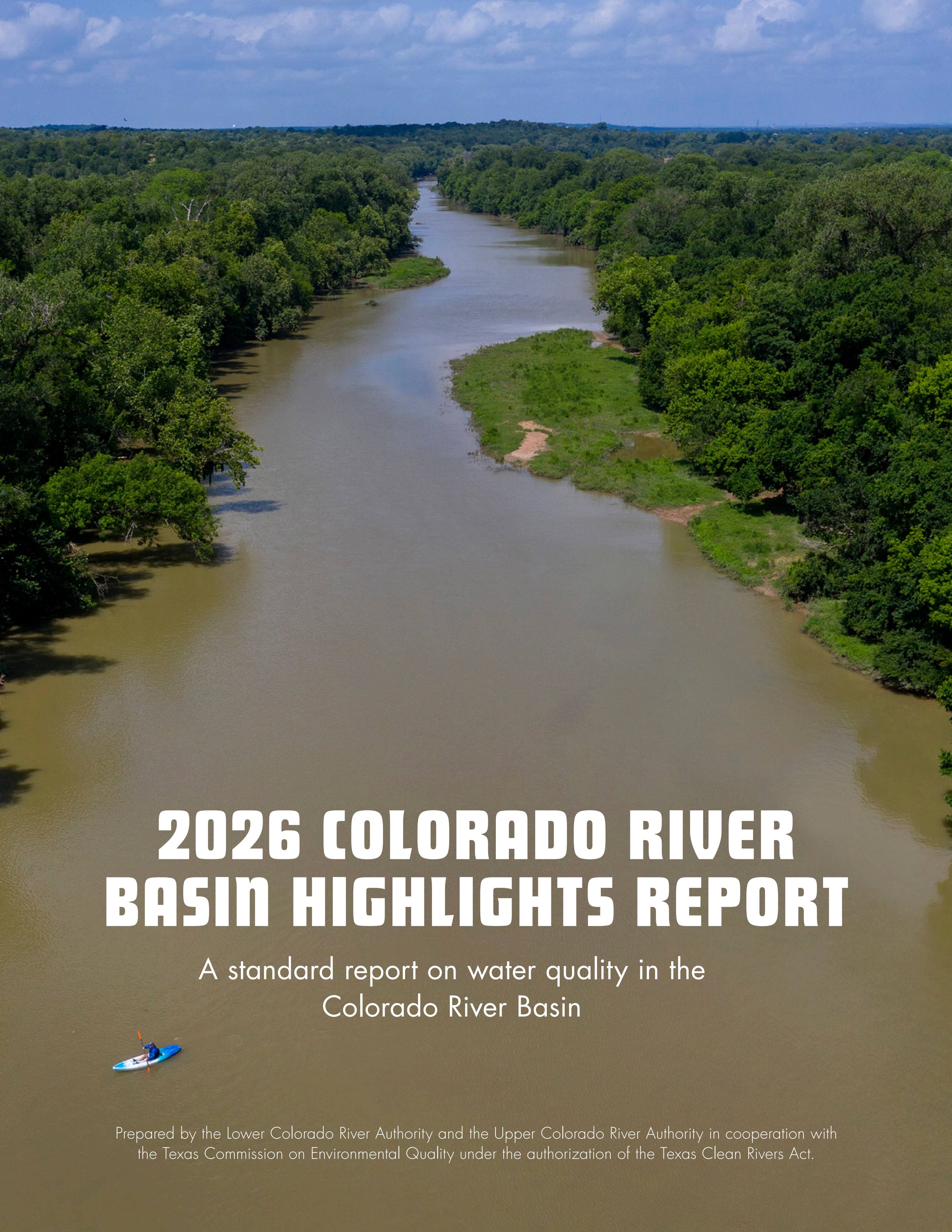

2026 COLORADO RIVER BASIN HIGHLIGHTS REPORT

A standard report on water quality in the Colorado River Basin

Prepared by the Lower Colorado River Authority and the Upper Colorado River Authority in cooperation with the Texas Commission on Environmental Quality under the authorization of the Texas Clean Rivers Act.

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ACRONYMS AND ABBREVIATIONS

µg/L	micrograms per liter
ALM	Aquatic Life Monitoring
AU	Assessment Unit
BMPs	*Best Management Practices*
BST	bacterial source tracking
CFU	colony forming units per 100 mL
CMS	Coordinated Monitoring Schedule
COA	City of Austin
CRWN	Colorado River Watch Network
DO	dissolved oxygen
E. coli	*Escherichia coli*
EPA	Environmental Protection Agency
FM	Farm-to-Market Road
FY	fiscal year
HLWO	Highland Lakes Watershed Ordinance
IBI	Index of Biotic Integrity
Integrated Report	Texas Integrated Report of Surface Water Quality for Clean Water Act Sections 305(b) and 303(d)
LBJ	Lyndon B. Johnson
LCRA	Lower Colorado River Authority
MPN	most probable number
msl	mean sea level
OSSF	On-Site Sewage Facilities
PAHs	Polycyclic Aromatic Hydrocarbons
PRISM	Parameter-elevation Regressions on Independent Slopes Model
QAPP	Quality Assurance Project Plan
RRC	Texas Railroad Commission
RUAA	Recreational Use Attainability Analysis
TCEQ	Texas Commission on Environmental Quality
TDS	Total Dissolved Solids
TKN	total kjeldahl nitrogen
TMDL	Total Maximum Daily Load
TPWD	Texas Parks and Wildlife Department
TSS	total suspended solids
TV	Travis County
UAA	Use Attainability Analysis
UCRA	Upper Colorado River Authority
USGS	United States Geological Survey
WAP	Watershed Action Plan
WPP	Watershed Protection Plan

I. Executive Summary

The Texas Clean Rivers Program is a statewide water quality monitoring and assessment program that provides funding and resources for regional watershed protection efforts. The program is administered by the Texas Commission on Environmental Quality (TCEQ) in partnership with river authorities and other regional governments. As Clean Rivers Program partners, together the Lower Colorado River Authority (LCRA) and Upper Colorado River Authority (UCRA) monitor over 140 sites throughout the basin and coordinate with the City of Austin and Travis County. The Clean Rivers Program also partners with TCEQ and U.S. Geological Survey (USGS) to monitor throughout the Colorado River basin and ensure efficient use of monitoring resources. In total, there are typically between 160 – 170 sites monitored throughout the Colorado River basin each year. The data are used for many purposes, including developing the Texas Surface Water Quality Standards, determining if water bodies meet the standards, modeling trends, providing baseline data for water quality protection projects and helping to establish wastewater permit limits.

In 2025, TCEQ evaluated 83 water bodies in the Colorado River basin. Based on the TCEQ assessment, the overall water quality in the basin is good. However, 21 of the assessed water bodies did not meet surface water quality standards. High bacteria levels, low levels of dissolved oxygen, high chloride and total dissolved solids, metals in water, excessive algal growth, and impaired fish and macrobenthic communities were among the causes of the impairments.

TCEQ, the Texas State Soil and Water Conservation Board, and the above-mentioned data providers are addressing the impairments through restorative projects. Five watershed protection plans (WPP) have been completed or are ongoing in the Colorado River basin, and there are nine Total Maximum Daily Load (TMDL) projects (including out-of-basin Tres Palacios Creek) that have been completed or are ongoing as of 2025. The agencies also carried out non-routine monitoring to verify impairments.

In 2025, LCRA and its Clean Rivers Program partners continued to reach out to the public to educate and help resolve local water quality issues. Two Water Quality Advisory Committee meetings were held in the basin. These meetings provided a venue for local stakeholders to learn about water in their region and provide input on projects in their communities.

II. INTRODUCTION

The Clean Rivers Program in the Colorado River basin is administered by LCRA in partnership with the UCRA, City of Austin, and Travis County (Figure 1). LCRA implements the program from below O.H. Ivie Reservoir to Matagorda Bay, and UCRA implements the program in the Concho River and Colorado River basin above O.H. Ivie Reservoir. The City of Austin and Travis County contribute in-kind data and expertise to help collect water quality data in Austin and Travis County under the TCEQ-approved Quality Assurance Project Plan. Travis County began partnering to collect data with the LCRA Clean Rivers Program in 2025.

Basin Highlight Reports are produced annually with a Basin Summary Report written every five to six years. This Basin Highlights Report is a Standard Report format, which describes water quality monitoring in the Colorado River basin during fiscal year (FY) 2025 with a focus on waterbodies with impairments or concerns listed in the 2026 Texas Integrated Report of Surface Water Quality for Clean Water Act Sections 305(b) and 303(d) (Integrated Report). Clean Rivers Program entities discussed in this report also include TCEQ and USGS to provide a holistic view of water quality monitoring stations and data in the Colorado River basin.

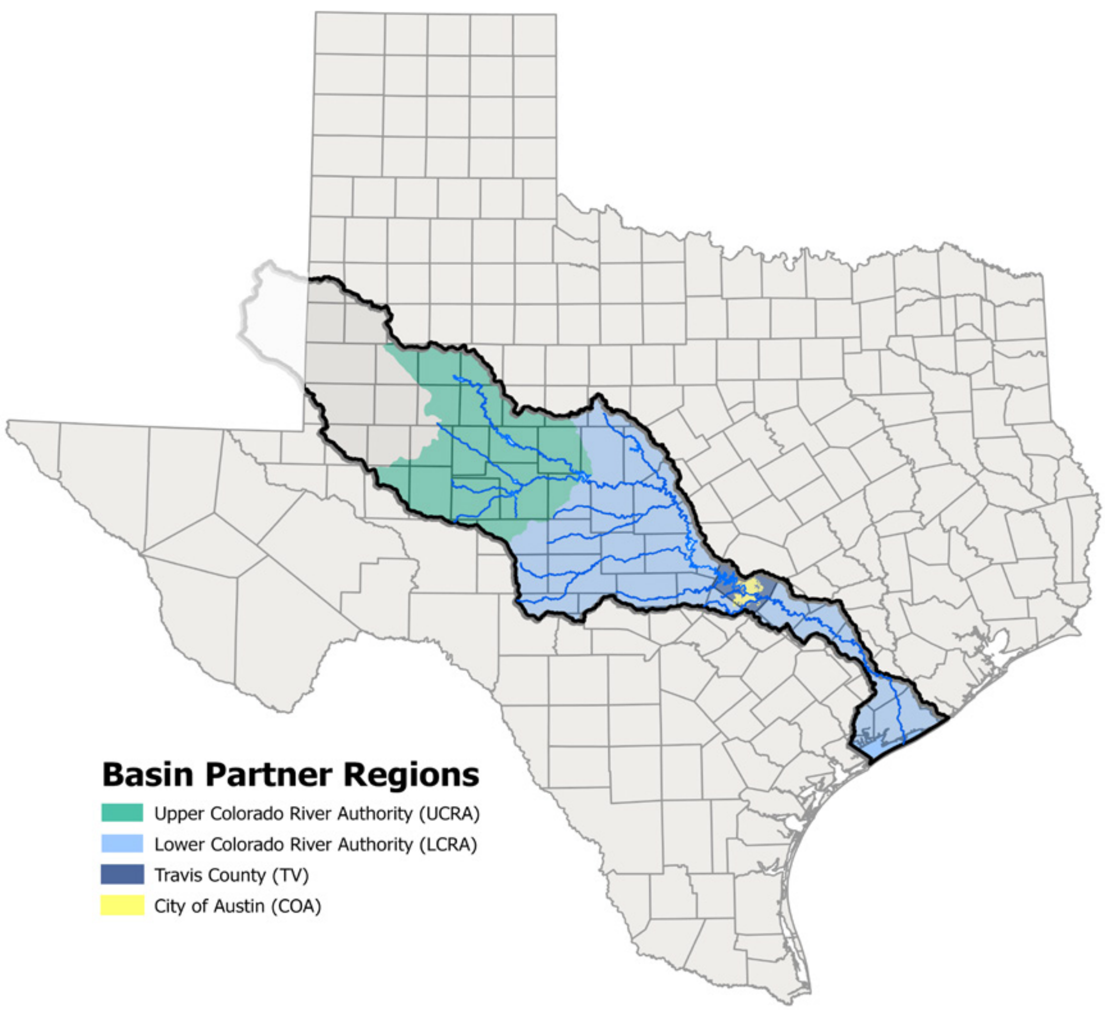


Figure 1. *Clean Rivers Program Partner Regions*

III. WATER QUALITY OVERVIEW

The Colorado River begins in the West Texas Plains and flows southeast more than 600 miles before emptying into Matagorda Bay. The 40,000-square-mile river basin is divided into 10 watersheds (Figure 2). Topography is extremely varied with elevation changes from nearly 3,000 feet in the upper watershed to sea level at the mouth of the Colorado River. Geology, soil, climate, vegetation, land uses and human activities influence the river as it traverses the state.

The upper Colorado and Concho river basins correspond with the Central Great Plains and Southwestern Tablelands ecoregions, where soils typically have elevated levels of minerals and salts, and streams contain high levels of chloride and sulfate. Streams here tend to be turbid (low water clarity). During periods of drought, chloride and sulfate levels increase in the reservoirs as water evaporates, making some of them comparable to brackish water in Matagorda Bay. Chloride and sulfate levels in the North Concho River west of San Angelo and nitrogen levels in the Concho River east of San Angelo are typically high. Conversely, the South Concho River is influenced by major springs south of San Angelo, and water is typically of very high quality.

In the middle portion of the basin, the Edwards Plateau ecoregion is dominated by limestone and granite bedrock. This area is also referred to as the Texas Hill Country due to its relatively steep terrain that gives rise to clear, fast-flowing, perennial rivers and streams. The principal tributaries to the Colorado River in this region are the San Saba, Llano and Pedernales rivers. The pH level of the water is typically higher in this region due to limestone deposits in the Hill Country. This region of the watershed also includes the Highland Lakes: Buchanan, Inks, LBJ, Marble Falls, Travis and Austin, as well as Lady Bird Lake in downtown Austin. The monthly flow of water coming into the Highland Lakes from the San Saba, Llano and Pedernales river tributaries and the Colorado River upstream of Lake Buchanan can be highly variable, but on average, this part of the basin sees the most rainfall and flow during the late spring.

In Austin, an ecoregion shift occurs where the Colorado River flows out of the limestone canyons of the Edwards Plateau and through the deep clay soils of the Blackland Prairie. Water in this region tends to be turbid, with higher amounts of total suspended solids (TSS). Treated wastewater that is discharged into the river affects flow and water quality downstream of Austin. The river then makes its way through the Lost Pines region near Bastrop and into the Post Oak Savannah. Past the town of Columbus, the river enters the Gulf Coast Prairie and Marshes defined by flat topography and coastal marshes. The mouth of the river then meets West Matagorda Bay before entering the gulf.

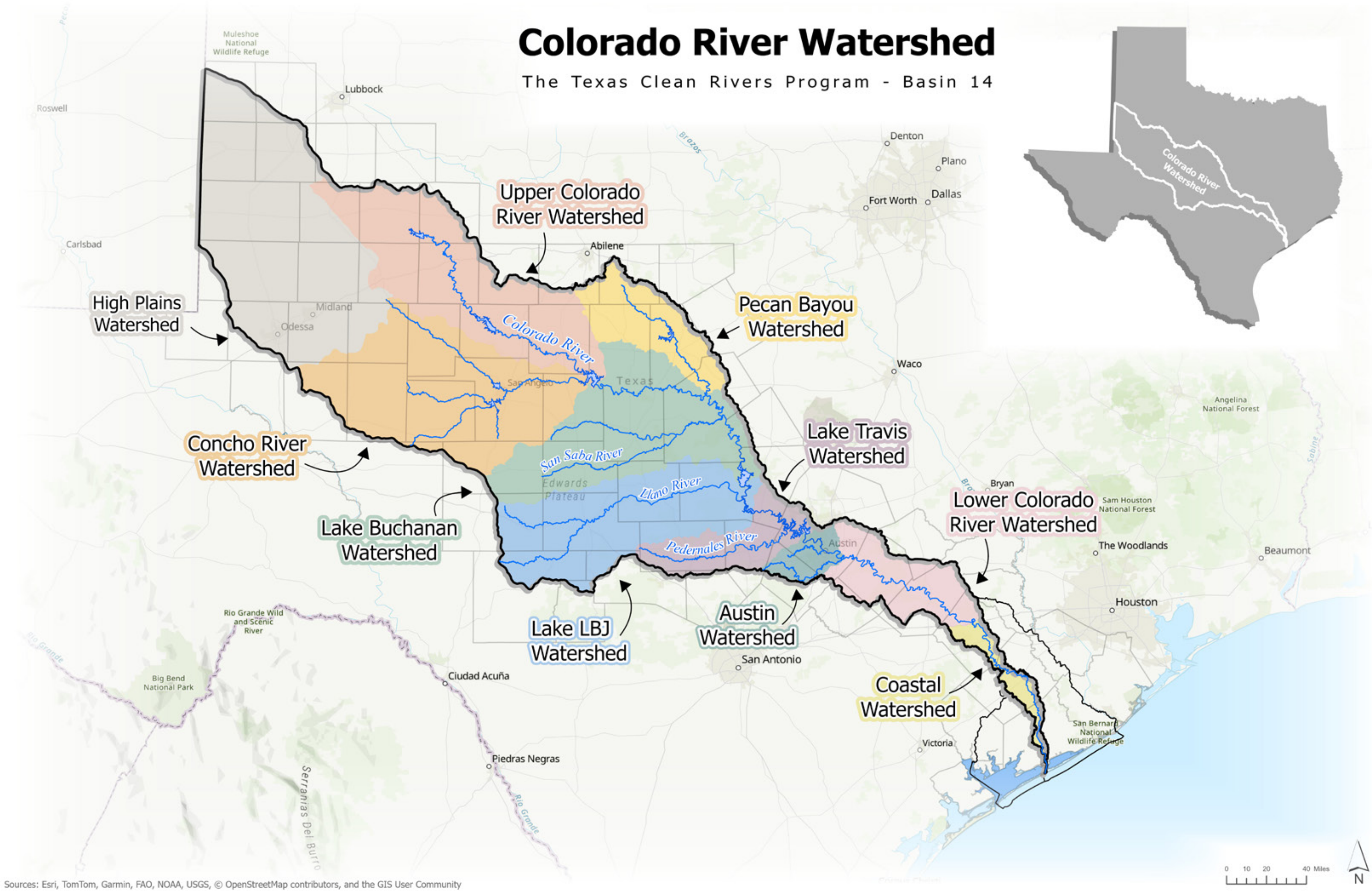


Figure 2. *The Colorado River basin watersheds*

Drought, Floods and Water Quality

Drought impacts reservoir storage, streamflow and water quality in the Colorado River basin. Since 2015, there have been multiple periods of extreme and exceptional drought across the basin. Reservoir storage of Lake Travis and Lake Buchanan is dependent on rainfall and extended periods of drought can cause declines in water storage in these reservoirs (Figure 3). Significant drought has impacted the basin since 2022, leading to declines in water storage in Lake Travis and Lake Buchanan. The July 2025 flood increased reservoir storage to near 100%, however dry conditions returned for the remainder of the year leading to increased drought in the basin and declining reservoir storage.

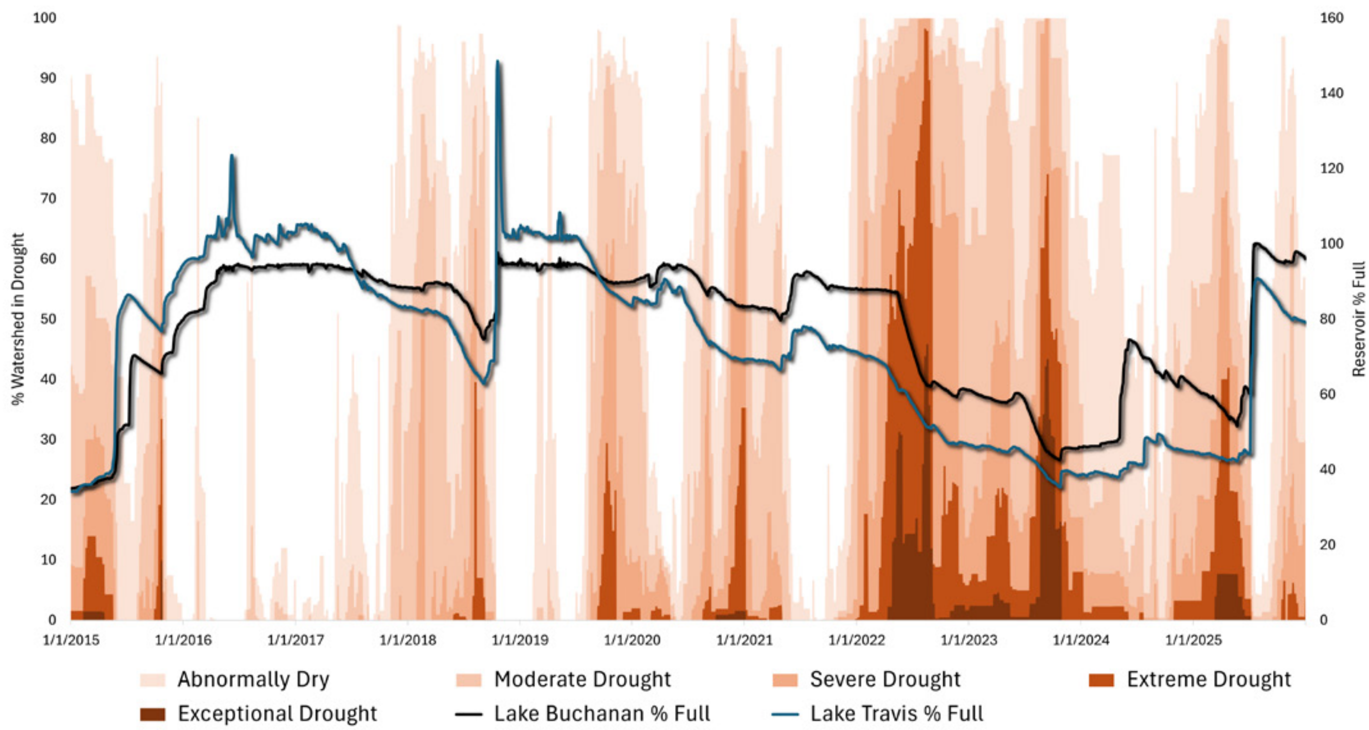


Figure 3. *Depicts the drought status of the Colorado River basin in percent area and how that impacts the reservoir storage (% full) of Lake Travis and Lake Buchanan. The drought status is determined by the US Drought Monitor. More intense and longer periods of drought (represented by darker colors) lead to declines in reservoir storage. Rainfall events are marked by sharp increases in reservoir storage, followed by reductions in drought status.*

Drought status at any given time varies drastically across the Colorado River basin. Exceptional drought could be present in one region, while no drought conditions are present in others. Because of the Colorado River watershed's large size, different temperatures and precipitation patterns occur across the basin. These differences can be seen in the figure below, which shows the drought status from 2015 to 2025 and average monthly rainfall in four sub-basins of the Colorado River watershed. For example, during 2021, exceptional and extreme drought conditions were prevalent across the Upper Colorado sub-basin while the other sub-basins had less intense drought conditions. Since mid-2025, the Lower Colorado sub-basin below Austin has seen increasing severe and extreme drought conditions while other areas of the watershed have seen less severe drought.

Water quality in surface water can be adversely affected by drought conditions. Reductions in dissolved oxygen and increases in water temperature, total algae and salinity are often observed in reservoirs and streams where drought is occurring. These drought-related impacts to water quality can impact aquatic habitats, recreational opportunities and impairment status of water bodies, which are assigned by TCEQ.

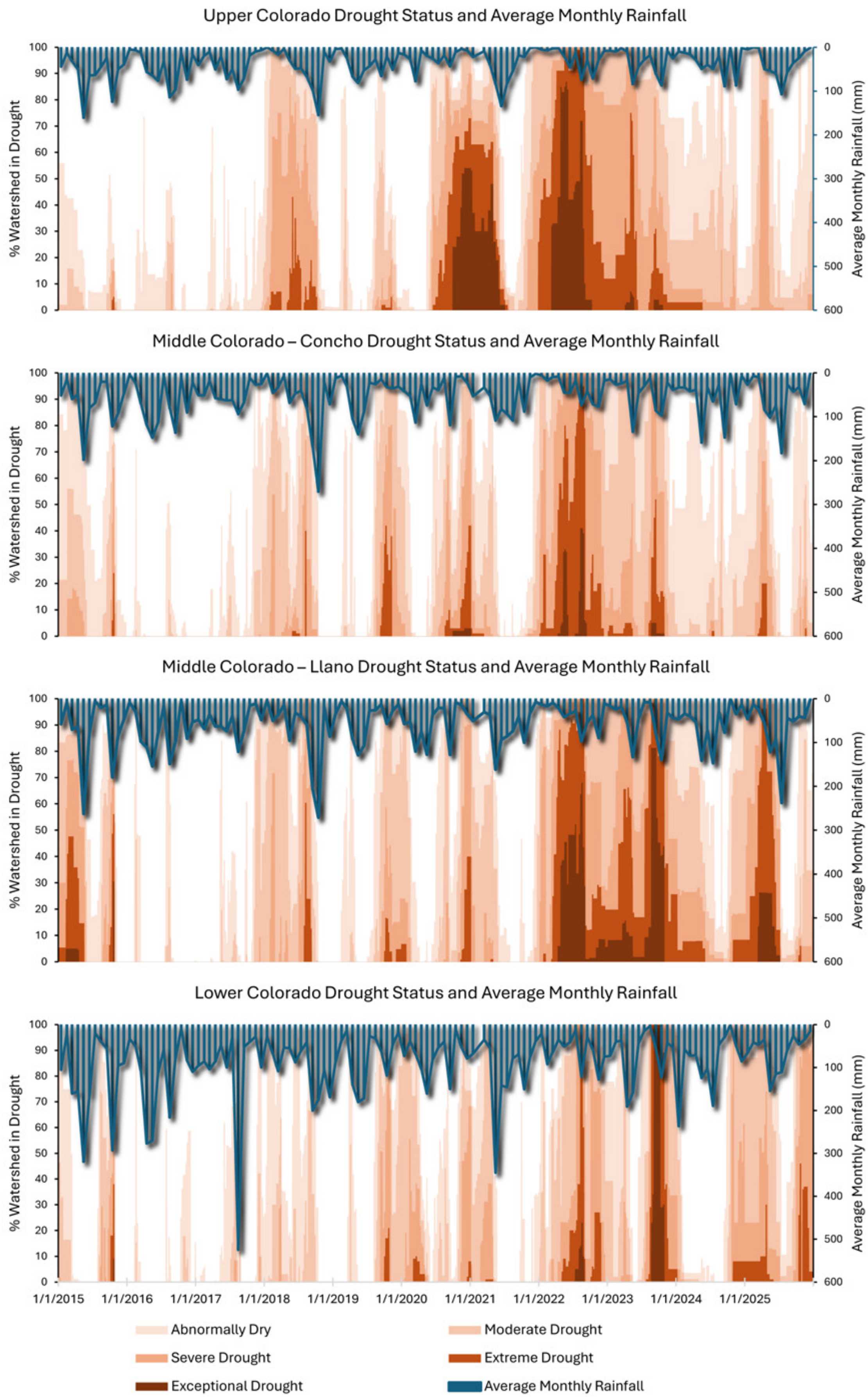


Figure 4. *Drought conditions in four sub-basins covering the Colorado River basin shown with average monthly precipitation values. Drought data is from the US Drought Monitor and precipitation data is from the PRISM gridded climate dataset.*

IV. WATER QUALITY MONITORING

Water quality monitoring data is collected by Clean Rivers Program partners under a TCEQ-approved quality assurance project plan (QAPP) to ensure that it is consistent with regulatory requirements. The data have many uses, including the development of the Texas Surface Water Quality Standards, determining if water bodies meet those standards and development of wastewater permit limits. LCRA, UCRA, City of Austin and Travis County perform monitoring under the approved LCRA Clean Rivers Program QAPP in the Colorado River basin. Other monitoring entities, including TCEQ and USGS, also collect water quality data in the Colorado River basin under separate QAPPs.

LCRA and UCRA host separate Clean Rivers Program Coordinated Monitoring Meetings annually to discuss active monitoring sites, monitoring frequencies and parameters, waterbody impairments, emerging water quality concerns, and additional monitoring needs for the upcoming fiscal year. Stakeholder feedback from Water Quality Advisory Committee meetings is also taken into consideration. The updated water quality monitoring sites, monitoring frequencies, and parameters collected are published on the LCRA Coordinated Monitoring Schedule website at http://cms.lcra.org.

The number of sites monitored by each collecting entity and the types of parameters sampled in FY 2025 is shown in Table 1. A map of FY 2025 water quality monitoring stations and collecting entities are shown in Figure 5. Water quality monitoring typically includes physical and chemical measurements such as levels of dissolved oxygen, suspended sediments, nutrients, temperature and pH. It can also include the collection of fish, aquatic insects and habitat data to measure aquatic life and assess the health of streams and reservoirs. Water quality parameters, their impact, and potential causes for impairment are shown in Table 2. The description of each parameter in the Coordinated Monitoring Schedule is listed below.

- **24-hour DO** – summary information for dissolved oxygen, specific conductivity, pH and temperature that are collected over a 24-hour period
- **Aquatic habitat** – habitat data collected for Aquatic Life Monitoring
- **Benthics** – benthic macroinvertebrate data collected for Aquatic Life Monitoring
- **Nekton** – fish data collected for Aquatic Life Monitoring
- **Metals** – total and/or dissolved metals
- **Organics** – petroleum hydrocarbons
- **Conventionals** – nutrients such as nitrogen and phosphorus species, hardness, chlorophyll *a*, alkalinity, chloride, sulfate, and suspended and dissolved solids
- **Bacteria** – *E. coli* or *Enterococci*
- **Flow** – instantaneous flow measurements, method of measurement and flow severity category
- **Field** – the standard four water quality parameters (dissolved oxygen, specific conductivity, pH, and temperature) as well as parameters describing any contact recreation activities and drought conditions

__Table 1.__ Fiscal Year 2025 Coordinated Monitoring Schedule Summary

Entity	# of Sites	24-Hour DO	Aquatic Habitat	Benthics	Nekton	Metals in Water	Organics in Water	Metals in Sediment	Organics in Sediment	Conven-tionals	Bacteria	Flow	Field
LCRA	65	X	X	X	X	X	–	–	–	X	X	X	X
UCRA	50	X	X	X	X	–	–	–	–	X	X	X	X
City of Austin	14	–	–	–	–	–	–	X	X	X	X	X	X
Travis County	13	–	–	–	–	–	–	–	–	X	X	X	X
TCEQ	34	X	–	–	–	–	–	–	–	X	X	–	X
USGS	1	–	–	–	–	X	X	–	–	X	–	X	X

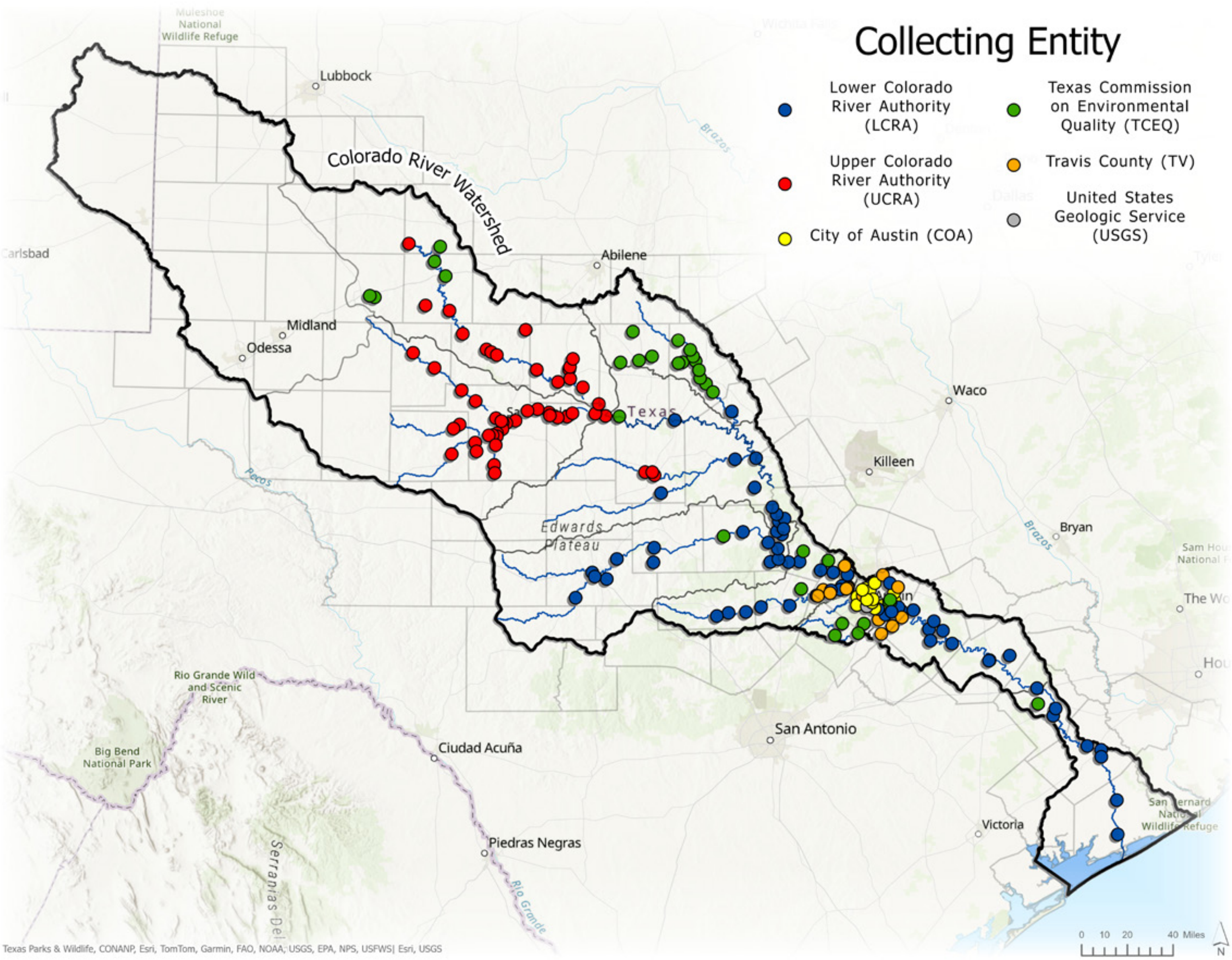


__Figure 5.__ Map of Fiscal Year 2025 Monitoring Stations

Water Quality Monitoring Terminology

The water quality parameters discussed in this section are explained below in Table 2.

Table 2. *Water quality parameters, their impact and potential causes for impairment.*

Parameter	Impact	Potential Causes
Temperature	Water temperature affects the oxygen content of the water, with warmer water unable to hold as much oxygen. When water temperature is too cold, cold-blooded organisms may either die or become weaker and more susceptible to other stresses, such as disease or parasites.	Colder water can be caused by reservoir releases. Warmer water can be caused by removing trees from the riparian zone, soil erosion or use of water to cool manufacturing equipment. Long-term drought conditions can reduce water levels, making water bodies more susceptible to greater temperature fluctuations.
Conductivity	Conductivity is a measure of the water body's ability to conduct electricity and indicates the approximate levels of dissolved salts, such as chloride, sulfate and sodium in the stream. Elevated concentrations of dissolved salts can impact the water as a drinking water source and as suitable aquatic habitat.	Runoff from agricultural and mining operations, industrial and domestic wastewater discharge, and the surrounding geology of the area can affect conductivity.
pH	Most aquatic life is adapted to live within a narrow pH range. Different organisms can live at and adjust to differing pH ranges, but pH levels below four (the acidity of orange juice) or above 12 (the pH of ammonia) are lethal to most fish species.	Industrial and domestic wastewater discharge, runoff from quarry operations and accidental spills can contribute to changes in pH.
Dissolved Oxygen (DO)	Organisms that live in the water need oxygen to sustain life. In stream segments where DO is low, organisms may not have sufficient oxygen to survive.	Modifications to the riparian zone, human activity that causes water temperatures to increase, increases in organic matter, bacteria and over abundant algae due to excess nutrients (phosphrous and nitrogen) may cause DO levels to decrease.
Stream Flow	Flow is an important parameter affecting water quality. Low flow conditions common in the warm summer months create critical conditions for aquatic organisms. At low flows, constituents like nutrients, chlorides, salts and TDS can become concentrated, and the stream has a lower assimilative capacity for waste inputs from point and nonpoint sources.	Stream flow may change as a result of natural factors (e.g., weather, evaporation, groundwater discharge and recharge) or human factors (e.g., water withdrawals or discharges, land use changes).
Secchi Disc	Transparency is a measure of the depth to which light is transmitted through the water column and thus the depth at which aquatic plants can grow.	Low secchi disc depth is an estimate of turbidity. Low transparency can be caused by suspended sediment, organic matter and algae.
Turbidity	Turbidity is a measure of water's clarity or light transmitting properties. Turbidity can impact primary productivity, habitat quality and drinking water use.	Increases in turbidity are caused by suspended and colloidal matter such as clay, silt, finely divided organic and inorganic matter, plankton, and other microscopic organisms.
Hardness	The hardness of water is critical due to its effect on the toxicity of certain metals. Higher hardness concentrations in the receiving stream can result in reduced toxicity of heavy metals.	Hardness is a composite measure of certain ions in the water, primarily calcium and magnesium.

Chloride	Chloride is an essential element for maintaining normal physiological functions in all organisms. Elevated chloride concentrations can disrupt osmotic pressure, water balance and acid/base balances in aquatic organisms which can adversely affect survival, growth or reproduction.	Natural weathering and leaching of sedimentary rocks, soils and salt deposits can release chloride into the environment. Other sources can be attributed to oil exploration and storage, sewage, and industrial discharges, run off from dumps and leachate infiltration from landfills, and saltwater intrusion.
Sulfate	Effects of high sulfate levels in the environment have not been fully documented. However, sulfate contamination may contribute to the decline of native plants by altering chemical conditions in the sediment.	Due to abundance of elemental and organic sulfur and sulfide mineral, soluble sulfate occurs in almost all natural waters.
Total Dissolved Solids (TDS)	High TDS may affect the aesthetic quality of the water, interfere with washing clothes and corrode plumbing fixtures. High TDS in the environment can also affect the permeability of ions in aquatic organisms.	Mineral springs, carbonate deposits, salt deposits and sea water intrusion are sources for naturally occurring high concentration TDS levels. Other sources can be attributed to oil exploration, drinking water treatment chemicals, storm water and agricultural runoff, and point and nonpoint sources.
Bacteria *Escherichia coli (E. coli)* or *Enterococci*	Although fecal indicator bacteria may not be harmful to human beings, their presence is an indicator of recent fecal matter contamination which may contain other pathogens that pose a risk to human health.	Naturally occurring in the digestive system of all warm-blooded animals, these indicator bacteria are in all surface waters. Poorly maintained or ineffective septic systems, overflow of domestic sewage or nonpoint sources, and runoff from animal feedlots can elevate bacteria levels.
Ammonia Nitrogen	Elevated levels of ammonia in the environment can adversely affect fish and invertebrate reproductive capacity and inhibit the growth of young.	Ammonia is excreted by animals and is produced during the decomposition of plants and animals. Ammonia is an ingredient in many fertilizers and is also present in sewage, storm water run-off, certain industrial wastewaters and runoff from animal feedlots.
Total Suspended Solids (TSS)	Suspended solids increase turbidity which reduces light penetration and decreases the production of oxygen by plants. They can also clog fish gills.	Degradation of the riparian buffer zone results from human activities like agriculture, urbanization and deforestation and can cause an increase in TSS. Excessive TSS is the result of accelerated erosion and is often associated with high flows where river banks are cut or sediment is entrained and suspended. It can also be the result of sheet erosion, where over land flow of water causes a thin layer of soil to be carried by the water to the stream.
Nutrients • Nitrogen • Nitrate • Total Phosphorus • Ortho-phosphate phosphorus • Total Kjeldahl Nitrogen (TKN)	Nutrients increase plant and algae growth. When plants and algae die, the bacteria that decompose them use oxygen. This reduces the dissolved oxygen in the water. High levels of nitrates and nitrites can produce nitrite toxicity, or "brown blood disease," in fish. This disease reduces the ability of blood to transport oxygen throughout the body.	Nutrients are found in effluent released from wastewater treatment plants, fertilizers and agricultural runoff carrying animal waste from farms and ranches. Soil erosion and runoff from farms, lawns and gardens can add nutrients to the water.
Chlorophyll *a*	High levels of chlorophyll *a* can cause algae blooms, decrease water clarity and cause swings in dissolved oxygen levels due to photosynthesis.	Algal blooms can result in elevated chlorophyll *a* levels, indicating an increase in nutrients such as nitrogen and phosphorus that increase growth and reproduction in algal species.

As the state regulatory agency, TCEQ establishes Texas Surface Water Quality Standards for all surface water in Texas. The standards are made up of two components: designated uses and criteria. Designated uses are purposes for which water is used. They include general use, aquatic life use and contact recreation use. Criteria are numeric or narrative limits used to compare water quality data or conditions. The designated uses and their associated criteria are:

- **General use:** Temperature, pH, nutrients, chlorophyll *a*, chloride, sulfate and total dissolved solids criteria are used to gauge support for general use. In the Colorado River basin, pH criterion is a range between 6.5 and 9.0 standard units as outlined in the Texas Surface Water Quality Standards. Criteria for temperature, chloride, sulfate and TDS varies by segment. Nutrients have historically only been used to label a concern; however, the Nutrient Reservoir Criteria was established by TCEQ and approved by the EPA for 39 reservoirs in 2013. Reservoirs with approved criteria can be assessed using chlorophyll *a*, total nitrogen, total phosphorus, and Secchi disc values to determine if the reservoir supports the use. These reservoirs are assessed at one sample location documented in Appendix F of the Texas Surface Water Quality Standards (30 TAC §307.10(6)) which is usually the sample location closest to the downstream dam of the reservoir. If this location is impaired, each TCEQ Assessment Unit (AU) in the reservoir will also be deemed impaired. Reservoirs with unapproved criteria continue to be assessed for only concerns. Nutrient criteria have not yet been established for rivers and tributaries in Texas.

- **Aquatic life use:** There are five levels of aquatic life use: exceptional, high, intermediate, limited and minimal. Aquatic life use is assessed using dissolved oxygen, and fish and benthic macroinvertebrate (aquatic bugs) community evaluation. Results from intensive field surveys are used to calculate aquatic life use. As a general rule, perennial streams are presumed to support a high aquatic life use. Water bodies that have designations other than high will be identified in each watershed summary section.

- **Contact recreation:** This use refers to how well a water body can safely support activities that involve human physical contact such as swimming. The standard for contact recreation is a measure of bacteria levels. In freshwater, the indicator is *Escherichia coli* bacteria (*E. coli*), though fecal coliform bacteria have historically been used. *Enterococci* bacteria are the indicators in coastal water bodies. Criteria for fecal coliform, *E. coli* and *Enterococci* are 200, 126 and 35 colony forming units (CFU) per 100 mL, respectively. Because of the high salt content of many West Texas waters, TCEQ also uses *Enterococcus* as the bacteriological indicator in select inland water bodies. This is the case in Segment 1412 in the upper basin where the criteria is 33 CFU.

Aquatic Life Monitoring

LCRA and UCRA biologists conduct Aquatic Life Monitoring (ALM) for the Clean Rivers Program following protocols described in TCEQ's Surface Water Quality Monitoring Procedures, Volume 2. Biological monitoring is conducted to provide baseline data on environmental conditions and to determine if criteria for aquatic life use and dissolved oxygen criteria are being attained. From 2021 to 2025, LCRA and UCRA conducted 14 ALM events throughout the Colorado River basin (Table 4).

Two ALM events are conducted in the index period which includes the warmer seasons of the year from March 15 – Oct. 15. The index period is divided into the non-critical period and critical period. The non-critical period, March 15 – Jun. 30 and Oct. 1 – Oct. 15, usually coincides with greater precipitation, higher streamflow, cooler temperatures and higher dissolved oxygen concentrations than the critical period. The critical period, July 1 – Sept. 30, is the time of year when minimum streamflow, maximum temperatures and minimum dissolved oxygen concentrations typically occur in Texas.

During an ALM event, freshwater fish are collected by seining and electrofishing methods. The fish are then identified to species, photo vouchered, enumerated and released. Benthic macroinvertebrates samples are collected with a D-frame kicknet, preferably from riffle habitat, or secondarily from run or glide habitats by kicking and disturbing the streambed. Samples are preserved in the field and are then identified back in the lab using a microscope. An Index of Biotic Integrity (IBI) is used to score the composition of fish and macroinvertebrate data. The results are compared to the expected aquatic life use designation for a site to determine aquatic life use attainment. In addition to the biological components, non-biological parameters such as stream physical habitat data, flow, 24-hour DO, and water chemistry are collected and assessed. These methods provide a holistic evaluation of the health of instream biological assemblages.

Table 3. *Aquatic Life Monitoring sites and scores**

Site	Station ID	Clean Rivers Program Fiscal Year	Aquatic Life Use Designation	Index Period	Nekton IBI	Habitat Score	Benthic IBI
Piney Creek	22308	FY21	High	Non-Critical	High	High	Intermediate
				Critical	Intermediate	High	High
Cummins Creek	22307	FY21	Exceptional	Non-Critical	Exceptional	Intermediate	Intermediate
				Critical	High	High	High
Dove Creek	12166	FY24	High	Non-Critical	High	High	High
				Critical	Intermediate	High	Intermediate
Colorado River at Utley	12463	FY24	Exceptional	Non-Critical	Exceptional	Intermediate	Intermediate
				Critical	High	Intermediate	High
Colorado River at Austin's Colony	22387	FY24	Exceptional	Non-Critical	Exceptional	Intermediate	High
				Critical	High	High	Exceptional
San Saba River	20662	FY24	High	Non-Critical	High	Intermediate	Intermediate
				Critical	High	Intermediate	Intermediate
Cedar Creek	16176	FY24	High	Critical	High	High	Intermediate
Colorado River at Bend State Park	17358	FY24	High	Critical	High	High	Intermediate
Concho River	12409	FY25	High	Non-Critical	High	High	Intermediate
				Critical	Intermediate	High	Intermediate
Colorado River at Austin's Colony	22387	FY25	Exceptional	Non-Critical	High	Intermediate	Intermediate
				Critical	High	High	Exceptional
Elm Creek	15536	FY25	High	Non-Critical	Intermediate	High	Intermediate
				Critical	High	Intermediate	High
Gilleland Creek	20474	FY25	High	Non-Critical	Intermediate	High	High
				Critical	Exceptional	High	High
Skull Creek	16805	FY25	High	Non-Critical	High	Intermediate	Intermediate
				Critical	High	Intermediate	Intermediate
South Concho River	12427	FY25	Exceptional	Non-critical	Exceptional	High	Intermediate
				Critical	Exceptional	High	Intermediate

**ALM data collected in 2024 and 2025 has not yet been approved by TCEQ.*

- For a map of current and historic water quality monitoring sites and data, visit: http://waterquality.lcra.org
- For more information on LCRA's Clean Rivers Program: https://www.lcra.org/water/quality/texas-clean-rivers-program/
- For more information on UCRA's Clean Rivers Program: https://www.ucratx.org/clean-rivers-program

Colorado River Watch Network

In 1992, LCRA began to manage the Colorado River Watch Network (CRWN) program and helped expand monitoring sites throughout the lower Colorado River watershed from Brownwood to Matagorda Bay. The CRWN program has grown into a sophisticated system of more than 100 certified volunteers spread across the basin. The program currently monitors water quality parameters including dissolved oxygen, temperature, pH and specific conductance, nitrates, *E. coli*, salinity, and water transparency. Physical observations are also reported including water color, odor, significant rainfall and algae abundance.

The water quality data is reviewed and analyzed by CRWN staff, creating an early warning system that alerts LCRA to potential water quality threats. Volunteers often monitor areas not routinely sampled by professionals. Routine water quality monitoring of a site creates baseline data and the ability to document changes over time. If an area of concern is identified, the information is communicated to LCRA water quality staff, who take appropriate follow-up action. CRWN data is not submitted to TCEQ. Current and historic CRWN monitoring stations and water quality data can be found at http://crwn.lcra.org. To find out more information on the CRWN program, visit https://www.lcra.org/water/quality/colorado-river-watch-network/.

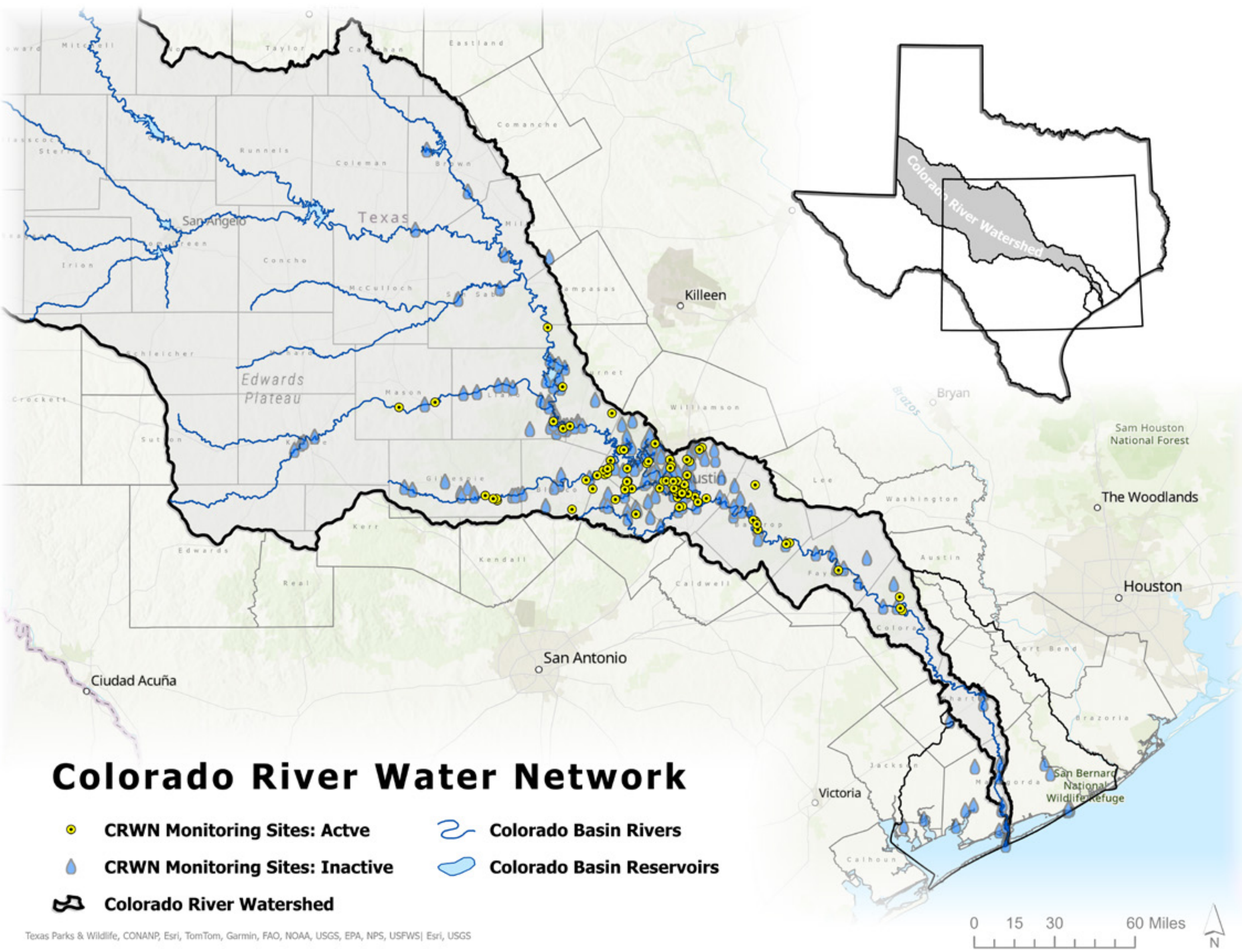


Figure 6. Monitoring sites as of May 2026 for the Colorado River Watch Network

V. WATER QUALITY ASSESSMENT

Every two years, TCEQ compares all available quality assured data to the surface water quality standards – or to screening levels when no standards have been established – and publishes the results in the Texas Integrated Report for Clean Water Act Sections 305(b) and 303(d). The Integrated Report defines the status of each water body as one of the following:

1. **Meets or supports status:** Sufficient data (at least 10 data points) are available to assess. The water body meets all applicable surface water quality standards and fully supports its uses.
2. **Concern status:** a) Sufficient data are not available to perform a full assessment, but the limited data indicate surface water quality standards are not being met, or b) surface water quality standards have not yet been established, as in the case with nutrients. If standards have not been established, the data are compared to screening levels. If water quality data indicate a concern, resources are allocated to collect more data and verify the concern.
3. **Impaired status:** Sufficient data are available and show that the water body does not meet surface water quality standards. If monitoring data indicate a water body does not support one or more of its designated uses, then it is said to be impaired. TCEQ publishes a list of impaired water bodies in the Texas Integrated Report for Clean Water Act, Section 303(d) List.

Water bodies may or may not support their designated uses based on a comparison of monitoring data to the water body's standards. In the simplest terms, if monitoring data indicate that a water body fully supports its uses, then the water body meets Texas Surface Water Quality Standards and water quality is considered good. If water quality data indicate a concern status based on the definition, then resources are allocated to collect more data and verify the concern. If monitoring data indicate that the water body does not support any of its designated uses, then it is said to be impaired and may have poor water quality. Streams and rivers cannot be deemed impaired for nutrients as TCEQ only has approved screening levels for nutrients which lead to concerns. Impaired water bodies are placed on the TCEQ 303(d) List of the Integrated Report and are sometimes referred to as "listed." The 303(d) List refers to the section of the Clean Water Act that requires states to identify impaired water bodies. Impaired water bodies in the Colorado River basin are identified in Table 5. Impairments and concerns which appear within the Draft 2026 Integrated Report for the Colorado River basin are noted within this report. The Draft 2026 Integrated Report included an evaluation of 84 waterbody segments in the Colorado River basin, and 22 received an impaired designation.

The Draft 2026 Texas Integrated Report was released for public review on Nov. 14, 2025, and closed on Dec. 13, 2025. TCEQ reviewed public comments and made any necessary changes to the draft report. TCEQ brought the revised version to the Commissioners who approved the Draft 2026 Integrated Report on April 1, 2026.

Table 4. *Impaired water bodies in the Colorado River basin according to the 2026 Texas Integrated Report - Texas 303(d) List (Category 5)*

Segment ID	Waterbody	County	Assessment Unit ID	Impairment Description	Year First Listed	Impairment Category
1402A	Cummins Creek	Colorado	1402A_01	Impaired fish community in water	2002	5c
				Impaired macrobenthic community in water	2002	5c
1402C	Buckners Creek	Fayette	1402C_01	Depressed dissolved oxygen in water	2010	5c
1402H	Skull Creek	Colorado	1402H_01	Depressed dissolved oxygen in water	2008	5c
1405	Marble Falls Lake	Burnet	1405_01	Excessive algal growth in water	2022	5c
			1405_02	Excessive algal growth in water	2022	5c
1406	Lake Lyndon B. Johnson	Burnet & Llano	1406_01	Excessive algal growth in water	2024	5b
			1406_02	Excessive algal growth in water	2022	5c
			1406_03	Excessive algal growth in water	2022	5c
			1406_04	Excessive algal growth in water	2022	5c
			1406_05	Excessive algal growth in water	2022	5c
			1406_06	Excessive algal growth in water	2022	5c
1407A	Clear Creek	Burnet	1407A_01	Copper in water	2018	5c
				Nickel in water	2014	5c
				Sulfate in water	2010	5c
				Total dissolved solids in water	2010	5c
				Zinc in water	2014	5c
				pH	2010	5c
1411	E.V. Spence Reservoir	Coke	1411_01	Chloride in water	2014	5b
			1411_02	Bacteria in water (Recreation Use)	2022	5c
				Chloride in water	2014	5b
1412	Colorado River Below Lake J. B. Thomas	Coke & Scurry	1412_02	Bacteria in water (Recreation Use)	2008	5c
			1412_03	Bacteria in water (Recreation Use)	2008	5c
1412B	Beals Creek	Mitchell & Howard	1412B_03	Bacteria in water (Recreation Use)	2010	5b
1416	San Saba River	Schleicher	1416_01	Bacteria in water (Recreation Use)	2008	5c
1416A	Brady Creek	San Saba & McCulloch	1416A_03	Depressed dissolved oxygen in water	2004	5r
1419	Lake Coleman	Coleman	1419_01	Excessive algal growth in water	2022	5c
1421	Concho River	Concho & Tom Green	1421_08	Depressed dissolved oxygen in water	2008	5c

1426	Colorado River Below E.V. Spence Reservoir	Runnels & Coke	1426_01	Sulfate in water	2024	5b
			1426_02	Sulfate in water	2024	5b
			1426_03	Sulfate in water	2024	5b
			1426_04	Sulfate in water	2024	5b
1427	Onion Creek	Travis & Blanco	1427_03	Sulfate in water	2014	5c
			1427_04	Sulfate in water	2014	5c
1429C	Waller Creek	Travis	1429C_01	Bacteria in water (Recreation Use)	2004	5c
				Impaired macrobenthic community in water	2002	5c
1434J	Piney Creek	Bastrop	1434J_01	Impaired fish community in water	2026	5c
				Impaired macrobenthic community in water	2026	5c
1501	Tres Palacios Creek Tidal	Matagorda	1501_01	Depressed dissolved oxygen in water	1999	5b

Category 5b: A review of the standards for the water body will be conducted before a management strategy is selected.

Category 5c: Additional data and information will be collected or evaluated before a management strategy is selected.

Category 5r: A Watershed Protection Plan is under development or accepted by EPA for this parameter.

VI. RESTORING IMPAIRED WATER BODIES

TCEQ and the Texas State Soil and Water Conservation Board prioritize impaired water bodies and set goals for improving water quality through processes such as a Watershed Action Plan (WAP). Clean Rivers Program partners and local stakeholders help identify potential causes of impairments and gauge community support of watershed improvement projects. The WAP database, which is managed by TCEQ, tracks progress as work is performed on the prioritized water bodies.

Once a water body is selected through the WAP process, the first step to restoring it is to determine the cause(s) of the impairment. This usually involves verification monitoring or a special study that includes a historical water quality data review, targeted monitoring or a detailed watershed analysis. One of the following projects may be initiated to address the impairment once the cause of the impairment is identified:

- **Total Maximum Daily Load (TMDL)** – a scientific model used to determine the amount or "load" of a pollutant that a water body can receive and still support its designated uses. Once the load is allocated among all potential sources, an implementation plan outlines strategies to reduce pollutants. Implementation plans are enforceable through regulatory compliance.
- **Watershed Protection Plan (WPP)** – A stakeholder-driven process to address causes of the identified impairments and develop strategies to reduce pollutant loads. Compliance with WPP strategies is voluntary rather than regulatory.
- **Use Attainability Analysis (UAA)** – Where TMDL and WPP strategies are designed to improve water quality by limiting pollutants, a UAA can help determine whether the level of use originally assigned to the water body is appropriate. For example, in the late 1980s most perennial rivers and streams were assigned a high aquatic life use. Since then, routinely collected data have shown that some water bodies do not meet a high aquatic life use, not because of pollution but because of natural conditions that prevent high aquatic life use from being attained. TCEQ performs UAAs to establish an appropriate level of aquatic life use in the Texas Surface Water Quality Standards.
- **Recreational Use Attainability Analysis (RUAA)** – Similar to a UAA, it confirms the level of recreational use that takes place in a stream. UAAs and RUAAs can result in a revision to the Texas Surface Water Quality Standards.

VII. WATER QUALITY REVIEW BY WATERSHED

This section highlights water quality in the nine major contributing watersheds in the Colorado River basin with emphasis on major water bodies, impairments and concerns, and efforts to bring water bodies into compliance with Texas Surface Water Quality Standards.

Upper Colorado River Watershed

The upper Colorado River basin covers approximately 5,800 square miles. It is situated mostly in the Southwestern Tablelands and Central Great Plains ecoregions of Texas. Semiarid climatic conditions exist over most of the watershed. Annual average precipitation ranges from less than 14 inches in its western portion to approximately 21 inches in its eastern portion. Many of the tributaries and drainage features of the watershed are either ephemeral or intermittent.

The majority of the watershed's soil consist of sand and clay. A major portion of the watershed is used for agriculture. Farming is common, and irrigation is often necessary to grow crops in the region. Much of the land in the watershed is used for rangeland to graze livestock and for commercial wildlife operations.

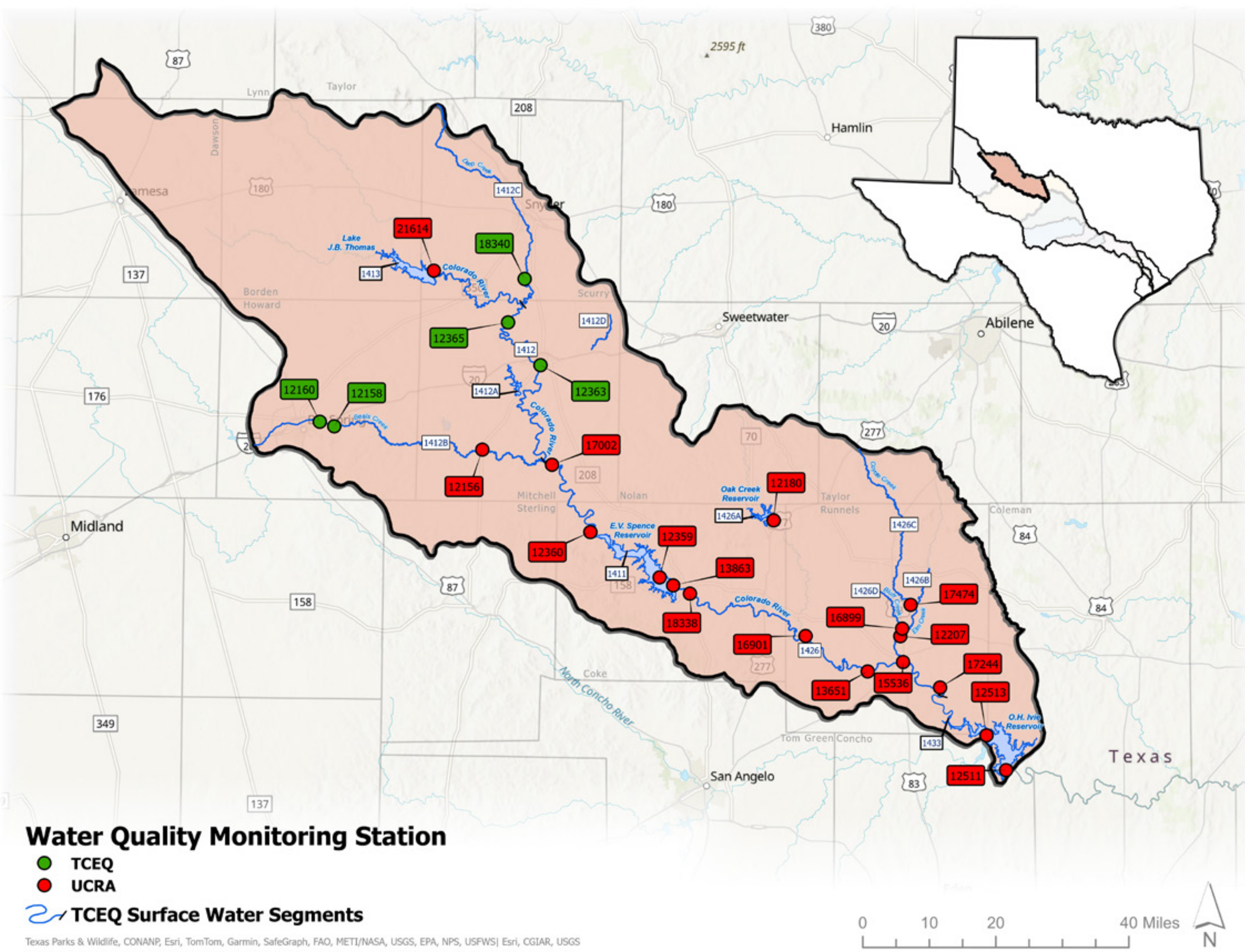


Figure 7. *Upper Colorado River Watershed Map and Station Locations*

In 2025, UCRA and TCEQ monitored 22 sites in the following water bodies:

- Segment 1411 – E.V. Spence Reservoir
- Segment 1412 – Colorado River below Lake J.B. Thomas
- Segment 1412B – Beals Creek
- Segment 1412C – Deep Creek
- Segment 1413 – Lake J. B. Thomas
- Segment 1426 – Colorado River below E.V. Spence Reservoir
- Segment 1426A – Oak Creek
- Segment 1426B – Elm Creek
- Segment 1426C – Bluff Creek
- Segment 1426D – Coyote Creek
- Segment 1433 – O.H. Ivie Reservoir

IMPAIRMENTS FOR THE UPPER COLORADO RIVER WATERSHED		
Segment ID	**Waterbody**	**Impairment**
1411	E.V. Spence Reservoir	Chloride
		Bacteria
		TDS
		Sulfate
1412	Colorado River below Lake J.B. Thomas	Bacteria
1412B	Beals Creek	Bacteria
1426	Colorado River below E.V. Spence Reservoir	Total dissolved solids

CONCERNS FOR THE UPPER COLORADO RIVER WATERSHED		
Segment ID	**Waterbody**	**Concern**
1411	E. V. Spence Reservoir	Fish Kill
1412	Colorado River Below Lake J. B. Thomas	Chlorophyll *a*
1412A	Lake Colorado City	Fish Kill
1412B	Beals Creek	Chlorophyll *a*
		Bacteria
		Phosphorus
		Nitrate
1412C	Deep Creek	Dissolved oxygen
		Bacteria
1426	Colorado River Below E.V. Spence Reservoir	Chlorophyll *a*
		Fish Kill
1426B	Elm Creek	Chlorophyll *a*
1426V	Bluff Creek	Nitrate
1426D	Coyote Creek	Nitrate
1433	O.H. Ivie Reservoir	Dissolved oxygen

Segment 1411 – E.V. Spence Reservoir

E.V. Spence Reservoir is an impoundment on the Colorado River near the town of Robert Lee. It drains about 4,000 square miles and has a surface area of 15,893 acres when full. The reservoir has a history of high total dissolved solids and sulfate. In 2014, it was also listed as impaired for chloride as a result of the drought during the seven-year assessment period. TDS, sulfate, chloride and bacteria remain impaired in the Draft 2026 Integrated Report. Fish kills in E.V. Spence remain a concern.

A TMDL was adopted by TCEQ in 2000 and approved by the EPA in 2003. The TMDL implementation plan includes measurements for brush management, management of diversions from the reservoir and plugging leaking oil wells. The management measures continue to be implemented. For more information on the E.V. Spence TMDL, visit the TCEQ website at https://www.tceq.texas.gov/waterquality/tmdl/04-spence.html.

Golden Algae

Golden algae (Prymnesium parvum) blooms are common in E.V. Spence Reservoir. Fish kills have occurred almost year since 2001 based on sampling by Texas Parks and Wildlife Department (TPWD). TPWD will continue to monitor in 2026.

Since 1985, golden algae has caused a number of fish kills in Texas water bodies. While golden algae can occur in stock tanks and reservoirs, it is usually kept in check by competition with other algal species. A bloom of golden algae may be triggered by significant temperature swings, cloudy weather or rising salinity levels. A minor bloom may kill or harm some fish, but serious kills can result when golden algae increases dramatically and produces toxins that impair fish gills, leading to asphyxiation. For more information, visit tpwd.texas.gov/landwater/water/environconcerns/hab/.

Segment 1412 – Colorado River below Lake J. B. Thomas

This segment of the Colorado River begins below the J.B. Thomas Reservoir Dam in Scurry County and ends about 99 miles downstream near the river's confluence with Little Silver Creek in Coke County. The watershed consists mainly of agricultural land. Colorado City is located in the middle of the segment along I-20. This segment of the Colorado River is impaired for contact recreation because of high levels of *E. coli*. Potential sources of bacteria include urban runoff, failing wastewater lines and inadequate septic systems as the station within the impaired assessment unit is located on the downstream side of Colorado City. A portion of the area upstream consists of farms and rangeland, and runoff from these operations and wildlife in the area also represent a potential source of bacteria. This segment has a concern for chlorophyll *a*. Routine monitoring is scheduled to continue in 2026.

Colorado River

Segment 1412B – Beals Creek

Beals Creek begins just upstream of Big Spring and ends about 60 miles downstream at its confluence with the Colorado River. The watershed drains an area of approximately 2,000 square miles and consists mainly of agricultural land. Oil and gas production activities occur in the segment. The upstream portion of Beals Creek is impaired due to high bacteria levels, and the downstream portion has concerns for high bacteria levels. The upper and lower portions have concerns for chlorophyll *a*. The impairment was first documented in 2010. Subsequent monitoring shows bacteria levels remain high. The City of Big Spring and the Colorado River Municipal Water District are permitted to discharge treated effluent into Beals Creek. Stormwater from Big Spring, failing septic systems and wildlife are likely the primary sources of bacteria in this stretch of the creek. Beals Creek has concerns of chlorophyll *a*, nitrate, phosphorus, and bacteria. Monitoring will continue in 2026.

Segment 1413 – Lake J. B. Thomas

Lake J. B. Thomas is impounded on the Colorado River in Scurry County. The lake has a surface area of 7,708 acres with a conservation storage capacity of 204,604 acre-feet. Historically, the lake has maintained only a fraction of its storage capacity. The watershed contains oil and gas deposits that have been in production since the 1930s. Seeps resulting from oil and gas production activities, including abandoned or inadequately plugged wells, have been identified in the watershed. These seeps typically produce high-saline water and contaminate surface water.

In previous reports, the lake did not meet its general use due to high levels of salts. Chloride, TDS and sulfate levels exceeded the state criteria. However, in the Draft 2026 Integrated Report, the lake did not have any parameters which were an impairment or a concern.

Sunset over Lake J.B. Thomas

Segment 1426 – Colorado River below E.V. Spence Reservoir

This segment of the Colorado River begins at the E.V. Spence Reservoir dam and continues about 72 miles downstream to just above O.H. Ivie Reservoir in Runnels County. This stretch of river flows through ranches and farms and the cities of Robert Lee and Ballinger. Oil and gas production occurs throughout the segment. In this segment, there is an abundance of salt cedar (Tamarix sp.), a highly competitive non-native tree that increases salt content of surface soils and consumes large amounts of water through evapotranspiration.

A TMDL implementation plan for chloride and TDS was completed and approved by the EPA in 2007. The implementation plan included targeted brush control (salt cedar) and the plugging of abandoned oil and gas wells. Utilizing aerial spraying and biological methods, the Texas State Soil and Water Conservation Board treated over 11,000 acres for salt cedar control. The Texas Railroad Commission (RRC) through its State Managed Plugging Program plugged 183 abandoned oil and gas wells. The RRC conducted groundwater investigations at the Wendkirk Oil Field and a saltwater seep site located near the town of Ballinger. Based on groundwater investigations, the RRC constructed and operated recovery trenches at both sites. In 2014, the TMDL implementation plan was revised and updated by UCRA with stakeholder input.

One of the recommended actions of the 2014 Implementation Plan Revision was to conduct an investigation to determine potential source(s) of high-salinity seeps into the Colorado River near station 18338. UCRA was awarded a grant to conduct the investigation which was completed in early 2022. The likely source of the seeps was determined to be an abandoned dry hole located approximately 1,250 meters south of the seep site at station 18338. The abandoned wellbore was plugged by the RRC with state funds in 1995.

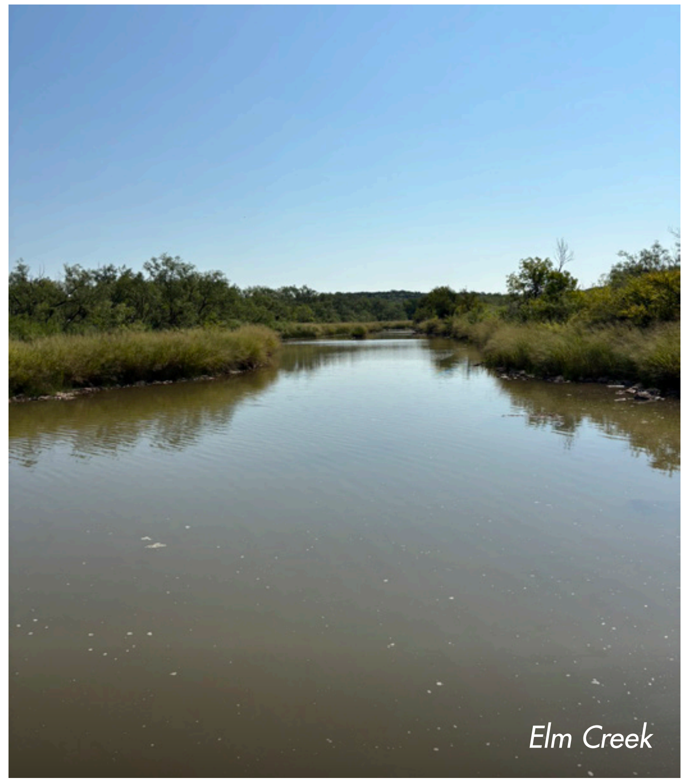
The Draft 2026 Integrated Report shows that this segment of the Colorado River does not support its general use due to elevated levels of TDS and sulfate. The segment also has concerns for chlorophyll *a* and fish kills. TPWD attributed the fish kills in the lower part of the segment to golden algae blooms.

Segment 1426, Site 16899

Segment 1426B – Elm Creek

Elm Creek is a 15-mile-long tributary of the Colorado River which meets the Colorado River in Ballinger. The watershed is rural and predominantly used for agriculture. The Draft 2026 Integrated Report indicates all uses are supported, though a concern has been identified for elevated levels of chlorophyll *a*. This sampling location has been moved from above the dam at the Ballinger city park downstream to the riffle area adjacent to the Ballinger wastewater treatment ponds. Whether these lined wastewater ponds have contributed to nutrient loads at Elm Creek is unknown. No visual indications of algal blooms or high algal activity have been noted. Therefore, the cause for the chlorophyll-a concern is unknown.

UCRA and LCRA biologists conducted Aquatic Life Monitoring for Elm Creek at Station 15536 in 2025 (Table 4). This creek is in ecoregion 27 and has an aquatic life use designation of High. TCEQ has not yet assessed the Elm Creek ALM data. Preliminary results indicate the fish score met the aquatic life use designation of High, but the benthic macroinvertebrate and habitat scores were Intermediate. Benthic macroinvertebrates are typically found in areas with high concentrations of dissolved oxygen like riffle complexes in creeks and rivers. Drought conditions during the critical period event severely impacted flow and the water level in the reach. However, the benthic macroinvertebrate community was not impacted as some small riffles remained in the critical period. The low water status of the creek impacted the overall habitat score.



Elm Creek

Segment 1433 – O.H. Ivie Reservoir

O.H. Ivie Reservoir is an impoundment of the Colorado River and Concho River. It is located in Coleman, Concho and Runnels counties. The contributing area is approximately 1,820 square miles. When full, the reservoir holds approximately 554,300 acre-feet of water. The Draft 2026 Integrated Report data indicate that water in O.H. Ivie Reservoir is fully supporting of all designated uses except for a concern for depressed dissolved oxygen in the upstream portions of the reservoir on the Concho River arm, AU 1433_02.

O.H. Ivie Reservoir

Concho River Watershed

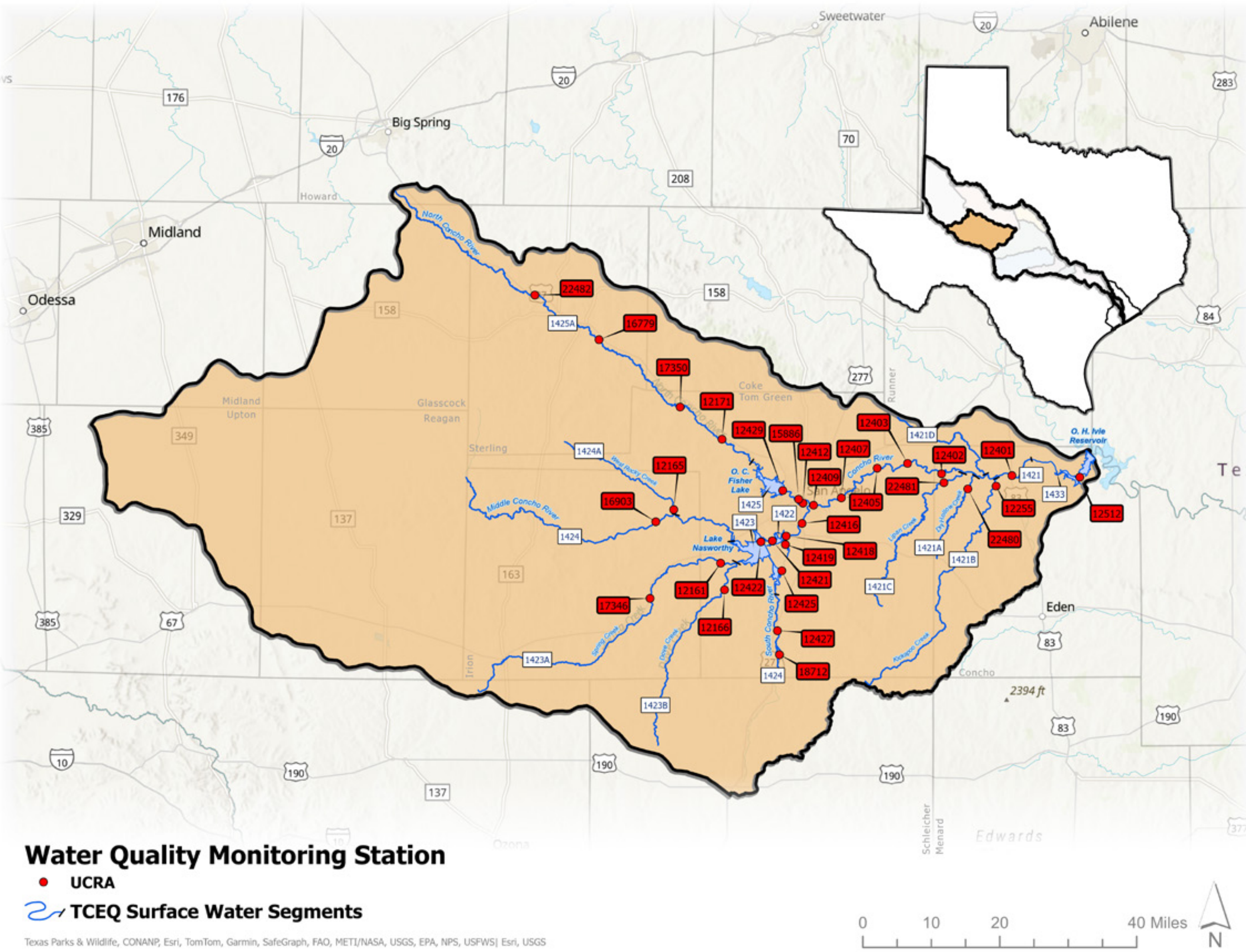


Figure 8. *Concho River Watershed Map and Station Locations*

With an area of approximately 6,700 square miles, the Concho River watershed is the largest in the Colorado River basin. It is situated at the convergence of the High Plains, the Central Great Plains and Edwards Plateau ecoregions. Semiarid conditions exist over most of the watershed with annual average precipitation ranging from less than 14 inches in its western portion to 21 inches in the eastern portion. Many of the tributaries are ephemeral or intermittent.

The principal rivers in the watershed are the North Concho, Middle Concho and South Concho, which all join to form the Concho River. The rivers are impounded several times near San Angelo. The confluence of the Middle Concho River and South Concho River is located at Lake Nasworthy west of San Angelo. The South Concho River continues below Lake Nasworthy to its confluence with the North Concho River above Bell Street Dam in east San Angelo to form the Concho River. The Concho River flows, although sometimes sparsely, through pastures and irrigated fields to O.H. Ivie Reservoir about 60 miles downstream of San Angelo.

The Middle and South Concho rivers are impounded in the north and south pools of Twin Buttes Reservoir, respectively. The pools, which are connected by an equalization channel, serve as the municipal water supply for San Angelo. From Twin Buttes Reservoir, water is released or pumped into Lake Nasworthy, situated immediately downstream. Downstream of Lake Nasworthy, the Concho River converges with sporadically released water from O.C. Fisher Lake on the North Concho River.

The North Concho River, Middle Concho River and Concho River valleys are characterized by broad floodplains that contain fluvial deposits of gravel, sand and clay and form shallow alluvial aquifers. The South Concho River, including Spring Creek and Dove Creek, are characterized by much narrower and steeper valleys. These waterways are primarily fed by springs from the northern edge of the Edwards-Trinity Aquifer.

Based on the Draft 2026 Integrated Report, the Concho River is impaired for low dissolved oxygen. During the 2025 reporting period, 30 sites were routinely monitored by UCRA and TCEQ on the following water bodies:

- Segment 1421 – Concho River
- Segment 1421A – Dry Hollow
- Segment 1421B – Kickapoo Creek
- Segment 1421C – Lipan Creek
- Segment 1422 – Lake Nasworthy
- Segment 1423 – Twin Buttes Reservoir
- Segment 1423A – Spring Creek
- Segment 1423B – Dove Creek
- Segment 1424 – Middle Concho/South Concho River
- Segment 1424A – West Rocky Creek
- Segment 1424B – Cold Creek
- Segment 1425 – Lake O.C. Fisher
- Segment 1425A – North Concho River
- Segment 1433 – O.H. Ivie Reservoir

IMPAIRMENTS FOR THE CONCHO RIVER WATERSHED		
Segment ID	**Waterbody**	**Impairment**
1421	Concho River	Dissolved oxygen

CONCERNS FOR THE CONCHO RIVER WATERSHED		
Segment ID	**Waterbody**	**Concern**
1421	Concho River	Nitrate
		Dissolved oxygen
		Chlorophyll *a*
		Bacteria
1421A	Dry Hollow Creek	Nitrate
1421B	Kickapoo Creek	Nitrate
1421C	Lipan Creek	Nitrate
		Chlorophyll *a*
1423A	Spring Creek	Nitrate
1424	Middle Concho/South Concho River	Nitrate
1424A	West Rocky Creek	Dissolved oxygen
1424B	Cold Creek	Nitrate
1425A	North Concho River	Chlorophyll *a*

Segment 1421 – Concho River

Segment 1421 includes the Concho River downstream of San Angelo and parts of the north and south forks of the Concho River in San Angelo up to O.C. Fisher Lake and Twin Buttes Reservoir. Below San Angelo, the segment extends downstream approximately 45 river miles to Paint Rock in an area known as the Lipan Flats. The area is comprised of rich farmland and sits atop the Lipan Aquifer, known for groundwater with high nitrogen concentrations.

The Draft 2026 Integrated Report data indicate that the upper reaches of the segment in San Angelo are non-supportive due to depressed oxygen levels in diel (24-hour) data with concerns for nutrients, chlorophyll *a* and bacteria throughout the watershed. The dissolved oxygen deficiency is attributable to low flows through the many impoundments from the O.C. Fisher Dam to the Bell Street Dam. These impoundments act as a series of stormwater detention ponds even though they were not constructed for that purpose. Previous reports have attributed the chlorophyll-a concerns to decomposition of organic matter and nutrient loadings including naturally occurring sources and agricultural practices on the Lipan Flats. As presented in the Concho River Basin WPP submitted to the state Soil and Water Conservation Board in May 2011, the bacteria impairment was likely attributable to avian sources. The Concho River continues to remain impaired for low dissolved oxygen.

UCRA and LCRA biologists conducted Aquatic Life Monitoring for the Concho River at Station 12409 in 2024 (Table 3). This segment of the Concho River flows through ecoregion 27 and has an aquatic life use designation of High. TCEQ has not yet assessed the Concho River ALM data. Preliminary results indicate the fish and habitat scores both meet the aquatic life use designation of High, but benthic macroinvertebrates scored Intermediate. Station 12409 is in AU 1421_07, which is the same portion that has a concern for chlorophyll *a*.

Concho River

Segments 1421A – Dry Hollow Creek, 1421B – Kickapoo Creek, and 1421C – Lipan Creek

Dry Hollow, Kickapoo and Lipan creeks are major tributaries of the Concho River. The Draft 2026 Integrated Report data indicate all creeks have a concern for nitrate. These creeks are surrounded by land that is dominated by agriculture. A potential source of nitrates comes from irrigation farming throughout their watersheds. Lipan Creek has a concern for chlorophyll *a*, which is likely a result of high nutrients coming from the groundwater. These creeks are spring fed from the Lipan Aquifer which is notoriously high in nitrates. The source is unknown, but previous reports attribute the high levels to historic agricultural practices, and some studies characterize it as naturally occurring.

Segment 1422 – Lake Nasworthy

Lake Nasworthy is an impoundment on the South Concho River, just below Twin Buttes Reservoir. Water released from Twin Buttes Reservoir is the primary source of water for the lake. The lake holds approximately 14,000 acre-feet of water when it's at conservation pool level. Lake Nasworthy met all applicable surface water quality standards, according to the Draft 2026 Integrated Report.

Segment 1423 – Twin Buttes Reservoir

Twin Buttes Reservoir is an impoundment on the south and middle forks of the Concho River and on Spring and Dove creeks. Monitoring data show that water quality in Twin Buttes Reservoir is good and meets applicable surface water quality standards.

Segment 1423B – Dove Creek

UCRA and LCRA biologists conducted Aquatic Life Monitoring for Dove Creek Station 12166 in 2024 (Table 3). This creek is in ecoregion 30 and has an aquatic life use designation of High. TCEQ has not yet assessed the Dove Creek ALM data. Preliminary results indicate the fish, benthic macroinvertebrate, and habitat scores all meet the aquatic life use designation for this site. Based on the Draft 2026 Integrated Report, there are currently no impairments or concerns for this waterbody.

Twin Buttes Reservoir

Segment 1424 – Middle Concho/South Concho Rivers

Although the South Concho and Middle Concho rivers are included in the same segment, the two rivers have very different characteristics. The South Concho River is a perennial spring-fed stream created by several large springs that form its headwaters. The Middle Concho River flows intermittently and during the most recent drought became dry for an extended period. Segment 1424 has a concern for nitrate in AU 1424_01 in the Draft 2026 Integrated Report.

UCRA and LCRA biologists conducted Aquatic Life Monitoring for the South Concho River at Station 12427 in 2025 (Table 4). This waterway is in ecoregion 30 and has an aquatic life use designation of Exceptional. TCEQ has not yet assessed the South Concho River ALM data. Preliminary results indicate the fish score meets the aquatic life use designation of Exceptional, but the benthic macroinvertebrate and habitat scores did not meet criteria. Station 12427 is in AU 1424_01 which is the same segment that has a concern for nitrate. High levels of nitrogen can act as a stressor to benthic macroinvertebrate communities, reducing species diversity and shifting community composition from sensitive species to more pollution-tolerant organisms.

Segment 1425 – O.C. Fisher Lake

O.C. Fisher Lake is an impoundment on the North Concho River west of San Angelo. The lake has a total storage capacity of 395,717 acre-feet and a drainage area of about 1,488 square miles (1,383 contributing). Its conservation storage capacity is 119,445 acre-feet. The contributing watershed of O.C. Fisher Lake consists mainly of rangeland with relatively few acres dedicated to irrigation or dry-land farming operations. The segment was previously impaired for chloride and total dissolved solids; however, the Draft 2026 Integrated Report data indicated the lake fully supported all uses with no concerns.

Segment 1425A – North Concho River

This segment consists of the North Concho River from O.C. Fisher Lake near San Angelo in Tom Green County upstream to the Glasscock/Howard County line. The watershed is primarily used for agriculture and wildlife operations. A small percentage of the watershed's acreage is dedicated to farming operations. The North Concho River is intermittent and about 104 miles long. Segment 1425A has a concern for chlorophyll *a* in the Draft 2026 Integrated Report.

South Concho River

Pecan Bayou Watershed

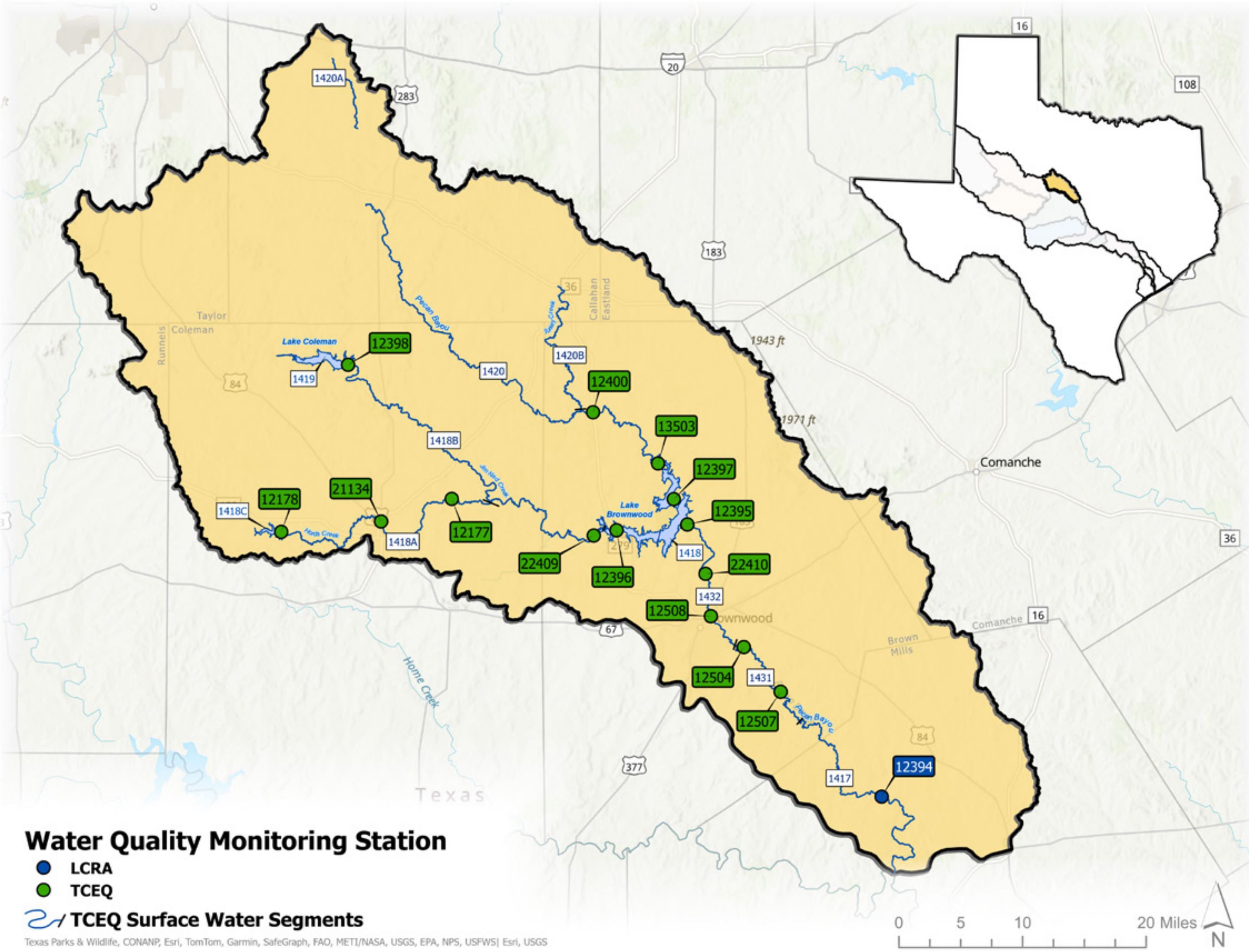


Figure 9. *Pecan Bayou Watershed Map and Station Locations*

The Pecan Bayou headwaters are southeast of Abilene. This 2,200-square-mile watershed is evenly split between the Central Great Plains and the Cross Timbers ecoregions. The stream flows to the southeast and into the Colorado River in Mills County above Lake Buchanan. Flat terrain and sluggish flow make the bayou more akin to an East Texas stream than other Colorado River tributaries. Several small tributaries provide intermittent flows to the bayou. Jim Ned Creek, a major tributary, forms Lake Coleman and merges with Pecan Bayou to form Lake Brownwood, near the City of Brownwood.

In 2025, LCRA and TCEQ routinely monitored 15 sites in the following water bodies:

- Segment 1417 – Lower Pecan Bayou
- Segment 1418 – Lake Brownwood
- Segment 1418A – Hords Creek
- Segment 1418B – Jim Ned Creek
- Segment 1418C – Hords Creek Reservoir
- Segment 1419 – Lake Coleman
- Segment 1420 – Pecan Bayou above Lake Brownwood
- Segment 1431 – Mid Pecan Bayou
- Segment 1432 – Upper Pecan Bayou

IMPAIRMENTS FOR THE PECAN BAYOU WATERSHED		
Segment ID	**Waterbody**	**Impairment**
1419	Lake Coleman	Algal growth

CONCERNS FOR THE PECAN BAYOU WATERSHED		
Segment ID	**Waterbody**	**Concern**
1417	Lower Pecan Bayou	Chlorophyll *a*
1418	Lake Brownwood	Manganese in sediment
1418A	Hords Creek	Chlorophyll *a*
1418B	Jim Ned Creek	Chlorophyll *a*
1420	Pecan Bayou Above Lake Brownwood	Chlorophyll *a*
1431	Mid Pecan Bayou	Phosphorus
		Nitrate
		Chlorophyll *a*
1432	Upper Pecan Bayou	Chlorophyll *a*
1424B	Cold Creek	Nitrate
1425A	North Concho River	Chlorophyll *a*

Segment 1417 – Lower Pecan Bayou

The most downstream segment of Pecan Bayou is undeveloped and includes mostly pastureland. Several small tributaries provide intermittent flows to the bayou. Jim Ned Creek, a major tributary, forms Lake Coleman and merges with Pecan Bayou to form Lake Brownwood, near the City of Brownwood. The Draft 2026 Integrated Report lists a concern for chlorophyll *a*.

Segment 1419 – Lake Coleman

Lake Coleman is an impoundment on Jim Ned Creek in Coleman County. The lake, which was impounded in 1966, has a surface area of approximately 2,000 acres at its normal pool elevation. The Draft 2026 Integrated Report indicated that the lake is impaired for excessive algal growth.

Segment 1431 – Mid Pecan Bayou

Mid Pecan Bayou begins downstream of Brownwood. The 13-mile segment is surrounded by land used for hay production and row crops, and there is a concentrated animal feeding operation in the upper end of the segment. The City of Brownwood wastewater treatment plant historically discharged treated effluent into Willis Creek, about 1.5 miles upstream of the monitoring site. However, in recent years, the city constructed a new wastewater treatment plant that reduced the amount of effluent entering the creek by reusing much of the wastewater. The Draft 2026 Integrated Report lists concerns for nitrate, phosphorus, and chlorophyll *a*.

Segment 1432 – Upper Pecan Bayou

Upper Pecan Bayou is not, as its name implies, the uppermost segment in the watershed. The name is a relic of old segment descriptions assigned by TCEQ and its predecessor agencies in the early days of delineating Texas streams. The segment, which is downstream of Lake Brownwood, is approximately 15 miles long. The Draft 2026 Integrated Report lists a concern for chlorophyll *a*.

Lake Buchanan Watershed

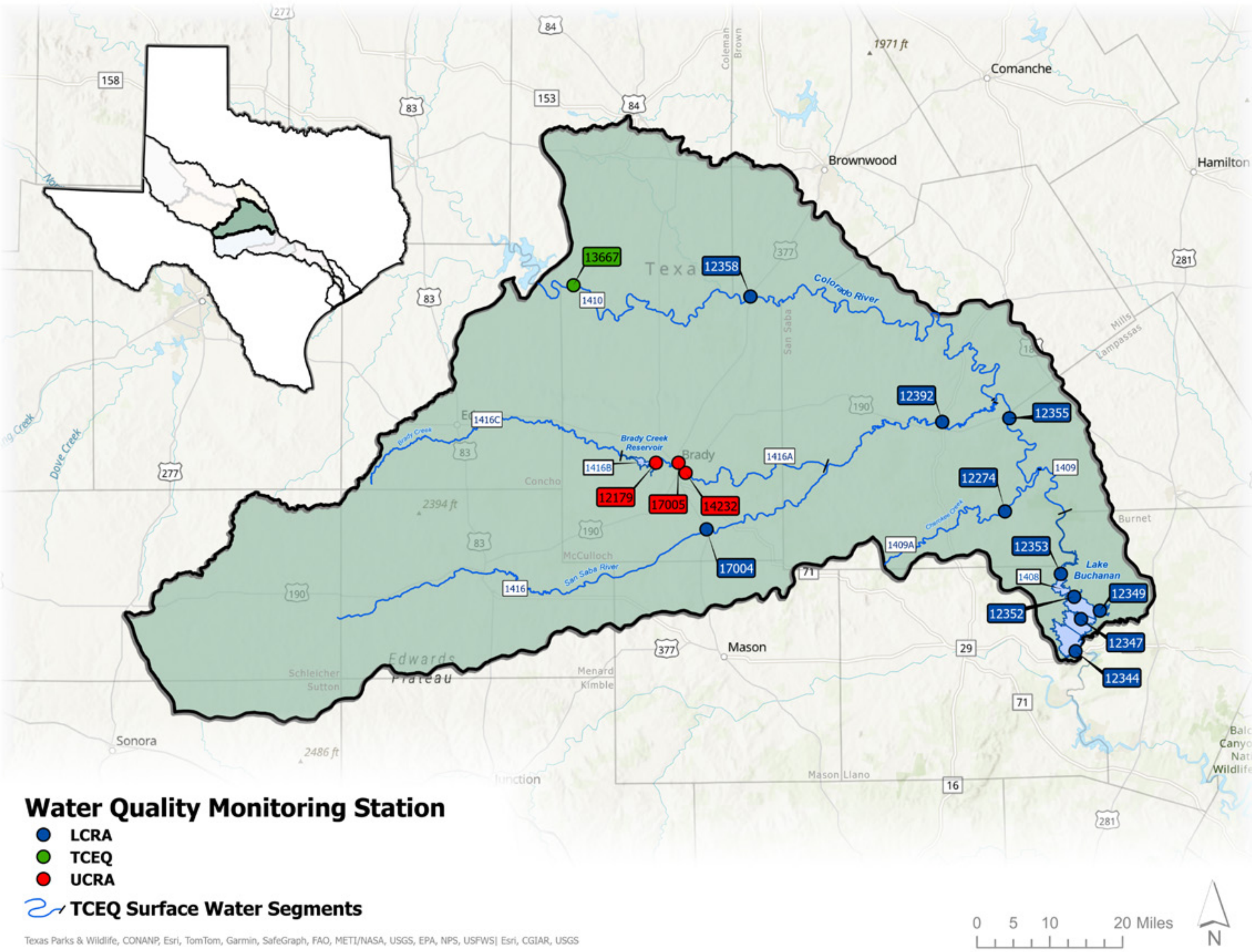


__Figure 10.__ Lake Buchanan Watershed Map and Station Locations

The Lake Buchanan watershed begins where the Colorado River flows from the dam at O.H. Ivie Reservoir. The watershed covers 5,660 square miles. It is situated mostly in the Central Great Plains and the Edwards Plateau, with each ecoregion contributing slightly different characteristics to water quality. The Central Great Plains in the uppermost portion of the watershed historically has received about 20 inches of rain annually. Droughts in recent decades have caused most of the streams in the region to flow intermittently. The soil consists of sand and clays, which contribute to turbidity. In contrast, the Edwards Plateau, in the lower parts of the watershed, contains a sparse network of historically perennial streams that flow over granite and limestone substrates. Streams in this region are relatively clear under normal flow conditions. Freshwater from Pecan Bayou, the San Saba River, and small perennial streams dilute the dissolved solids common in the upper basin. Water quality in most of the watershed meets surface water quality standards. The two exceptions are the San Saba River and Brady Creek. The San Saba River has elevated bacteria levels, and Brady Creek contains low levels of dissolved oxygen.

In 2025, LCRA and TCEQ routinely monitored 14 sites in the following water bodies:

- Segment 1408 – Lake Buchanan
- Segment 1409 – Colorado River above Lake Buchanan
- Segment 1409A – Cherokee Creek
- Segment 1410 – Colorado River below O. H. Ivie Reservoir
- Segment 1416 – San Saba River
- Segment 1416A – Brady Creek
- Segment 1416B – Brady Creek Reservoir

IMPAIRMENTS FOR THE LAKE BUCHANAN WATERSHED		
Segment ID	**Waterbody**	**Impairment**
1416	San Saba River	Bacteria
1416A	Brady Creek	Dissolved oxygen

CONCERNS FOR THE LAKE BUCHANAN WATERSHED		
Segment ID	**Waterbody**	**Concern**
1409	Colorado River Above Lake Buchanan	Chlorophyll *a*
1409A	Cherokee Creek	Bacteria
1410	Colorado River Below O.H. Ivie Reservoir	Chlorophyll *a*
1416A	Brady Creek	Phosphorus
		Nitrate
		Chlorophyll *a*
		Dissolved oxygen
		Chlorophyll *a*
1416C	Brady Creek above Brady Creek Reservoir	Nitrate

Segment 1408 – Lake Buchanan

Lake Buchanan is an impoundment of the Colorado River in Burnet and Llano counties. With 22,335 surface acres, Lake Buchanan is the largest of the Highland Lakes and is one of the two water supply reservoirs in the Highland Lakes system, with the other being Lake Travis. Monitoring data indicate that the lake meets all applicable surface water quality standards.

Lake Buchanan at Black Rock Park

On-Site Sewage Facility (OSSF) Ordinance

On-site sewage facilities (OSSF) or septic systems are an integral part of rural America. They can be an efficient way to remove household waste and protect the environment when properly designed and maintained. In 1971, TCEQ delegated regulatory authority of OSSF systems in the Highland Lakes area to LCRA. Since then, LCRA has regulated the installation and operation of thousands of OSSF systems in the four-county area. This oversight ensures the best available technology is used to treat septic waste so pollutants such as bacteria, phosphorus and nitrogen don't leach into surface water. In 2025, LCRA's OSSF program issued 367 construction permits and conducted over 2,000 inspections.

Highland Lakes Watershed Ordinance (HLWO)

Stormwater runoff carries pollution — pesticides, soil, nutrients, toxics and other residues from everyday human activities. LCRA actively manages stormwater runoff around the Highland Lakes through the Highland Lakes Watershed Ordinance. Through a permitting process, the ordinance requires developers to stabilize land and minimize sediment migration. Water quality is protected by limiting stormwater runoff, creating buffer zones, and installing erosion and sediment controls. New quarries and mines are also covered under the ordinance and must implement measures similar to other developments.

Segment 1409 – Colorado River above Lake Buchanan


Colorado River upstream of Lake Buchanan

The Colorado River above Lake Buchanan is located between Lake Buchanan and the confluence of the San Saba and Colorado rivers in San Saba County. The segment is approximately 37 miles long. Flow contributions from the San Saba River and other smaller perennial streams typically help dilute the higher chloride and TDS levels that can occur in the mainstem Colorado River. Bedrock is the dominant substrate, and water in this region tends to be clearer than upstream. During the recent droughts, these historically perennial streams went dry, resulting in intermittent pools in the main stem of the Colorado River in Segment 1409. Despite the dry conditions, this stretch of the river met all designated uses during the height of the drought. However, coming out of the drought the upper portion of this segment now has a concern for chlorophyll *a*.

LCRA biologists conducted Aquatic Life Monitoring at the Colorado River in Colorado Bend State Park at Station 17358 in 2024 (Table 4). Only one monitoring event during the index period could be collected. More data will need to be collected for TCEQ to make an assessment in this segment. This creek is in ecoregion 30 and has an aquatic life use designation of High. Fish and habitat scores from the critical period both met the aquatic life use designation of High. Benthic macroinvertebrates scored Intermediate and did not meet the criterion. LCRA will revisit this site in the future to conduct additional biological monitoring.

Segment 1410 – Colorado River below O.H. Ivie Reservoir

The Colorado River below O.H. Ivie Reservoir is located between the confluence of the Colorado and San Saba rivers and the O.H. Ivie Reservoir Dam. The segment is approximately 138 miles long. Water in this segment flows through farmland and ranches where it is used to irrigate hay, wheat, cotton and pecan orchards. Segment 1410 has a concern for chlorophyll *a* according to the Draft 2026 Integrated Report.

Segment 1416 – San Saba River

The San Saba River begins in Schleicher County where the north and middle prongs of the San Saba River converge. It flows approximately 168 miles downstream to the confluence with the Colorado River in San Saba County. The San Saba River watershed is predominantly rural. Near its headwaters, flow is sparse, and the landscape is largely undeveloped, dotted with a few ranch houses among the oaks and mesquites along the river. As the river flows past the city of Menard, the landscape changes to irrigated hayfields and row crops. Downstream of Menard, the river winds through unimproved pastures and pecan orchards before reaching the city of San Saba and, ultimately, the Colorado River.

The lower portion of San Saba River between the city of San Saba and the confluence with the Colorado River does not support contact recreation, according to the Draft 2026 Integrated Report. TCEQ first placed the river on the 303(d) List in 2008 for elevated bacteria levels. After some preliminary study, the main source of bacteria remained unclear. In early 2023, LCRA was approved to use Clean Rivers Program FY2022–2023 funds to conduct a bacterial source tracking project for the San Saba River.

San Saba River at San Saba Nature Park

San Saba Bacterial Source Tracking

Bacteria Source Tracking (BST) is a tool that can help identify and rule out sources of *E. coli* bacteria in a waterway. The method uses DNA fingerprints and bacterial markers to compare *E. coli* DNA collected from the river or stream to a statewide library of known sources. This method was selected for the San Saba River bacteria impairment to shed light on potential sources of the chronic bacteria detections in the lower portion of the San Saba.

Three San Saba River sites (river crossings at SH 16, CR 208, and CR 200) were selected within the impaired reach (AU 1416_01), and water samples were collected four times under different flow and seasonal conditions. Two events were conducted during stormwater flow and two during normal, ambient conditions. Field parameters (water temperature, dissolved oxygen, pH and specific conductance) and flow parameters (instantaneous stream flow, flow severity, stream flow estimate and flow method) were measured and recorded for each site.

Water samples from each collection event were shipped to Texas A&M Soil and Aquatic Microbial Laboratory for BST analysis. Samples were filtered and plated to isolate individual *E. coli* colonies. Random *E. coli* colonies were selected, DNA fingerprinted and compared to known sources (wildlife, agriculture, or human). Across all sampling events, several overall patterns were evident. Wildlife sources were consistently present and often represented the largest category of isolates. Livestock sources, particularly cattle, were identified in multiple events and sites, especially during ambient summer conditions and storm events. Human-associated isolates were present in smaller proportions and were most common in the winter ambient event. The percentage of unidentified isolates varied among sampling dates and was highest during the winter ambient event. Variability in source contributions between stormwater and ambient conditions and among seasons suggests that the origin and transport of fecal material changes throughout the year. The full report for this study will soon be available on lcra.org.

Moving forward, LCRA will continue routine monitoring at Site 12392. Field evaluations may help identify areas where bacteria enter the river, such as livestock access points or stormwater pathways. Sharing results with landowners, agricultural producers and local officials may help support voluntary implementation of management practices, including improved riparian buffers, controlled livestock access, alternative water supplies and feral hog management, where appropriate. Any future management action implemented in the watershed can be evaluated over time using traditional water quality monitoring.

LCRA biologists conducted Aquatic Life Monitoring at the San Saba River at Station 20662 in 2024 (Table 3). This creek is in ecoregion 30 and has an aquatic life use designation of High. TCEQ has not yet assessed ALM data from this site. Preliminary results indicate the fish score meets the aquatic life use designation of High, but the benthic macroinvertebrate and habitat scores were Intermediate.

Segment 1416A – Brady Creek

The Brady Creek watershed in Concho, McCulloch and San Saba counties is approximately 784 square miles. Brady Creek is 90 miles long and primarily rural with much of the upper portion used for agriculture. Brady Creek was historically impaired for depressed dissolved oxygen in the early 2000s. In response to these oxygen issues, UCRA worked with the City of Brady to construct stormwater improvements, develop a Brady Creek Master Plan and Watershed Characterization Plan, and complete a Watershed Protection Plan with federal funds received from the EPA Nonpoint Source Management Program. The program is managed by the TCEQ Nonpoint Source Pollution Program.

The goal of the WPP is to improve water quality within the impaired segment and to protect the integrity of the remaining watershed. UCRA received grant funding for the first phase of the WPP Implementation Project in September 2017. The primary objective of the initial phase of implementation was to improve the dissolved oxygen in the impaired segment to a level that was fully supportive of the aquatic life use criteria.

UCRA is implementing two of the best management practices (BMPs) recommended in the WPP: the installation of a demonstration structural BMP and a comprehensive education and outreach program. The City of Brady is a full partner in these endeavors. Installation of a vortex separator for the demonstration site was completed in July 2020 and monitoring is conducted as storm events occur. The City of Brady was a vital part of the construction process, and education and outreach for the project is ongoing. For more information, visit https://www.ucratx.org/brady-creek.

Brady Creek is impaired for dissolved oxygen in the assessment unit that runs through the city of Brady, according to the Draft 2026 Integrated Report. Brady Creek has concerns for elevated levels of chlorophyll *a*, phosphorus and nitrate.

Brady Creek Reservoir

Lake LBJ Watershed

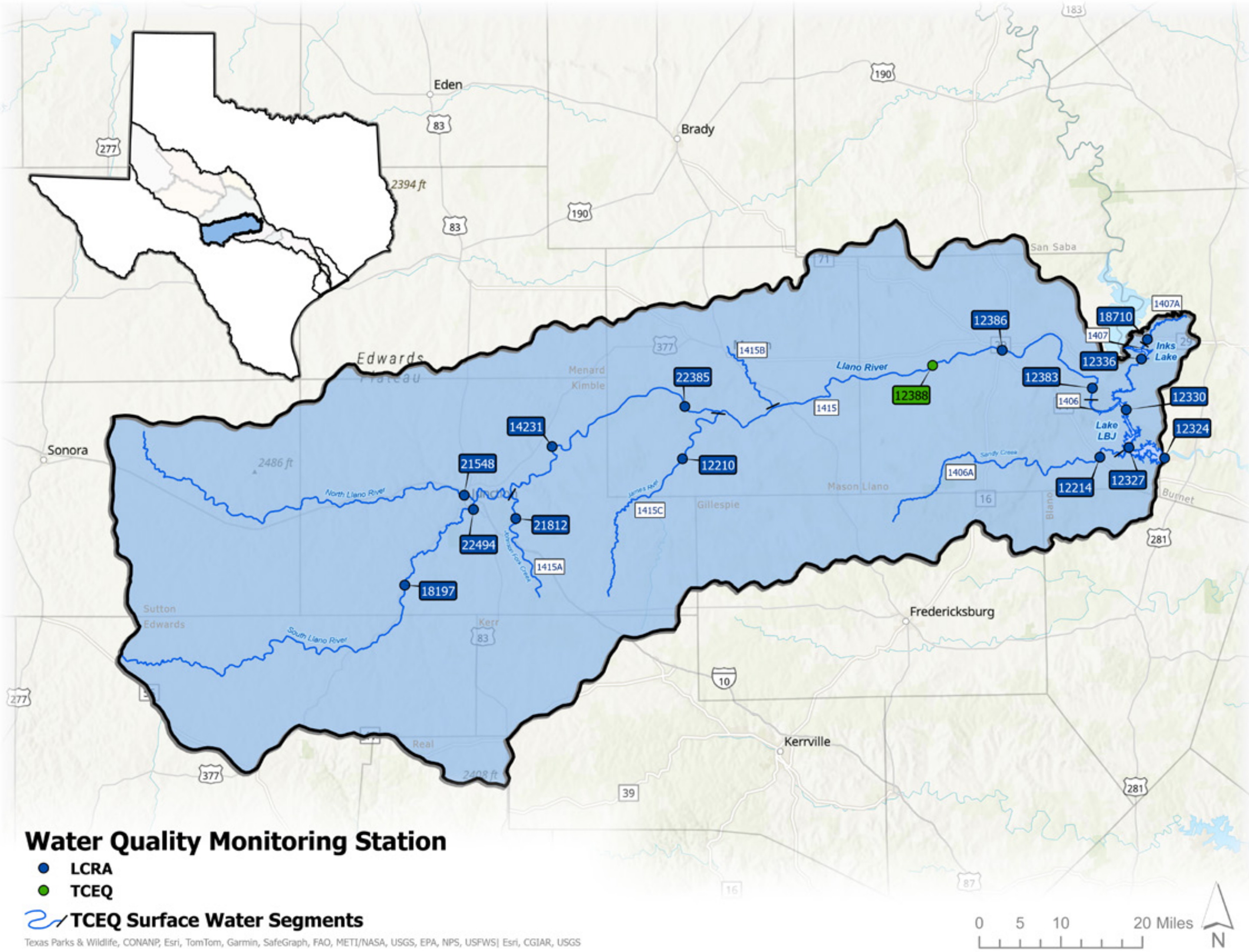


Figure 11. *Lake LBJ Watershed Map and Station Locations*

The Lake LBJ watershed begins where the Colorado River is released from Buchanan Dam in Burnet and Llano counties. Immediately below Buchanan Dam, the river flows into the headwaters of Inks Lake, a pass-through reservoir with little detention time. Below Inks Dam, the river flows about 10 miles to the community of Kingsland, where it merges with the Llano River before flowing into Lake LBJ. The 5,000-square-mile watershed is entirely within the Edwards Plateau. Steep hills with rock and limestone substrate create clear, cool, fast-flowing streams like the Llano and James rivers. Perennial streams in the watershed are spring-fed and typically more alkaline because of the limestone geology. There are two impairments in this subwatershed: Clear Creek, a tributary of Inks Lake, does not meet surface water quality standards due to pH, sulfate, TDS, and aluminum, copper, nickel and zinc in the water. Lake LBJ was recently impaired for excessive algae.

In 2025, LCRA and TCEQ routinely monitored 16 sites on the following water bodies:

- Segment 1406 – Lake LBJ
- Segment 1406A – Sandy Creek
- Segment 1407 – Inks Lake
- Segment 1407A – Clear Creek
- Segment 1415 – Llano River (including the north and south forks)
- Segment 1415A – Johnson Fork Creek
- Segment 1415C – James River

IMPAIRMENTS FOR THE LAKE LBJ WATERSHED		
Segment ID	**Waterbody**	**Impairment**
1406	Lake LBJ	Excessive algae
1407A	Clear Creek	Aluminum
		Copper
		Nickel
		Sulfate
		Zinc
		Total dissolved solids
		pH

CONCERNS FOR THE LAKE LBJ WATERSHED		
Segment ID	**Waterbody**	**Concern**
1406	Lake LBJ	Dissolved oxygen
1407	Inks Lake	Manganese in sediment
1407A	Clear Creek	Cadmium

Segment 1406 – Lake LBJ

Lake LBJ is impounded where the Colorado and Llano rivers converge in Burnet and Llano counties. The 6,256-acre reservoir was completed in 1950 to supply hydroelectric power to the area. Granite Shoals, Sunrise Beach, Horseshoe Bay and Kingsland are growing communities that surround the lake. Development around the lake has the potential to impact water quality through increased impervious cover. The Highland Lakes Watershed Ordinance and the On-Site Sewage Facility Ordinance, which are administered by LCRA, help reduce the impact of development on water quality. The Draft 2026 Integrated Report identified impairments in the nutrient reservoir criteria for excessive algal growth in each assessment unit within the lake.


Lake LBJ

The Draft 2026 Integrated Report – Supplemental Data for Reservoir Nutrient Assessment published the most recent assessment of Station 12324. The median chlorophyll-a value of 11.75 (µg/L) exceeded the criteria of 10.29 (µg/L), which resulted in continued impairment for excess algal growth in Lake LBJ. This impairment was first listed on the 303(d) List in 2022, when TCEQ developed Category 5n for waterbodies which did not meet chlorophyll-a criteria making it possible for reservoirs to be listed for this impairment; however, chlorophyll-a data from Station 12324 has exceeded the criteria established in the Reservoir Nutrient Assessments since its inception in 2016. For more information on the Draft 2026 Integrated Report – Supplemental Data for Reservoir Nutrient Assessment, visit: https://www.texasrecyclestvs.org/downloads/water–quality/assessment/2026–integrated–report.

Segment 1407 – Inks Lake

Inks Lake is a 777-acre impoundment on the Colorado River just downstream of Buchanan Dam. Monitoring data indicate the lake supports its designated uses, but there were concerns related to aquatic life specifically for manganese in sediment in the Draft 2026 Integrated Report. These concerns were carried forward from previous reports. The source of manganese in sediments is unknown but previous reports have suggested that the source is natural.

Segment 1407A – Clear Creek

Clear Creek is an intermittent tributary of Inks Lake. The creek is about 4.5 miles long, and its watershed is comprised mostly of ranchland. A 23-acre tailings pile – a remnant of an abandoned graphite mine – is located on the banks of the creek, and is the source of pH, TDS, sulfate and metal impairments. Stormwater runoff from the pile can result in acid mine drainage, if not properly managed. Mining operations began in 1915. The property has had several owners, most recently Greensmiths Inc., which purchased the facility in 2000 and began using reclaimed tailings materials to landscape golf courses. Greensmiths has engineered BMPs to prevent runoff and improve water quality in Clear Creek. Monitoring by the TCEQ and LCRA is ongoing to determine if BMPs have effectively contained stormwater to prevent contaminated runoff. The creek has flowed intermittently since 2011. Limited sampling performed in 2025 showed water quality still did not meet surface water quality standards.

More information on Clear Creek can be found in LCRA's 2025 Basin Highlights Report:
https://www.lcra.org/download/2025-lcra-basin-highlights-report/?wpdmdl=38747

Inks Lake

Segment 1415 – Llano River (including the north and south forks)

The Llano River begins in Junction where the North Llano and South Llano rivers converge. The river, including the north and south forks, is approximately 231 miles long. Both streams are spring-fed from the Edwards-Trinity Aquifer. Below Junction, the Llano River flows east to the town of Llano. This area, known as the Llano Uplift, contains granite and limestone outcrops that produce clear, fast-flowing streams. Below the town of Llano, the river flows into the Colorado River and the headwaters of Lake LBJ. The Llano River watershed remains largely rural. The soil and geology in the watershed lend themselves to ranching more than farming. There are fewer irrigated fields compared to the surrounding watersheds. The Llano River met all applicable surface water quality standards according to the Draft 2026 Integrated Report.

Texas House Bill 1688 (88th Legislature, 2023), authored by Rep. Andrew Murr, established the Coke Stevenson Scenic Riverway to protect the South Llano River in Kimble County. The bill was put into effect in September 2023 and helps to tighten regulations on water quality protections in the designated reach. Twice per year, TCEQ, TPWD and LCRA staff conduct paddling trips on the river to fulfill requirements of this bill. A report on 2025 activities is included in Appendix A.

Upper Llano River Watershed Protection Plan

In 2011, the Texas State Soil and Water Conservation Board began work on the Upper Llano River WPP. Guided by the EPA's Healthy Watersheds Initiative, the two agencies worked with the Llano River Watershed Alliance and other stakeholders to characterize historical and current water quality conditions. The project developed models to help educate the public about water quality in the watersheds.

Stakeholders identified loss of spring flow, spread of invasive species and potential for declines in water quality and stream flows as their primary concerns. The resulting plan outlines strategies for implementing water quality management plans, wildlife habitat management, feral hog management and septic system education and outreach. The plan was approved by the EPA in 2016. The plan can be viewed at http://www.llanoriver.org/watershed-protection-plan.

Llano River

Lake Travis Watershed

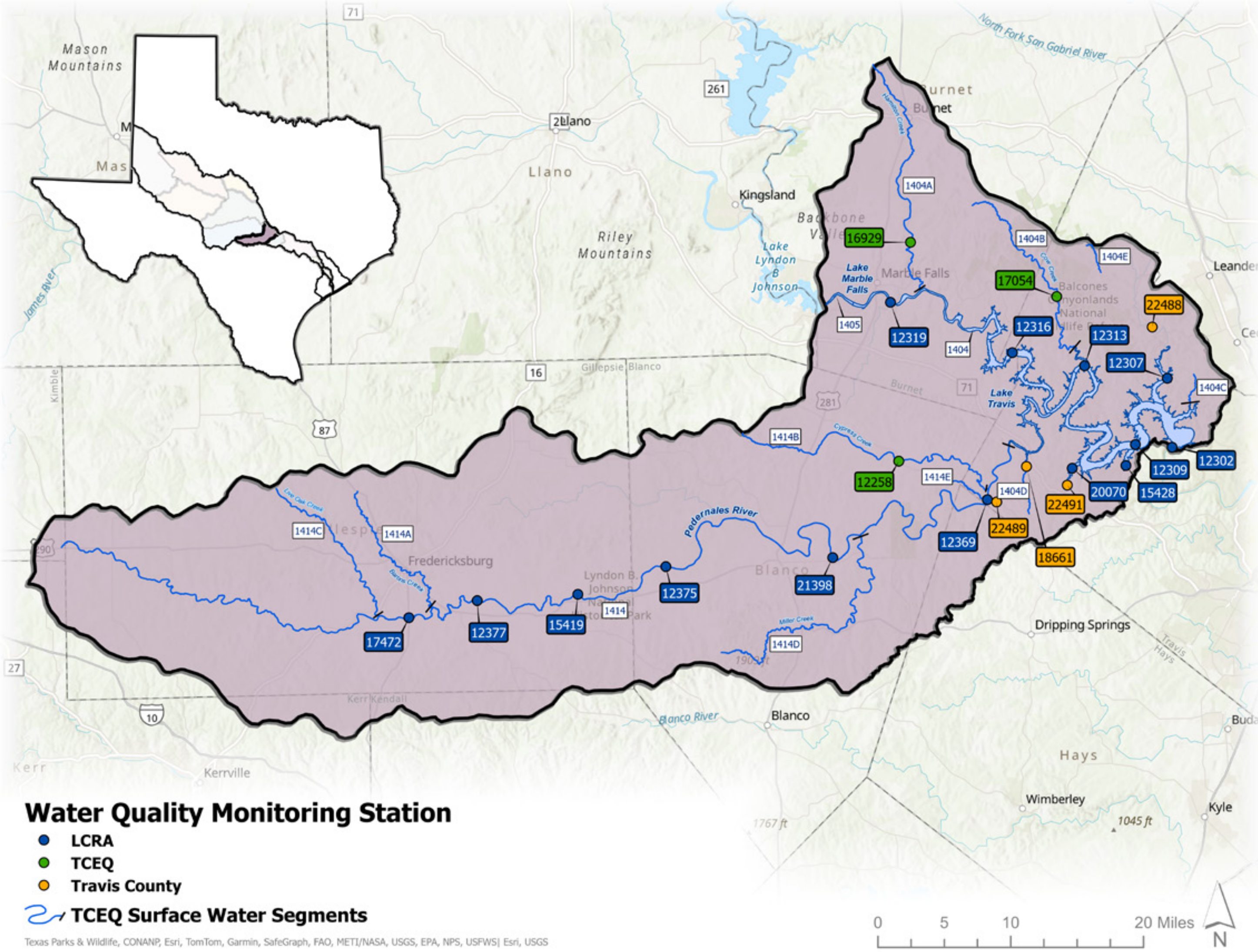


Figure 12. *Lake Travis Watershed Map and Station Locations*

Located in the Texas Hill Country, the Lake Travis watershed is approximately 1,830 square miles and includes the Pedernales River and lakes Travis and Marble Falls. The watershed lies within the Edwards Plateau, a region distinguished by rocky terrain and clear perennial streams. Growth and development have dramatically changed the landscape in the region over the past 20 years. Lake Marble Falls became impaired for excessive algae in 2022 and added to the 303(d) list.

In 2025, LCRA, Travis County, and TCEQ routinely monitored 21 sites on the following segments:

- Segment 1404 – Lake Travis
- Segment 1404A – Hamilton Creek
- Segment 1404B – Cow Creek
- Segment 1404D – Lick Creek
- Segment 1405 – Lake Marble Falls
- Segment 1414 – Pedernales River
- Segment 1414B – Cypress Creek

IMPAIRMENTS FOR THE LAKE TRAVIS WATERSHED		
Segment ID	**Waterbody**	**Impairment**
1405	Marble Falls Lake	Excessive algae

CONCERNS FOR THE LAKE TRAVIS WATERSHED		
Segment ID	**Waterbody**	**Concern**
1404	Lake Travis	Dissolved oxygen

Segment 1404 – Lake Travis

Mansfield Dam impounds Lake Travis on the Colorado and Pedernales rivers in western Travis County. The reservoir is about 18,929 surface acres and is over 50 meters deep near the dam. Lake Travis is the only lake in the Highland Lakes chain specifically designed to hold back floodwaters. Lake Travis is considered full for water supply purposes at 681 feet above mean sea level. At that level, the lake contains 1.1 million acre-feet of water. Lake Travis is designed to hold an additional 776,062 acre-feet of floodwaters in what is referred to as the flood pool. Historically, it is one of the clearest reservoirs in the state and is a popular recreation destination.

In 2017, invasive zebra mussels were first introduced into the Colorado River basin in the lower part of Lake Travis. Since then, zebra mussels have spread into all the Highland Lakes from Buchanan to Lake Austin, Lady Bird Lake and the Colorado River below Austin. LCRA partners with TPWD to share the Clean, Drain, Dry message and help prevent their further spread.

Lake Travis has a concern for dissolved oxygen in the Draft 2026 Integrated Report. Ongoing LCRA initiatives to protect the lake include the Highland Lakes Watershed Ordinance, the On-Site Sewage Facilities program and the Colorado River Environmental Models.

Lake Travis

Colorado River Environmental Models

In the early 2000s, LCRA began developing models to evaluate water quality issues, discern trends and predict the impacts of various decisions, actions and future scenarios on the Highland Lakes. The first model was completed on Lake Travis in 2009 followed by lakes Inks, Marble Falls and LBJ in 2011. The Lake Buchanan model was completed in 2013.

These Colorado River Environmental Models have been used to demonstrate the impact of different discharge scenarios and help establish wastewater permit limits in the Highland Lakes watersheds. LCRA will continue to develop the models as lake conditions change and to work with Highland Lakes communities to develop reasonable treatment options that protect water quality. For more information on Colorado River Environmental Models visit https://www.lcra.org/water/quality/water-quality-permit-review-program/water-quality-models/.

Segment 1405 – Lake Marble Falls

Max Starcke Dam forms Lake Marble Falls on the Colorado River near the City of Marble Falls. With a surface area of 545 acres, it is the smallest reservoir in the chain of Highland Lakes. Lake Marble Falls is impaired for excessive algae in the Draft 2026 Integrated Report.

Segment 1414 – Pedernales River

The headwaters of the Pedernales River are located near Harper in Kimble County. The river flows east through Fredericksburg, Stonewall and Johnson City before reaching the mouth of Lake Travis. It is approximately 125 miles long. In the upper reaches, it is intermittent. And in recent droughts the river became pooled throughout most of its length. Intense thunderstorms can create heavy rainfall that dramatically increases flow in the river and can transport large amounts of silt and organic debris downstream and into Lake Travis. Data within the Draft 2026 Integrated Report indicate that the river supports all its designated uses.

Lake Marble Falls

Austin Watershed

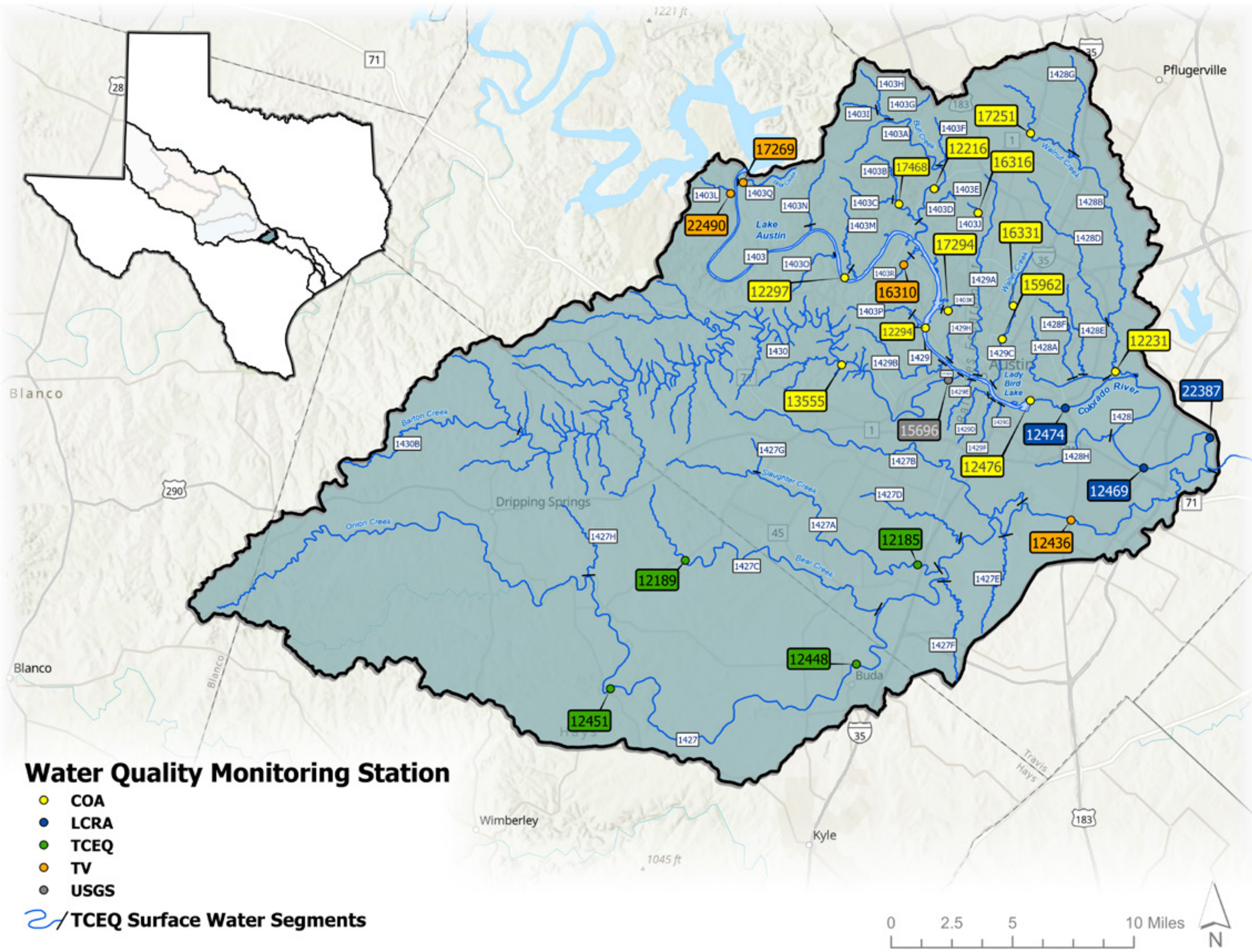


Figure 13. *Austin Watershed Map and Station Locations*

The Austin metropolitan watershed encompasses about 700 square miles in Central Texas. Austin's population is approximately 1 million people within the city limits and over 2 million in the metro area, making it the most urbanized watershed in the basin. Lake Austin and Lady Bird Lake in this region of the watershed are narrow and shallow in comparison to the reservoirs upstream. Both lakes lie within the full purpose city limits receiving stormwater runoff from several urban tributaries. Austin is situated at a geological crossroads where the Edwards Plateau ecoregion (western side) meets the Blackland Prairie (eastern side). As such, there are differences in geomorphology, hydrology and water quality as the river flows from the northwest to the southeast. The transition between the two ecoregions is delineated by the Balcones Fault zone which creates a rugged karst landscape that includes areas of recharge to the Edwards Aquifer, as well as numerous springs which support clear perennial stream segments. Creeks on the east side of Austin are lower gradient, often higher turbidity, and are supported by shallow groundwater. The urban creeks are highly influenced by the impervious cover in the watershed, which creates conditions where water moves quickly through the tributaries during and after heavy rain events. The altered hydrology presents challenges for aquatic life, and urban infrastructure such as stormwater drainage systems and wastewater lines can result in decreased water quality. Some urban creeks have elevated bacteria levels, especially after rainfall events.

In 2025, the City of Austin, Travis County, TCEQ, USGS and LCRA monitored 24 sites on the following water bodies:

- Segment 1403 – Lake Austin
- Segment 1403A – Bull Creek
- Segment 1403B – West Bull Creek
- Segment 1403J – Spicewood
- Segment 1403K – Taylor Slough
- Segment 1403L – Deer Creek
- Segment 1403Q – Bear Creek
- Segment 1403R – unnamed tributary to Lake Austin
- Segment 1427 – Onion Creek
- Segment 1427A – Slaughter Creek
- Segment 1427C – Bear Creek
- Segment 1428 – Colorado River below Austin
- Segment 1428B – Walnut Creek
- Segment 1429 – Lady Bird Lake
- Segment 1429C – Waller Creek
- Segment 1430 – Barton Creek
- Segment 1430A – Barton Springs

IMPAIRMENTS FOR THE AUSTIN WATERSHED		
Segment ID	**Waterbody**	**Impairment**
1403J	Spicewood Tributary to Shoal Creek	Bacteria
1403K	Taylor Slough South	Bacteria
1427	Onion Creek	Sulfate
1429C	Waller Creek	Bacteria
		Impaired macrobenthic community

CONCERNS FOR THE AUSTIN WATERSHED		
Segment ID	**Waterbody**	**Concern**
1403	Lake Austin	Manganese in sediment
1403A	Bull Creek	Bacteria
1403B	West Bull Creek	Bacteria
1403D	Barrow Preserve Tributary	Nitrate
1403E	Stillhouse Hollow	Nitrate
1403J	Spicewood Tributary to Shoal Creek	Nitrate
1403K	Taylor Slough South	Nitrate
1403R	Westlake-Davenport Tributary to Lake Austin	Bacteria
1427A	Slaughter Creek	Dissolved oxygen
1427G	Granada Hills Tributary to Slaughter Creek	Nitrate
1428B	Walnut Creek	Bacteria
		Impaired macrobenthic community
		Impaired habitat
1429C	Waller Creek	Toxicity in sediment
		Fish kill
1429D	East Bouldin Creek	Toxicity in sediment
1430	Barton Creek	Toxicity in sediment
1430A	Barton Springs	Toxicity in sediment

Segment 1403 – Lake Austin

Lake Austin

Tom Miller Dam impounds the Colorado River to form Lake Austin. It's a narrow and shallow lake that, by size and fluvial properties, is more akin to a river than the upstream Highland Lakes. There are 20 miles between Mansfield Dam below Lake Travis and Tom Miller Dam. Land around the lake was developed mostly as residential properties, and much of the natural shoreline has been turned into bulkheads to limit erosion from wave action caused by boat traffic. The lake, which is approximately 1,830 surface acres, is used extensively for recreation.

Historical data showed frequent low dissolved oxygen concentrations near the headwaters at Mansfield Dam, which is designed to release water from the bottom of Lake Travis into Lake Austin. Deep water can become depleted of oxygen due to a natural phenomenon called stratification. To increase dissolved oxygen in upper Lake Austin, LCRA installed an aerator in Mansfield Dam to oxygenate the water during releases. Verification sampling began in 2013 and showed improvements in dissolved oxygen levels. As a result, the dissolved oxygen impairment has been removed. The Draft 2026 Integrated Report lists a concern for manganese in sediment, which has historically been discussed as being natural and not a result of pollution.

Segment 1403A – Bull Creek

Bull Creek is a perennial, spring-fed tributary of Lake Austin. Roughly half of the watershed is considered urban. The remaining half is undeveloped and is dominated by parks, preserves and open space, much of which is protected from future development and managed for endangered species. Water in the headwater tributaries of the watershed is strongly influenced by groundwater can include low concentrations of dissolved oxygen; however, the benthic macroinvertebrate data collected by the City of Austin and the stable community of protected Jollyville Plateau salamanders indicate that Bull Creek maintains high aquatic life use. Previous data that implied impairment for dissolved oxygen were likely a result of site selection near a spring that naturally contained low levels of oxygen as it came from the groundwater. Recent diel data have shown that Bull Creek meets the standard for dissolved oxygen. The Draft 2026 Integrated Report lists bacteria as a concern for Bull Creek between the Loop 360 crossing near Lakewood Drive upstream to the Spicewood Springs Road crossing. The City of Austin has conducted extensive testing of the wastewater infrastructure in the upstream watershed and did not find significant sources. A study by the University of Texas at Austin indicated that the elevated *E. coli* concentrations are likely attributed to the large community of barn swallows that reside under the Loop 360 bridge. In addition, this area is near an off-leash dog park, which has historically been thought to be a source of the *E. coli*. Austin Watershed Protection provides education and outreach for a Scoop the Poop program to address bacteria problems like this where the source may be exacerbated by domestic pets.

Segment 1403B – West Bull Creek

West Bull Creek is a 6.9 square mile watershed located southwest of Bull Creek. A total of 2.67 square miles of the watershed is upgradient of the recharge zone, with the southern portion downgradient of the recharge zone. The waterbody was noted with a concern for bacteria in the 2012 Integrated Report. At that time the watershed contained approximately 10% impervious cover. High values of *E. coli* were observed by City of Austin Watershed Protection in the downstream portion of this waterbody until 2016. Some City of Austin infrastructure projects have been completed since that time and are expected to resolve the bacteria concerns. City of Austin Watershed Protection began collecting and reporting data for this segment in 2025 to obtain more recent data to enable an assessment in the next few years.

Segments 1403D – Barrow Preserve Tributary and 1403E – Stillhouse Hollow

The Barrow Preserve and Stillhouse Hollow tributaries are listed for a concern for nitrate based on historic data. Although the City of Austin does not currently monitor the surface water or springs at these locations, the sites have been studied extensively over 15 years through several studies using water samples, dye traces, soil samples and fertilizer studies to try to identify and reduce nitrate concentration in spring flow. Results indicated highly variable nutrient concentrations with no clear pattern/trend. Evaluation of the data indicated that the elevated nitrate was fingerprinted to fertilizers. The neighborhoods in this watershed are high density with steep slopes and an underlying karst geology. The City of Austin Watershed Protection worked to engage and educate the public on these better lawn maintenance practices that would reduce fertilizer runoff into the creeks and groundwater. In addition, the city reached out to a commercial fertilizer company operating in the watershed to inquire about modifying the nutrient blend. Ultimately, these efforts did not show much success. Based on these and other challenges, additional monitoring is not being pursued at this time.

Bull Creek

Bacteria TMDL for four Austin Creeks

In 2012, TCEQ initiated a bacteria TMDL for the Spicewood Tributary of Shoal Creek, Taylor Slough, Waller Creek and Walnut Creek. TCEQ contracted with the University of Texas Center for Public Policy Dispute Resolution to facilitate public input and develop a TMDL implementation plan. City of Austin Watershed Protection and other stakeholders developed an implementation plan to reduce bacteria in the creeks. Strategies include riparian zone restoration, wastewater infrastructure maintenance, domestic pet waste education, resident outreach, and stormwater treatment. This document titled Implementation Plan for Five Total Maximum Daily Loads for Bacteria in Four Austin Streams is available at https://www.tceq.texas.gov/waterquality/tmdl/101–austinbacteria. TCEQ approved the plan in 2015, and in June 2021, an Improving Austin Streams stakeholder group formed a committee to create an updated plan based on the most current data and what they learned about the effectiveness of their chosen best management practices (BMPs). The updated implementation plan targets sources of bacteria in Austin-area streams for a five-year period that extends through 2027. For more information, visit https://www.tceq.texas.gov/downloads/water-quality/tmdl/austin-watersheds-recreational-101/101b-as-254-22-adopted-austin-implementation-plan-update-2022-08.pdf. The implementation plan includes these assessment units:

- 1403J_01 – Spicewood Tributary to Shoal Creek downstream of Spicewood Springs (entire waterbody)
- 1403K_01 – Taylor Slough South (entire waterbody)
- 1428B – Walnut Creek (AU 01-05)
- 1429C – Waller Creek (AU 02 and 03)

Segment 1403J – Spicewood Tributary to Shoal Creek

This small tributary to Shoal Creek, known as Spicewood Springs Tributary, is in the upper portion of the Shoal Creek watershed on the north side of Lady Bird Lake in Austin. It begins near the west side of Loop 1 (MoPac Expressway) in north Austin, and becomes a perennial stream where Spicewood Springs discharges. The creek is in an established residential area where wastewater lines traverse the stream's banks. The shallow, spring-fed stream is only about a half mile long and has historically contained a small population of threatened Jollyville Plateau salamanders (Eurycea tonkawae).

Previous water quality data collected near the springs indicated elevated levels of bacteria and subsequently, TCEQ placed it on the 303(d) List in 2002. At the request of the city, TCEQ initiated a TMDL for bacteria late in 2012. TMDL implementation plan began in 2013 and continues today. The creek is currently in Category 4a, because it contains an approved TMDL and implementation plan. In 2025, City of Austin Watershed Protection conducted longitudinal surveys in the Spicewood Springs Tributary to identify potential infrastructure leaks. A leak in a sanitary line was found near the spring. The City of Austin Watershed Protection staff coordinated with Austin Water to find the specific location of the leak and repair it. More monitoring will be conducted in 2026 to determine if the infrastructure repair resolved the high bacteria issue.

Segment 1403K – Taylor Slough South

The Taylor Slough South watershed is located on the northeast side of Lake Austin upstream from Tom Miller Dam. It is in a dense urban landscape composed mostly of single-family residences. Sewer lines cross the creek at several locations in the watershed. Water quality data collected from Reed Park in the downstream portion of the stream indicate elevated levels of bacteria. TCEQ placed it on the 303(d) List in 2002. TCEQ initiated a TMDL for bacteria in 2012. The TMDL implementation plan began in 2013 and continues today. The creek is now in Category 4a, because it contains an approved TMDL and implementation plan. City of Austin Watershed Protection has continued to monitor the stream at Reed Park in addition to implementing longitudinal surveys in the contributing tributaries. Multiple minor wastewater leaks been identified and resolved through this process. In addition, a major wastewater infrastructure maintenance project is the in the process of implementation. Monitoring will continue to determine if the repairs and future maintenance will resolve the elevated *E. coli* concentrations.

Segment 1403R – Westlake-Davenport Tributary to Lake Austin

The concern for bacteria in Westlake-Davenport Tributary has been attributed to historic events related to chronic spills of effluent identified in 2008 from a release valve from Davenport Water Treatment Plant. The City of Austin spill response team investigated this issue and resolved the problem shortly thereafter. Subsequently, the Davenport Water Treatment Plant has been decommissioned, so no future spills are possible. A review of Westlake-Davenport Tributary data collected to investigate this stream reach is included in the City of Austin publication Supplemental monitoring of selected water bodies with contact recreation impairments (SR-11-04). Bacteria concentrations of 21 samples collected in the study indicated that the geometric mean was below TCEQ contact recreation thresholds and were therefore fully supporting contact recreation standards. Travis County is currently collecting samples in Westlake-Davenport Tributary for further assessment by TCEQ.

Segment 1427 – Onion Creek

The headwaters of Onion Creek are located in Blanco County. The creek flows intermittently about 78 miles to the east to its confluence with the Colorado River in Travis County. The stream interacts with groundwater as it flows over and into limestone fissures in the Edwards Aquifer recharge zone southwest of Austin. High sulfate levels in the upper part of the watershed resulted in the creek not supporting general uses in Draft 2026 Integrated Report. Monitoring continues in 2026. However, the high sulfate is currently thought to be of natural sources. The Glen Rose formation that influences reaches of Onion Creek is known to have higher sulfate concentration than the Edwards Aquifer. Groundwater pumping for residential use, agriculture and ponds is a common occurrence in this rural area, potentially leading to higher sulfate concentrations in surface water. No other parameters associated with aquatic degradation are apparent, which indicates that the sulfate in Onion Creek is from aforementioned sources.

LCRA added Onion Creek Station 12436 to the Clean Rivers Program Aquatic Life Monitoring program. Surveys for fish, macroinvertebrates and habitat will be conducted in 2026.

Segment 1427A – Slaughter Creek

Located in southern Travis County, the Slaughter Creek watershed is approximately 31 square miles and largely urban. The lower watershed consists primarily of densely clustered residential housing. From the headwaters near U.S. Hwy 290, the stream flows to the east about 17 miles to the confluence with Onion Creek. A six-mile section of the creek near MoPac Expressway lies over the Edwards Aquifer recharge zone and this mid-reach portion of the creek does not maintain baseflow under normal conditions. The creek was placed on the 2002 303(d) List for not meeting a high aquatic life use based on biological samples.

In 2016, the TCEQ proposed new aquatic life use standards for the upper portion of the stream, designating it as an intermediate aquatic life use. Slaughter Creek has a concern for dissolved oxygen in the Draft 2026 Integrated Report. Monitoring will continue in 2026.

Segment 1427G – Granada Hills Tributary to Slaughter Creek

Due to a concern for nitrate, the Granada Hills tributary to Slaughter Creek was monitored from 1995-2002 as part of a larger study by City of Austin which evaluated different methods of residential wastewater disposal. *E. coli* values were low, and although the nutrient concentrations were elevated, the data served its research purpose and was not pursued over other monitoring priorities. Nutrients are presumed to be from fertilizers in residential neighborhoods similar to Barrow Preserve and Stillhouse Hollow with no clear path forward to resolution (see 1403D and 1403 above).

Segment 1428B – Walnut Creek

Walnut Creek is a tributary of the Colorado River below Longhorn Dam. This is one of the larger watersheds in Austin (43.5 square miles) running 22.3 miles from north Austin through downtown before joining the Colorado River. Historic data collected from several sites in the creek indicate elevated levels of bacteria, and as a result, the stream was placed on the 303(d) List in 2002. Potential sources of bacteria include urban runoff and leaking wastewater lines. City of Austin Watershed Protection conducted verification monitoring in 2010 and mapped on-site sewage facilities to isolate potential sources. A TMDL on Walnut Creek and three other Austin creeks was initiated in 2012. An implementation plan was approved in 2015 and implementation and monitoring continue in 2026. Cumulative projects conducted within Walnut Creek seem to be working to address the high bacteria concentrations in the waterbody. In the Draft 2026 Integrated Report, bacteria were only noted as a concern in Walnut Creek instead of non-supporting.

Walnut Creek

Segment 1429C – Waller Creek

The Waller Creek watershed is on the north side of Lady Bird Lake in downtown Austin. The headwaters begin in north Austin and the stream flows about 5 miles to its confluence with Lady Bird Lake. Waller Creek is heavily urbanized. Monitoring data collected from several sites on the creek showed elevated levels of bacteria and in 2002, it was placed on the 303(d) List. Potential sources of bacteria include pet and human waste, leaking wastewater infrastructure and urban runoff. Waller Creek subsequently was listed as impaired for benthic macroinvertebrates.

Construction of the Waller Creek Tunnel, a major hydrologic alteration project, began in 2011 and filled with water for the first time in 2015. The project has altered the course of Waller's baseflow, stormflow and habitat in the creek, while also reducing flooding in the watershed. The tunnel is used to convey floodwater during storm events and circulate water from Lady Bird Lake through lower Waller Creek during non-storm conditions. The tunnel project, in combination with significant redevelopment has effectively replaced the baseflow in Waller Creek with water from Lady Bird Lake and therefore, altered the water quality. TCEQ initiated a TMDL for bacteria in the upstream portions of the watershed in 2012. TMDL implementation began in 2013. Water quality monitoring is ongoing.

Segments 1429D – East Bouldin Creek, 1403 – Barton Creek, and 1430A – Barton Springs

Concerns for toxic sediment were first noted in the 2002 Integrated Report for East Bouldin Creek, Barton Creek and Barton Springs. Between 2000 and 2005, the City of Austin and USGS conducted studies to examine concentrations and sources of Polycyclic Aromatic Hydrocarbons (PAHs) in Austin creek and lake sediments. These compounds are currently on the Toxic Pollutants and Priority Pollutants lists of the Code of Federal Regulations in 40 CFR 401.15 and 40 CFR 423 Appendix A, respectively. PAHs are considered Toxic Pollutants because they persist in the environment; several are toxic, carcinogenic, mutagenic, and/or teratogenic (causing birth defects) to aquatic life; and seven are probable human carcinogens. Studies done by the USGS determined that coal-tar sealant was a significant human-made source of PAHs. At the time, coal-tar sealant was commonly used as a pavement sealant for parking lots to slow the degradation of asphalt and prolong the life of the paved surface. The USGS and City of Austin studies determined that coal-tar sealant was a primary source for the toxic sediments that were found in Austin creeks and lakes. In 2006, the City of Austin banned the use of coal-tar based pavement sealant, and the City of Austin continued to monitor sediment throughout Austin through 2016. The impacts of the ban were not seen until several years later. By 2016 the toxic levels of PAHs in most monitored locations in Austin were below toxic levels.


Barton Creek

Lower Colorado River Watershed

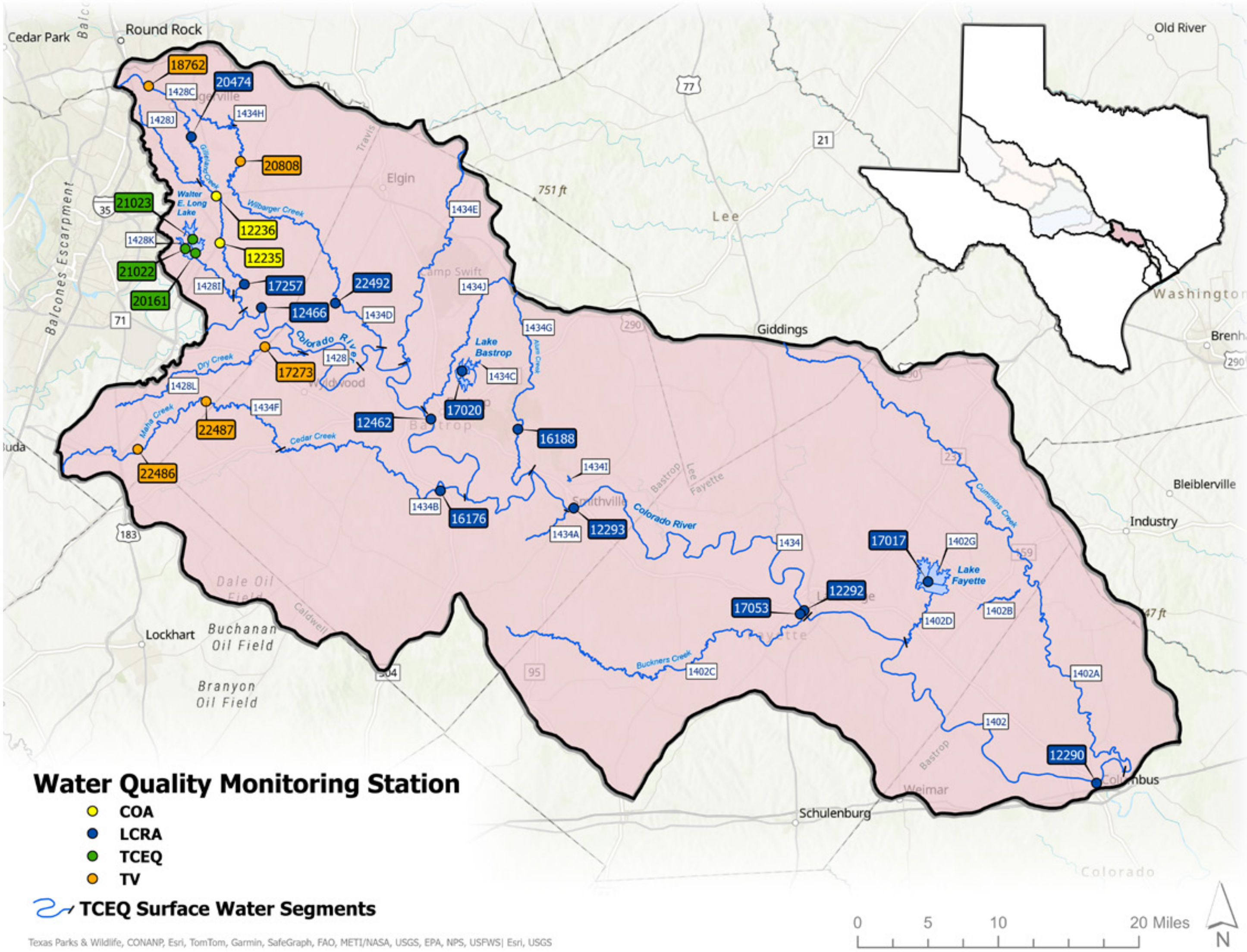


Figure 14. *Lower Colorado River Watershed Map and Station Locations*

The lower Colorado River subwatershed begins at FM 969 near Utley where it then flows for over 200 river miles until it reaches the tidally influenced region of the river near the coast. The watershed encompasses an area of about 2,900 square miles. Water typically flows more slowly here than in the river above Austin because of the relatively low relief. The watershed slices through a variety of Texas ecoregions as it travels east out of the Austin area. The annual average precipitation ranges from 34 inches near Austin to 46 inches at the southern edge of the watershed.

During times of drought and low flow, the section of the Colorado River downstream of Austin has a majority of its flows contributed by treated effluent from wastewater treatment plants. Without much dilution of this effluent, the resulting elevated nutrients can impact water quality and cause a significant amount of algae and submerged aquatic vegetation to grow in the river.

Flow management in the Colorado River below Austin

LCRA manages lakes Travis and Buchanan under a state-approved Water Management Plan. The plan governs LCRA's operation of the Highland Lakes to supply water to users throughout the lower Colorado River basin. Read more about LCRA's current water supply operations at https://www.lcra.org/water/water-supply-planning/water-supply-operations/.

During a drought, the plan requires that LCRA curtail or cut off interruptible stored water from the Highland Lakes so firm water supplies will continue to be available to meet the basic needs of cities, businesses and industries. The plan also requires LCRA to provide water from the lakes to help meet the environmental needs of the lower Colorado River below Austin and Matagorda Bay.

The plan establishes three sets of operating conditions to determine the availability of interruptible stored water, which is used by agricultural customers in Colorado, Wharton and Matagorda counties. It also sets two dates – March 1 and July 1 – for determining the amount of interruptible stored water available for first and second crops.

In 2025, LCRA began the process of updating the Water Management Plan, as required by TCEQ. The process included significant input from interested participants, including water customers, agricultural interests, environmental interests, lake interests, state agencies and others. For more information visit https://www.lcra.org/water/water-supply-planning/water-management-plan-for-lower-colorado-river-basin/.

In 2025, LCRA, TCEQ, City of Austin and Travis County monitored 23 sites on the following water bodies:

- Segment 1402 – Colorado River below La Grange
- Segment 1402C – Buckners Creek
- Segment 1402G – Fayette Reservoir
- Segment 1428 – Colorado River below Austin
- Segment 1428C – Gilleland Creek
- Segment 1428K – Walter E. Long Lake
- Segment 1434 – Colorado River between Utley and La Grange
- Segment 1434B – Cedar Creek
- Segment 1434C – Lake Bastrop
- Segment 1434D – Wilbarger Creek
- Segment 1434F – Maha Creek
- Segment 1434G – Alum Creek

IMPAIRMENTS FOR THE LOWER COLORADO RIVER WATERSHED		
Segment ID	**Waterbody**	**Impairment**
1402A	Cummins Creek	Impaired fish community
		Impaired macrobenthic community
1402C	Buckners Creek	Dissolved oxygen
1428C	Gilleland Creek	Bacteria
1434J	Piney Creek	Impaired fish community
		Impaired macrobenthic community

CONCERNS FOR THE AUSTIN WATERSHED		
Segment ID	**Waterbody**	**Concern**
1402A	Cummins Creek	Impaired habitat
1402C	Buckners Creek	Chlorophyll *a*
1428	Colorado River Below Lady Bird Lake	Impaired fish community
		Impaired macrobenthic community
		Phosphorus
		Nitrate
		Dissolved oxygen
1428C	Gilleland Creek	Nitrate
1434	Colorado River above La Grange	Phosphorus
		Nitrate
1434B	Cedar Creek	Bacteria
		Dissolved oxygen
1434D	Wilbarger Creek	Bacteria
1434E	Big Sandy Creek	Chlorophyll *a*
1434G	Alum Creek	Dissolved oxygen

Segment 1402A – Cummins Creek

Cummins Creek runs approximately 55 miles from the confluence with the Colorado River, near Columbus, to the headwaters near Giddings. Land in the watershed is used primarily for agriculture and ranching. LCRA biologists conducted Aquatic Life Monitoring for Cummins Creek in 2021 (Table 4). This creek is in ecoregion 33 and has an aquatic life use designation of Exceptional. The fish and benthic macroinvertebrate IBI scores averaged High and Intermediate, respectively. The assessment of the data resulted in impairments for fish and benthic macrobenthic communities, thus placing them on the 303(d) List in the Draft 2026 Integrated Report (Table 5). Additionally, the Draft 2026 Integrated Report lists a concern for impaired habitat. Lack of habitat diversity may result in poor fish and benthic communities.

Segment 1402C – Buckners Creek

Located on the south side of the Colorado River near La Grange, the Buckners Creek watershed is about 176 square miles. The stream's headwaters are near the community of Rosanky in Bastrop County. It ends 26 miles downstream at its confluence with the Colorado River. The Buckners Creek watershed is rural. The Draft 2026 Integrated Report lists impairment for dissolved oxygen and a concern for chlorophyll *a*. This creek was first listed as impaired dissolved oxygen in 2010. Potential causes of low dissolved oxygen include decomposition of organic matter coupled with slow flows and inadequate mixing. LCRA completed a UAA for Buckners Creek in 2019.

Segment 1428 – Colorado River below Austin

This segment of the Colorado River below Lady Bird Lake is approximately 41 miles long. It begins at Longhorn Dam and ends near the river's intersection with FM 969 northwest of Bastrop. The upper end of the segment is urbanized while the lower end is mostly rural but

with a growing amount of development. The two City of Austin wastewater treatment plants with major discharges to the Colorado River (South Austin Regional and Walnut Creek) have a total permitted capacity of 150 million gallons per day of treated effluent. Treated effluent can make up the majority of the flow in this section of river during low flow conditions.

The Draft 2026 Integrated Report lists concerns for impaired fish and impaired macrobenthic communities for the Colorado River below Austin. These concerns were first listed in the 2022 Integrated Report and have been carried forward in subsequent Integrated Reports. This area of the Colorado River also has concerns for phosphorus, nitrate and dissolved oxygen.

LCRA biologists conducted Aquatic Life Monitoring on the Colorado River at Austin's Colony at Station 22387 (AU ID 1428_02) in 2024 and 2025 (Table 3). An ALM event was also conducted on the Colorado River at Utley at Station 12463 (AU ID 1428_03) in 2024 (Table 3). TCEQ has not yet assessed the Colorado River ALM data for Stations 22378 and 12463. Both sites have an aquatic life use designation of Exceptional. Preliminary results for Austin's Colony indicate the benthic macroinvertebrate score meets the aquatic life use designation of Exceptional, but the fish and habitat scores did not meet criteria. Conversely, the site at Utley met the Exceptional criteria for fish but did not meet the criteria for bugs or habitat. Both stations are in assessment units that have concerns for nitrate and phosphorus. High nutrient levels can act as a stressor to benthic macroinvertebrate communities, reducing diversity and shifting community composition from sensitive species to more pollution-tolerant organisms. For Utley, there is a concern for low dissolved oxygen concentrations which can also negatively impact benthic communities.

Segment 1428 in Webberville

Segment 1428C – Gilleland Creek

Gilleland Creek, a tributary of the Colorado River downstream of Austin, was placed on the 303(d) List in 1999 due to elevated bacteria levels. Land use in the watershed is transitioning from agricultural to urban. The results of urbanization are most evident during dry weather, when the water in Gilleland Creek is dominated by treated effluent from the municipal wastewater treatment facilities in the watershed. The watershed includes the City of Pflugerville, a small portion of the City of Round Rock, and portions of the cities of Manor and Austin.

In the 2000s, LCRA led the effort to develop the Gilleland Creek TMDL and Implementation Plan through a contract with TCEQ. It was adopted by TCEQ in 2007 and approved by the EPA in 2009. The TMDL Implementation Plan – including waste load allocations, stormwater prevention and education – was approved by TCEQ in 2011. For more information about the Gilleland Creek TMDL, visit http://www.tceq.texas.gov/waterquality/tmdl/nav/69–gillelandcreekbacteria.

Gilleland Creek remains impaired for bacteria, and three of the four assessment units exceed the 126 MPN (most probable number) criterion in the Draft 2026 Integrated Report. The highest bacteria concentration is in assessment unit 1428C_04 which has a geomean of 483.25 MPN. Gilleland Creek has a concern for nitrate in all assessment units.

LCRA biologists conducted Aquatic Life Monitoring at Gilleland Creek in 2025 at Station 20474 (Table 3). This creek is in ecoregion 32 and has an aquatic life use designation of High. TCEQ has not yet assessed the Gilleland Creek ALM data. Preliminary results from the index period indicate fish, benthic macroinvertebrate, and habitat data resulted in a High score, meeting the aquatic life use criteria for the creek.

Segment 1434 – Colorado River above La Grange

The Colorado River segment between Utley and La Grange begins at FM 969 near Bastrop and ends at State Highway 71 in La Grange. The segment is approximately 74 miles long. Except for Bastrop, Smithville and La Grange, this section of the river flows through mostly farmland. The water is turbid due to sandy loams and clay soils in the East Central Texas Plains ecoregion. The Draft 2026 Integrated Report lists concern for phosphorus and nitrate.

Colorado River in Utley

Segment 1434B – Cedar Creek

Cedar Creek is a perennial stream which stretches approximately 21 miles from the confluence with the Colorado River, roughly between Bastrop and Smithville to State Highway 130 near Mustang Ridge. Maha Creek enters Cedar Creek from the north near State Highway 21 and FM 535. These creeks currently have several wastewater treatment plant discharge permits with applications filed for even more direct discharge to the surface waters.

LCRA biologists conducted Aquatic Life Monitoring at Cedar Creek in 2024 at Station 16176 (Table 3). Only one monitoring event during the index period could be collected. TCEQ has not yet assessed the Cedar Creek ALM data. This creek is in ecoregion 33 and has an aquatic life use designation of High. Fish and habitat scores from the critical period both met the aquatic life use designation of High. Benthic macroinvertebrates scored Intermediate and did not meet the criterion. The Draft 2026 Integrated Report lists concerns for bacteria and dissolved oxygen in Cedar Creek, which are carried forward from previous assessments. LCRA will continue to monitor Station 16176 for conventional parameters, bacteria, field and flow six times a year in 2026.

Segment 1434D – Wilbarger Creek

The Wilbarger Creek watershed is approximately 116,000 acres in eastern Travis County and western Bastrop County. It has historically been dominated by rangeland and cultivated farmland but has seen significant development as the cities of Pflugerville, Elgin and Manor have grown in recent years. The majority of the upper watershed is in the Blackland Prairie ecoregion characterized by deep clay soils, with the lower portion flowing through the Post Oak Savannah known for its large stands of oaks intermixed with rolling grasslands. Travis County currently monitors Wilbarger Creek at two locations: Wilbarger at Bitting School (about 8 miles upstream of County Road 55), and Gregg Lane (about 6 miles upstream of Loop 212). There has been a significant expansion of wastewater discharge permit volume applications in Wilbarger Creek in the last several years.

Segment 1434J – Piney Creek

Piney Creek is a direct tributary to the Colorado River in the City of Bastrop. It flows through a region known as the Lost Pines known for its deep sandy soils and large stands of loblolly pines. LCRA biologists conducted Aquatic Life Monitoring for Piney Creek in 2021 (Table 3). This creek is in ecoregion 33 and has an aquatic life use designation of High. The fish and benthic IBI scores both averaged to an Intermediate score. The assessment of the data resulted in impairments for fish and benthic macrobenthic communities, thus placing them on the 303(d) List in the Draft 2026 Integrated Report (Table 4). However, the ALM habitat scored High meeting the aquatic life use designation for this creek.

Coastal Watershed

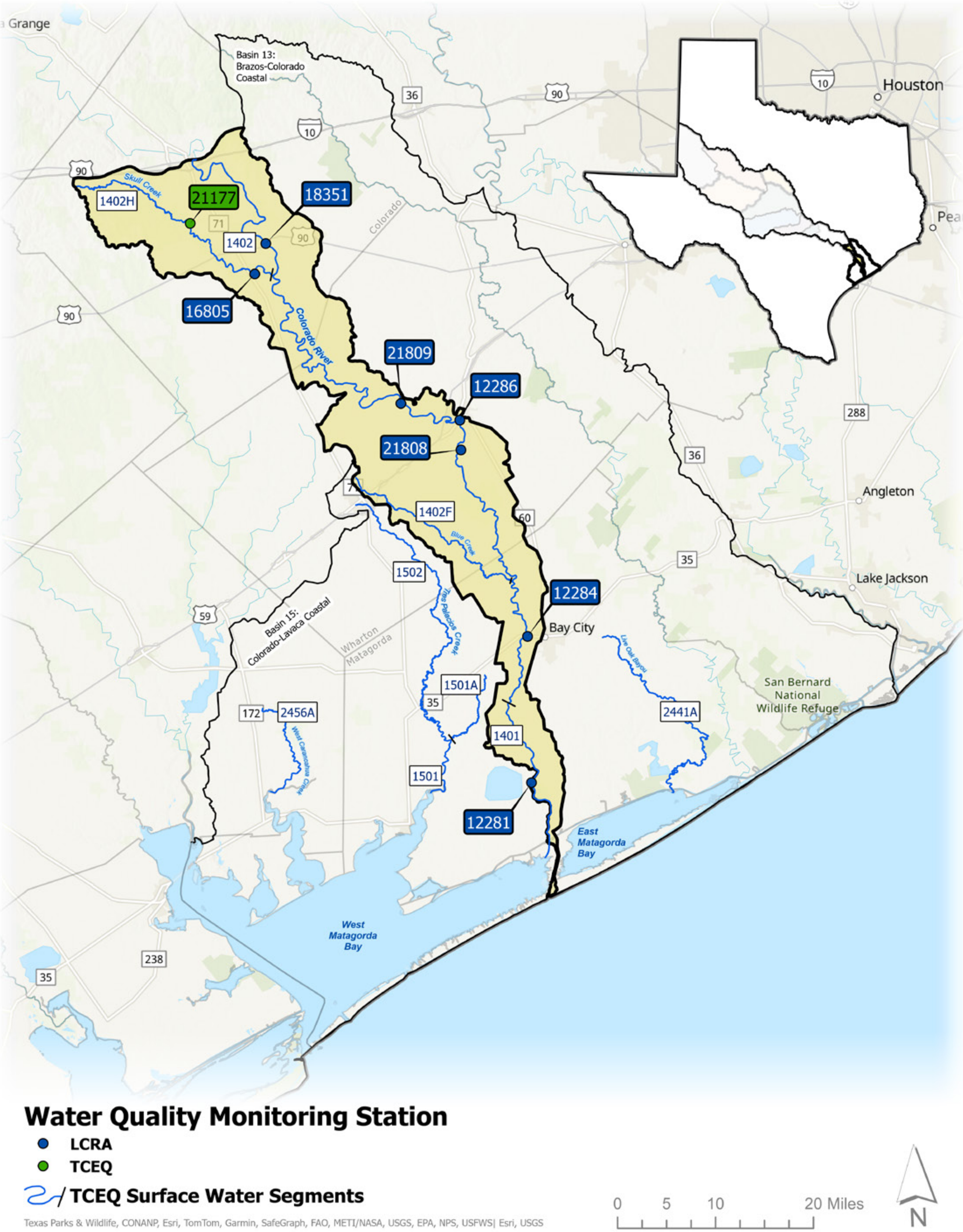


Figure 15. Coastal Watershed Map and Station Locations

The Coastal watershed of the Colorado River basin begins downstream of the City of Columbus. The Colorado River flows out of the rolling plains and oak savannahs into the Gulf Prairies and Marshes ecoregion. This part of the basin includes Colorado, Wharton and Matagorda counties, and the river flows through several towns including Garwood, Wharton and Bay City. The land is quite flat in this region of Texas, and waterways flow more slowly as they meander their way toward the marshes, estuaries and Matagorda Bay. Ranching and farming are the primary land uses and crops of rice, sorghum, soybeans, wheat, hay and cotton have been grown in the region. The mouth of the Colorado River is in West Matagorda Bay, where the freshwater inflows provide vital habitat for finfish, shrimp, crab, oysters and many migratory bird species.

Tres Palacios Creek (Segments 1501 and 1502), located just west of the Colorado River mainstem and a tributary to West Matagorda Bay, is monitored by the Texas Water Resources Institute as a part of the Tres Palacios Creek Watershed Protection Plan (available at https://twri.agrilife.org/wp-content/uploads/2024/04/tr-500.pdf). LCRA and TCEQ historically collected data on Tres Palacios Creek, and that data and site information is available at waterquality.lcra.org.

In 2025, LCRA and TCEQ routinely monitored 8 sites in the following segments:

- Segment 1401 – Tidally influenced portion of the Colorado River
- Segment 1402 – Colorado River below La Grange
- Segment 1402H – Skull Creek

IMPAIRMENTS FOR THE COLORADO COASTAL WATERSHED		
Segment ID	**Waterbody**	**Impairment**
1402H	Skull Creek	Dissolved oxygen

CONCERNS FOR THE COLORADO COASTAL WATERSHED		
Segment ID	**Waterbody**	**Concern**
1401	Colorado River Tidal	Nitrate
		Chlorophyll *a*
1402	Colorado River below La Grange	Nitrate
		Chlorophyll *a*
		Phosphorus

Segment 1402 – Colorado River below La Grange

Segment 1402 of the Colorado River begins in La Grange and ends 150 miles downstream near Bay City. The segment traverses two subwatersheds; the Lower Colorado River subwatershed and the Coastal subwatershed. The upper portion of the segment is discussed above in the Lower Colorado River watershed section. The lower portion of the river flows sluggishly over the flat landscape. Most of the land is used for agriculture. Sediment deposition and episodic floods created a floodplain rich with nutrients and earth materials. Gravel mining is a major industry in the region. Draft 2026 Integrated Report data from sites near Columbus, Wharton and La Grange indicate that the segment has concerns for nitrate, phosphorus and chlorophyll *a*.

Segment 1402H – Skull Creek

Skull Creek is located downstream of Columbus on the south side of the Colorado River. The watershed is approximately 112 square miles and the creek runs about 30 miles with its headwaters close to Weimar. Much of the riparian area in the upper watershed has been cleared and used for cattle grazing. Several gravel operations are located in the lower part of the watershed. The Draft 2026 Integrated Report listed the creek as having an impairment for depressed dissolved oxygen. This impairment is due to diel dissolved oxygen averages and minimums being below the state criteria levels. Skull Creek was first placed on the 303(d) List in 2008 for not supporting its designated aquatic life use at the monitoring site located near the confluence with the Colorado River. Potential causes of the impairment include decomposition of organic matter and sluggish flow regimes. In 2012, TCEQ completed an aquatic life monitoring study, which concluded the creek supported a diverse aquatic community despite chronic low dissolved oxygen levels. As a result of this study, TCEQ assigned new site-specific standards for dissolved oxygen in the creek.

In 2019, LCRA was alerted by local citizens that Skull Creek had turned black. The pollution was tied to the illegal discharge of oil and gas waste from a waste recycling facility on the banks of the creek near state Highway 71. The state took legal action against the company that owned the facility. LCRA conducted extensive monitoring and routine monitoring by TCEQ continues. Sediment data submitted to TCEQ as part of Clean Rivers Program continues to show all parameters are below the detection limit. There are no concerns for toxic substances in the sediment in the Draft 2026 Integrated Report.

LCRA biologists conducted Aquatic Life Monitoring for Skull Creek at Station 16805 in 2025 (Table 4). This creek is in ecoregion 34 and has an aquatic life use designation of High. Preliminary results indicate the fish score met the aquatic life use designation of High, but the benthic macroinvertebrate and habitat scores were Intermediate. TCEQ has not yet assessed the Skull Creek ALM data. Benthic macroinvertebrates are typically found in areas with high concentrations of dissolved oxygen like riffle complexes in creeks and rivers. Drought conditions were evident during both ALM events. Skull Creek, classified as perennial, was pooled throughout the reach, and there were no riffles available to sample. These factors and the dissolved oxygen impairment likely contributed to a poor macrobenthic community. The low water status of the creek and lack of riffles also impacted the overall habitat score.

Skull Creek

Segment 1401 – Colorado River Tidal

The tidal portion of the Colorado River begins downstream of Bay City and ends where it flows into Matagorda Bay. Monitoring data collected about 12 miles upstream of the Intracoastal Waterway indicate elevated levels of bacteria. TCEQ placed the segment on the 303(d) List in 2006. Prior to 2006, fecal coliform was the primary bacterial indicator in tidal water bodies. In 2006, TCEQ began to use *Enterococcus* to measure attainment of contact recreation in the surface water quality standards. The result was an increase in bacteria listings along the Texas Coast, including segments 1401 and 1501. In the 2014 Integrated Report, Segment 1401 was removed from the 303(d) List because data used in the assessment showed that the segment met the standard for contact recreation. The Draft 2026 Integrated Report lists no impairments for this segment, but there are concerns for nitrate and chlorophyll *a*.

Matagorda Bay

Matagorda Bay depends on freshwater from the Colorado River to help maintain a productive environment. LCRA is required by the state-approved Water Management Plan to ensure a certain amount of freshwater flows into the bay. Flow requirements are lower during drought, but critical flows must be maintained to provide a low salinity area near the mouth of the Colorado River for oysters and other important estuarine species.

Matagorda Bay

Segment 1501 – Tres Palacios Creek Tidal

Segment 1501 is the tidally influenced portion of Tres Palacios Creek. It begins below State Highway 35 and extends approximately 8 miles downstream to its confluence with Tres Palacios Bay where it then connects with the larger Matagorda Bay ecosystem. This segment is listed on the Draft 2026 Texas 303(d) List for depressed dissolved oxygen, with the impairment first identified in 1999 (Category 5b). Historical monitoring near the confluence with Tres Palacios Bay identified concerns related to dissolved oxygen conditions typical of low-gradient, tidally influenced coastal streams. Dissolved oxygen levels in this segment are likely influenced by a combination of tidal exchange, elevated water temperatures, high organic matter and sluggish flows, all of which can contribute to periodic low dissolved oxygen concentrations. The Texas Water Resources Institute managed activities for the Total Maximum Daily Load and associated Implementation Plan on behalf of TCEQ and developed the Watershed Protection Plan for the Tres Palacios Creek watershed, which was accepted by the U.S. Environmental Protection Agency in 2018. Since adoption of the 2018 Watershed Protection Plan, implementation activities in the Tres Palacios Creek watershed have included widespread adoption of agricultural conservation practices (over 430 practices on more than 62,000 acres), targeted feral hog removal (>10,600 animals), localized repair of failing septic systems near the tidal segment, municipal stormwater planning, pet waste management, wastewater infrastructure upgrades, and sustained education and outreach programming. These efforts demonstrate meaningful implementation progress, even as some measures, such as illicit dumping reduction and wastewater reuse, saw limited activity due to funding or institutional constraints. For more information visit https://trespalacios.twri.tamu.edu/resources/.

Segment 1502 – Tres Palacios Creek Above Tidal

Segment 1502 encompasses the freshwater, non-tidal portion of Tres Palacios Creek. The headwaters are located near El Campo, and the segment consists of a perennial freshwater stream with relatively steeper banks and a narrow riparian corridor as it flows through predominantly cultivated agricultural land. Segment 1502 meets all applicable Texas Surface Water Quality Standards and is not listed as impaired.

Tres Palacios Creek (photo by Michael Schram, Texas Water Resources Institiute)

VIII. PUBLIC PARTICIPATION

The Texas Clean Rivers Act was enacted in 1991 in response to growing concerns about water quality issues across the state. This legislation, which created the TCEQ Clean Rivers Program, established a way for citizens to participate in helping guide goals for effective watershed management strategies. Public participation via Clean Rivers Program steering committee meetings provide a venue for local stakeholders to learn about water in their region and provide input on waterway monitoring priorities and water quality improvement projects in their communities. LCRA, UCRA and TCEQ refer to these annual stakeholder meetings in the Colorado River basin as Water Quality Advisory Committee meetings. Members of the Water Quality Advisory Committees can include representatives from city and county government, industrial and agricultural interests, state agencies, environmental organizations, and the public. The meetings are open to the public and are held two to three times per year at different locations in the basin. Between 2021 and 2025, 12 Water Quality Advisory Committee meetings were held on a variety of water quality topics and issues.

Further information about the Water Quality Advisory Committee meetings, including presentations and minutes from past meetings can be found at:
https://www.lcra.org/water/quality/texas-clean-rivers-program/public-outreach/.

Attendees to the Nov. 13, 2024, Water Quality Advisory Committee meeting at McKinney Roughs Nature Park in Bastrop County.

VIV. APPENDIX A

TX HB1688 | 88th Legislature | Reporting

In the 88th Texas Legislative session, House Bill 1688 amended Section 26.551 of the Texas Water Code by adding a provision to designate the South Llano River in Kimble County as the "Coke Stevenson Scenic Riverway". This designation now occurs alongside the John Graves Scenic Riverway in the Brazos River basin. The bill states that LCRA, TCEQ and TPWD will work together to visually inspect the riverway from both the surface and from aircraft and test water samples from this section of the South Llano River at least once in a winter month and at least once in a summer month. The subchapter directing these activities expires Sept. 1, 2027.

Implementation of this legislation by LCRA, TCEQ and TPWD was established as follows in the 2024 LCRA Coordinated Monitoring Meeting:

- "aircraft" inspections: TPWD will be conducting flyovers twice per year and is overseeing the scheduling of these events.
- "surface" inspections: staff from all three agencies are coordinating bi-annual kayak trips down this stretch of river to visually survey.
- Testing of water samples: Under the Clean Rivers Program, LCRA conducts testing in the designated Coke Stevenson Scenic Riverway at the following locations. This data are displayed at https://waterquality.lcra.org/.
    - o TCEQ Station 18197 – South Llano River in Kimble County approximately 10 miles upstream of South Llano River State Park 204 yards upstream of second US 377 crossing. Data has been collected at this site since 2002. Currently, LCRA is sampling four times per year at this location.
    - o TCEQ Station 22494 – Cedar Creek at W. Ranch Rd 2169 in Junction. Monitoring at this site began in fiscal year 2025 with a frequency of four times per year for core water quality data, bacteria and flow.
- Reporting on activities related to HB 1688 will take place in the annual Clean Rivers Program Basin Highlights Reports drafted and published by LCRA.

Surface Inspection Report from March 6, 2025

Environmental scientists from LCRA, TCEQ and TPWD surveyed the South Llano River in Kimble County on March 6, 2025, to document any unpermitted activities as well as continue documentation of the biological diversity of this reach. Surveyors paddled the river in kayaks starting on Paint Creek Ranch near the Kimble County line to the State Loop 481 bridge in Junction. There were no new observations of intake/discharge pipes or construction below the ordinary high-water mark for this survey event. All previous instances of these activities appeared to be related to recreational access and domestic and livestock water rights withdrawals.

Surface Inspection Report from July 25, 2025

LCRA, TCEQ and TPWD again collaborated to conduct the summer monitoring on the South Llano River on July 25, 2025. No unpermitted activities were observed.

Aircraft Inspection Report from February 13, 2025

Environmental scientists from TCEQ and TPWD surveyed the South Llano River in Kimble County via helicopter on Feb. 13, 2025, to document any unpermitted activities via air inspection. No additional sites of potential concern or violations were identified in this survey.