



Lower Neches Basin and Neches-Trinity Coastal Basin Highlights Report

Clean Rivers Program Update
2022

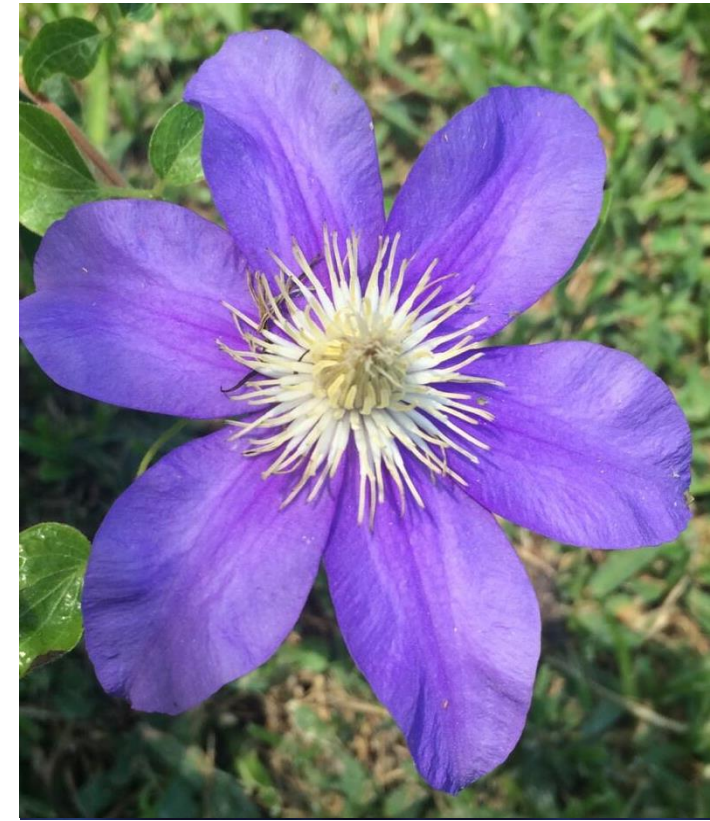
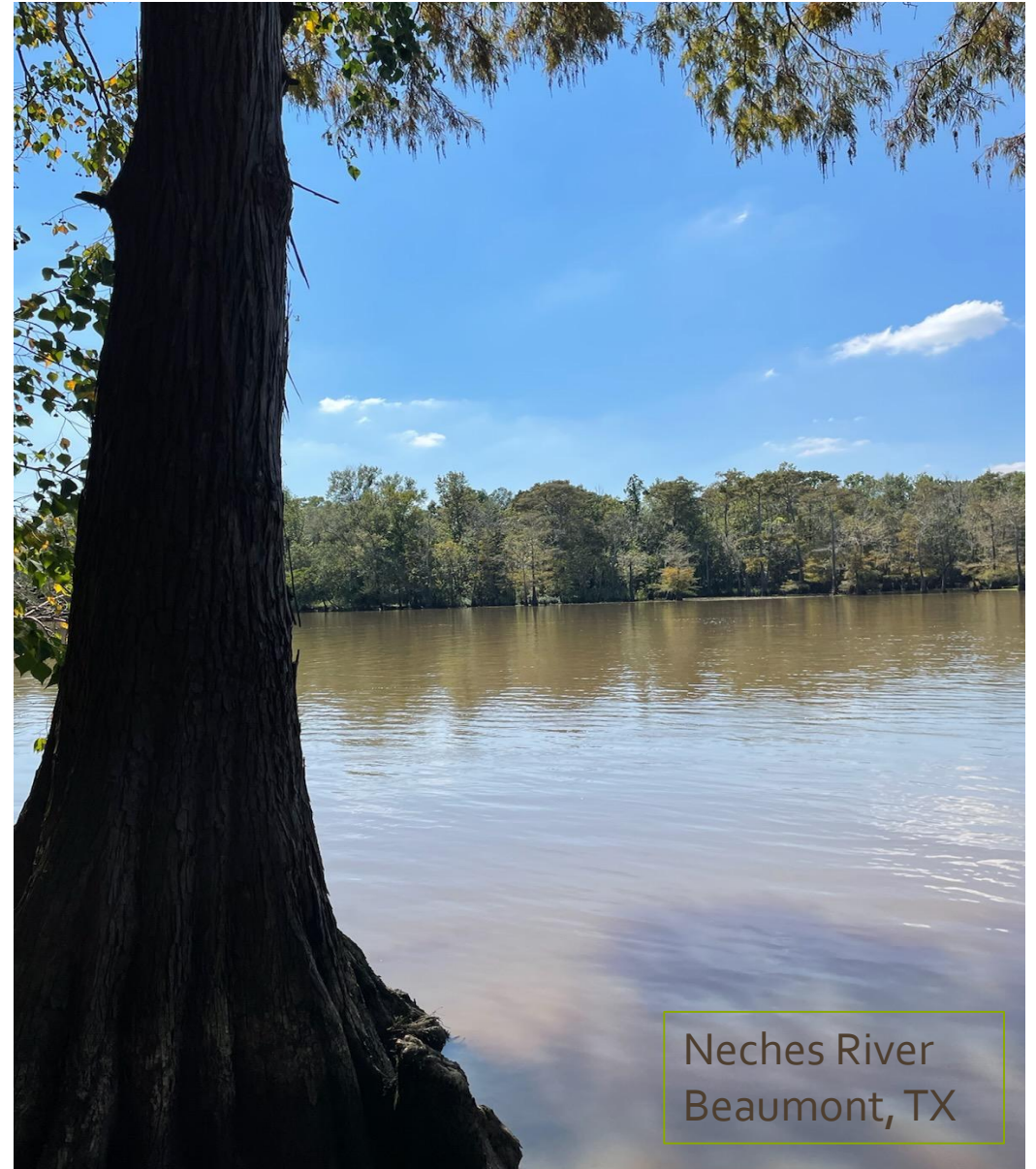


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Neches River
Beaumont, TX

Introduction

Texas Clean Rivers Program

The Texas Legislature passed the Texas Clean Waters Act, in 1991, to ensure rivers and streams across the state are protected and sustainably utilized, without jeopardizing the integrity of the resource. As a result, the Texas Clean Rivers Program (CRP) was born. This program, in coordination with the Texas Commission on Environmental Quality (TCEQ) and regional water authorities across the state, is tasked with water quality monitoring, basin health assessments, and to engage stakeholders on how to improve the quality of surface water within each river basin of Texas. Currently, fifteen (15) regional water authorities, which are made up of twelve (12) river authorities, one (1) water district, one (1) council of governments, and one (1) international water commission, possess contracts with the TCEQ to conduct water quality monitoring, assessments, and stakeholder outreach in the 23 major river and coastal basins of Texas. The Lower Neches Valley Authority (LNVA) monitors and assesses surface water quality in the lower Neches Basin.

2022 Basin Highlights Report

This report is an update on the Clean River Program in the Lower Neches and Neches-Trinity Coastal Basins in 2021. Report sections include highlights of the events and activities that took place in 2021. A section on public involvement with water quality including education and outreach activities that occurred within the year. The last major section is a summarization of the water quality monitoring and special projects taking place within the basins.

Clean Rivers Goals and Objectives

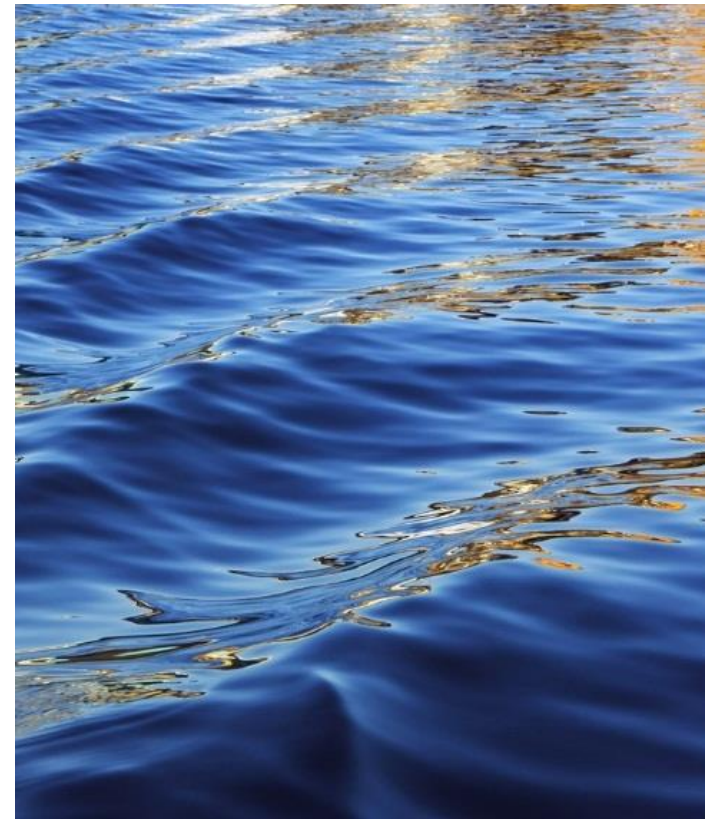
The goal of the Clean Rivers Program is to maintain and improve the quality of surface water within each river basin in Texas through an ongoing partnership involving the Texas Commission on Environmental Quality, river authorities, other state agencies, regional entities, local governments, industry, and citizens. The program's watershed approach will identify and evaluate water quality issues, establish priorities for corrective action, work to implement those actions and adapt to changing priorities. There are six program objectives for the Clean Rivers Program. These objectives are:

- ❖ Provide quality-assured data to the TCEQ for use in decision making
- ❖ Identify and evaluate water quality issues
- ❖ Promote cooperative watershed planning
- ❖ Recommend management strategies
- ❖ Inform and engage stakeholders
- ❖ Maintain efficient use of public funds





2021 Highlights



Basin Summary Report

In order to accomplish the program goal and objectives, the Clean Rivers Program is divided into six different tasks. These tasks are as follows:

- [Task 1 - Project Administration](#)
- [Task 2 - Quality Assurance](#)
- [Task 3 - Water Quality Monitoring](#)
- [Task 4 - Data Management](#)
- [Task 5 - Data Analysis and Reporting](#)
- [Task 6 - Stakeholder Participation and Public Outreach](#)
- [Task 7 - Special Projects](#)

The basin summary report is a requirement of Task 5 Data Analysis and Reporting. The purpose of the basin summary report, is to provide a comprehensive review of water quality data and involves a detailed discussion of data analysis findings. This report serves to develop a greater understanding of basin water quality conditions, identify trends and changes, and aid in making decisions regarding water quality issues in each river and coastal basin in Texas.

In the 2021 report, the water quality in the Lower Neches and Neches-Trinity Coastal Basin segments do not meet all state water quality standards and assessment criteria. All of the segments have listed impairments and/or concerns. Some of these impairments and concerns can be attributed to natural conditions within the basin. The specific causes of those that aren't natural will require further study. Significant progress has been made to address some of these issues. Additional monitoring efforts to target specific impairments, as well as more coordination with agencies like the Texas Department of State Health Services and the Texas Commission on Environmental Quality will be required.

Please visit the LNVA website at <https://lnva.dst.tx.us> to view the 2021 Basin Summary Report of the Lower Neches and Neches Trinity Coastal Basins in its entirety.

Mussel Studies in the LNVA Canal System

The LNVA canal harbors 24 of the 32 freshwater mussel species present in the Neches Basin, including two state threatened species. One of which, the Louisiana Pigtoe Mussel (LPM) is under review by the United States Fish and Wildlife Service to determine if Federal protection is warranted.

In 2021, after LPM were observed at other locations within the canal system, a survey was conducted by Bio-West Inc. to enhance distribution and abundance data for freshwater mussels within the LNVA canal. In total, 11,200 mussels were collected from 24 sites. Louisiana Pigtoe were located at 14 of the 24 sites and ranked 2nd in overall abundance among the 21 mussel species found during this effort. Bio-West Inc. collected 1984 LPMs and LNVA staff collected an additional 118 which were confirmed by biologists. This brings the total number of LPM observed in the LNVA Canal System to 2,102 individuals. This represents the largest known population of LPM documented to date, and more than doubles the number of contemporary observations of the species throughout its range since 2000.

In summary, the results from this study show high abundances, successful spawning, and recent recruitment of LPM, suggesting that a healthy population currently persists within certain areas of the LNVA Canal System. Although habitat data was not analyzed as part of this survey, observations suggest that areas of the canal system which experience a rather constant year-round flow and have firm substrates exhibited the highest abundance of LPM. Such areas are often found below dam structures in the industrial/municipal portions of the canal system. In contrast, the species was not detected in agricultural supply canals with greater flow variability, seasonal usage, and softer substrates.



1,790 Observations Reported from All Known Populations since 2000
2,102 Discovered by LNVA and Environmental Consultant Bio-West Found During April Canal Surveys



Louisiana Pigtoes are Only Found in Canals Maintaining Constant Flow Due to Sustainable Demand

Completion of Aquatic Life Monitoring on Beech and Cypress Creeks

Cypress 15352	Critical		Index		Critical		Index		2019 - 2021	
	8/19/2019	ALU	6/5/2020	ALU	7/24/2020	ALU	4/12/2021	ALU	Average	ALU
Habitat*	17.5	I	21.5	H	18.5	I	18.5	I	19.0	I
Benthic*	31	H	29	H	30	H	28	I	29.5	H
Fish	42	H	41	I	49	H	43	H	43.8	H

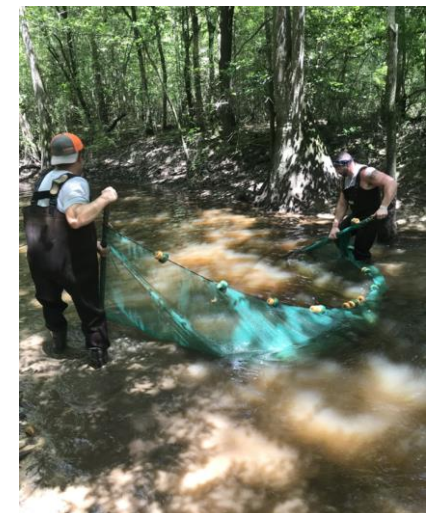
Aquatic Life Monitoring (ALM) was conducted from 2019-2021 at Beech and Cypress Creeks by Water Monitoring Solutions, Inc., assisted by LNVA CRP staff. This data will be used to determine when TCEQ will perform a Use Attainability Analysis (UAA) Study. Data from a UAA can result in changes to screening levels that more accurately reflect the natural stream conditions.

Beech 10529	Critical		Index		Critical		Index		2019 - 2021	
	8/19/2019	ALU	6/5/2020	ALU	7/23/2020	ALU	4/12/2021	ALU	Average	ALU
Habitat*	19.5	H	20.5	H	20.5	H	21	H	20.4	H
Benthic*	28	I	30	H	26	I	30	H	28.5	I/H
Fish	43	H	45	H	43	H	43	H	43.5	H

ALM events are conducted during the Index period, March through October, with at least one-half to two-thirds of the samples in the critical period. The critical period is when aquatic life are most stressed with higher temperatures and lower flow. Water chemistry, streamflow, nekton (fish), macrobenthics, and habitat are assessed. Results show between intermediate and high aquatic life use on Cypress and Beech Creek. The pictures below show the ALM biological data gathering in progress.

ALU	Habitat*	Benthic*	Fish
Exceptional	26-31	>36	>52
High	20-25	29-36	42-51
Intermediate	14-19	22-28	36-41
Limited	<13	<22	<36

* State-wide Metrics



24 Hour DO Monitoring

Along with routine monitoring, LNVA conducted 24 hour dissolved oxygen (DO) monitoring on four different sites where special monitoring had been assigned. These four sites consisted of Pine Island Bayou at SH 105 (Site ID 15367), Boggy Creek at FM 421 (Site ID 16127), Mill Creek at FM 418 (Site ID 16126), and Little Pine Island Bayou at SH 326 (Site ID 15346). Sites chosen for 24 hour DO monitoring are often water bodies on the 303(d) list and that have a concern for low DO that could impact it's aquatic-life use classification.

Conducting 24 hour DO monitoring consists of leaving a calibrated sonde out at the site for at least 24 hours. During this time the sonde collects measurements at least once every hour. The resulting data is used to calculate an average dissolved oxygen value. Values from these monitoring events help to determine if a stream body is in compliance with Aquatic Life Use Standards set by the Texas Surface Water Quality Standards and helps to reassess the DO impairment on the water body.



Station 15346
Little Pine Island Bayou at SH 326



Station 16127
Boggy Creek

2021 Neches River Study

For over 50 years independent academic and scientific institutions have conducted periodic monitoring studies of the lower Neches river.

During October 2021, the Patrick Center for Environmental Research of the Academy of Natural Sciences completed the seventh in a series of biological and water quality surveys. Previous studies were performed in 1953, 1956, 1960, 1973 and 1996, and 2003. The study was designed to assess the general "health" of the river by taking water quality measurements, sampling attached algae, macroinvertebrate, and fish communities. Many levels of the aquatic food web are studied because no single group can reliably indicate the condition of an ecosystem. LNVA CRP staff assisted with the water chemistry sample collections for this event. One new addition to last years study was the inclusion of a station above the LNVA saltwater barrier. The LNVA saltwater barrier was put into operation in October of 2003.

The results from the data collected will be compiled in a report to assess the overall health of the Neches River compared to the results of previous studies.



Seining during the 2021 Neches River study



Public Participation and Outreach

Public Participation and Educational Outreach

Steering Committee

Maintaining and improving the quality of water in each of the 23 river basins throughout Texas through partnerships with TCEQ, local governments, industry, regional governments, and river authorities like LNVA is the primary goal of the Clean Rivers Program. Promoting cooperative watershed planning requires input from informed and engaged stakeholders. Stakeholders in LNVA's program range from concerned citizens, representatives of local industry and municipalities, state and federal agencies, tribal groups and environmental groups, to the general public. These stakeholders make up LNVA's CRP Steering Committee.

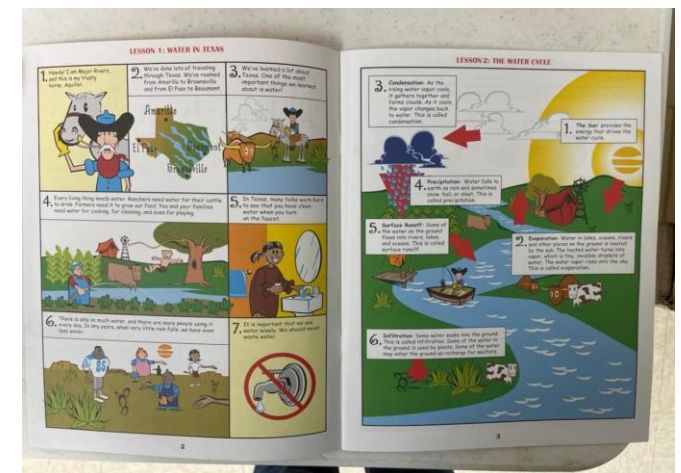
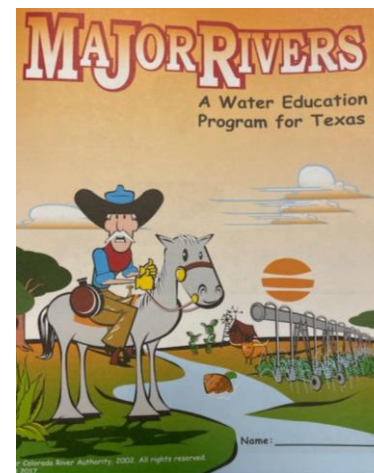
LNVA's CRP Steering Committee meets annually to discuss water quality issues within the basin. At these meetings, members are able to voice their local or regional concerns and work together to create realistic water quality objectives and basin priorities. Through these meetings, monitoring priorities are established, and the need or want for special studies are discussed. Having a diverse basin-wide committee helps open the platform for different interests, concerns, and priorities of each watershed to be represented. LNVA's annual meetings are open to the public and are posted on the website at <https://lnva.dst.tx.us/>.

Major Rivers

Each year, LNVA sponsors Major Rivers and distributes it's content to local elementary schools. Major Rivers is an educational program developed by the Texas Water Development Board to educate students in the 4th and 5th grade of Texas' major water resources. Major Rivers acts as a great tool to teach students about all the waterways of Texas and how important it is to care for this vital resource.

During the COVID pandemic, the Texas Water Development Board made Major Rivers information available on their website for teachers and students to continue water resource education virtually. The materials are available for viewing and printing at

www.twdb.texas.gov/conservation/education/kids/MajorRivers/index.asp



Neches River Festival River Day

In addition to school outreach programs, the LNVA engages the younger generation by attending various public events. At these events, the LNVA provides visual aids and handouts educating the public on what the Clean Rivers Program is and why water quality is important. One event the LNVA participates in annually is the Neches River Festival River Day (NRF), which focuses on the area's high school seniors.

The NRF celebrates the Southeast Texas area and its greatest natural resource, the Neches River. The actual festival takes place over a week but the River Day is the day dedicated to science. The event also highlights local organizations and how they are working to improve the environment in and around the Neches River. The one-day focus allows the LNVA to set up its educational booth and have staff ready to answer any questions graduating seniors may have.

This past River Day, LNVA staff allowed the students to participate in testing Neches River water for parameters such as pH and dissolved oxygen. The seniors enjoyed having a hands on experience and learning what these water quality parameters can tell us about the health of our rivers.



Texas Speaker of the House, Dade Phelan, addressing students during the Neches River Day event.



Ivory Bill tour boat on the Neches River



LNVA CRP staff at their demonstration booth.



LNVA General Manager, Scott Hall, addressing students during the Neches River Day event.

Texas Stream Team

Since 2009, the LNVA has been involved in the Texas Stream Team program. Operating out of Texas State University in San Marcos, Stream Team is a statewide volunteer network that began in 1991. Volunteers monitor program approved water bodies on a monthly basis. After being trained, citizens are able to test for parameters such as dissolved oxygen, pH, water temperature, and conductivity. The LNVA provides volunteers within their basin with the water quality test kits, supplies, and refill agents needed for Stream Team monitoring activities. LNVA staff are currently in the process of becoming Stream Team trainers for area citizens to become part of the program in addition to providing supplies.

LNVA held a Stream Team training in June of 2021 at the Saltwater Barrier in partnership with Angelina Neches River Authority. Ten new stream team members were trained and are now certified to monitor water quality. A current list of the sites being monitored by the LNVA Texas Stream Team are listed in the table.

LNVA will continue to hold annual Texas Stream Team trainings. Upcoming training dates are posted to the LNVA website at <https://lnva.dst.tx.us>

Current LNVA Stream Team Sites

Site ID	Site Description
80979	Village Creek at US Hwy 69
15489	Keith Lake Comal at Hwy 87
10668	Taylor Bayou at SH 73
80550	Neches River at the Saltwater Barrier
80681	Village Creek at Hwy 327
10578	Neches River at Collier's Ferry Boat Dock
80549	Acid Ditch at Atlantic Road



Stream Team field training event



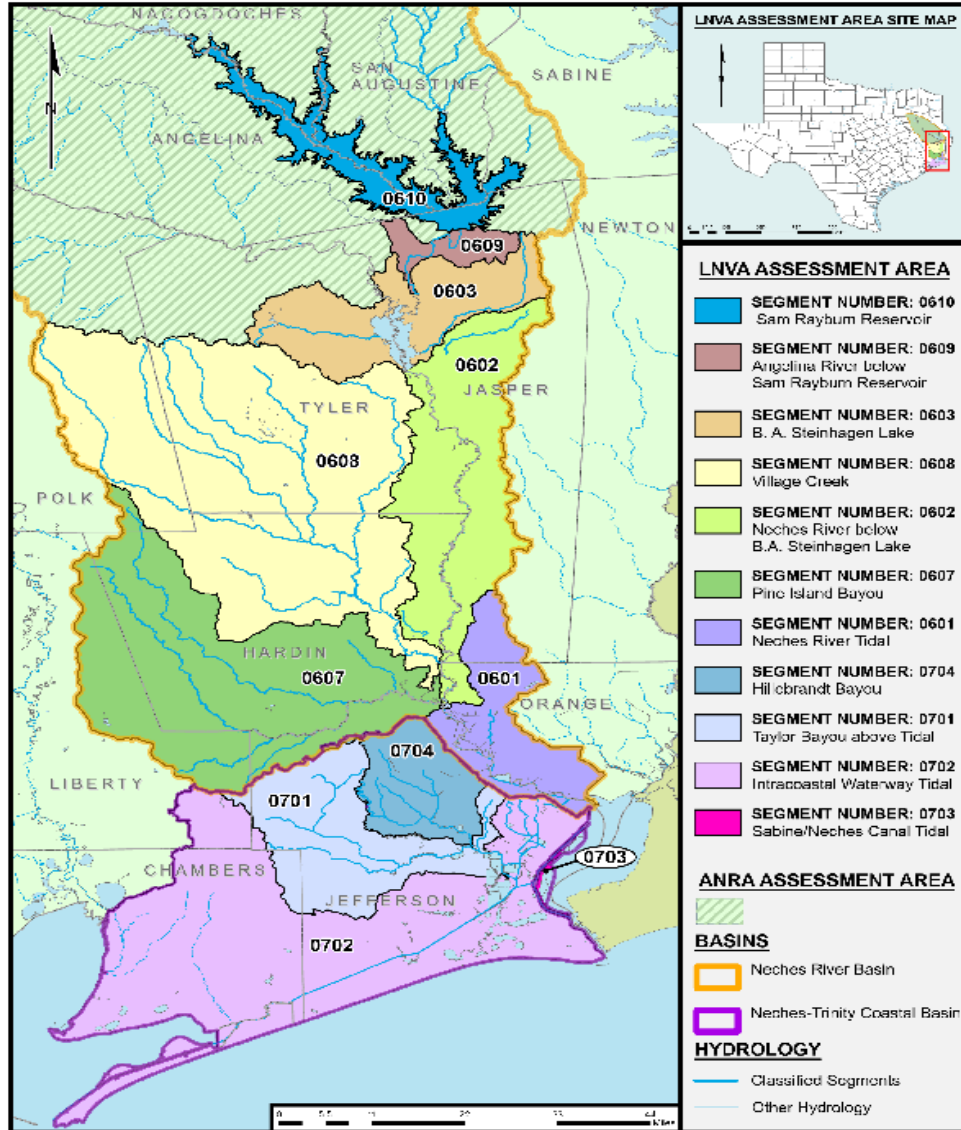
Classroom training at the LNVA Saltwater Barrier



LNVA Water Quality Monitoring



LNVA CRP Monitoring Program



The Texas Integrated Report works to describe the status of Texas' natural waters based on historical data, and how these waters stand in accordance with the *Texas Surface Water Quality Standards (TSWQS)*.

The 2020 assessment period of record for the last seven years is from December 1, 2011 through November 30, 2018. If the minimum sample number is not met, the most recent samples collected in the preceding three years (December 1, 2008 through November 30, 2011) can be included to meet the sample requirements. At least 10 samples (20 for bacteria) over the seven-year period of record are required for assessment of use attainment (listing and delisting).

The Texas Integrated Report satisfies the requirements of the federal Clean Water Act Sections 305(b) and 303(d). The TCEQ produces a new report every two years in even-numbered years, as required by law. The 303(d) List must be approved by the EPA before finalization. The 2020 Texas Integrated Report is used as a reference tool for this report to show impairments and concerns existing in each segment of the lower Neches and Neches-Trinity Coastal Basins. Each segment is assigned a water quality use category by the TCEQ, which indicates the status of water quality in the segment. Categories 4 and 5 are further subdivided to communicate the plans TCEQ has for addressing a particular water quality impairment.

Lower Neches Valley Authority monitors 23 sites within the lower Neches basin and the TCEQ monitors 19 sites in the Neches-Trinity Coastal Basin and the lower Neches Basin. The segment summary section of this report includes a map of sample sites, the segment ID listed in the TSWQS and any impairments listed on the Integrated, possible causes of the impairments, actions taken already, and future actions recommended. The parameters collected by LNVA's water quality monitoring program are listed and defined on the following page.

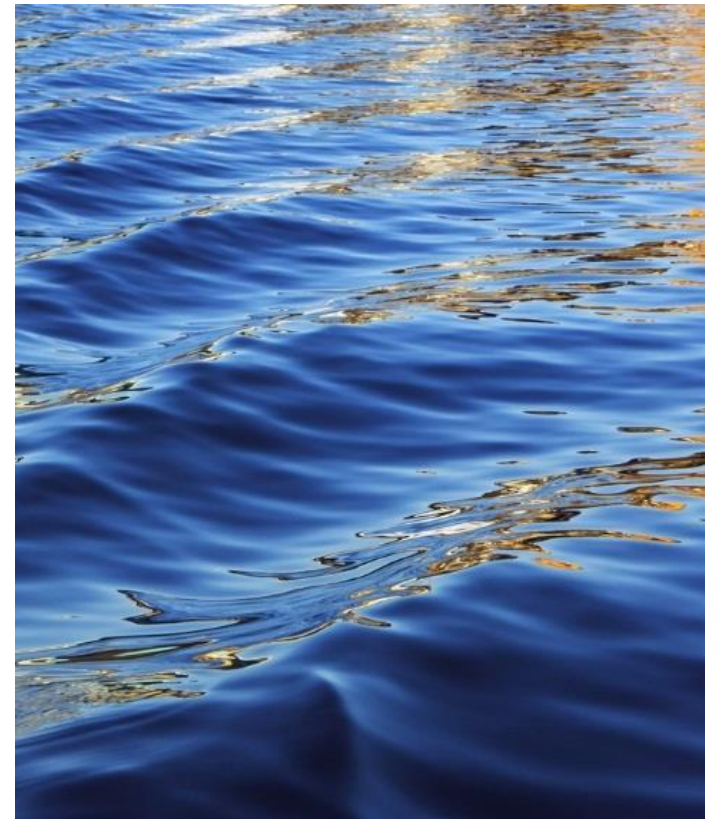
Water Quality Parameters

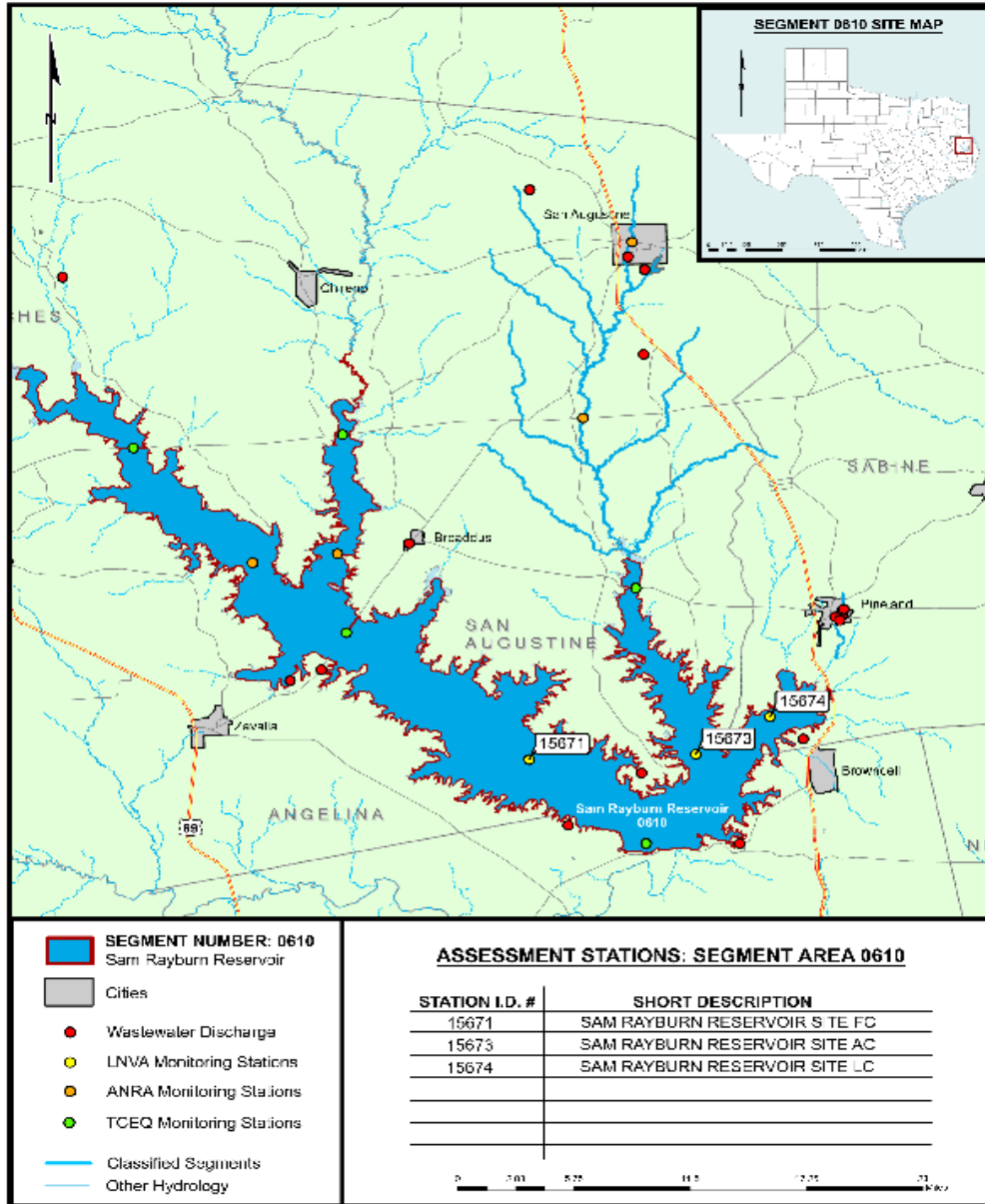
The following water quality parameters are collected by LNVA routine monitoring on a quarterly basis:

- **Bacteria** –Monitoring of bacteria consists of *E.coli* in freshwater environments and *Enterococcus* in saltwater marine environments. These bacteria are used as indicators of the presence of fecal material in waters.
- **Chloride**- Nearly all-natural waterways contain the element chloride. The chloride ion is found most commonly as a component of salt (sodium chloride) and is a major component of dissolved solids. Chloride naturally enters water when rocks and sediments dissolve through weathering.
- **Conductivity**-Conductivity is the ability of water to conduct electrical current. This current relies heavily on the amount of inorganic dissolved solids such as chloride, sulfate, and sodium in the stream. Elevated levels of conductivity indicate higher amounts of dissolved salts which can impact drinking water and/or aquatic habitat.
- **Dissolved Oxygen**-Dissolved oxygen is the amount of oxygen dissolved in water available to aquatic life. The amount of oxygen available for aquatic organisms tells a lot about the health of a stream and the quality of the water.
- **Hardness**-The hardness of the water describes the amount of dissolved minerals present in water, specifically calcium and magnesium.
- **Nutrients**-Nitrate, nitrite, and ammonia, which are compounds of nitrogen, and total phosphorus are nutrients routinely monitored. These nutrients are essential for plant and animal growth, but can also be harmful in higher amounts. All animals produce nitrogenous waste; however, ammonia is the primary waste product in aquatic animals. Some algae and bacteria use ammonia for growth and reproduction through a process called nitrification, which is the breakdown of ammonia into nitrite and conversion into nitrate.
- **pH**- pH stands for potential hydrogen and specifies the acidity or basicity of the water. It is on a scale of 0 (acidic) to 14 (basic).
- **Stream Flow**-Stream flow refers to the amount of water flowing in a river, which is measured in cubic feet per second (cfs). Flow is an important parameter because it greatly affects the water quality.
- **Temperature**-Temperature is an important parameter to monitor because of its influence on biological activity and growth, as well as its effect on the water chemistry. The temperature of the water determines what organisms can survive and affects the dissolved oxygen, as colder water contains more oxygen than warmer water.
- **Sulfates**-Sulfates are a combination of sulfur and oxygen and are found naturally in most waters as minerals in sediment and rock. Industrial discharges, sewage treatment plant discharges, and runoff from fertilizers used on agricultural land are unnatural sources of sulfates.
- **Total Suspended Solids**-Total suspended solids is the measure of solid particles found suspended in the water column that can be trapped by a filter.
- **Total Dissolved Solids** -Total dissolved solids in water, which mainly consist of carbonates, bicarbonates, chlorides, and sulfates, are sometimes referred to as total salinity.
- **Turbidity**-Turbidity refers to the cloudiness of the water and its transparency due to the presence of suspended solids.



Segment Summaries

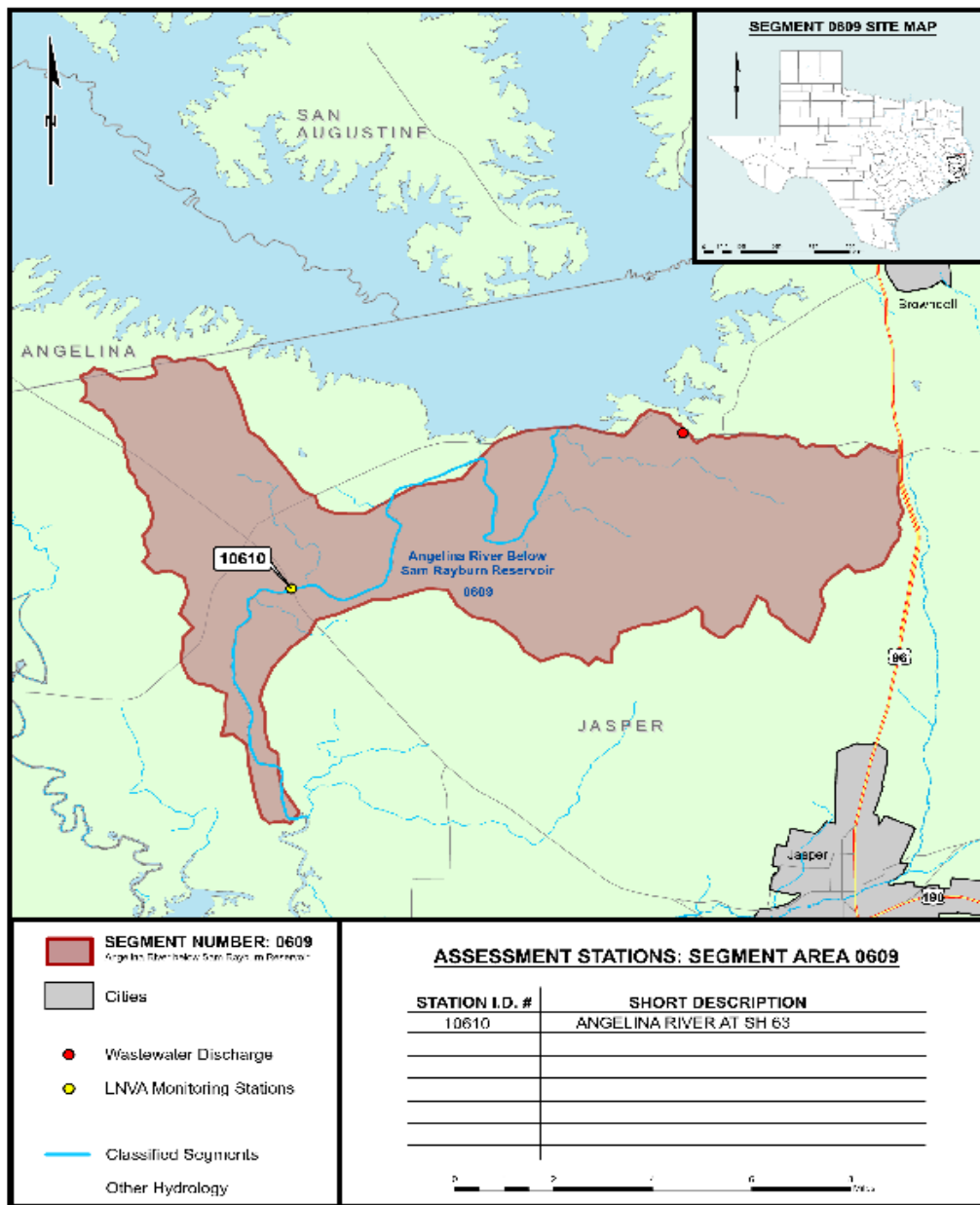




Segment ID: 0610 Sam Rayburn Reservoir From Sam Rayburn Dam to a point 5.6 km (3.5 mi) upstream of Marion's Ferry on the Angelina River Arm and to a point 3.9 km (2.4 mi) downstream of Curry Creek on the Attoyac Bayou Arm, up to the normal pool elevation of 164.4 feet (except on the Angelina River)

Basin Characteristics: Approximately 167 square miles of recreational areas that include hiking trails, camp grounds, fishing, boating ramps, marinas, and swimming areas. The reservoir itself is designed for flood regulation and hydroelectric power generation, and water supply.

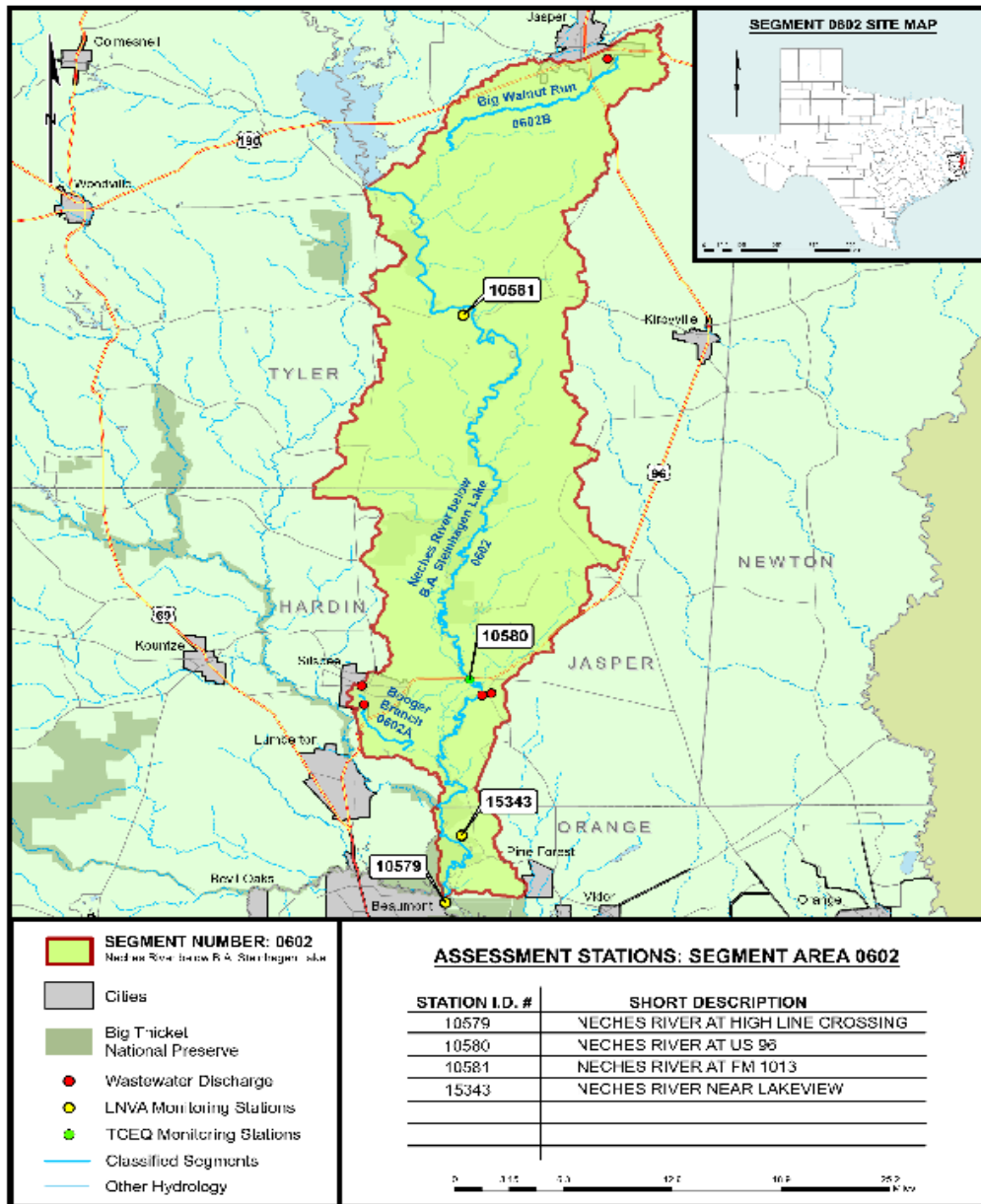
Segment #	Segment Name	Impairments and Concerns Listed in 2020 Texas Integrated Report	Reason for Impairment	Actions Taken	Future Action Recommended
0610	Lake Sam Rayburn Reservoir	Not supporting fish consumption due to mercury	Source unknown; Atmospheric deposition for mercury	Advisory issued Department of State Health Services	Updated fish tissue sampling by Department of State Health Services
		Screening level concern for iron and manganese	Sources unknown	Routine collection of metals in sediment by TCEQ	TCEQ continue routine collection
0610A	Ayish Bayou	Not supporting contact recreation for E.coli	Non-point source and unknown sources	Routine Monitoring Angelina Neches River Authority	Continued monitoring by Angelina Neches River Authority
0610P	Bayou Carrizo @ SH	Not supporting contact recreation for E.coli	Non-point source and unknown sources	Routine Monitoring Angelina Neches River Authority	Continued monitoring by Angelina Neches River Authority



Segment ID: o609 Angelina River Below Sam Rayburn Reservoir From a point immediately upstream of the confluence of Indian Creek in Jasper County to Sam Rayburn Dam in Jasper County

Basin Characteristics: Approximately 107 square miles of heavily forested and sparsely populated land with minimal non-irrigated cropland in the southeast quadrant. Land cover is forested and includes bald cypress, pine and hardwood trees. Wildlife common to this area includes deer, squirrels, quail, dove, and ducks.

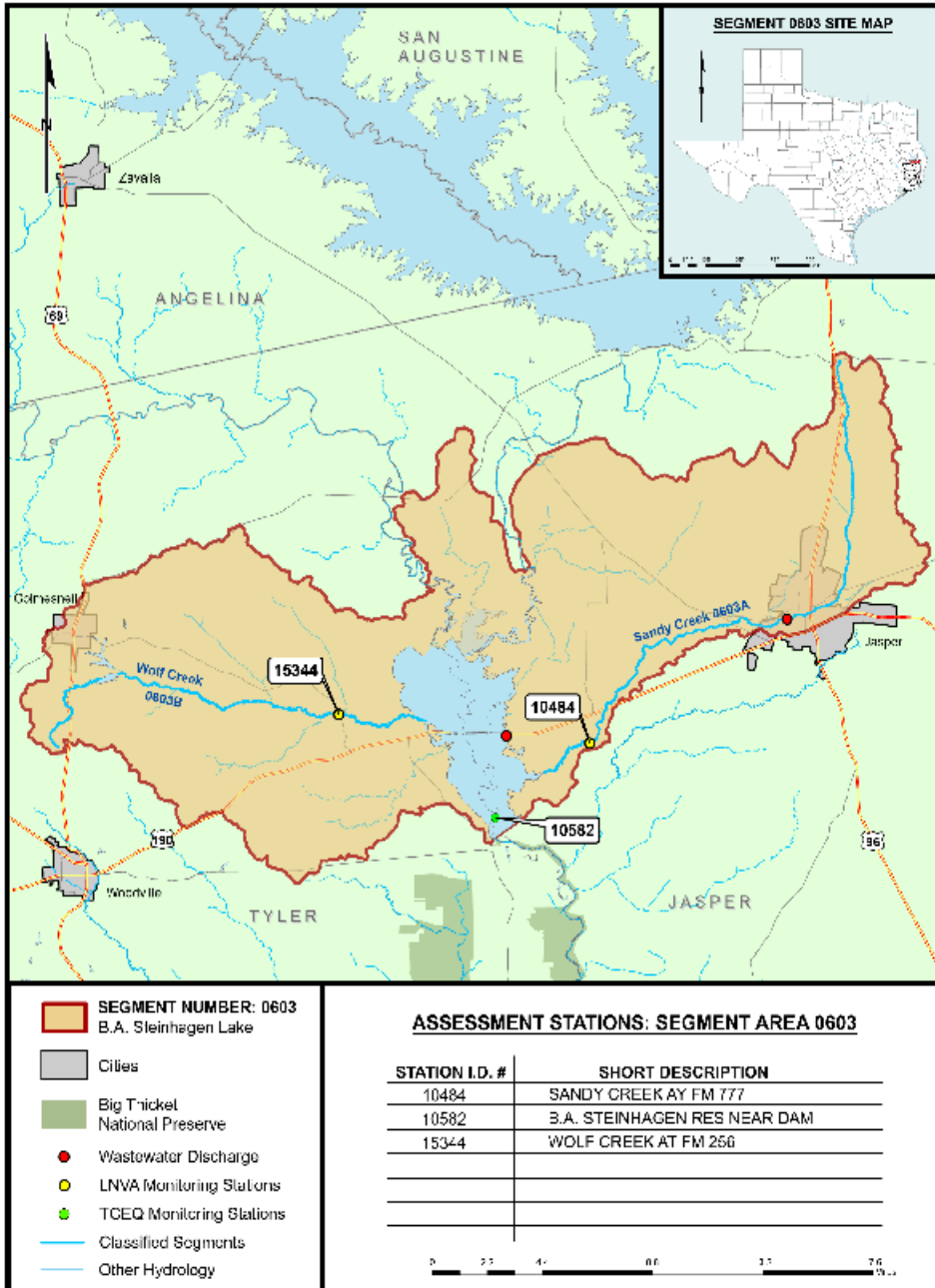
Segment #	Segment Name	Impairments and Concerns Listed in 2020 Texas Integrated Report	Reason for Impairment	Actions Taken	Future Action Recommended
o609	Angelina River below Sam Rayburn Reservoir	Not supporting fish consumption for mercury and dioxin	Atmospheric Deposition-Toxics; Source unknown	Advisory issued Department of State Health Services (January 24, 2014)	Updated fish tissue sampling by Department of State Health Services



Segment ID: o602 Neches River Below B. A. Steinhagen Lake From the Neches River Saltwater Barrier, which is at a point 0.8 km (0.5 mi) downstream of the confluence of Pine Island Bayou, in Orange County to Town Bluff Dam in Jasper/Tyler County

Basin Characteristics: Situated in a broad flood plain, Segment 0602 is 84 miles long and major tributaries include Village Creek and Pine Island Bayou. Stream flow is regulated by Town Bluff Dam and at Lake B.A. Steinhagen and varies depending on releases from Sam Rayburn Reservoir and upstream Neches River flows. Land use is livestock grazing, hunting, timber production, improved pasture, recreation, wildlife, and oil and gas production, and both state and federal land. Land cover is mixed, evergreen, and deciduous forest, pine plantations, and forested wetlands.

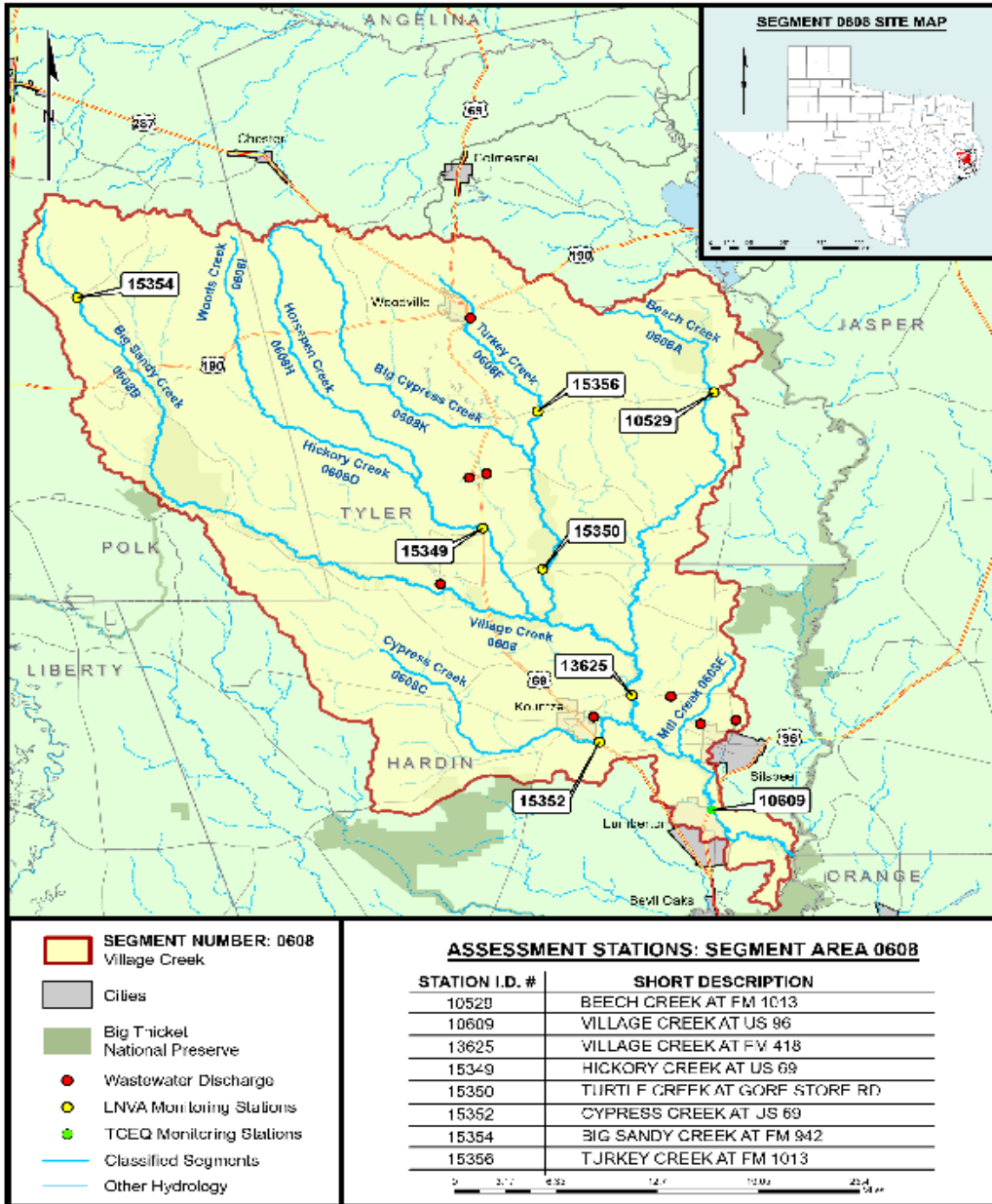
Segment #	Segment Name	Impairments and Concerns Listed in 2020 Texas Integrated Report	Reason for Impairment	Actions Taken	Future Action Recommended
o602	Neches River below B.A. Steinhagen	Not supporting fish consumption use due to mercury and dioxins in edible tissue	Atmospheric Deposition-Toxics; Industrial point source discharge; Source unknown	Advisory issued Department of State Health Services (January 24, 2014)	Updated fish tissue sampling by Department of State Health Services
		Concern for mercury in edible tissue	Source unknown	TCEQ sampled fish tissue for toxics	Update fish tissue sampling by Department of State Health Services; TCEQ continue monitoring



Segment ID: o603 B. A. Steinhagen Lake From Town Bluff Dam to a point immediately upstream of the confluence of Hopson Mill Creek on the Neches River Arm and to a point immediately upstream of the confluence of Indian Creek on the Angelina River Arm, up to the normal pool elevation of 83 feet

Basin Characteristics: The reservoir itself is about 20 square miles and is located in the piney woods. It assists the Sam Rayburn Reservoir in flow regulation, electricity generation, and water supply. Sandy And Wolf Creeks in addition to the Angelina River are the main tributaries to the reservoir. With its acidic and sandy soils, land cover is mostly pine and hardwood forests. Land use is primarily timber production, public land use, pasture and livestock production, recreation, and wildlife habitat.

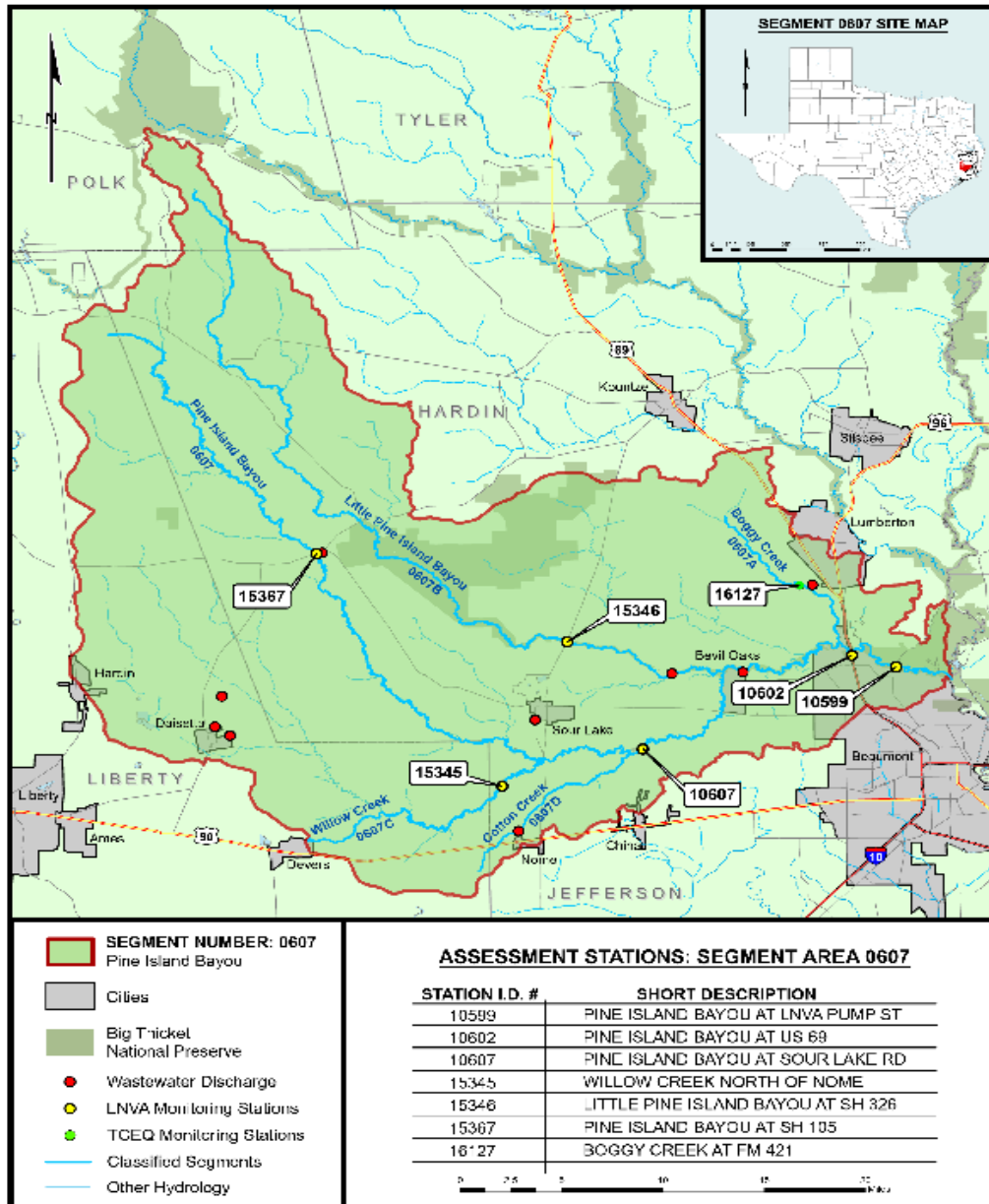
Segment #	Segment Name	Impairments and Concerns Listed in 2020 Texas Integrated Report	Reason for Impairment	Actions Taken	Future Action Recommended
o603	B.A. Steinhagen	Not supporting fish consumption use due to mercury and dioxins in edible tissue	Atmospheric Deposition-Toxics; Industrial Point Source Discharge; Other unknown source	Advisory issued Department of State Health Services (January 24, 2014)	Updated fish tissue sampling by Department of State Health Services
o603A	Sandy Creek	Not supporting contact recreation use due to bacteria	Non-Point Source-Agriculture and Grazing in Riparian Zone or Shoreline Zones	LNVA Routine Monitoring; Total Maximum Daily Load and Implementation Plan under development	More data is recommended; Total Maximum Daily Load and Implementation plan finalized
o603B	Wolf Creek	Not supporting contact recreation use due to bacteria	Non-Point Source-Agriculture and Livestock Grazing or Feeding Operations	LNVA Routine Monitoring; Total Maximum Daily Load and Implementation Plan under development	More data is recommended; Total Maximum Daily Load and Implementation Plan finalized



- Segment ID: o6o8 Village Creek** From the confluence with the Neches River in Hardin County to Lake Kimble Dam in Hardin County
- Segment ID: o6o8A Beech Creek** From the confluence of Village Creek northeast of Kountze in Hardin County to the upstream perennial portion of the stream southeast of Woodville in Tyler County
- Segment ID: o6o8B Big Sandy Creek** From the confluence of Village and Kimball Creeks in Hardin County upstream to headwaters in Polk County
- Segment ID: o6o8C Cypress Creek** From the confluence of Village Creek (o6o8) east of Kountze in Hardin County to the confluence with Bad Luck Creek northwest of Kountze in Hardin County
- Segment ID: o6o8E Mill Creek in Hardin County** From the confluence of Village Creek (o6o8) west of Silsbee in Hardin County upstream to headwaters northwest of Silsbee in Hardin County
- Segment ID: o6o8G Lake Kimball** From Kimble Creek Dam northwest of Kountze in Hardin County to normal pool elevation in Tyler County (impounds Kimble and Village Creeks)

Basin Characteristics: Village Creek and a number of smaller tributaries make up the 1,113 square miles of Segment o6o8. Land use is primarily recreation and made up of the Big Thicket National Preserve, state parks, and conservation sanctuaries. This segment is a popular destination for campers, hikers, kayakers, and canoers. Land cover includes several species of pine including conservation land for the longleaf pine.

Segment #	Segment Name	Impairments and Concerns Listed in 2020 Texas Integrated Report	Reason for Impairment	Actions Taken	Future Action Recommended
o6o8A	Beech Creek	Not supporting aquatic life use due to elevated copper	Source unknown	TCEQ Region 10 metals sampling	More metals data should be collected before management strategy is determined
		Concern for E.coli	Non-point source; Source unknown	LNVA Routine Monitoring	LNVA will continue routine monitoring
		Screening level concern for impaired habitat	Source unknown	LNVA Routine Monitoring	LNVA will continue routine monitoring
o6o8B	Big Sandy Creek	Screening level concern for dissolved oxygen	Source unknown; Non-point source	LNVA Routine Monitoring	LNVA will continue routine monitoring
o6o8C	Cypress Creek	Not supporting aquatic life use due to depressed dissolved oxygen	Natural Conditions-Water Quality Standards Use Attainability Analyses Needed; Source Unknown	LNVA Routine Monitoring; Aquatic Life Monitoring	TCEQ should review standards to see if possible Texas Surface Water Quality Standards revision is necessary; LNVA will add 24 hour dissolved oxygen to a future monitoring schedule
		Concern for impaired habitat	Unknown Source	LNVA Routine Monitoring	LNVA will continue routine monitoring
		Concern for bacteria	Unknown source; Non-Point Source	LNVA Routine Monitoring	LNVA will continue routine monitoring
o6o8E	Mill Creek	Not supporting aquatic life use due to depressed dissolved oxygen	Natural sources; Industrial point source discharge; Municipal point source discharge	TCEQ Routine Monitoring	More data should be collected before a management plan is developed; LNVA adding 24 hr dissolved oxygen collection in FY 22
o6o8G	Lake Kimball	Not supporting fish consumption use due to mercury in edible tissue	Atmospheric deposition-toxics; Source unknown	Advisory issued Department of State Health Services (September 21, 2009 and April 23, 1999)	Updated fish tissue sampling by Department of State Health Services



Segment ID: o607 Pine Island Bayou From the confluence with the Neches River in Hardin/Jefferson County to FM 787 in Hardin County

Segment ID: o607A Boggy Creek From the confluence of Pine Island Bayou upstream to the confluence with an unnamed tributary 4 km downstream of the crossing of the Southern Pacific Railroad.

Segment ID: o607B Little Pine Island Bayou From the confluence of Pine Island Bayou southwest of Lumberton in Hardin County to the upstream perennial portion of the stream west of Kountze in Hardin County

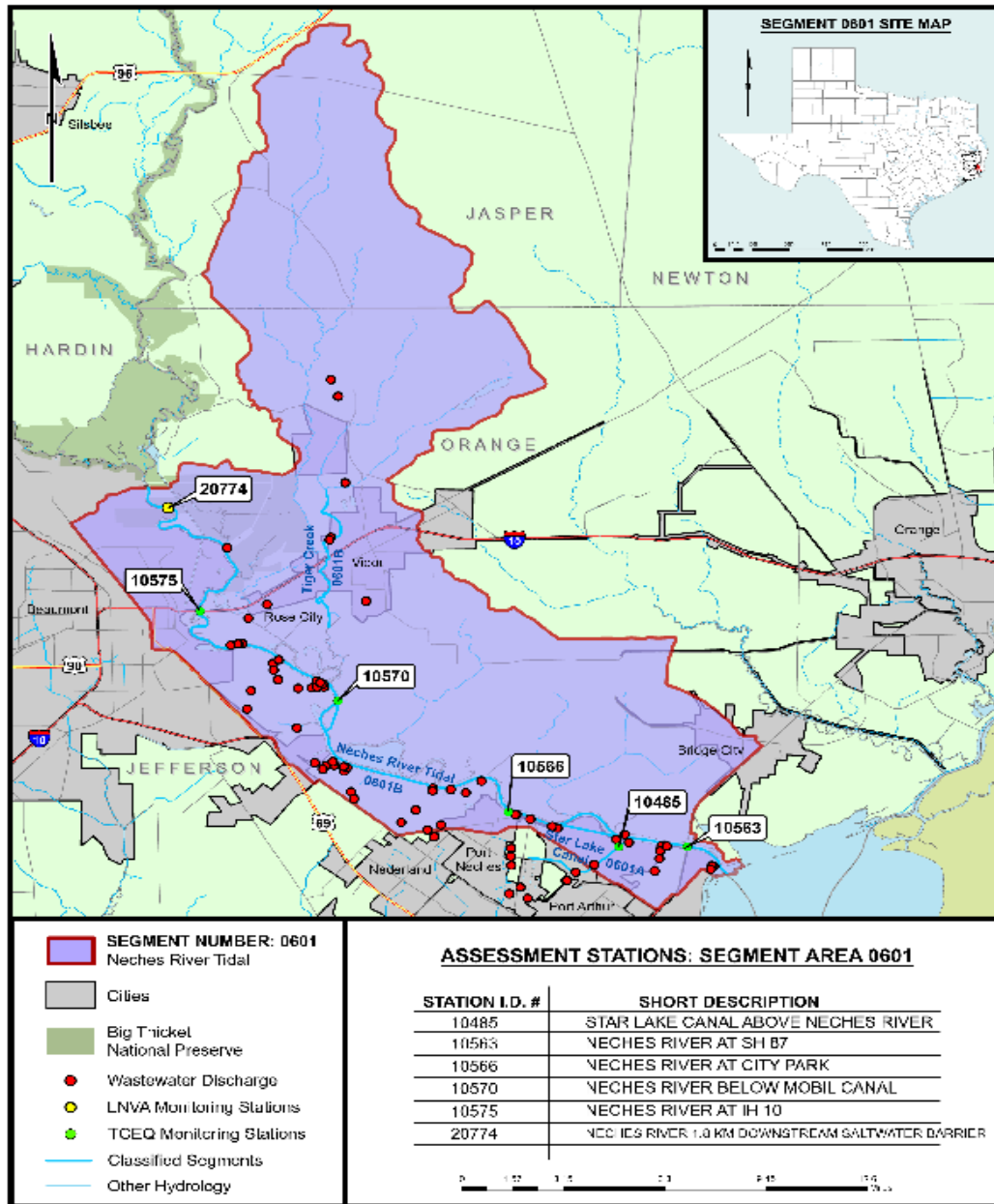
Segment ID: o607C Willow Creek From the confluence of Pine Island Bayou north of Nome in Jefferson County to the upstream perennial portion of the stream east of Devers in Liberty County

Basin Characteristics: Segment 0607 is 657 square miles and made up of Pine Island Bayou and several smaller tributaries. Land use includes timber, pasture land, agriculture, and oil and gas production. The upper portions of this segment heavily forested while the lower portions provide drainage for the communities of Sour Lake, Pinewood Estates, Bevil Oaks, and northern Beaumont.

LNVA's Clean Rivers Program maintains a Continuous Water Quality Monitoring Network (CWQMN) station, CAMS 749, on Pine Island Bayou. Links to the CWQM stations by basin and the current revision of the Quality Assurance Project plan (QAPP) are available at:

http://www.tceq.texas.gov/waterquality/monitoring/swqm_realtime.html

Segment #	Segment Name	Impairments and Concerns Listed in 2020 Texas			Future Action Recommended
		Integrated Report	Reason for Impairment	Actions Taken	
0607	Pine Island Bayou	Not supporting aquatic life use due to depressed dissolved oxygen	Natural Conditions-Water Quality Standards Use Attainability Analyses needed; Natural sources	LNVA Routine Monitoring, Continuous Water Quality Monitoring Network Real-time Monitoring Station; Intermediate Aquatic Life Use category proposed by TCEQ in 2014 Texas Surface Water Quality Standards; 24 HR dissolved oxygen collected by LNVA in FY20-21 at station #15367 Pine Island Bayou @ 105	2018 Texas Surface Water Quality Standards includes approved lower dissolved oxygen standard; LNVA will continue monitoring based on lower standard for future assessments; 24 HR dissolved oxygen data will continue to be collected in FY22 by LNVA
0607A	Boggy Creek	Not supporting aquatic life use due to depressed dissolved oxygen	Natural Conditions-Water Quality Standards Use Attainability Analyses Needed; Natural Sources; Streambank Modifications/De-stabilization; Unknown Source	TCEQ Region 10 Routine Monitoring; 24 HR Dissolved Oxygen collected by TCEQ; LNVA collected 24 HR DO in FY 20-21; Intermediate Aquatic Life Use category in 2018 Texas State Water Quality Standards	TCEQ Region 10 will continue monitoring based on lowered standard; 24 HR dissolved oxygen data will continue to be collected in FY 22 by LNVA
		Concern for bacteria	Source Unknown; Non-Point Source	TCEQ Region 10 Routine Monitoring	TCEQ Region 10 continue routine monitoring; TCEQ schedule a Recreational Use Attainability Analysis
		Concern for impaired habitat in Boggy Creek	Non-Point Source-Loss of riparian habitat	TCEQ Biological Assessment; LNVA collected 24 hour dissolved oxygen	TCEQ Region 10 continue routine monitoring with assessment using lowered standard; LNVA will keep monitoring 24 hour dissolved oxygen
0607B	Little Pine Island Bayou	Not supporting aquatic life use due to depressed dissolved oxygen	Natural Conditions-Water Quality Standards Use Attainability Analyses Needed; Natural Sources; Source unknown	LNVA routine monitoring and 24 hour dissolved oxygen collection in FY 20-21 ; Intermediate Aquatic Life Use category in 2018 Texas Surface Water Quality Standards	LNVA will continue routine monitoring based on lowered standard for dissolved oxygen; Use attainability analysis under development
		Concern for bacteria	Non-Point Source; Source Unknown	LNVA Routine Monitoring	LNVA continue routine monitoring; TCEQ schedule a Recreational Use Attainability Analysis
0607C	Willow Creek	Not supporting aquatic life use due to depressed dissolved oxygen	Natural Conditions-Water Quality Standards Use Attainability Analyses Needed; Natural Sources; Source unknown	LNVA routine monitoring ; Intermediate Aquatic Life Use category in 2018 Texas Surface Water Quality Standards	LNVA will continue routine monitoring based on lowered standard for dissolved oxygen



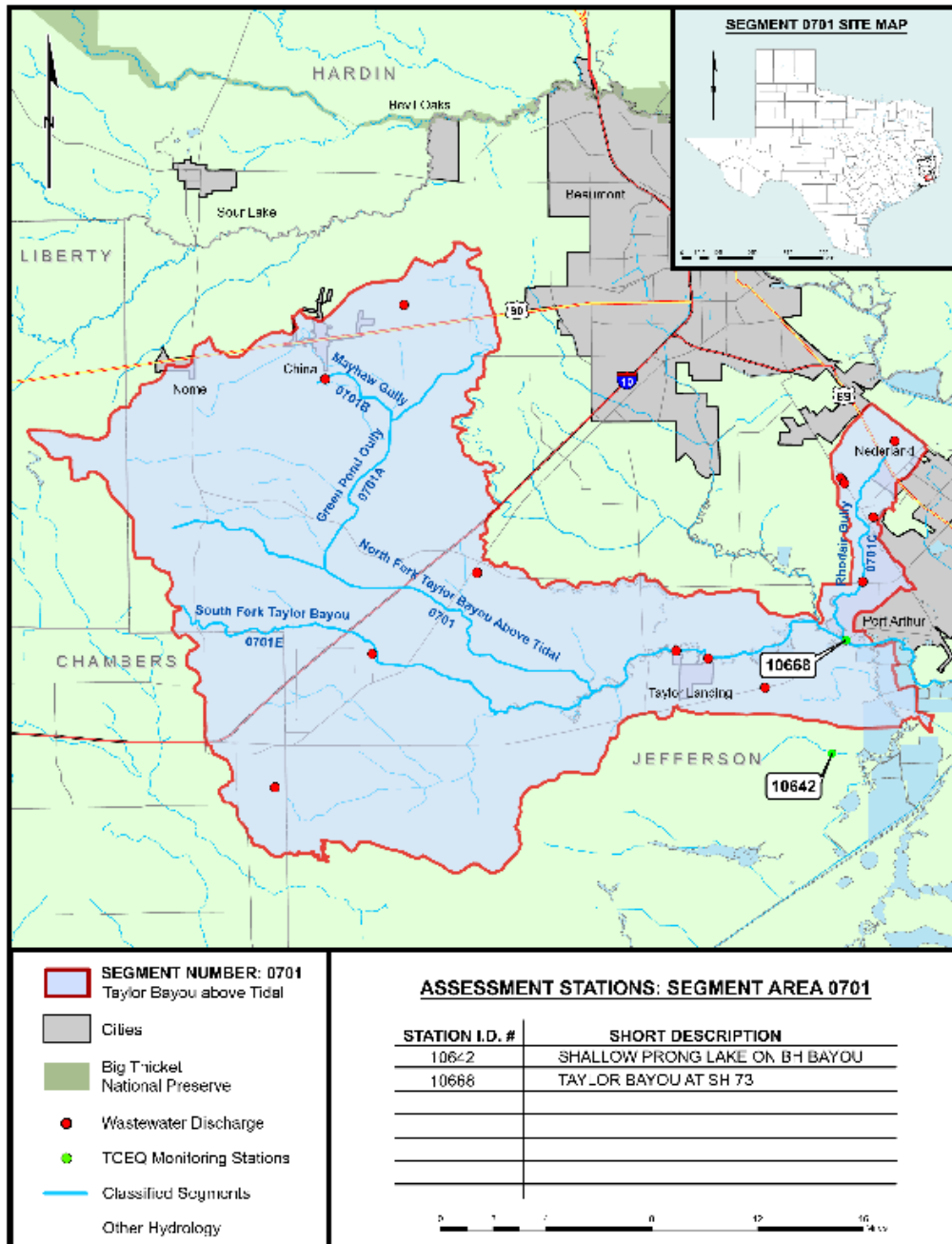
Segment ID: o601 Neches River Tidal From the confluence with Sabine Lake in Orange County to the Neches River Saltwater Barrier, which is at a point 0.8 km (0.5 mi) downstream of the confluence of Pine Island Bayou, in Orange County

Basin Characteristics: Segment o601 is a tidal stream segment. Land cover is dominated by water tolerant trees such as water tupelo, bald cypress, willow, and oaks in the upper portion of the segment and reeds and grasses in the flat plains, and marshes and bayous of the lower portion. A dredged navigation channel from the mouth of the Neches River to the Port of Beaumont is maintained by the U.S. Army Corps of Engineers (USACE). Land use in this segment is primarily oil and gas production, marshland, waterfowl and wildlife habitat, crop land, and urban/industrial use.



Roseate Spoonbill

Segment #	Segment Name	Impairments and Concerns Listed in 2020 Texas Integrated Report	Reason for Impairment	Actions Taken	Future Action Recommended
o6o1	Neches River Tidal	Not supporting contact recreation use due to bacteria in Neches River Tidal	Source unknown	LNVA & TCEQ routine monitoring; Total Maximum Daily Load and Implementation Plan drafted	Continue routine bacteria monitoring, Total Maximum Daily Load and Implementation Plan finalized by TCEQ
		Not supporting fish consumption due to polychlorinated biphenyls in edible tissue	Source unknown	Advisory issued Department of State Health Services (Dec 29, 2011)	Updated fish tissue sampling by Department of State Health Services
		Concern for aquatic life use due to malathion (lower segment only)	Source unknown	TCEQ organics in water monitoring	Routine monitoring for organics in water
o6o1A	Star Lake Canal	Not supporting contact recreation use due to bacteria (Enterococcus)	Source unknown	TCEQ Region 10 Routine Monitoring	Additional sampling by TCEQ Region 10 needed in order to reevaluate primary contact recreation use
		Concern for aquatic life use due to malathion	Source unknown	TCEQ organics in water monitoring	Routine monitoring for organics in water
		Screening level concern for ammonia	Non-point source; Pesticide application	TCEQ Region 10 Routine Monitoring	Additional sampling by TCEQ Region 10 needed



Segment ID: 0701 Taylor Bayou/North Fork Taylor Bayou Above Tidal From the saltwater lock 7.7 km (4.8 mi) downstream of SH 73 in Jefferson County to the Lower Neches Valley Authority Canal crossing of North Fork Taylor Bayou in Jefferson County

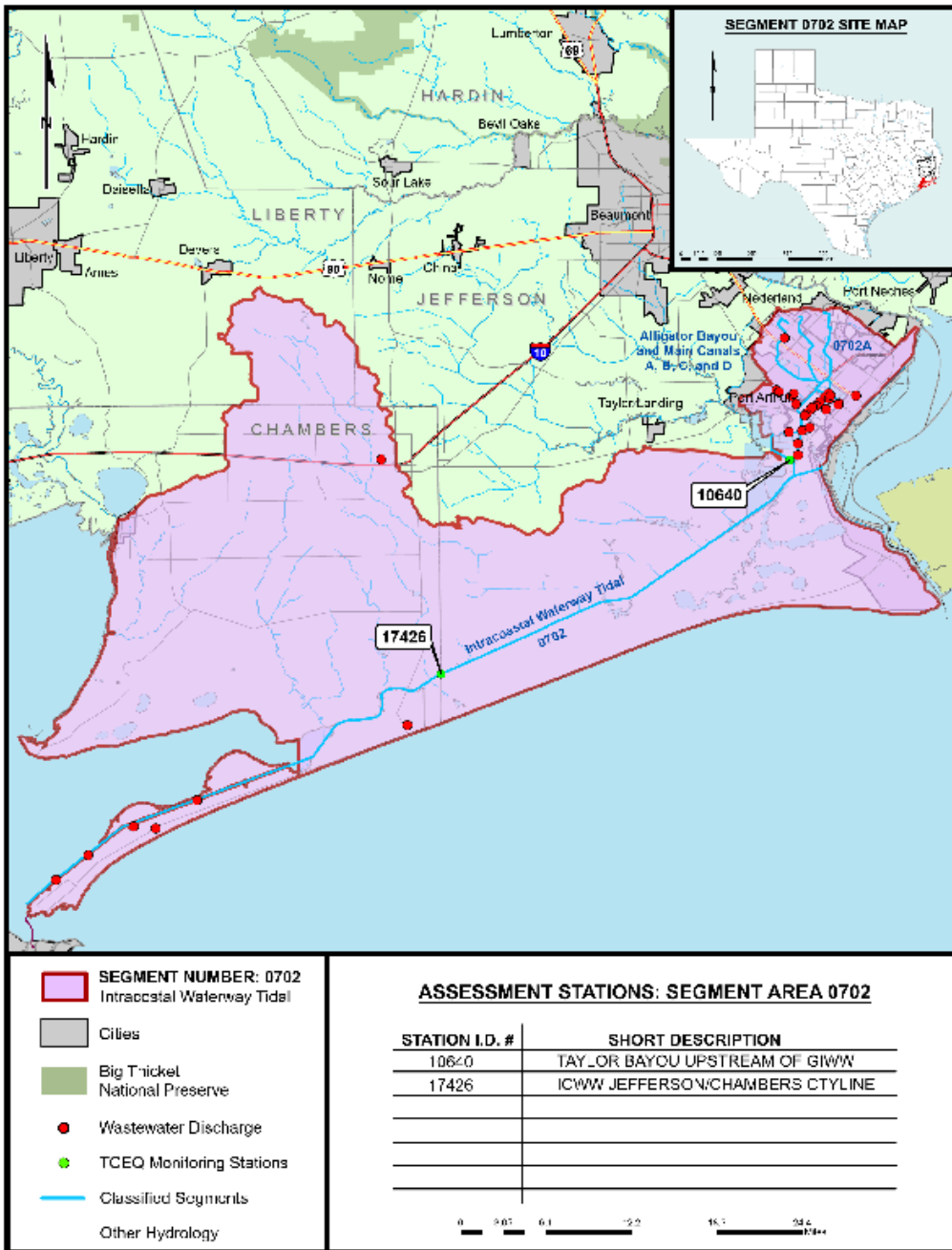
Segment ID: 0701D Shallow Prong Lake Widest upper portion of Big Hill Bayou about 2.0 km (1.26 mi) north of Blind Lake

Basin Characteristics: Segment 0701 is generally flat plains, with much of the area covered by tidal marshes with bayous, lakes, and canals, and wetlands. Land use is pasture/hay, and cultivated crops of rice, grain, sorghum, cotton, and soybeans. There are also urban/industrial uses, oil and gas production, and waterfowl and wildlife habitat throughout the segment.



Red Winged Blackbird

Segment #	Segment Name	Impairments and Concerns Listed in 2020 Texas Integrated Report	Reason for Impairment	Actions Taken	Future Action Recommended
0701	Taylor Bayou Above Tidal	Not supporting aquatic life use due to depressed dissolved oxygen	Natural Conditions-Water Quality Standards Use Attainability Analyses needed; Natural Sources; Source unknown	TCEQ Region 10 Routine Monitoring	TCEQ continue routine monitoring and collect new 24 hour dissolved oxygen measurements; TCEQ should schedule a Use Attainability Analysis
0701D	Shallow Prong Lake	Concern for chlorophyll-a	Source unknown	TCEQ Region 10 Routine Monitoring	Continue routine monitoring; develop a nutrient standard
		Concern for arsenic in edible tissue	Source unknown	TCEQ Region 10 sampled for fish tissue	Update fish tissue sampling to see if advisory necessary by Department State Health Services
		Concern for dissolved oxygen	Source unknown; Non-point source	TCEQ Region 10 Routine Monitoring	TCEQ continue routine monitoring
		Concern for ammonia in water	Source Unknown	TCEQ Region 10 Routine Monitoring	TCEQ continue routine monitoring
		Nonsupport for dissolved oxygen minimum grab	Source unknown; Non-point source	TCEQ Region 10 Routine Monitoring	TCEQ continue routine monitoring



Segment ID: 0702 Intracoastal Waterway Tidal From the confluence with Galveston Bay at Port Bolivar to the confluence with the Sabine-Neches/Port Arthur Canal (including Taylor Bayou Tidal from the confluence with the Intracoastal Waterway up to the saltwater lock 7.7 km (4.8 mi) downstream of SH 73

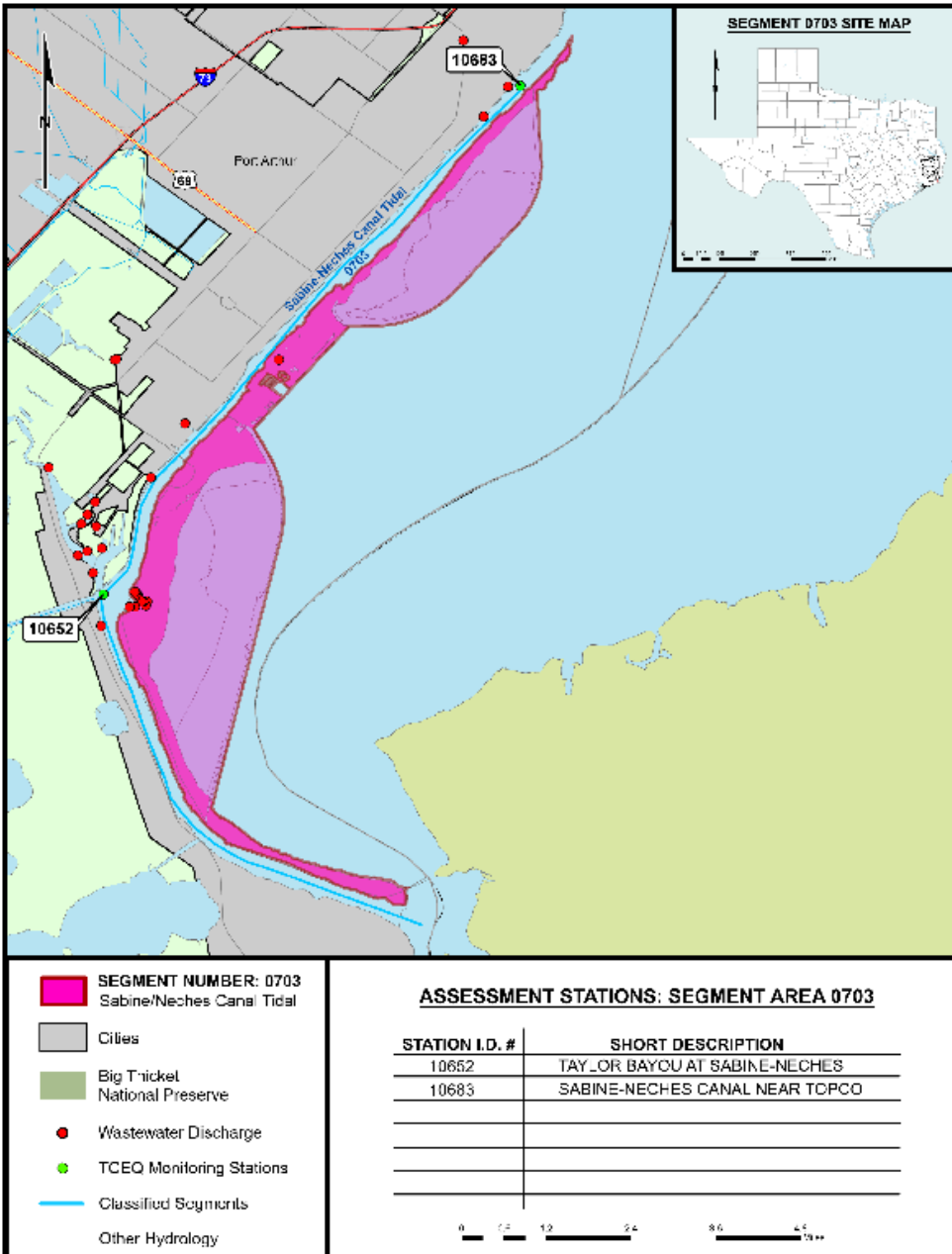
Segment ID: 0702A Alligator Bayou and Main Canals A, B, C, and D All perennial canals in Jefferson County Drainage District No. 7 that eventually drain into the tidal portion of Taylor Bayou at the pump house gate, including Alligator Bayou

Basin Characteristics: Segment 0702 is 63 miles long. Land use includes extensive agricultural land for cultivated crops and pasture/hay/marshland, wildlife and waterfowl habitat, oil and gas production, and intensive urban/industrial development in the eastern most portion of the watershed. Fishing is commercially important and recreationally popular in this segment as well. Dominant vegetation is various species of marsh grasses. The marshes provide wintering grounds for ducks and geese as well as rearing grounds for a variety of fish and shrimp.



Black Bellied Whistling Ducks

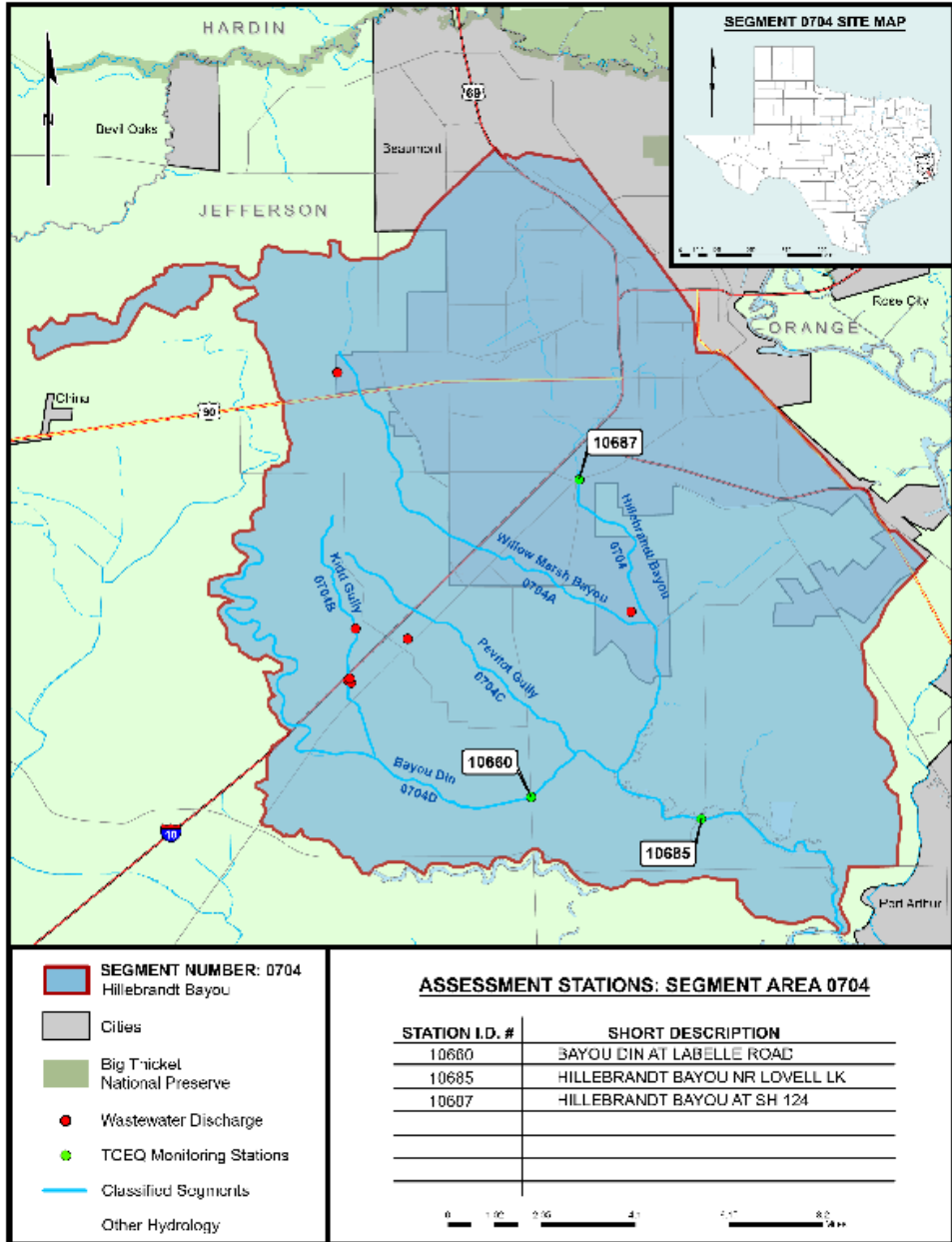
Segment #	Segment Name	Impairments and Concerns Listed in 2020 Texas Integrated Report		Actions Taken	Future Action Recommended
		Integrated Report	Reason for Impairment		
0702	Intracoastal Waterway Tidal	Not supporting contact recreation use due to bacteria	Non-point source; Source unknown	TCEQ Region 10 Routine Monitoring	Consider a secondary contact recreation use standard
		Not supporting fish consumption due to polychlorinated biphenyls and dioxin in edible tissue	Industrial point source discharge; Source unknown	Advisory issued Department of State Health Services (January 26, 2013)	Updated fish tissue sampling by Department of State Health Services
		Concern for chlorophyll-a in Taylor Bayou Tidal	Source unknown	TCEQ Region 10 Routine Monitoring	Continue routine monitoring; develop a nutrient standard
0702A	Alligator Bayou	Not supporting aquatic life use due to acute toxicity in water and sediment toxicity	Petroleum/Natural gas activities; Industrial point source discharge; Source unknown	TCEQ toxicity sampling	Complete Total Maximum Daily Load; keep monitoring to determine source
		Concern for lead in sediment	Petroleum/Natural gas activities; Industrial point source discharge; Source unknown	TCEQ metals sampling	Continue monitoring for metals in sediment
		Concern for chlorophyll-a	Source unknown	TCEQ Region 10 Routine Monitoring	Continue routine monitoring; develop a nutrient standard



Segment ID: 0703 Sabine-Neches Canal Tidal From the confluence with Sabine Pass at the southern tip of Pleasure Island in Jefferson County to the Sabine Lake seawall at the northern tip of Pleasure Island in Jefferson County

Basin Characteristics: Segment 0703 is considered a tidal stream and 16 miles in length. The freshwater and saltwater coastal marshes in this segment consist of grasses, sedges, and wedges. There are very few trees found in this segment. Land use includes urban/industrial development, oil and gas production, as well as the marshland, wildlife, and waterfowl habitat.

Segment #	Segment Name	Impairments and Concerns Listed in 2020 Texas Integrated Report	Reason for Impairment	Actions Taken	Future Action Recommended
0703	Sabine-Neches Canal Tidal	Not supporting contact recreation use due to bacteria	Source unknown	TCEQ Region 10 Routine Monitoring	Consider secondary or noncontact recreation use standards; Recreational Use Attainability Analysis



Segment ID 0704 Hillebrandt Bayou From the confluence of Taylor Bayou in Jefferson County to a point 100 meters (110 yards) upstream of SH 124 in Jefferson County.

Segment ID 0704D Bayou Din From the confluence with Hillebrandt Bayou upstream to headwaters in Jefferson County.

Basin Characteristics: Segment 0704 is a freshwater stream that includes floodplain forested land to the north and prairie land in the south until the convergence with Taylor Bayou when the land becomes flat plains of marsh grasses. Land use is improved pasture, cultivated cropland, urban and industrial development, oil and gas production, storm water drainage through Cattail Marsh wetlands to Hillebrandt Bayou, recreational parks, and gold courses. Cattail Marsh is a popular area for birding, photography, jogging, horseback riding, hiking, and other recreational activities.

Segment #	Segment Name	Impairments and Concerns Listed in 2020 Texas Integrated Report	Reason for Impairment	Actions Taken	Future Action Recommended
0704	Hillebrandt Bayou	Not supporting contact recreation use due to bacteria	Urban runoff/Storm sewers	TCEQ Region 10 Routine Monitoring; Total Maximum Daily Load and Implementation plan drafted	Total Maximum Daily Load and Implementation plan finalized; Recreational Use Attainability Analysis

Agency Websites

Angelina & Neches River Authority: www.anra.org

Environmental Protection Agency: www.epa.gov

Department of State Health Service: www.dshs.texas.gov

Lower Neches Valley Authority: <https://lnva.dst.tx.us>

Texas Commission on Environmental Quality: www.tceq.texas.gov

Texas Water Development Board: www.twdb.texas.gov



For more information about the Lower Neches Valley Authority Clean Rivers Program, please visit the LNVA website at <https://lnva.dst.tx.us> or contact (409)892-4011.

