



LONE WOMAN MOUNTAIN CYPRESS CREEK WATERSHED SUMMARY REPORT

September 2026



Photo Credit: Pat Heintz



This report was prepared in cooperation with, and financed through, grants from the U.S. Environmental Protection Agency through the Texas Commission on Environmental Quality.

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ACKNOWLEDGEMENTS

The Texas Stream Team encourages life-long learning about the environment and people’s relationship to the environment through its multidisciplinary community science programs. We also provide hands-on opportunities for Texas State University students and inspire future careers and studies in natural resource related fields. Preparation of this report fulfills a contract deliverable for the granting entity, but it also serves as a valuable educational experience for the students that assisted in preparing the report. The Texas Stream Team staff values the student contributions and recognizes each individual for their role. The following staff and student workers assisted in the preparation of this report and are acknowledged for their contributions:

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EXECUTIVE SUMMARY

The Lone Woman Mountain Cypress Creek watershed is primarily composed of shrubland, covering nearly 47% of the area. Other land uses include forest (41.39%), developed areas (10.94%), herbaceous cover (0.56%), wetlands (0.30%), open water (0.14%), and less than 1% barren land.

According to the 2026 Integrated Report by the Texas Commission on Environmental Quality, Cypress Creek (segment 1815) is impaired for depressed dissolved oxygen, impaired fish community, and impaired microbenthic community.

Trained Texas Stream Team community scientists monitored eight sites in the watershed intermittently from February 2001 to August 2026, recording 479 monitoring events. Six sites with 10 or more monitoring events were analyzed for water quality, including the number of samples, mean, standard deviation, and range of values (Table 7). Parameters monitored included air and water temperature, specific conductance, dissolved oxygen, pH, Secchi disk transparency, transparency tube readings, *E. coli* bacteria, and total depth. Water quality standards for designated uses in the watershed were compared to the monitoring results to evaluate overall water quality. Major findings include the following:

- Dissolved oxygen averages met standards at all sites except site 12677, with discrete measurements below standards at sites 12677 (48 times), 80415 (25 times), 80443 (20 times), 80502 (2 times), and 80926 (4 times).
- Discrete pH measurements were outside the acceptable range at sites 12677 (2 times) and 80415 (once).
- Total dissolved solids averages exceeded the standards at sites 80415 and 81688, with discrete exceedances at 80926 (5 times), 80443 (18 times), 80415 (32 times), 12677 (23 times), and 81688 (58 times).
- Discrete *E. coli* Bacteria measurements exceeded standards 3 times at site 81688 with a below.
- Water temperature averages met standards at all sites with one discrete exceedance at site 12677.

Average water quality standards were met for most parameters across the watershed; however, several sites exhibited recurring discrete exceedances for dissolved oxygen and total dissolved solids, indicating potential water quality concerns. Texas Stream Team community scientists are encouraged to maintain core and *E. coli* bacteria monitoring monthly. Upstream and downstream *E. coli* bacteria monitoring alongside optical brightener monitoring can be implemented to help identify fecal sources.

This report would not have been possible without the dedicated efforts of the Wimberley Valley Monitors, whose work has been pivotal in collecting water quality data for the Lone Woman Mountain and the larger Cypress Creek watershed. These community scientists have consistently monitored sites across the watershed, contributing valuable data that underpins this report. Texas Stream Team will continue to support these efforts by providing technical assistance and training new community scientists to expand, grow, and sustain water quality monitoring in this area and beyond.

For more details on the Texas Stream Team program or to find upcoming training opportunities, please email TxStreamTeam@txstate.edu or visit our events calendar at [TexasStreamTeam.org](https://texasstreamteam.org).

INTRODUCTION

Texas Stream Team

Texas Stream Team is a volunteer-based community science water quality monitoring program. Water quality monitoring occurs at predetermined monitoring sites, at roughly the same time of day each month. The information that Texas Stream Team community scientists collect is covered under a Texas Commission on Environmental Quality-approved Quality Assurance Project Plan to ensure that a standard set of methods are used statewide. The data may be used by professionals to identify surface water quality trends, target additional data collection needs, identify potential pollution events and sources of pollution, and to test the effectiveness of water quality management measures. Texas Stream Team community scientist data can be used by the state to assess whether water bodies are meeting the designated surface water quality standards, however it is not a requirement. The data collected by Texas Stream Team provides valuable records, often collected in portions of a water body that professionals are not able to monitor frequently or monitor at all.

For additional information about water quality monitoring methods and procedures, including the differences between professional and volunteer community science monitoring, please refer to the following sources:

- [Texas Stream Team Core Water Quality Community Scientist Manual](#)
- [Texas Stream Team Advanced Water Quality Community Scientist Manual](#)
- [Texas Stream Team Quality Assurance Project Plan](#)
- [Texas Commission on Environmental Quality Surface Water Quality Monitoring Procedures](#)

The purpose of this report is to provide a summary of the data collected by Texas Stream Team community scientists under a specific watershed. The data presented in this report should be considered in conjunction with other relevant water quality reports for a holistic view of water quality. Such sources may include, but are not limited to, the following:

- Texas Surface Water Quality Standards
- Texas Water Quality Inventory and 303(d) List (Integrated Report)
- Texas Clean Rivers Program partner reports, such as Basin Summary and Highlight Reports
- Texas Commission on Environmental Quality Total Maximum Daily Load reports
- Texas Commission on Environmental Quality and Texas State Soil and Water Conservation Board Nonpoint Source Program funded reports, including watershed protection plans

To get involved with Texas Stream Team or for questions regarding this watershed data report contact us at TxStreamTeam@txstate.edu or at 512.245.1346. Visit our website for more information on our programs at www.TexasStreamTeam.org.

Recognition of Field Contributions

This report would not have been possible without the dedicated efforts of Wimberley Valley Monitors Texas Stream Team monitoring group. Their invaluable contributions have played a pivotal role in

collecting water quality data for the Lone Woman Mountain Cypress Creek watershed (the watershed). These dedicated community scientists have consistently monitored sites across the watershed, providing essential data that serves as the foundation for the analysis presented in this report.

The Wimberley Valley Monitors have been active since 2020, consistently monitoring in the region and growing monitoring coverage since inception. The group consists of residents, Hays County Texas Master Naturalist, and is supported by the Guadalupe-Blanco River Authority and Hays County to sustain monitoring efforts in the watershed beyond the capacity of professional monitoring. The Texas Stream Team is deeply grateful for their dedication, which has not only made this report possible but also contributed to the overarching mission of safeguarding and preserving Texas waterways. The data they have gathered remains an indispensable resource, guiding ongoing conservation efforts and shaping informed policy decisions for the future.

WATERSHED DESCRIPTION

Location and Physical Description

The watershed is in western Hays County and part of the Guadalupe river basin. Cypress Creek feeds into the Blanco River, the Blanco River feeds into the San Marcos River, the San Marcos River feeds into the Guadalupe River, where it finally empties into the Gulf of Mexico in San Antonio Bay (Jasinski, 2025; Smyrl, 2020, 2022; Texas State Historical Association, 1994). The watershed is approximately 38 square miles with an artesian spring, Jacob's Well. Jacob's Well can greatly contribute to flow and recreational activity within the watershed (Texas Commission on Environmental Quality, n.d.).

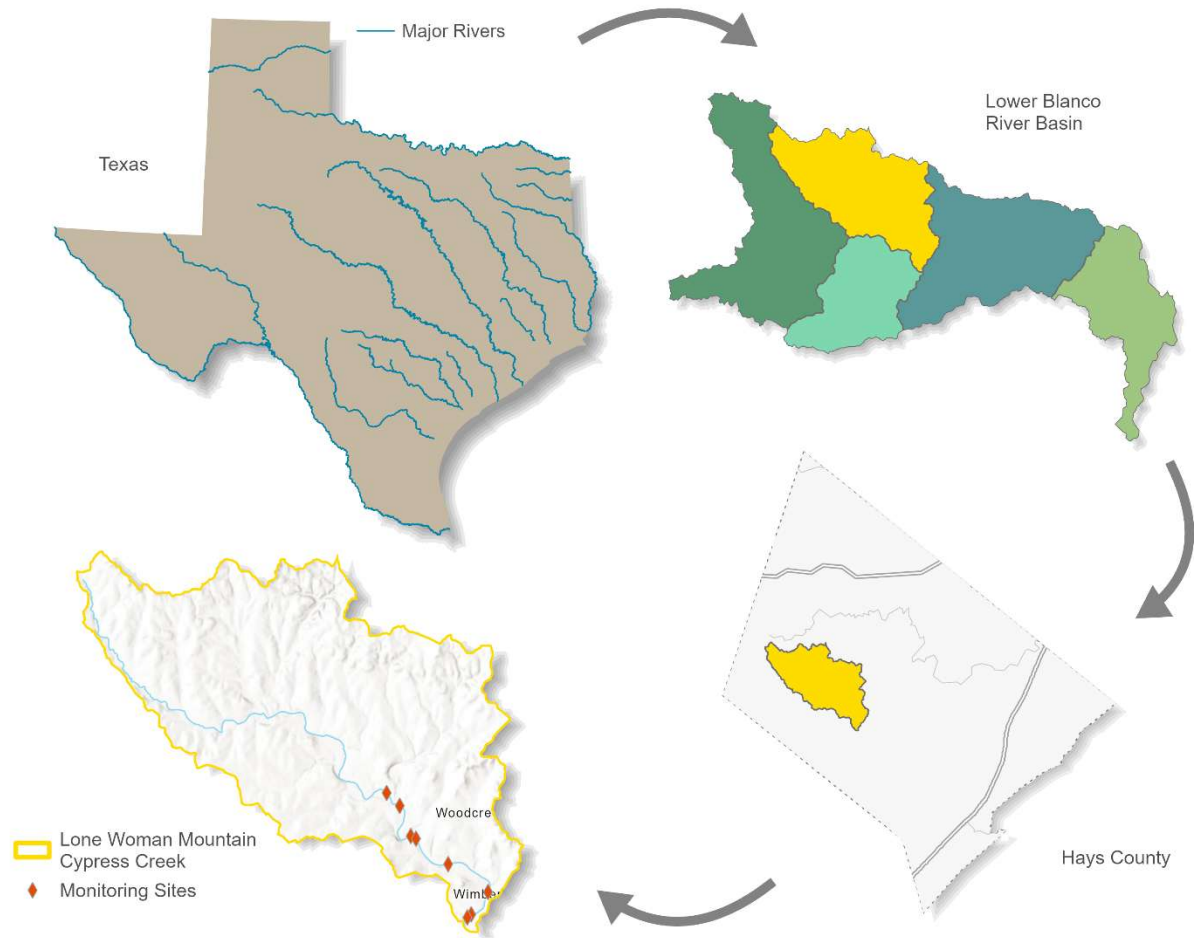


Figure 1. The watershed in Hays County, Texas.

The watershed lies at the eastern edge of the Edwards Plateau ecoregion of Texas and includes the Balcones Canyonlands sub-ecoregion. The physiography is described as dissected plateau and escarpment of bedrock and cobble in a stair step-like topography formation. There is a wealth of flowing water across the ecoregion with multiple aquifers feeding the waterbodies and being recharged via limestone substrate. These aquifers are the central Edwards Plateau aquifer, the Edwards aquifer, and the Trinity-Edwards aquifer. The elevation of the watershed ranges from 650 feet to 2,400 feet with a local relief of 150 feet to 700 feet. The flora in this area includes, but is not limited to, Texas persimmon, yellow Indiangrass, Texas wintergrass, threeawn, black willow, Vasey oak, boxelder, and bigtooth maple. The fauna includes, but is not limited to, white-tailed deer, Rio Grande wild turkey, brown-headed cowbird, and golden-cheeked warbler. Exotic game such as axis, fallow, and sika deer are raised by ranchers in the area (Griffith et al., 2007).

The Texas Commission on Environmental Quality designates classifications for streams, rivers, lakes, and bays throughout Texas, including those within the watershed. One classified freshwater stream was monitored by Texas Stream Team community scientists and is described in Table 1.

Table 1. Texas Commission on Environmental Quality segment classifications (Texas Commission on Environmental Quality, 2026).

Segment Number	Segment Name	Segment Description
1815	Cypress Creek	From the confluence with the Blanco River in Hays County to a point 6.4 km (4.0 mi) upstream of the most upstream unnamed county road crossing in Hays County

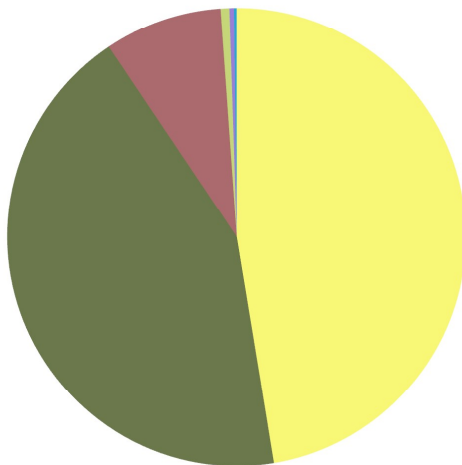
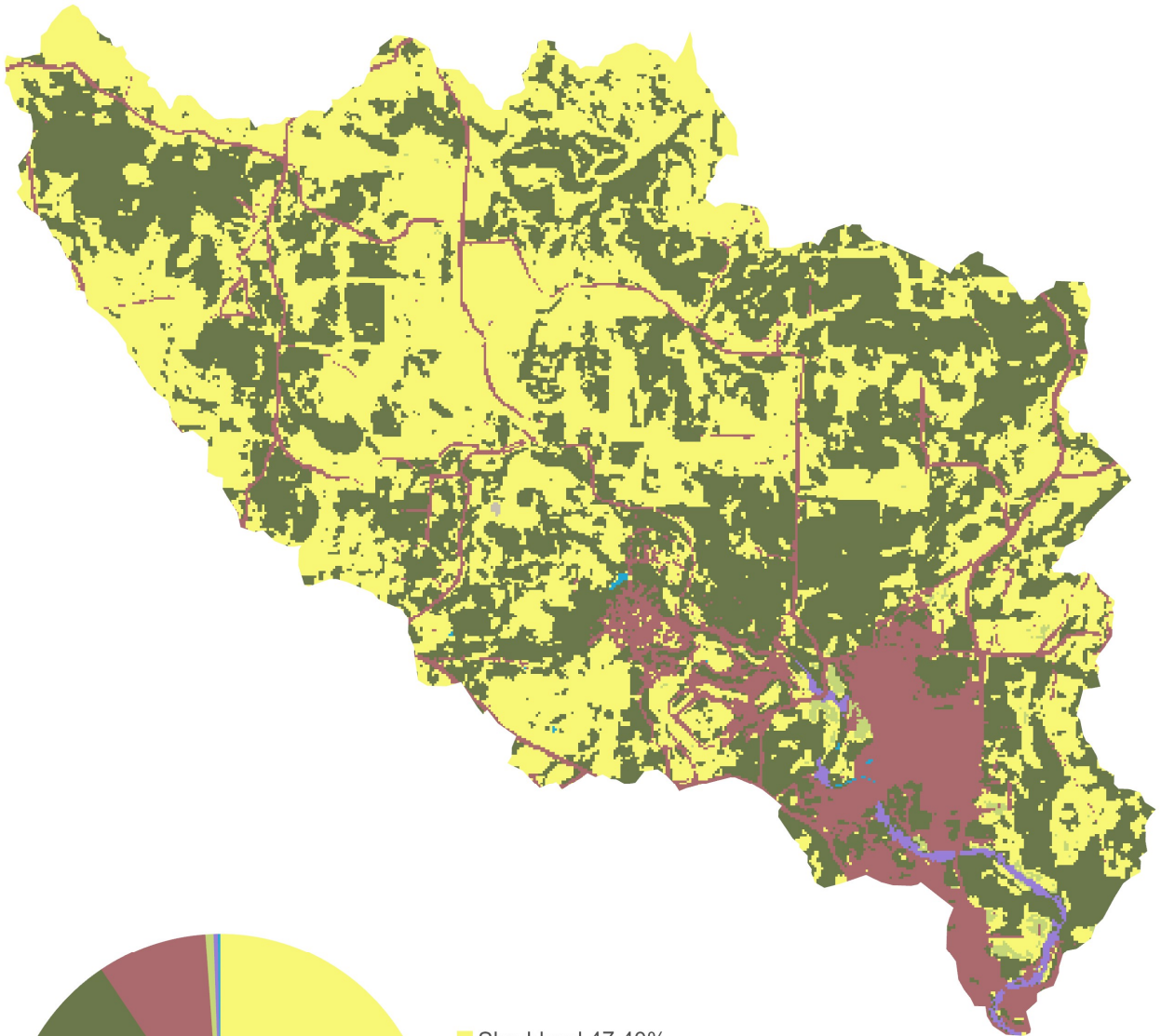
History

Various archeological studies and excavations have indicated that the Hays County area has been inhabited for thousands of years. Paleo-Indian communities were present near the San Marcos Springs an estimated 8,000 years ago. Tonkawa native Americans were revealed to have been farming the area on the west side of Wimberley around A.D. 1200. Apache and Comanche native Americans also had presence in the Hays County area. Spanish settlers began establishing passageways and expeditions in the late 1600s. Various missions and settlements were authorized over the 1700s, but it wasn't until 1807 that the first permanent settlement was attempted: San Marcos de Neve. However, this settlement was abandoned after just four years due to flooding and native American attacks. The first Anglo-American settler first arrived in 1835 with land issued from the Mexican government (Cecil and Greene, 2020).

Hays County was officially established by the state legislature in 1848. Populations steadily increased with sporadic drops due to border changes across the Blanco and Comal Counties. These boundaries were relatively stable until over 16,000 acres were added to Hays County following the Hays-Travis resurvey. This along with the abundance of educational institutions in the area and the Hays County rail line spurred another population boom; in 1900 the population was 14,142, a near doubling of the 7,555 count in 1880. These educational institutions played a large role in the county's economy, with the non-agricultural income outweighing that of agriculture. As development increased, the area also received money from tourism and recreation from the many springs, wells, and caves of Hays County (Cecil and Greene, 2020).

Land Use

Land cover types were determined from spatial datasets from the National Land Cover Database and processed in Esri ArcGIS Pro for the watershed (Figures 2 and 3).



- Shrubland 47.40%
- Forest 43.18%
- Developed 8.30%
- Herbaceous 0.61%
- Wetlands 0.32%
- Open Water 0.18%
- Barren 0.01%

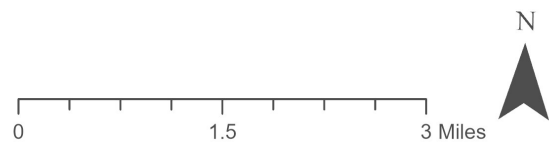


Figure 2. 2001 Land use and land cover for the watershed in Hays County, Texas (National Land Cover Data, 2001).

In 2001, the watershed was primarily dominated by shrublands (47.40%) and forests (43.18%) throughout the area. Developed land made up 8.30% of the watershed while the remaining 1.12% of the watershed consisted of herbaceous cover, wetlands, open water, and barren land.

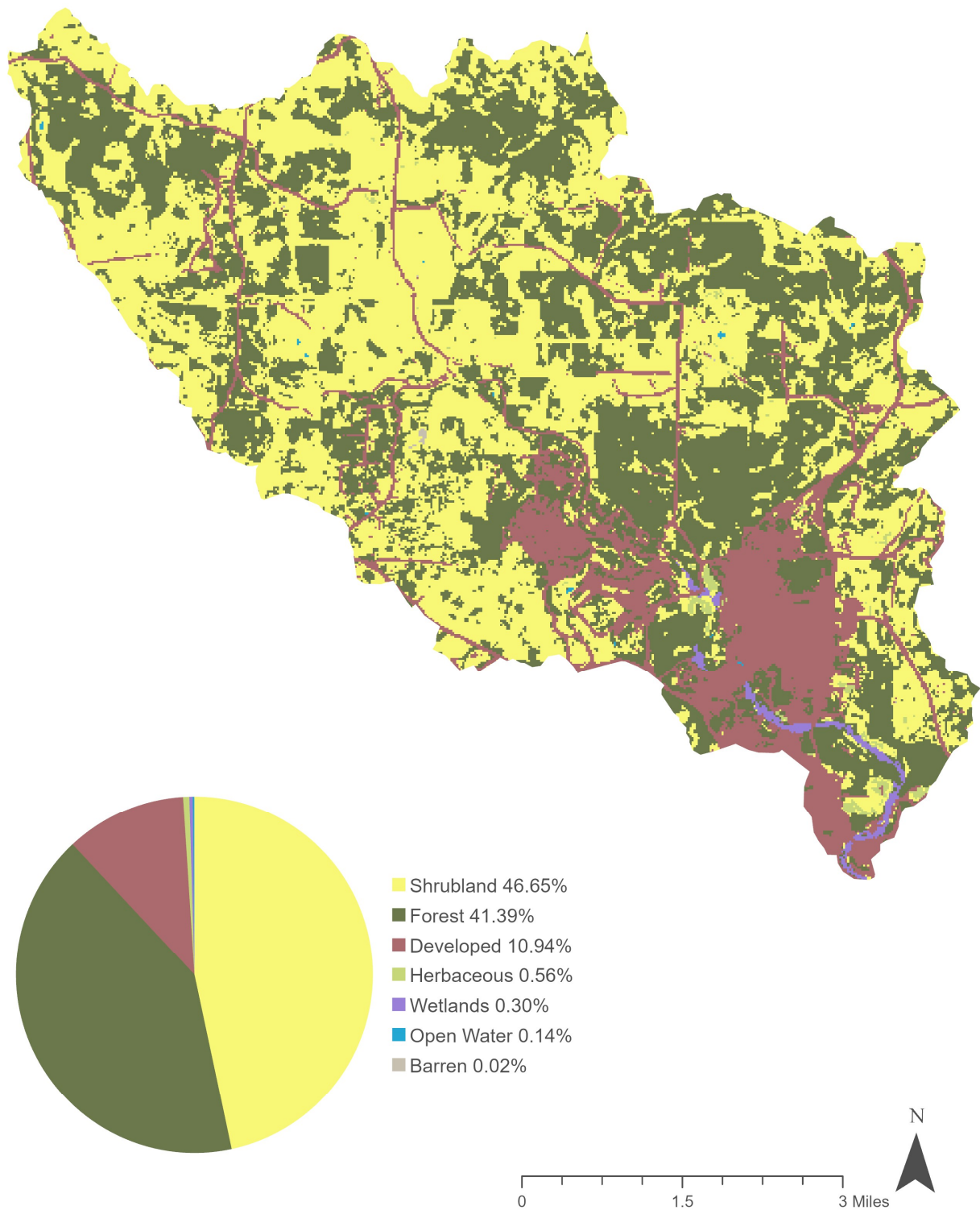


Figure 3. 2023 Land use and land cover for the watershed in Hays County, Texas (National Land Cover Data, 2023).

In 2023, the watershed remained primarily dominated by shrublands (46.65%) and forests (41.39%) throughout the area. Developed land made up 10.94% of the watershed while the remaining 1.02% of the watershed consisted of herbaceous cover, wetlands, open water, and barren land.

Table 2. Comparison of watershed land use categories by acreage and percentage in 2001 and 2023 (National Land Cover Data, 2001 and 2023).

Land Use	2001, Acreage	2001, Percentage	2023, Acreage	2023, Percentage	Percent Change
Open Water	88.3	0.2%	67.8	0.1%	-23.2%
Developed	4,110.3	8.3%	5,418.9	10.9%	31.8%
Barren	4.9	0.01%	8.7	0.02%	77.3%
Forest	21,378.6	43.2%	20,492.8	41.4%	-4.1%
Shrubland	23,472.0	47.4%	23,099.0	46.7%	-1.6%
Herbaceous	302.5	0.6%	279.1	0.6%	-7.7%
Planted/Cultivated	0.2	0.0%	0.2	0.0%	0.0%
Wetlands	157.2	0.3%	147.4	0.3%	-6.2%
TOTAL	49,513.9	100.0%	49,513.9	100.0%	

Endangered Species and Conservation Needs

The common names of 20 species listed as threatened or endangered (under the authority of Texas state law and/or the United States Endangered Species Act) within the watershed are included in Appendix A. A summary of the number of species per taxonomic group listed as state or federally endangered, threatened, G1 or G2 (critically imperiled or imperiled), species of greatest conservation need, and/or endemic is provided in Table 3.

Table 3. State and federally listed species in the watershed (Texas Parks and Wildlife Department: Rare, Threatened, and Endangered Species of Texas, 2025).

Taxon	Endangered (Federal or State) LE/E	Threatened (Federal or State) LT/T	G1 or G2 (Critically Imperiled/ Imperiled)	Species of Greatest Conservation Need (TPWD) (S1 or S2)	Endemic Total Count
Amphibians	2	1	3	3	3
Birds	2	2	2	2	0
Fish	1	0	1	1	1
Mammals	1	0	0	1	0
Reptiles	0	0	0	0	0
Insects	2	0	2	2	1

Mollusks	6	1	7	5	6
Plants	1	1	2	2	2
Total	15	5	17	16	13

Climate

The climate in this area (Cfa) is described as humid and subtropical with hot, humid summers, mild winters, and no dry season (Köppen-Geiger climate classification). Climate data from the National Oceanic and Atmospheric Administration was collected from two weather stations in Hays County, Texas and acquired from the National Data Center (National Oceanic and Atmospheric Administration, 2021). A station in Wimberley was used for the precipitation data, and a station in San Marcos was used for temperature data. The San Marcos station is the only station in Hays County that records temperature data. It should be noted that this discrepancy in location may not accurately reflect the average temperature of the watershed area.

The average annual precipitation is 37.15°C and typically occurs year-round (Figure 4). Long-term monthly precipitation shows a bimodal distribution, with peaks occurring in May and October, averaging 4.40 inches of rainfall during these months. The least amount of rainfall (1.92 inches) occurs in February. The warmest and coldest months of the year are August (29.72°C) and January (10.33°C), respectively.

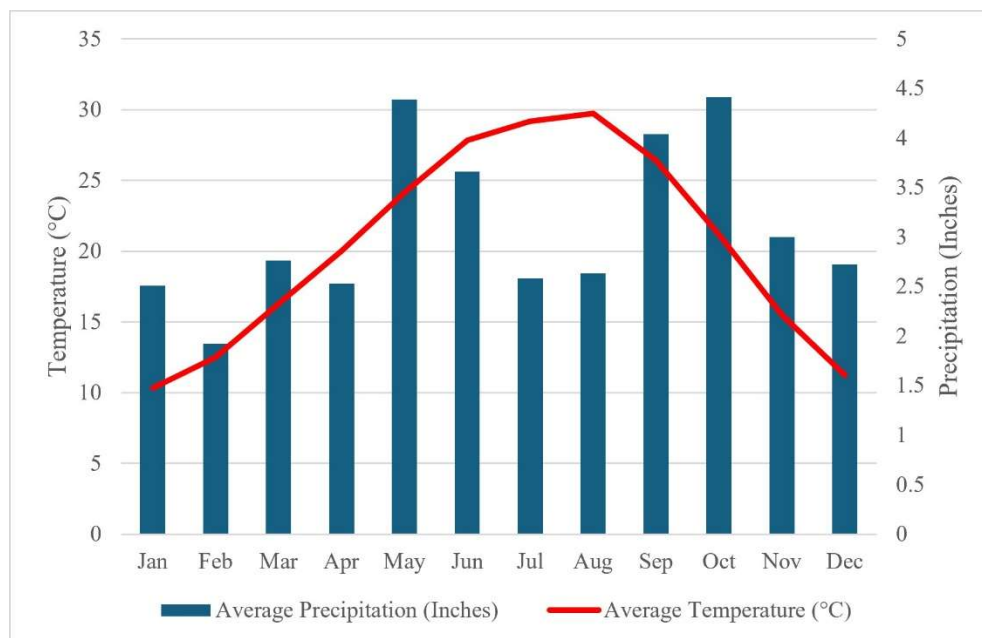


Figure 4. Long-term (1991-2020) monthly average precipitation (inches) and air temperature (°C) from the watershed (National Oceanic and Atmospheric Administration Climate Data, 2021).

Texas Water Quality Standards

The Texas Surface Water Quality Standards establish explicit goals for the quality of streams, rivers, lakes, and bays throughout the state. These standards are designed to maintain surface water quality in support of public health, aquatic life, and recreational uses, while remaining consistent with sustainable economic development. Water quality standards identify the appropriate uses of classified and unclassified water bodies, including aquatic life protection, recreation, and public water supply.

For monitoring sites located on tributaries feeding into segment 1815, the criteria used to assess support of these designated uses are summarized in Table 4. Unclassified water bodies are not defined individually in the state's standards but are associated with the classified segment because they lie within the same watershed. The dissolved oxygen criterion represents the minimum allowable mean concentration at any site within the segment. The acceptable pH range applies to any monitoring location within the watershed. The total dissolved solids criterion represents the mean allowable concentration for the segment. The indicator bacteria criterion for freshwater systems is a geometric mean based on *E. coli* levels. The temperature criterion represents the maximum allowable value at any site within the segment.

Table 4. State water quality criteria for the watershed (Texas Commission on Environmental Quality, 2022).

Segment	Dissolved Oxygen (mg/L)	pH Range (s.u.)	Total Dissolved Solids (mg/L)	<i>E. coli</i> Bacteria (CFU/100 mL)	Temperature (°C)
1815	6.0	6.5-9.0	400	126	30

Water Quality Impairments

The 2026 Texas Integrated Report of Surface Water Quality for Clean Water Act Sections 305(b) and 303(d) includes an Index of Water Quality Impairments (Texas Commission on Environmental Quality, 2024). Table 5 summarizes the water quality impairments and Total Maximum Daily Load status for the stream segments within the watershed that were evaluated in this assessment cycle.

Table 5. Water Quality Impairments and Total Maximum Daily Load Status of the watershed (Texas Commission on Environmental Quality, 2026).

Segment	Name	Impairment Parameter(s)	Category	TMDL Status
1815	Cypress Creek	Depressed dissolved oxygen in water, Impaired fish community in water, Impaired microbenthic community in water	5r, 5c	A Watershed Protection Plan has been developed or accepted by EPA; therefore, no separate TMDL is required.

WATER QUALITY PARAMETERS

Conductivity

Conductivity (specific conductance) is a measure of the ability of a body of water to conduct electricity. It is measured in microsiemens per centimeter ($\mu\text{S}/\text{cm}$). A body of water is more conductive if it has more total dissolved solids such as nutrients and salts, which indicates poor water quality if they are overly abundant. High concentrations of nutrients can lead to eutrophication, which results in lower levels of dissolved oxygen. High concentrations of salt can inhibit water absorption and limit root growth for vegetation, leading to an abundance of more drought tolerant plants, and can cause dehydration of fish and amphibians. Sources of total dissolved solids can include agricultural runoff, domestic runoff, or discharges from wastewater treatment plants.

Dissolved Oxygen

Dissolved oxygen refers to the amount of oxygen gas present in water as tiny, dissolved molecules. It is typically measured in milligrams per liter (mg/L). Oxygen is necessary for the survival of organisms like fish and aquatic insects. The amount of oxygen needed for survival and reproduction of aquatic communities varies according to species composition and adaptations to watershed characteristics like stream gradient, habitat, and available streamflow.

The dissolved oxygen concentrations can be influenced by other water quality parameters such as nutrients and temperature. High concentrations of nutrients can lead to excessive surface vegetation and algae growth, which may starve subsurface vegetation of sunlight and, therefore, reduce the amount of oxygen they produce via photosynthesis. This process is known as eutrophication. Low dissolved oxygen can also result from high groundwater inflows (which have low dissolved oxygen due to minimal aeration), high temperatures, or water releases from deeper portions of dams where dissolved oxygen stratification occurs. Supersaturation typically occurs underneath waterfalls or dams with water flowing over the top where aeration is abundant.

E. coli Bacteria

Escherichia coli (*E. coli*) bacteria, a member of the total coliform group of bacteria, originates in the digestive tracts of warm-blooded animals and enter water bodies through fecal contamination. For this reason, the presence of *E. coli* in water indicates fecal pollution and the potential presence of pathogens, which are disease-causing biological agents. The U.S. Environmental Protection Agency has identified *E. coli* as the primary indicator for assessing microbial contamination in freshwater systems.

Bacterial impairment is determined by using the geometric mean of *E. coli* measurements. The geometric mean is used because *E. coli* concentrations can vary widely, ranging from zero to thousands of colony-forming units per 100 milliliters (CFU/100 mL). A water body is considered impaired if the geometric mean exceeds the water quality stand.

pH

The pH scale measures the concentration of hydrogen ions in a range from zero to 14 and is reported in standard units (s.u.). The pH of water can provide information regarding acidity or alkalinity. The range is

logarithmic; therefore, every one-unit change is representative of a 10-fold increase or decrease in acidity or alkalinity. Acidic sources, indicated by a low pH level, can include acid rain and runoff from acid-laden soils. Acid rain is predominantly caused by coal powered plants with minimal contributions from the burning of other fossil fuels and other natural processes, such as volcanic emissions. Soil-acidity can be caused by excessive rainfall leaching alkaline materials out of soils, acidic parent material, crop decomposition creating hydrogen ions, or high yielding fields that have drained the soil of all alkalinity. Sources of high pH (alkaline) include geologic composition, as in the case of limestone increasing alkalinity and the dissolving of carbon dioxide in water. Carbon dioxide is water soluble, and as it dissolves it forms carbonic acid. A suitable pH range for healthy organisms is between 6.5 and 9.0 s.u. measurement.

Water Temperature

Water temperature influences the physiological processes of aquatic organisms, and each species has an optimum temperature for survival. High water temperatures increase oxygen-demand for aquatic communities and can become stressful for fish and aquatic insects. Water temperature variations are most detrimental when they occur rapidly, leaving the aquatic community with no time to adjust. Additionally, the ability of water to hold oxygen in solution (solubility) decreases as temperature increases. This effect is exacerbated in coastal water bodies influenced by tidal, saline waters. Warm water temperatures occur naturally with seasonal variation, as water temperatures tend to increase during summer and decrease in winter in the Northern Hemisphere. Daily (diurnal) water temperature changes occur during normal heating and cooling patterns. Man-made sources of warm water include power plant effluent after it has been used for cooling or hydroelectric plants that discharge warm water. Community scientist monitoring may not identify fluctuating patterns due to diurnal changes or events such as power plant releases because of the monthly sampling frequency. While community scientist data may not show diurnal temperature fluctuations, they could demonstrate the fluctuations over seasons and years when collected consistently at predetermined monitoring sites and monthly frequencies.

Water Transparency and Total Depth

Two instruments can be used by Texas Stream Team community scientists to measure water transparency, a Secchi disc or a transparency tube. Both instruments are used to measure water transparency or to determine the clarity of the water, a condition known as turbidity. The Secchi disc is lowered into the water until it is no longer visible, then raised until it becomes visible, and the average of the two depth measurements is recorded. A transparency tube is filled with sample water and water is released until the Secchi pattern at the bottom of the tube can be seen. The tube is marked with two-millimeter increments and is used to measure water transparency. Transparency measurements less than the total depth of the monitoring site are indicative of turbid water. Readings that are equal to total depth indicate clear water. Highly turbid waters pose a risk to wildlife by clogging the gills of fish, reducing visibility, and carrying contaminants. Reduced visibility can harm predatory fish or birds that depend on good visibility to find their prey. Turbid waters allow less light to penetrate deep into the water, which, in turn, decreases the density of phytoplankton, algae, and other aquatic plants. This reduces the dissolved oxygen in the water due to reduced photosynthesis. Contaminants are mostly

transported in sediment rather than in the water. Turbid water can result from sediment runoff from construction sites, erosion of farms, or mining operations.

DATA ANALYSIS METHODOLOGIES

Data Collection

The field sampling procedures implemented by trained community scientists are documented in the Texas Stream Team Core Water Quality Community Scientist Manual and the Texas Stream Team Advanced Water Quality Community Scientist Manual. The sampling protocols in the manuals adhere closely to the Texas Commission on Environmental Quality Surface Water Quality Monitoring Procedures Manual, Volume 1 (August 2012). Additionally, all data collection adheres to Texas Stream Team's Texas Commission on Environmental Quality-approved [Quality Assurance Project Plan](#).

Procedures documented in Texas Stream Team Water Quality Community Scientist Manuals or the Texas Commission on Environmental Quality Surface Water Quality Monitoring Procedures Manual, Volume 1 (August 2012) outlines the necessary steps to prevent contamination of samples, including direct collection into sample containers, when possible. Field quality control samples are collected and analyzed to detect whether contamination has occurred and to ensure data accuracy and precision. Field sampling activities are documented on Environmental Monitoring Forms. The following items are recorded for each field sampling event: station ID, location, sampling time, date, depth, sample collector's name/signature, group name, meter calibration information, and reagent expiration dates.

Specific conductance values are converted to solids using a conversion factor of 0.65 and are reported as mg/L. Values for measured parameters are recorded. If reagents or media are expired, it is noted, and data are flagged and communicated to Texas Stream Team staff. Sampling is not permitted with expired reagents or bacteria media; the corresponding values will be flagged in the database and excluded from data reports. Detailed observational data recorded include water appearance, weather, field observations (biological activity and stream uses), algae cover, unusual odors, days since last significant rainfall, and flow severity. Comments related to field measurements, number of participants, total time spent sampling, and total round-trip distance traveled to the sampling site are also recorded for grant reporting and administrative purposes.

Data Management

The community scientists collect field data and report the measurement results to Texas Stream Team, by submitting a hard copy of the Environmental Monitoring Form, entering the data directly into the online Waterways Dataviewer database, or by using the electronic Environmental Monitoring Form. All data are reviewed to ensure they are representative of the samples analyzed and locations where measurements were made. The measurements and associated quality control data are also reviewed to ensure they conform to specified monitoring procedures and project specifications as stated in the approved Quality Assurance Project Plan. Data review and verification is performed using a quality control checklist and self-assessments, as appropriate to the project task, followed by automated database functions that validate data as the information is entered into the database. The data are

verified and evaluated against project specifications and are checked for errors, especially errors in transcription, calculations, and data input. Potential errors are identified by examination of documentation and by manual and computer-assisted examination of corollary or unreasonable data. Issues that can be corrected are corrected and documented. Once entered, the data can be accessed publicly through the online [Texas Stream Team Datamap](#).

Data Analysis

Data was compiled, analyzed, summarized, and compared to state water quality standards and/or criteria to provide readers with a reference point for parameters that may be of concern. The statewide, biennial assessment performed by the Texas Commission on Environmental Quality involves more stringent monitoring methods and oversight than those used by community scientists and staff in this report. However, the Texas Stream Team data is intended to inform stakeholders about general characteristics and assist professionals in identifying areas of potential concern to plan future monitoring efforts. All data collected by community scientists in the watershed were exported from the Texas Stream Team database and grouped by site. Sites with 10 or more monitoring events were maintained in the dataset for analysis. Sites with fewer than 10 monitoring events were excluded from the analysis for this report but may be used in future watershed summary reports. Once compiled, data was sorted, and summary statistics were generated and reviewed. To ensure data quality and consistency, the Data Engineering view in ArcGIS Pro was utilized to identify and correct range violations, outliers, and QA/QC issues across all parameter groups. Validated datasets were then visualized by creating charts within ArcGIS Pro. This tool automatically generates standardized figures and summary tables based on user-defined water quality standards. Together, these automated tools enhanced data reliability, ensured graphical consistency, and reduced manual processing time.

Best professional judgement was used to verify outliers. Outlier boxes or scatter plots were prepared to provide a compact view of the distribution of the data for each parameter and site(s). The horizontal line within the box plots represents the median sample value, while the ends of the box represent the 25th and 75th quantiles or the interquartile range. The lines extending from each end of the box, or whiskers, are computed using the 25th/75th quantiles $\pm 1.5 \times$ (interquartile range). Outliers are plotted as points outside the box plot.

DATA RESULTS

Water quality data from 8 Texas Stream Team monitoring sites in the watershed were acquired for this report (Figure 5).

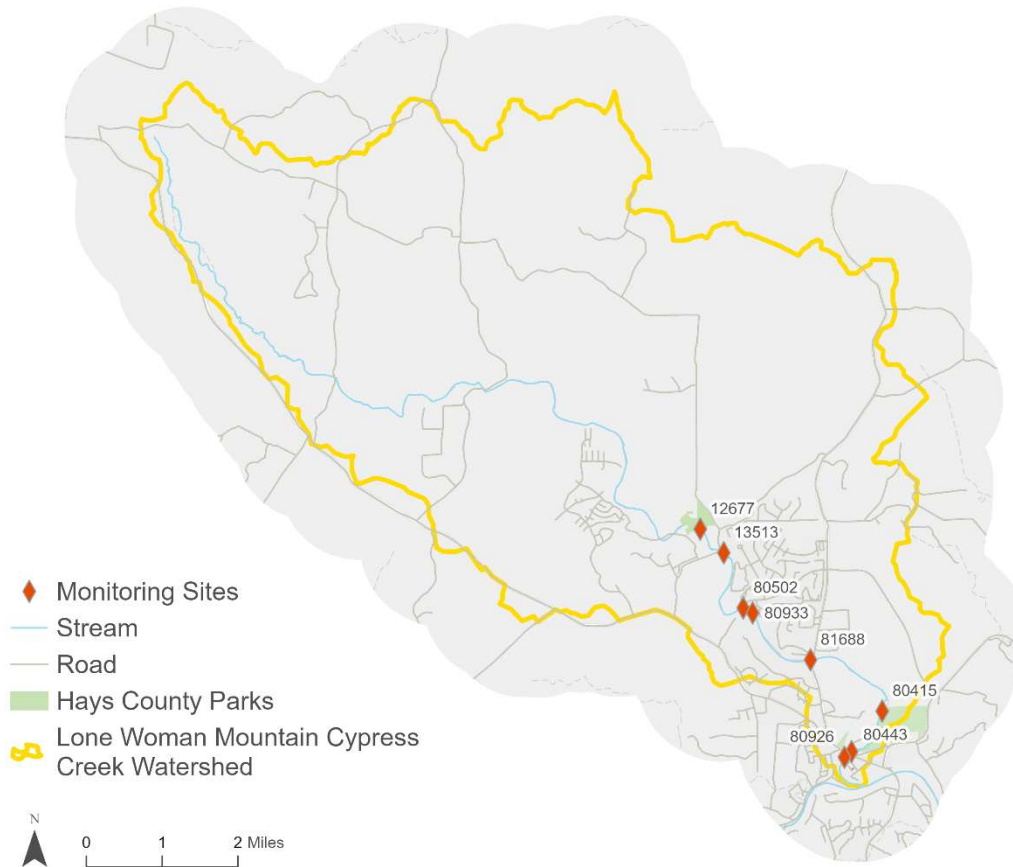


Figure 5. Texas Stream Team monitoring sites in the watershed.

The period of record for the sampling events ranged from February 2001 through August 2026, with some sites experiencing temporal intermittent sampling. Trained community scientists conducted between three and 113 monitoring events at each site, for a total of 479 events. Of the eight sites, six of the sites had 10 or more monitoring events and were monitored sporadically from February 2001 through August 2026 (Table 6).

Table 6. Texas Stream Team monitoring sites in the watershed.

Site ID	Description	Number of Events	Period of Record
12677	Cypress Creek @ Jacob's Well	120	02/03/2001 – 07/23/2025
13513	Cypress Creek @ CR 220 Downstream Of Jacob's Well	3	02/25/2007 – 05/09/2007
80502	Cypress Creek @ Woodcreek	18	03/26/2010 – 07/23/2025

80933	Cypress Creek @ First Dam	7	05/21/2013 – 07/24/2014
81688	TCEQ Site 12676 - Cypress Creek at RR12 (The Cottages)	111	07/14/2022 – 08/20/2025
80415	Cypress Creek @ Blue Hole	82	02/25/2007 – 07/23/2025
80443	Cypress Creek @ Old Kyle Road Upstream Of Bridge And Dam	113	09/07/2007 – 05/14/2022
80926	Cypress Creek @ RR12	25	06/12/2015 – 05/14/2022
Total		479	02/03/2001 – 11/12/2025

SITE ANALYSIS

Quality controlled water quality monitoring data were analyzed and summarized to include the number of samples, mean (average), standard deviation, and range of values (Table 7). Only sites with 10 or more sampling events were included in the analysis. Additionally, not all water quality parameters were measured during every site visit, and some parameters were recorded for only a subset of sites. As a result, the number of valid measurements varies by parameter and by site, and sites with fewer than 10 valid observations for a given parameter were excluded from the statistical summaries. Sites 13513 (three monitoring events) and 80933 (seven monitoring events) were excluded from the analysis due to the limited number of monitoring events that took place at each. A total of six monitoring sites were pulled for this assessment (Table 7), encompassing 469 monitoring events conducted between February 2001 and November 2025. All available measurements were screened using Texas Stream Team quality control criteria.

Community scientists monitored all sites for 9 parameters, including air and water temperature, specific conductance (total dissolved solids were calculated based on conductance values), dissolved oxygen, pH, Secchi disk transparency, transparency tube, *E. coli* bacteria, and total depth.

Table 7. Texas Stream Team data summary for sites in the watershed (February 2001 - August 2026).

Parameter	Statistic	12677	80502	81688	80415	80443	80926
Air Temperature (°C)	Mean	21.89	24.76	20.41	19.35	19.05	19.53
	Std Dev	6.81	7.78	7.15	5.54	7.30	7.98
	Range	30.00	23.80	29.00	28.00	46.00	25.50
Conductivity (µS/cm)	Mean	590.29	588.57	677.82	641.76	584.41	590.12
	Std Dev	84.75	11.67	85.75	101.18	31.76	33.50
	Range	565.00	40.00	671.00	595.00	157.00	108.00
Dissolved Oxygen (mg/L)	Mean	5.91	6.90	6.07	5.59	6.76	6.92
	Std Dev	0.98	0.84	1.40	1.91	1.43	2.01
	Range	5.95	2.70	6.20	7.30	8.30	7.22
<i>E. coli</i> Bacteria (CFU/100 mL)	Mean	ND	ND	66.56	ND	ND	ND
	Std Dev	ND	ND	64.63	ND	ND	ND
	Range	ND	ND	280.00	ND	ND	ND
pH (standard units)	Mean	7.02	7.35	7.81	7.05	7.75	7.58
	Std Dev	0.26	0.33	0.30	0.27	0.33	0.34
	Range	2.84	1.30	1.00	1.44	1.42	1.26
Secchi Disk (m)	Mean	3.55	1.67	ND	1.88	1.09	0.43
	Std Dev	3.47	0.88	ND	1.04	1.22	0.20
	Range	8.80	2.55	ND	6.75	7.58	0.5
Total Depth (m)	Mean	3.96	1.68	0.52	1.86	0.96	0.42
	Std Dev	4.97	0.97	0.16	1.00	0.71	0.25
	Range	35.00	2.58	1.00	6.80	6.80	0.89
Total Dissolved Solids (mg/L)	Mean	383.69	382.57	440.58	471.15	379.87	383.58
	Std Dev	55.09	7.59	55.74	65.77	20.64	21.77
	Range	367.25	26.00	436.15	386.75	102.05	70.20
Water Temperature (°C)	Mean	20.80	22.17	19.23	19.86	19.39	21.53
	Std Dev	2.91	5.35	3.96	4.54	5.55	5.48
	Range	25.70	14.90	14.50	18.50	28.00	17.10

Air and Water Temperature

Average air temperature for all sites ranged from 19.05°C to 24.76°C (Table 7). The lowest mean air temperature (19.05°C) was observed at Cypress Creek @ Old Kyle Road Upstream of Bridge and Dam (site 80443) whereas the highest mean air temperature (24.76°C) was observed at Cypress Creek @ Woodcreek (site 80502). The average water temperature at all sites ranged from 19.23°C to 22.17°C (Table 7). The lowest mean water temperature (19.23°C) was observed at TCEQ Site 12676 - Cypress Creek at RR12 (The Cottages) (site 81688) whereas the highest mean water temperature (22.17°C) was observed at Cypress Creek @ Woodcreek (site 80502). Discrete water temperature measurements met the water quality standard of 32.2°C throughout the period of record except for one occurrence at site 12677 on August 23, 2023, with a reading of 32.70°C (Figure 6).

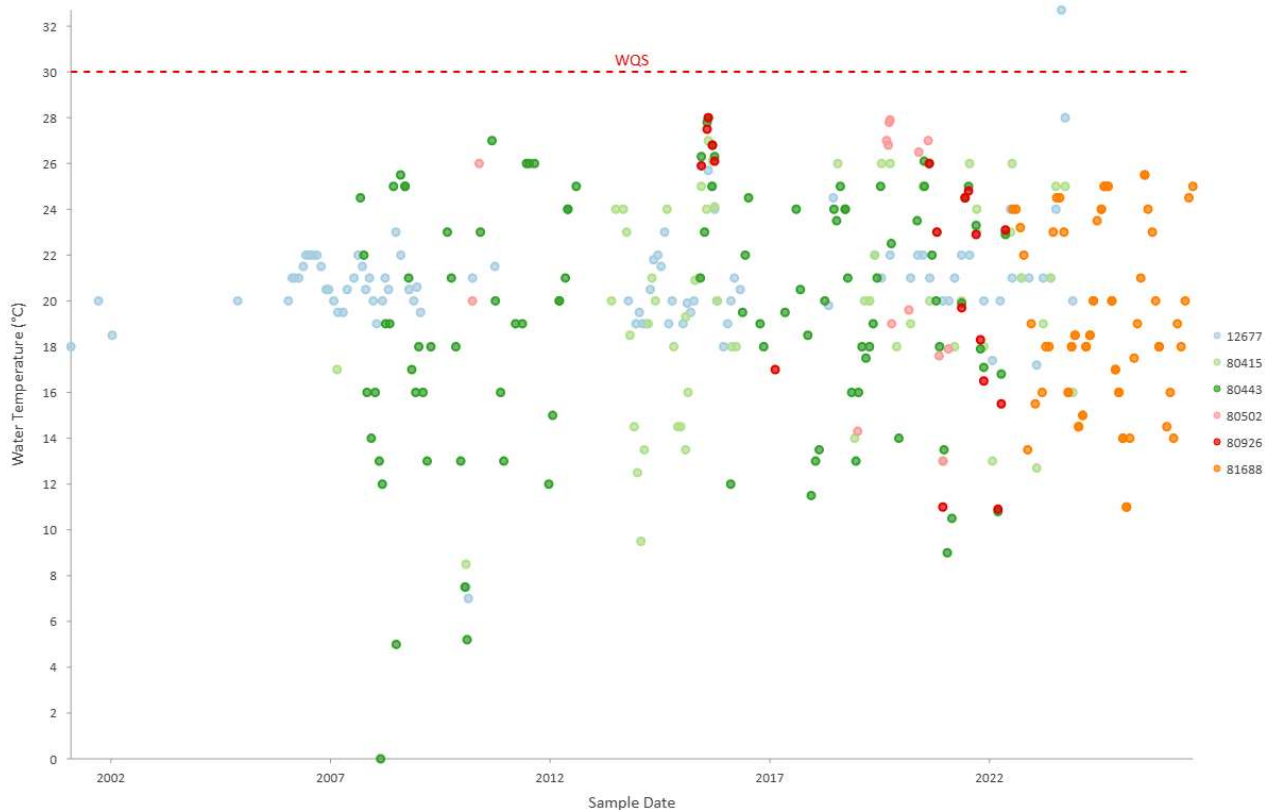


Figure 6. Water Temperature for Texas Stream Team sites in the watershed (February 2001 – August 2026). WQS = Water Quality Standard.

Specific Conductance and Total Dissolved Solids

Total dissolved solids values were calculated from specific conductance measurements. The average total dissolved solids at all sites ranged from 379.87 to 471.15 mg/L (Table 7). The lowest average total dissolved solids (379.87 mg/L) was observed at Cypress Creek @ Old Kyle Road Upstream of Bridge and Dam (site 80443) whereas the highest average total dissolved solids (471.15 mg/L) was observed at Cypress Creek @ Blue Hole (site 80415). Each of the six sites had discrete measurements of total dissolved solids that exceeded the water quality standard of 400 except for site 80502. However, the average total dissolved solids values for all sites remained below the water quality standard of 400 mg/L except for sites 80415 and 81688 (Figure 7).

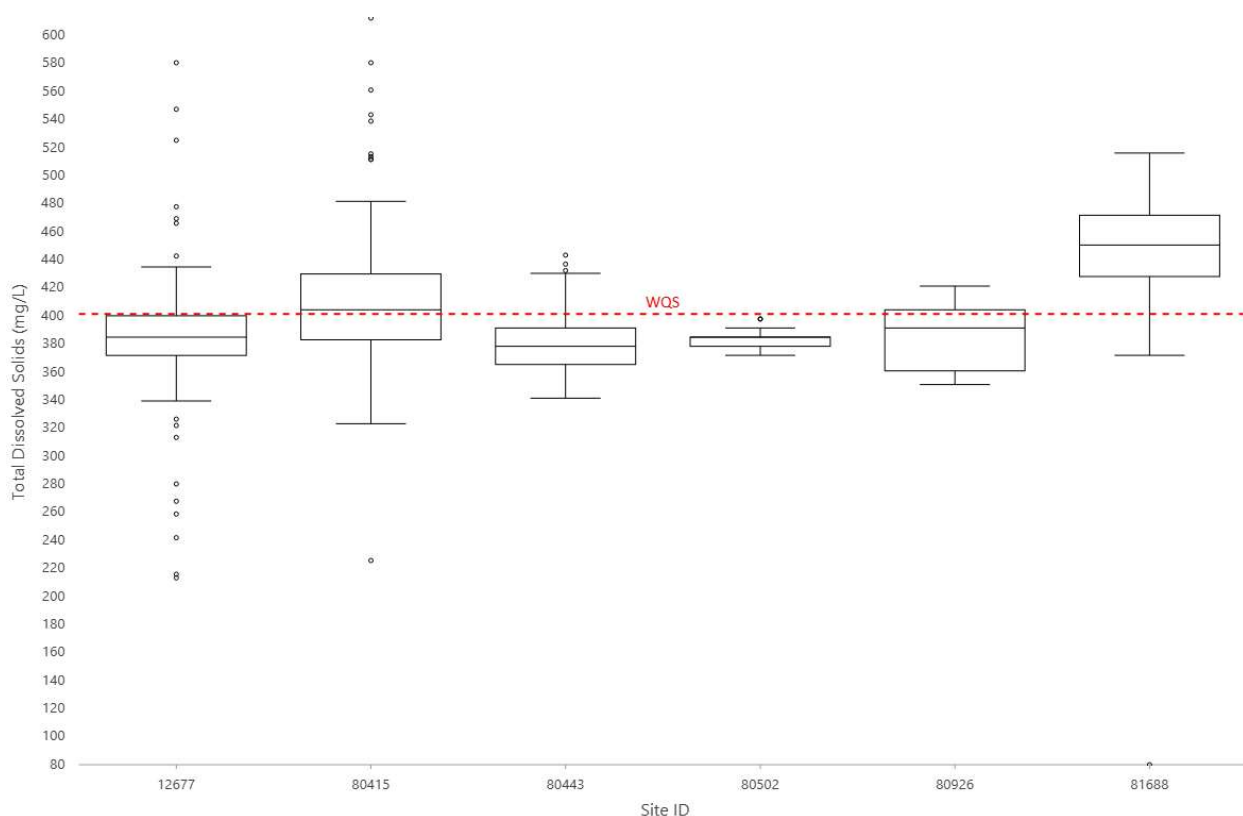


Figure 7. Total Dissolved Solids for Texas Stream Team sites in the watershed (February 2001 – August 2026). WQS = Water Quality Standard.

E. coli Bacteria

E. coli measurements were taken at all six monitoring sites within the watershed. However, not enough discrete measurements were collected to qualify all the sites for analysis except for 81688. The average *E. coli* measurement at site TCEQ Site 12676 - Cypress Creek at RR12 (The Cottages) (site 81688) was 66.56 CFU/100 mL (Table 6). Discrete *E. coli* measurements exceeded the water quality standard of 126 CFU/100 mL throughout the period of record, while the mean met the water quality standards (Figure 8).

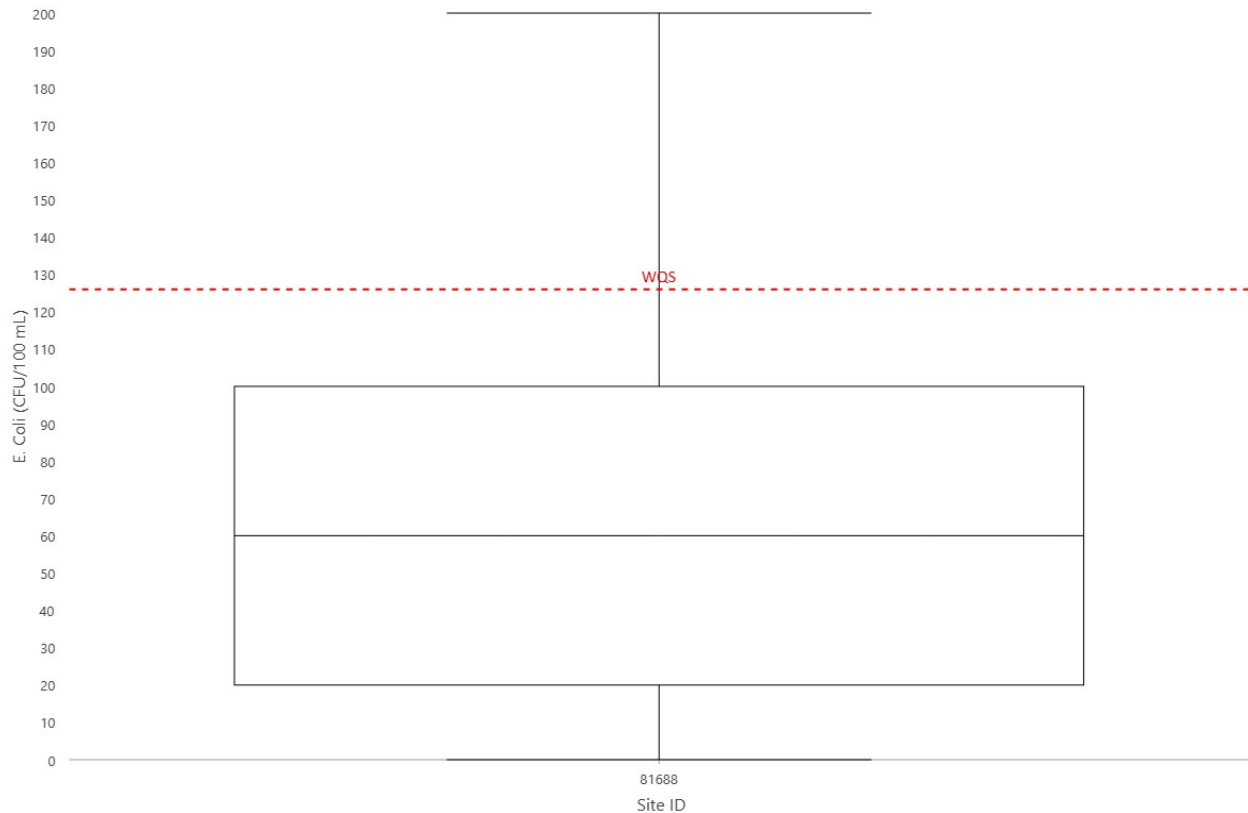


Figure 8. *E. coli* for Texas Stream Team site in the watershed (February 2001 – August 2026). WQS = Water Quality Standard.

Dissolved Oxygen

The average dissolved oxygen for all sites ranged from 5.59 to 6.92 mg/L (Table 6). The lowest average dissolved oxygen (5.59 mg/L) was observed at Cypress Creek @ Blue Hole (site 80415) whereas the highest average dissolved oxygen (6.92 mg/L) was observed at Cypress Creek @ RR12 (site 80926). Out of the six sites, two of the sites had average dissolved oxygen values that fell below the water quality standard of 6.0 mg/L. These sites included site 12677 and 81688. Additionally, all the sites had discrete measurements that fell below the water quality standard on multiple occasions (Figure 9).

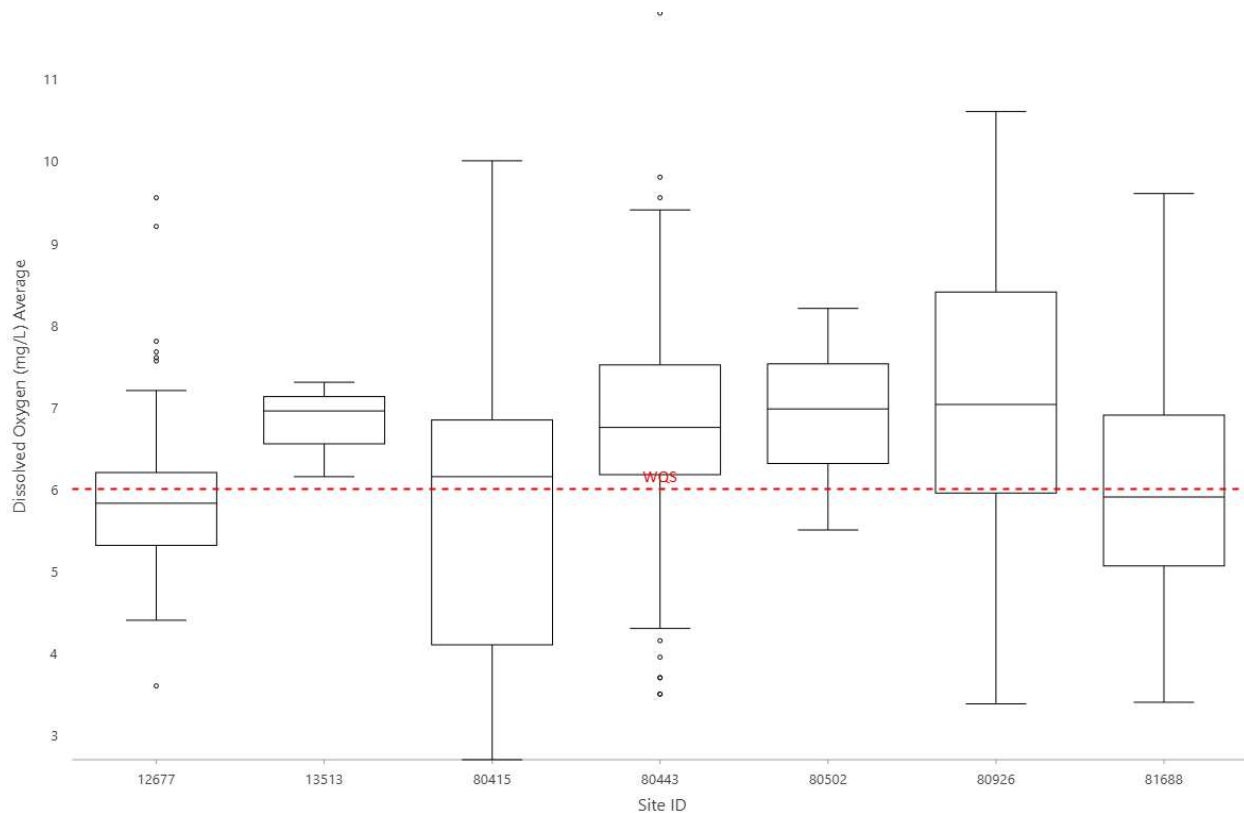


Figure 9. Dissolved Oxygen for Texas Stream Team sites in the watershed (February 2001 – August 2026). WQS = Water Quality Standard.

pH

The average pH at all sites ranged from 7.02 to 7.81 standard units (Table 6). The lowest average pH value (7.02 standard units) was observed at Cypress Creek @ Jacob's Well (site 12677) whereas the highest average pH value (7.81 standard units) was observed at TCEQ Site 12676 - Cypress Creek at RR12 (The Cottages) (site 81688). Discrete pH measurements met the water quality standard of 6.5-9 standard units throughout the period of record except for two occurrences at site 12677 and one occurrence at site 80415 (Figure 10).

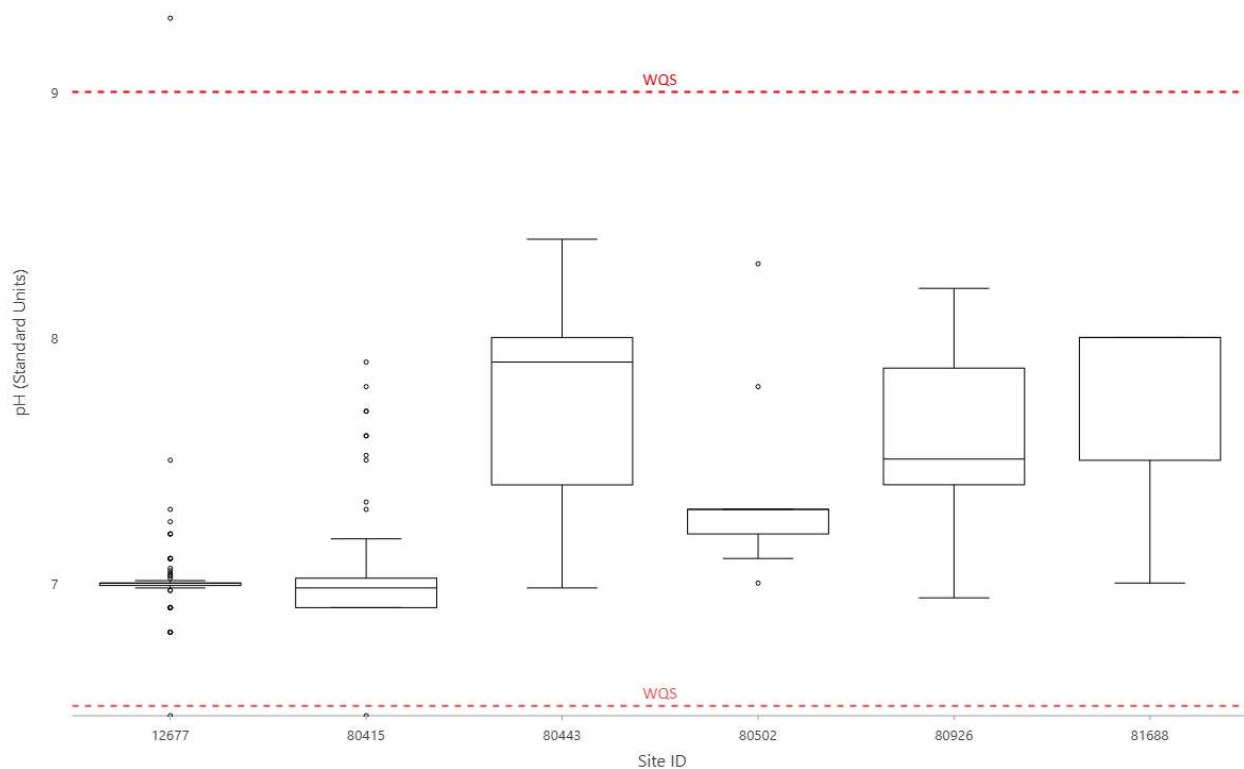


Figure 10. pH for Texas Stream Team sites in the watershed (February 2001 – August 2026). WQS = Water Quality Standard.

Transparency and Total Depth

The average total depth at all sites ranged from 0.42 to 3.96 m (Table 6). The largest average depth (3.96 m) was observed at Cypress Creek @ Jacob's Well (site 12677) whereas the smallest (0.42 m) was observed at Cypress Creek @ RR12 (site 80926). Secchi disks and/or transparency tubes were used to measure transparency at all monitoring sites within the watershed. However, transparency tube measurements were not analyzed for all six sites as not enough discrete measurements had been gathered to qualify these sites for a transparency analysis (Figure 11). Similarly, Secchi disk measurements were not analyzed at site 81688 as not enough discrete measurements had been gathered to qualify these sites for a transparency analysis (Figure 11). Average transparency gathered via the Secchi disk ranged from 0.43 to 3.55 m with the lowest average recorded at Cypress Creek @ RR12 (site 80926) and the highest at Cypress Creek @ Jacob's Well (site 12677) (Table 6).

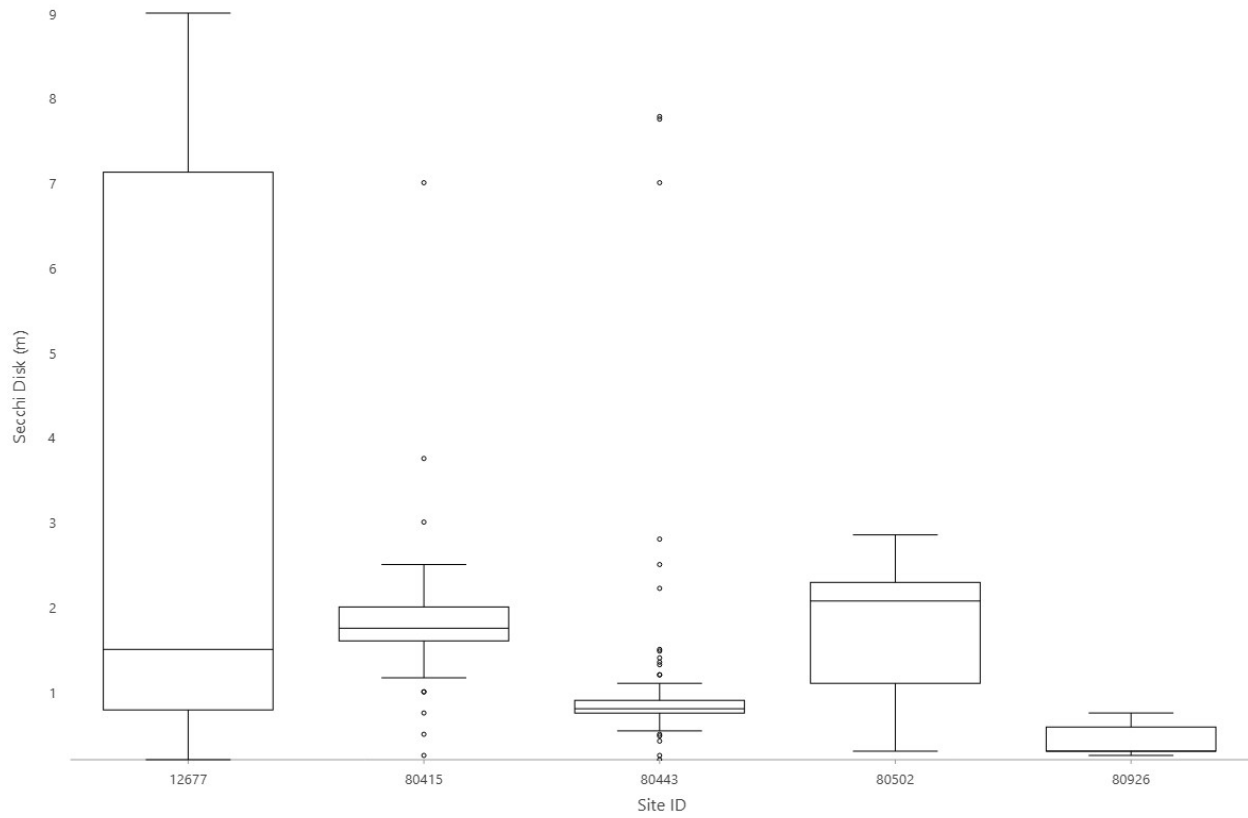


Figure 11. Secchi Disk Transparency for Texas Stream Team sites in the watershed (February 2001 – August 2026). WQS = Water Quality Standard.

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APPENDIX A

Table 8. Endangered species located within the watershed.

Species Type	Common Name	Federal/State Listing
Amphibian	Barton Springs Salamander	State Listed as Endangered
	Texas Blind Salamander	State Listed as Endangered
Bird	Whooping Crane	State Listed as Endangered
	Golden-Cheeked Warbler	State Listed as Endangered
Fish	Fountain Darter	State Listed as Endangered
Mammal	Tricolored Bat	Federally Proposed as Endangered
Insect	Comal Springs Riffle Beetle	State Listed as Endangered
	Comal Springs Dryopid Beetle	State Listed as Endangered
Mollusk	Texas Fatmucket	State Listed as Endangered
	Guadalupe Fatmucket	State Listed as Endangered
	Texas Pimpleback	State Listed as Endangered
	Guadalupe Orb	State Listed as Endangered
	Balcones Spike	State Listed as Endangered
	False Spike	State Listed as Endangered
Plant	Texas Wild-Rice	State Listed as Endangered

Table 9. Threatened species within the watershed.

Species Type	Common Name	Federal/State Listing
Amphibian	San Marcos Salamander	State Listed as Threatened
Bird	Piping Plover	State Listed as Threatened
	Yellow-Billed Cuckoo	State Listed as Threatened
Mollusk	Texas Fawnsfoot	State Listed as Threatened
Plant	Bracted Twistflower	State Listed as Threatened