlorophyll-a

0801A Lost River

This 8-mile unclassified segment runs from approximately 3.7 miles upstream of the confluence with John Wiggins Bayou to IH 10 in Chambers County (see Figure 140). The watershed is woody and herbaceous wetland and flows through the Floodplains and Low Terraces and Texas-Louisiana Coastal Marshes ecoregions. There is no Clean Rivers Program monitoring scheduled in this segment for FY 2020.

There is no Clean Rivers Program monitoring scheduled in this segment for FY 2023.

No impairments or concerns for aquatic life, recreation, or general uses were identified in this segment.

0801E Cotton Bayou Above Tidal

This 4.3-mile unclassified segment runs from a point 1.17 miles north of IH 10 in Mont Belvieu in Chambers County to a point 0.74 miles upstream of the confluence of Cotton Lake (see Figure 140). The watershed is a mix of hay, pasture, and crop land as well as development around the City of Mont Belvieu. It lies within the Northern Humid Gulf Coastal Prairies ecoregion.

Clean Rivers Program water quality monitoring is being conducted at two sites within this segment as shown in Table 222. Monitoring is being conducted by TCEQ Region 12 and University of Houston Clear Lake. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 222: FY2023 Monitoring stations in Segment 0801E

Assessment Unit	Station Description	Station ID	Collecting Entity
0801E_01	COTTON BAYOU AT FM 565	18696	TCEQ Region 12
0801E_01	COTTON BAYOU 10 METERS UPSTREAM OF WESTBOUND IH 10 FRONTAGE ROAD IN MONT BELVIEU	22232	University of Houston Clear Lake

A summary of the concerns and impairments identified in the TCEQ 2022 Texas Integrated Report is shown in Table 223.

Table 223: Findings of TCEQ 2022 Texas Integrated Report for Segment 0801E

Assessment Unit	Use	Parameter	Criteria	Finding
0801E_01	Aquatic Life Use	Dissolved oxygen Grab	5 mg/L	CS
0801E_01	General Use	Chlorophyll-*a*	14.1 ug/L	CS
0801E_01	General Use	Total Phosphorus	0.69 mg/L	CS
0801E_01	General Use	Nitrate	1.95 mg/L	CS

Concerns for Total Phosphorus, Nitrate, Chlorophyll-*a*, and Dissolved Oxygen were identified in this segment. Sampling has been conducted at two stations; Station 22232 near the upper end and Station 18696 near the middle of the segment. There is no flow data available for Station 18696, however, based on the data at Station 22232 (see Figure 151), Nitrate and Total Phosphorus exhibit the typical pattern observed in effluent dominated streams downstream of wastewater treatment facilities; higher nutrient values and low flows which decrease at higher flows. Most wastewater treatment facilities do not have advanced nutrient removal technology. Overall, 75% of the Nitrate data and 66% of the Total Phosphorus data exceed the screening levels of 1.95 mg/L and 0.69 mg/L, respectively.

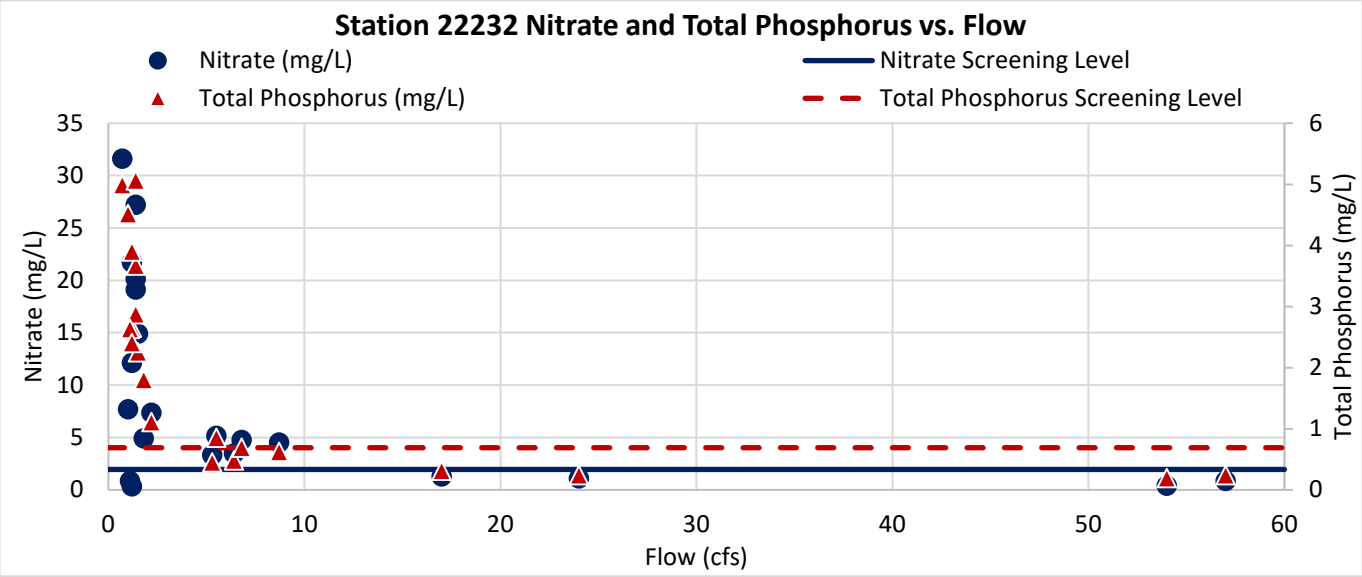

Figure 151: Station 22232 Nitrate and Total Phosphorus vs. Flow

Chlorophyll-*a* levels were moderately correlated to both Nitrate and Total Phosphorus (correlation coefficients = 0.56 and 0.49, respectively). This indicates that nutrients from the wastewater treatment facilities are affecting algal populations. The average Chlorophyll-*a* in this segment was 23.2 ug/L with a range of 1.49 to 165 ug/L. 42% of the data exceeded the screening level of 14.1 ug/L. It does not appear that algal populations were excessively affecting Dissolved Oxygen levels as there was no correlation between Dissolved Oxygen and Chlorophyll-*a*. Dissolved Oxygen was moderately correlated to Water Temperature (correlation coefficient = -0.57). As Water Temperature increased, the saturation potential for Oxygen decreases and can lead to lower Dissolved Oxygen levels. This segment is relatively narrow ranging from approximately 5 meters wide at the upstream end to 33 meters wide at the downstream end under normal flow conditions and little tree canopy. There are some areas of space tree canopy along the middle of the segment. Water column depths at Station 22232 ranged from 0.34 to 0.65 meters while depths at the mid-segment Station 18696 ranged from 0.2 to 1.2 meters. Additionally, this segment is upstream of the tidally influence Segment 0801C. The channel morphology, lack of shading, and potential backwater effect during high tide may be the cause of the low Dissolved Oxygen levels and higher Water Temperatures. Dissolved Oxygen levels were higher at the upstream Station 22232 than they were at Station 18696. Average Dissolved Oxygen levels at these two stations were 7.1 and 5.2 mg/L, respectively; 24% of the data at Station 22232 and 35% of the data at Station 18696 were reported below the screening level of 5 mg/L.

0801C Cotton Bayou Tidal

This 0.7-mile unclassified segment runs from a point near The Plantation neighborhood 0.74 miles upstream of the confluence with Cotton Lake to the confluence of Cotton Lake southeast of Mont Belvieu in Chambers County (see Figure 140). This portion of the watershed is largely residential development with some woody and emergent wetland. It lies within the Northern Humid Gulf Coastal Prairies and Texas-Louisiana Coastal Marshes ecoregions.

Clean Rivers Program water quality monitoring is being conducted at one site within this segment as shown in Table 224. Monitoring is being conducted by TCEQ Region 12. Additional details of sampling can be found in the FY 2023 Coordinated Monitoring Schedule.

Table 224: FY2023 Monitoring stations in Segment 0801C

Assessment Unit	Station Description	Station ID	Collecting Entity
0801C_01	COTTON BAYOU AT BOAT RAMP 0.46 KM UPSTREAM OF THE CONFLUENCE WITH COTTON LAKE	18697	TCEQ Region 12

A summary of the concerns and impairments identified in the TCEQ 2022 Texas Integrated Report is shown in Table 225.

Table 225: Findings of TCEQ 2022 Texas Integrated Report for Segment 0801C

Assessment Unit	Use	Parameter	Criteria	Finding
0801C_01	Aquatic Life Use	Dissolved oxygen Grab	4 mg/L	CS

Assessment Unit	Use	Parameter	Criteria	Finding
0801C_01	Aquatic Life Use	Dissolved oxygen Grab	3 mg/L	NS (Carry Forward)
0801C_01	General Use	Chlorophyll-*a*	21 ug/L	CS
0801C_01	Recreation Use	*Enterococcus*	35 MPN/100 mL	NS

An impairment for Dissolved Oxygen below the minimum standard of 3 mg/L was carried forward from previous assessments. However, there was a concern identified for Dissolved Oxygen below the screening level of 4 mg/L. The average Dissolved Oxygen in this segment was 6.3 mg/L with 19% of the data reported below 4 mg/L and 8% of the data reported below 3 mg/L. Dissolved Oxygen was not correlated to Water Temperature or Chlorophyll-*a* but was moderately correlated to days since precipitation (correlation coefficient = 0.50) with lower values being reported after recent precipitation. Although there was no correlation to Specific Conductance, higher Dissolved Oxygen levels were reported at lower Specific Conductance values as shown in Figure 152. This indicates that the Dissolved Oxygen issues in this segment may be due to the tidal nature of this portion of the stream.

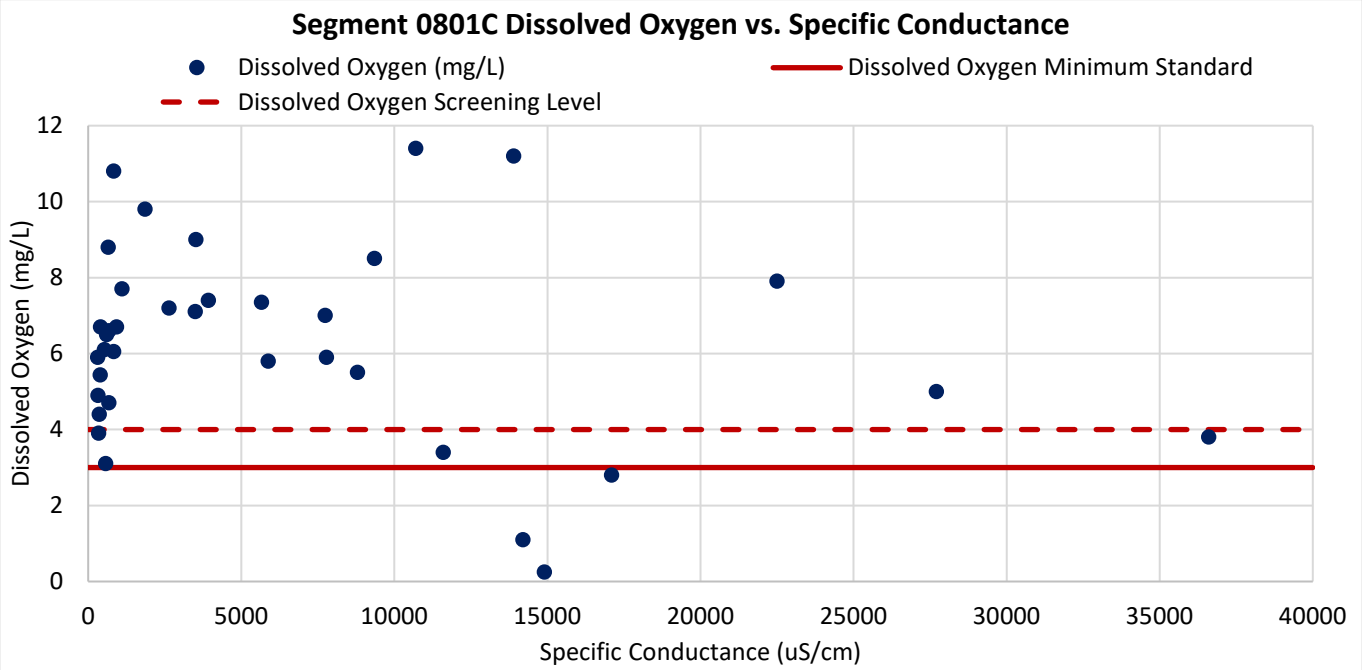

Figure 152: Segment 0801C Dissolved Oxygen vs. Specific Conductance

The Chlorophyll-*a* concerns in this segment were not correlated to nutrients but were moderately correlated to days since precipitation (correlation coefficient = 0.42) which indicates that algal populations are likely being washed in from the upstream Segment 0801E. The average Chlorophyll-*a* was 27.2 ug/L with a range of 1.9 to 75.9 ug/L.

An impairment for *Enterococcus* was identified in this segment. As shown in Figure 153, 78% of the *Enterococcus* data was reported above the standard of 35 MPN/100 mL. There were no correlations with days since precipitation and there are no flow data available. Therefore, this impairment cannot be fully analyzed. However, because *Enterococcus* levels were high

regardless of drought or recent precipitation, the impairment may be due to a mix of point and runoff related sources. There are residential communities upstream of Station 18697 in this segment as well as a wooded area on the right bank of the bayou. Runoff containing waste from pets and wildlife may be a likely contributor to the impairment. Homeowner education and pet waste best management practices may help reduce bacterial loading from pet sources. Additionally, failing wastewater infrastructure may be introducing bacteria from the neighborhoods adjacent to the bayou.

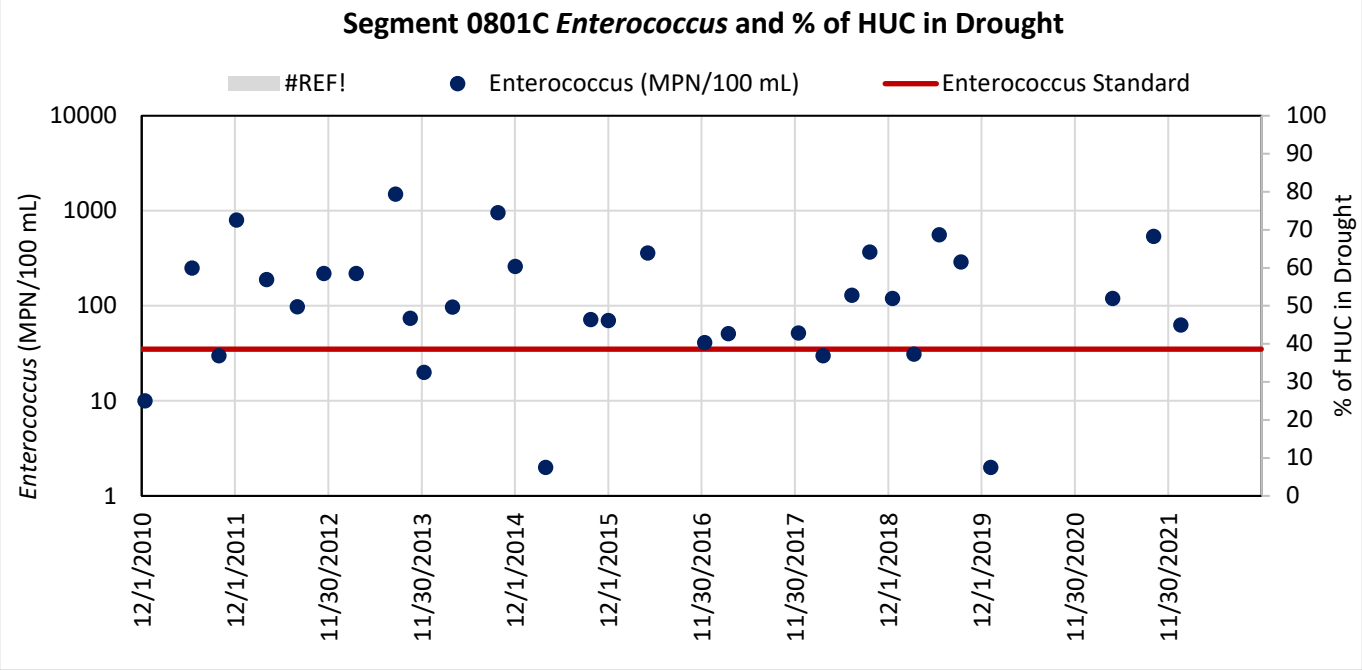

Figure 153: Segment 0801C Enterococcus and % of HUC in Drought