2019 Lavaca Basin Highlights Clean Rivers Program Report

Purple Gallinule at Lake Texana

Prepared by the
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LAVACA BASIN HIGHLIGHTS REPORT 2019

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Acronyms

AU	Assessment Unit
CFS	Cubic feet per second
CRP	Clean Rivers Program
DO	Dissolved Oxygen (in water)
EPA	Environmental Protection Agency
IR	Integrated Report
LNRA	Lavaca Navidad River Authority
Mg/L	Milligrams per Liter
MPN	Most Probable Number
MSL	Mean Sea Level
OSSF	On-Site Sewage Facilities
PPT	Parts Per Thousand
RUAA	Recreational Use Attainability Analysis
SH	State Highway
SWQM	Surface Water Quality Monitoring
TCEQ	Texas Commission on Environmental Quality
TDS	Total Dissolved Solids
TIAER	The Texas Institute for Applied Environmental Research
TWRI	Texas Water Resources Institute
UAA	Use Attainability Analysis
USGS	United States Geological Survey
WPP	Watershed Protection Plan
WQS	Water Quality Standards

2018 Basin Highlights:

- The Lavaca Basin receives an average annual rainfall ranging from thirty-four (34) inches along the western boundary to forty-two (42) inches along the eastern boundary. During 2018, the average rainfall recorded for 36 sites totaled thirty-nine (39) – sixty-three (63) inches, slightly less than the forty-two (42) inch average. For most of the year, below average rainfall occurred throughout the Basin (2.10 inches/month) resulting in a depressed lake elevation. The last third of the year resulted in above average rainfall (5.72 inches/month) filling the reservoir and keeping it at full conservation level of 44.0 ft. MSL. The Lavaca Basin has minimal water quality impairments, yet there are still a couple issues that need to be addressed. Bacteria in the upper basin of the Lavaca River and Rocky Creek still have elevated values that exceed the Texas Surface Water Quality bacteria standard of 126 CFU per 100 ml. Long term trend analysis indicate nutrient median values to be increasing on the Mustang Creek arm of Lake Texana. The Lavaca Navidad River Authority (LNRA) is actively pursuing best management practices to benefit local stakeholders in reducing nutrient levels and the amount of sediment entering Lake Texana.

- A Rural Use Attainability Analysis (RUAA), was initiated in 2017 on Rocky Creek, an unclassified waterbody in Segment 1602B. Rocky Creek is on the State's 303d list for exceedance of the established bacteria limits for primary contact recreation. Two data collection surveys were conducted, one in May 2017 and a second in July of 2017. Results of the surveys were released in June 2018 and were used in the evaluation process.

- A Watershed Protection Plan (WPP) was established for the Lavaca River with a strategy developed by stakeholders located in the Lavaca River watershed to restore water quality.

- The Lavaca-Navidad River Authority responded to one reportable incident this year. Failure of a berm constructed to contain oil field sludge caused the sludge material to enter a nearby water course, carried by runoff caused by heavy rainfall. The incident was located off FM 2982 southwest of the City of Ganado, the incident was contained, and the cleanup of the waste resolved quickly by the performing party.

Figure 1: Lavaca Basin within The State of Texas

Rocky Creek RUAA:

Rocky Creek, a 36-mile perennial stream, begins in Gonzales county and traverses south into Lavaca County where it flows into the Lavaca River. The Rocky Creek RUAA was introduced in 2017 by the Texas Water Resource Institute due to the stream being on the state 303d list of impaired waters. Rocky Creek was placed on the State's 303d list in 2014 due to elevated bacteria levels that exceeded the primary contact recreation criteria of 126 CFU/ml. Since the 2014 Integrated Report sampling results indicate that this waterbody continues to exceed the established criteria for bacteria.

Primary contact recreation includes water-based activities, such as skiing, swimming, and diving that puts a person at a higher risk of ingesting water. A water body may be classified as having a secondary contact recreation use if its physical characteristics limit the possibility for water activities. Motor-boating, kayaking, fishing, and canoeing are examples of secondary contact recreation.

A Recreational Use Attainability Analyses was conducted to determine if the current designated use assigned to Rocky Creek (primary contact recreation) is appropriate and attainable. The Texas Water Resource Institute (TWRI) contracted with Texas Institute for Applied Environmental Research (TIAER) to perform the RUAA. TIAER performed two types of surveys in their evaluation of Rocky Creek: physical field surveys and questionnaire surveys from local stakeholders.

TIAER conducted two surveys in 2017. The first survey was conducted on May 16, 2017 and the second survey on July 25, 2017. The first survey required a physical survey of selected sites to determine if any recreation was occurring. Seventeen sites were selected with most of the sites being at public road crossings. Data collected as part of the physical surveys included the average stream depth, measurement of stream transect, width and depth of pools, and observation data (stream type, stream slope, stream accessibility). Photos containing a 360-degree view were taken of the selected sites, to document what recreation, if any, was evident at the site. The second method of surveying was conducted through a questionnaire that was filled out by local stakeholders to, identify the types of recreation landowners perform or observe in the stream.

A public meeting was held in November of 2017 at Weid Hall near Hallettsville, Texas to discuss the findings of the field surveys that TIAER collected. At the conclusion of two field surveys, TIAER personnel did not observe any evidence of primary contact recreation being performed within the stream. Although the stream did not exhibit any indication of primary contact recreation during the field surveys, interviews with adjacent landowners revealed that primary contact recreation did happen in sections of Rocky Creek. These activities included swimming, wading, fishing, and hunting. With the conclusion that primary contact recreation occurred within Rocky Creek, the current water quality standard established by TCEQ was deemed appropriate.

Figure 2: Livestock in Rocky Creek downstream of LNRA sample site

Lavaca River WPP:

A watershed is described as an area of land in which water drains to a common body of water. The Lavaca River watershed encompasses roughly 910 square miles, with the headwaters starting near Moulton, Texas and ending at the mouth of Lavaca Bay near the City of Point Comfort. It embodies all or parts of Lavaca, Jackson, Dewitt, Gonzales, and Victoria counties. The Lavaca River watershed also includes several other smaller watersheds. These smaller watersheds include Rocky Creek, Big Brushy Creek, and Dry Creek. The Lavaca River Watershed Protection Plan (WPP) was developed to improve water quality in impaired segments in the Lavaca River and Rocky Creek through reducing bacteria levels. In 2008, the Lavaca River was identified as impaired on the State's 303(d) list for exceedance of water quality standards for primary contact recreation. Along with Rocky Creek, the Lavaca River surpassed the water quality standard of 126 CFU/mL for bacteria. A WWP is described as a coordinated outline for applying arranged and integrated water quality protection and restoration ideas powered by environmental objectives.

The EPA has developed nine key elements for the Lavaca River WPP. These nine elements are as follows:

1. Identification of causes and sources of impairment
2. Expected load reductions from management strategies
3. Proposed management measures
4. Technical and financial assistance to implement management measures
5. Information, education, and public participation needed to support implementation
6. Schedule for implementing management measures
7. Milestones for progress of WPP implementation
8. Criteria for determining successes of WPP implementation
9. Water quality monitoring

There are a variety of contributing factors to elevated bacteria levels within the stream including livestock, wildlife, an onsite sewage facility, and stormwater runoff. In order to meet the goals outlined in the WPP it will take approximately 10 years to reduce bacteria levels below criteria. To better target potential sources of bacteria, TWRI has contracted with LNRA to sample four (4) sites monthly for twenty-four (24) months targeting areas of interest within the River with higher levels of *E. coli*. Overall, the plan sets goals to improve the water quality of the streams and allow stakeholders to rely on the resource for their livelihoods.

Sludge Spill:

On Friday December 14, 2018 the Lavaca-Navidad River Authority was contacted regarding a potential oil spill. The location of the spill was southwest of the City of Ganado along FM 2982 and approximately a quarter mile from Lake Texana. The landowner reported that runoff from overnight rains had washed an oily residue into the front yard of his home, leaving a visible residue and noxious smell. The Lavaca Navidad River Authority investigated the incident and located the source of the sludge material. Upon further investigation, it was determined that the containment berm had been inadequately built to retain the salt water sludge and rainwater. The sludge had been pumped from the sludge pit onto the ground located around the well, then built a makeshift berm to contain the sludge. The berm located around the sludge began to fail once the containment berm was saturated. Given the local topography, the contaminated runoff eventually made its way into Lake Texana, approximately 800 yards from the well site. The Texas Railroad Commission was notified along with the owner of the well. LNRA made a second visit to the site on Monday December 17, 2018 to ensure proper measures were taken to collect and contain the sludge. The appropriate berm had been built and the land scraped in efforts to collect the sludge that had made its way downhill towards the Lake Texana. Water quality remains positive even after the spill likely due to low pollutant volume introduced into the lake.

Figure 3: Sludge being pumped from oil field sludge pit

Figure 4: Berm failure at oil field sludge spill site

Figure 5: Berm reconstruction at oil field sludge spill site

Figure 6: Water flowing into Lake Texana from oil field sludge spill site

Water Quality Monitoring:

The Lavaca-Navidad River Authority preforms water quality monitoring throughout the Lavaca River Basin for a variety of field and conventional parameters along with bacteria.

Field data can include***:*** Dissolved oxygen, pH, temperature, specific conductivity, flow, salinity, secchi disk to measure water clarity and depth.

Conventional water analyses include: Total alkalinity, chloride, ammonia, total organic carbon, turbidity, total hardness, sulfate, nitrate-nitrogen, total kjeldahl nitrogen (TKN), total suspended solids, total phosphorus, and chlorophyll-a at the reservoir sites.

Bacterial analysis is conducted for *E. coli* with the IDEXX Colilert system. More details on monitoring parameters follow at the end of this section.

Figure 6, Table 1, and the lists that follow show the water quality sites monitored for FY 2018 along with the parameter sets and frequency. A detailed coordinated monitoring schedule with aerial maps for Lavaca Basin can be accessed from **LNRA Web Site** as follows: from the "Programs" pull-down menu, choose "Water Quality" and click on "FY 2018 Coordinated Monitoring Schedule".

Field parameters:

Secchi disk - Physical measurement of water clarity via visibility.

Water temperature - The degree of heat in a body of water. For CRP purposes water temperature is measured in degrees Celsius.

Dissolved oxygen - Oxygen dissolved in water column readily available to aquatic organisms.

Specific conductance - Measure of electrical current carrying capacity of water. This indicates the amount of dissolved solids and salts in the water. Total Dissolved Solids (TDS) can be derived from specific conductance by multiplying its µS/cm value by 0.65 to obtain mg/L TDS.

pH - Measure of whether water is acidic, basic or neutral.

Salinity - The amount of dissolved salts in a body of water. Salinity is usually low in fresh water and higher in tidally influenced water, bays, and oceans. Usually measured in parts per thousand (ppt). Average ocean water is ~35 ppt.

Depth - Depth of water column where measurement occurs.

Flow - The volume of water flowing through a point in a stream -- measured in cubic feet per second (cfs).

Conventional parameters:

Total Suspended Solids (TSS) - All particles suspended in water which will not pass through a filter, commonly results from erosion of soils, run-off, and sediment**.**

Sulfate - An abundant water-soluble sulfur-containing compound.

Chloride - Can be defined as a chemical compound in which one or more chlorine atoms are covalently bonded in the molecule. Chlorides can be either inorganic or organic compounds. Also, the salts of hydrochloric acid are called chlorides. Chlorides can be high from salt water intrusion near the coast or from gas and oil drilling operations where brine water is not contained properly.

Ammonia - A compound of nitrogen and hydrogen in the formula NH_3 that occurs naturally in surface waters through decomposition of organic nitrogen, but may be elevated from agricultural runoff, human and/or animal wastes. Ammonia occurs in trace amounts in the atmosphere and in rainwater. The kidneys secrete ammonia to neutralize excess acid; thus it can be found in urine.

Total Hardness - A measurement of the amount of calcium and magnesium in association with carbonates.

Nitrate-Nitrogen - Nitrate is the compound of nitrogen and oxygen in the formula of NO_3. Too much nitrate in water can be harmful to both fish and humans. Elevated levels can be the result of agricultural and/or feedlot runoff or improperly treated wastewaters or septic tanks. Nitrate is highly soluble and can be transported to surface and groundwater during precipitation events.

Total Phosphorous - A measure of all chemical forms of phosphorus in the water. Phosphorus can be the limiting factor to plant growth, and elevated levels can lead to eutrophication of surface waters via increased algal growth resulting in depleted dissolved oxygen when the plant material is decomposed by bacterial activity.

Total Alkalinity - Measure of the buffering capacity (ability to resist changes in pH when acids or bases are added) of water.

Total Organic Carbon - Measured by the amount of carbon dioxide produced when a water sample is atomized in a combustion chamber--gives indication of the amount of carbon covalently bound in organic compounds in the water. Important to drinking water treatment planning. Only sampled at site 15377.

Turbidity - Laboratory measurement of suspended particles in water affecting clarity.

Chlorophyll-a - Photosynthetic pigment found in all green plants, algae and cyanobacteria -- concentration used to estimate phytoplankton biomass in surface water.

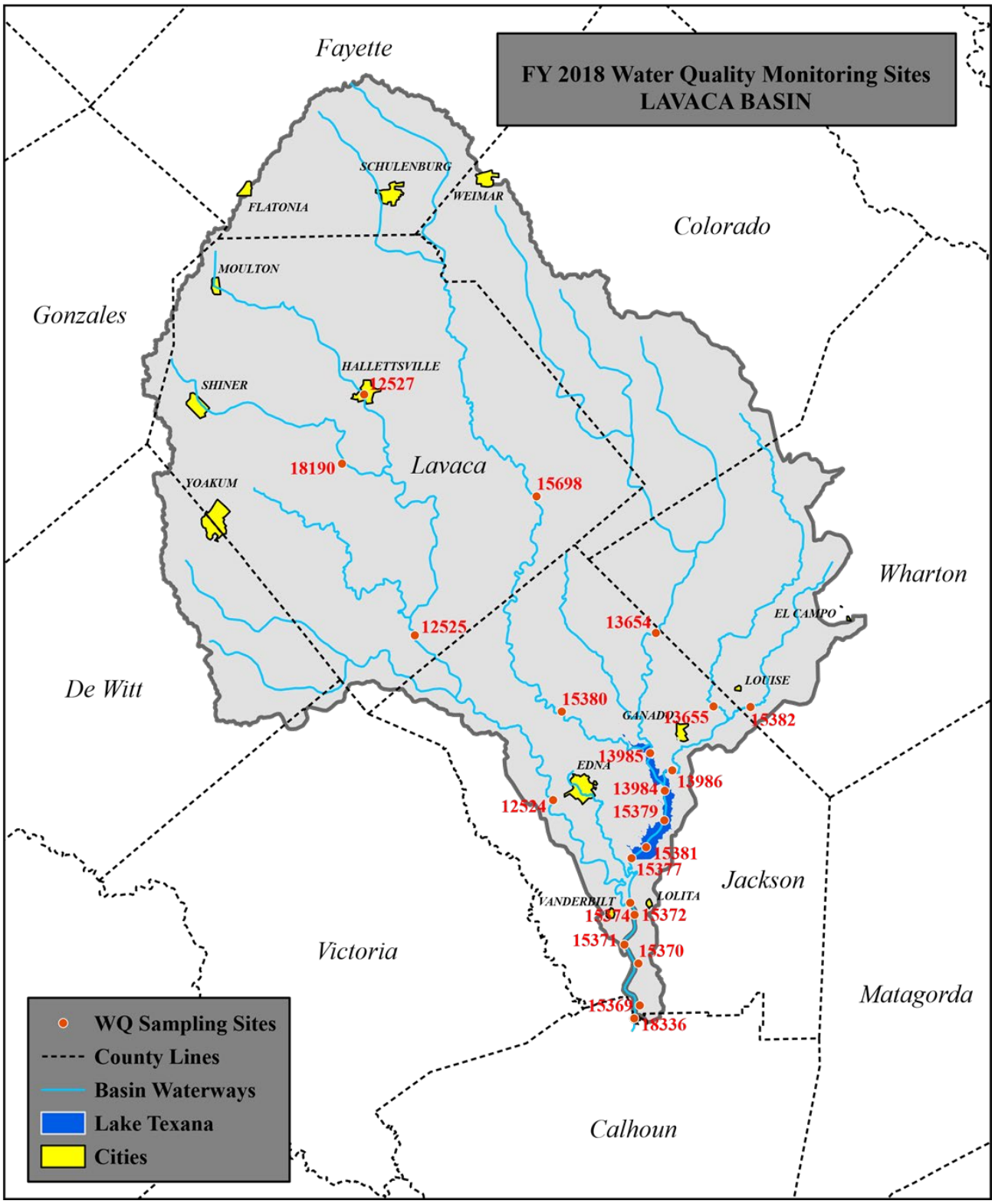

Figure 7: FY 2018 Lavaca Basin Water Quality Monitoring Sites

Table 1-Monitoring Sites for FY 2018

Segment #	Station ID	LNRA ID	Long Description	Latitude	Longitude	Conv.	Bact	Flow	Field
1601	15372	215	Lavaca River @ Frels Landing	28.8233	-96.5752				12
1601	15371	220	Lavaca River @ Mobil dock	28.7876	-96.5891				12
1601	15370	225	Lavaca River @ mouth of RedfishLk	28.7651	-96.5700				12
1601	15369	230	Lavaca River @ mouth of Swan lake	28.7150	-96.5682				12
1601	18336	232	Lavaca River near Lavaca Bay mouth	28.6994	-96.5758	4			12
1602	12525	111	Lavaca River @ SHwy 111 bridge	29.1566	-96.875	4	4	12	12
1602	12524	110	Lavaca River @ Hwy 59 bridge	28.9602	-96.6863	4	4	12	12
1602	12527		Lavaca River @ Hallettsville 90A	29.4430	-96.9441	4	4	4	4
1602	18190		Rocky Creek @ Lavaca CR 387	29.3609	-96.9743	4	4	4	4
1603	15374	210	Navidad River 30m above Lavaca	28.8411	-96.5766	4			12
1604	15377	9	Lake Texana near spillway	28.8909	-96.5794	4			12
1604	15381	8	Lake Texana near dam	28.9040	-96.5594	4			12
1604	15379	7	Lake Texana south of Hwy 111	28.9361	-96.5346	4	4		12
1604	13984	6	Lake Texana north of Hwy 111	28.9714	-96.5340	4	4		12
1604	13985	5	Lake Texana main body near Hwy 59	29.0162	-96.5540	4	4		12
1604	13986	4	Lake Texana - Mustang Creek arm	28.9957	-96.5238	4	4		12
1604	13654	2	Sandy Creek @ FM 710	29.1595	-96.5462	4		12	12
1604	15382	10	East Mustang @ FM 647	29.0713	-96.4172	4		12	12
1604	13655	1	West Mustang @ Hwy 59	29.0720	-96.4676	4		12	12
1605	15380	3	Navidad River @ Strane Park bridge	29.0657	-96.6745	4		12	12
1605	15698	Speaks	Navidad River @ Speaks bridge	29.3220	-96.709	4			4

Monitoring Frequency by Site:

- **East Mustang Creek** - monthly field data and quarterly conventional.
- **West Mustang Creek -** monthly field data and quarterly conventional.
- **Sandy Creek** - monthly field data and quarterly conventional.
- **Navidad River at Speaks** - quarterly field and conventional.
- **Navidad River at Strane Park -** monthly field data and quarterly conventional.
- **Lake Texana -** 6 sites monitored for field data monthly and quarterly for conventional and chlorophyll a. Four (4) Lake Sites are sampled quarterly for *E.coli* bacteria.

- **Navidad River below spillway and above confluence with Lavaca** - monthly field data
- and quarterly conventional.

- **Rocky Creek -** quarterly field, conventional, and bacterial.
- **Lavaca River at Hallettsville -** quarterly field, conventional, flow and bacterial.
- **Lavaca River at Hwy 59 and at SH 111 -** monthly field data and quarterly conventional
- and bacterial.

- **Lavaca River at 5 sites between confluence with Navidad River below spillway and**
- **Lavaca Bay -** monthly field data at 5 sites and quarterly conventional data at one site.

- **In addition, Lake Texana and its inflows** - Navidad River, Sandy Creek, and East and
- West Mustang Creeks are monitored by contract with USGS for pesticides, herbicides, and metals.

Water Quality Conditions:

Water quality in the Lavaca River Basin still remains positive to this day. Two key contributing factors that result in few water quality impairments, are size and lack of development. The Lavaca River Basin is the smallest and least industrialized river basin in the State. Due to the geographic placement of the Basin, it provides a very rural landscape with a heavy agriculture background. With these key factors in place, water quality within the Basin is generally good.

The Surface Water Quality Monitoring (SWQM) Team of TCEQ assesses water quality data using techniques appropriate for each of the various parameters measured. For more information on specific guidelines and methods for assessing water quality please visit **The Surface Water Quality Monitoring (SWQM) Team** website.

For water quality assessment purposes, TCEQ divides the Lavaca Basin into 5 main segments. Segments highlighted in green represent waterbodies that meet the criteria for their designated uses. Those in red represent waterbodies that are not meeting those criteria and are impaired.

Segment 1601 – Lavaca River tidal portion (including Redfish and Swan Bays):
This 23-mile segment runs from the confluence with Lavaca Bay northwest to a point 8.6 km (5.3 miles) downstream of US 59 in Jackson County. Several small tributaries, the Menefee Lakes, Redfish Lake, Swan Lake, Redfish Bayou, and Catfish Bayou are included in this segment. The Redfish and Swan Lakes are important nursery grounds for marine organisms. Wastewater treatment plants include Vanderbilt at a flow not to exceed 45,000 gallons per day.

Assessment:
The aquatic life and general uses are fully supported. The contact recreation and fish consumption uses were not assessed.

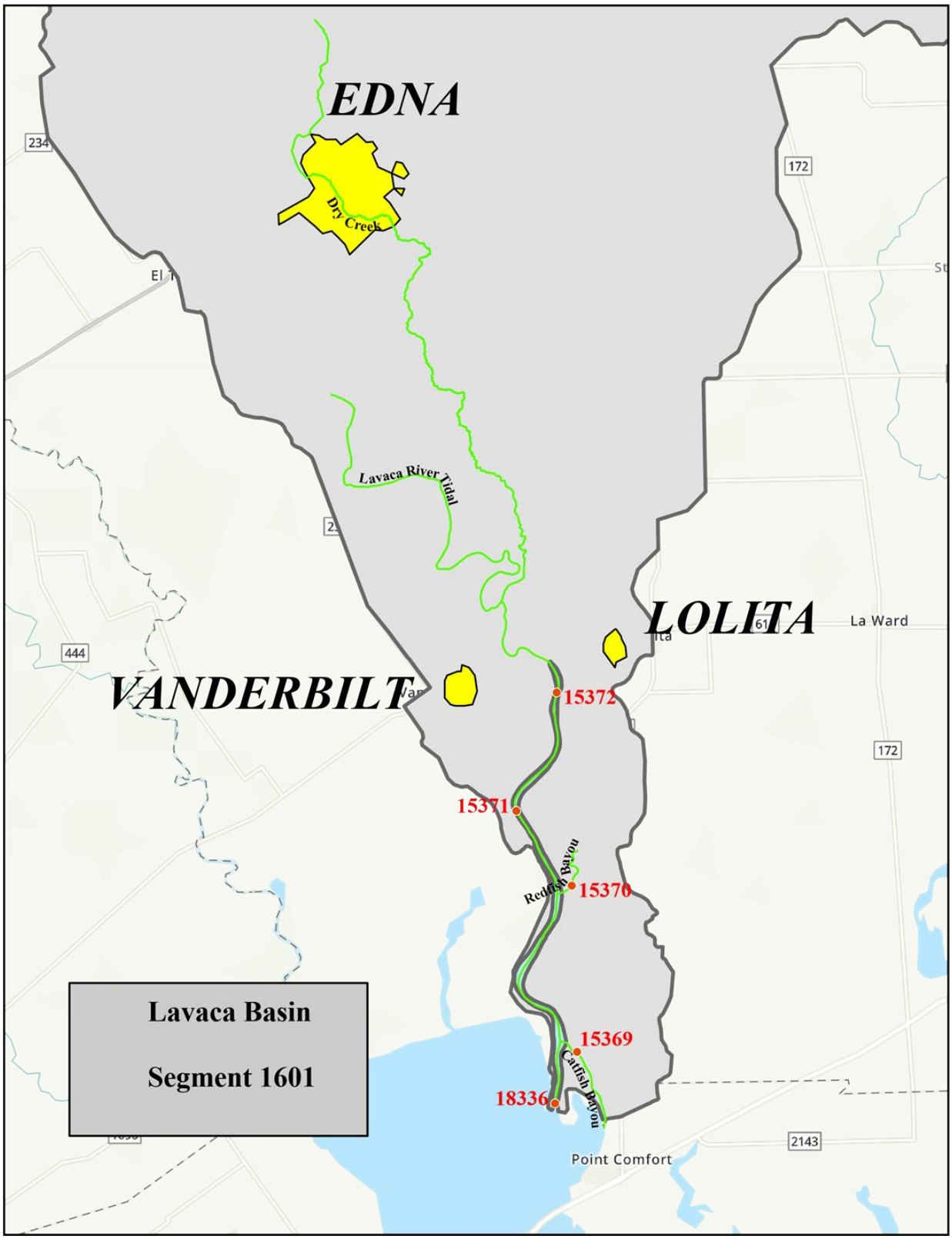

Figure 8: Segment 1601 of the Lavaca River Basin

Segment 1602 – Lavaca River above tidal:

This segment runs from a point 8.6 km (5.3 miles) downstream of US 59 in Jackson County upstream to the confluence with the West Prong of the Lavaca River in Lavaca County. Assessment Unit (AU) 1602_01 is now considered intermittent with pools and runs from the confluence with Campbell Branch just above Hallettsville up to the end of the segment at the West Prong confluence. The small portion of the Lavaca above the West Prong confluence is considered intermittent with a DO criteria of 3.0 mg/L average and 2.0 mg/L minimum. Many tributaries drain into the Lavaca River. Wastewater effluent from Shiner drains into Rocky Creek, while Yoakum effluent flows into Big Brushy and Clarks Creeks. Moulton and Hallettsville dispose of their effluent directly into the Lavaca River.

Assessment:

The public water supply and general uses are fully supported. The fish consumption uses were not assessed. Since the 2004 Texas Water Quality Inventory (TWQI), the upper portion of the Lavaca River (above Hallettsville) has been listed for non-support of the high Aquatic Life Use (ALU) classification's concomitant dissolved oxygen (DO) criteria due to depressed DO at times of low to no flow. It is listed as a Category 5b, meaning that the standards for this upper portion of the river were re-assessed via the Use Attainability Analysis (UAA). The UAA has determined that this long segment should be broken into 2 basic divisions: the lower perennial flow section and the upper intermittent with pools section with the division point being the confluence with Campbell Branch just northwest of Hallettsville.

The freshwater bacterial geometric mean standard for Primary Contact Recreation streams remains at 126 colonies most probable number (mpn) per 100 milliliters of water. Segment 1602_03 has been listed for elevated bacterial levels since 2008 and segment 1602B_01 (Rocky Creek) since 2014. These two segments are subject to long periods of low flow followed by brief periods of high flow which can contribute to elevated bacteria levels. In addition to the affect caused by overland flow, on numerous occasions cattle and feral hogs have been seen soaking in the shallow waters of segment 1602B_01. Both are listed as a category 5c which means more data and information will be collected before a TMDL is scheduled. A WPP has been implemented on the Lavaca River to try and lower bacterial counts below the 126 mpn criteria. A recently completed RUAA along Rocky Creek has been submitted to EPA for approval. This rural tributary receives wastewater from Shiner and meets the Lavaca River below Hallettsville.

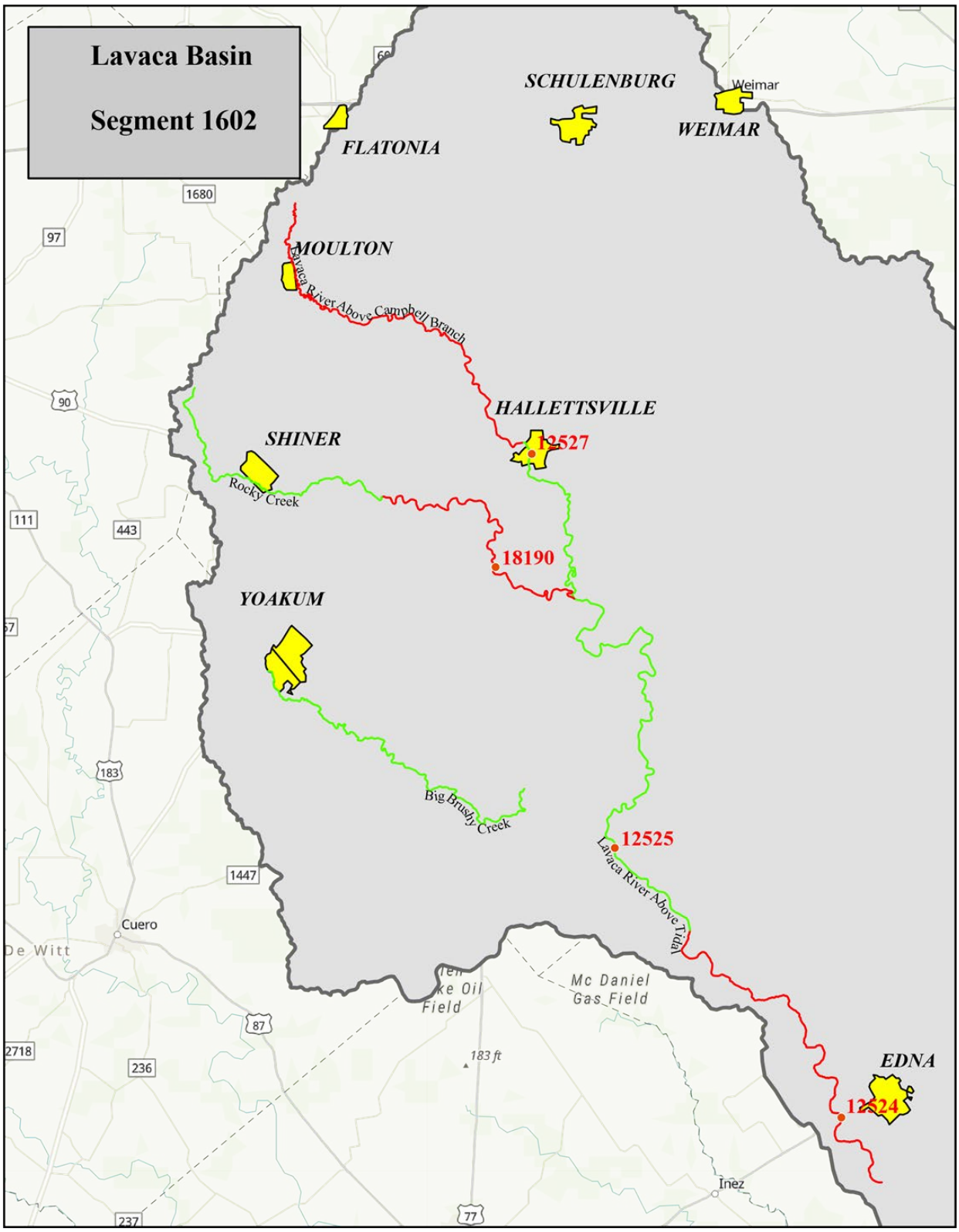

Figure 9: Segment 1602 of the Lavaca River Basin.

Segment 1603 – Navidad River (tidally influenced portion):

This 9-mile segment runs from the confluence with the Lavaca River in Jackson County north to Palmetto Bend Dam in Jackson County. Dry creek drains wastewater effluent from Edna into this segment. The east and west drains along the east and west dikes of Lake Texana also drain water into this segment.

Assessment:

The aquatic life and general uses are fully supported. The contact recreation and fish consumption uses were not assessed.

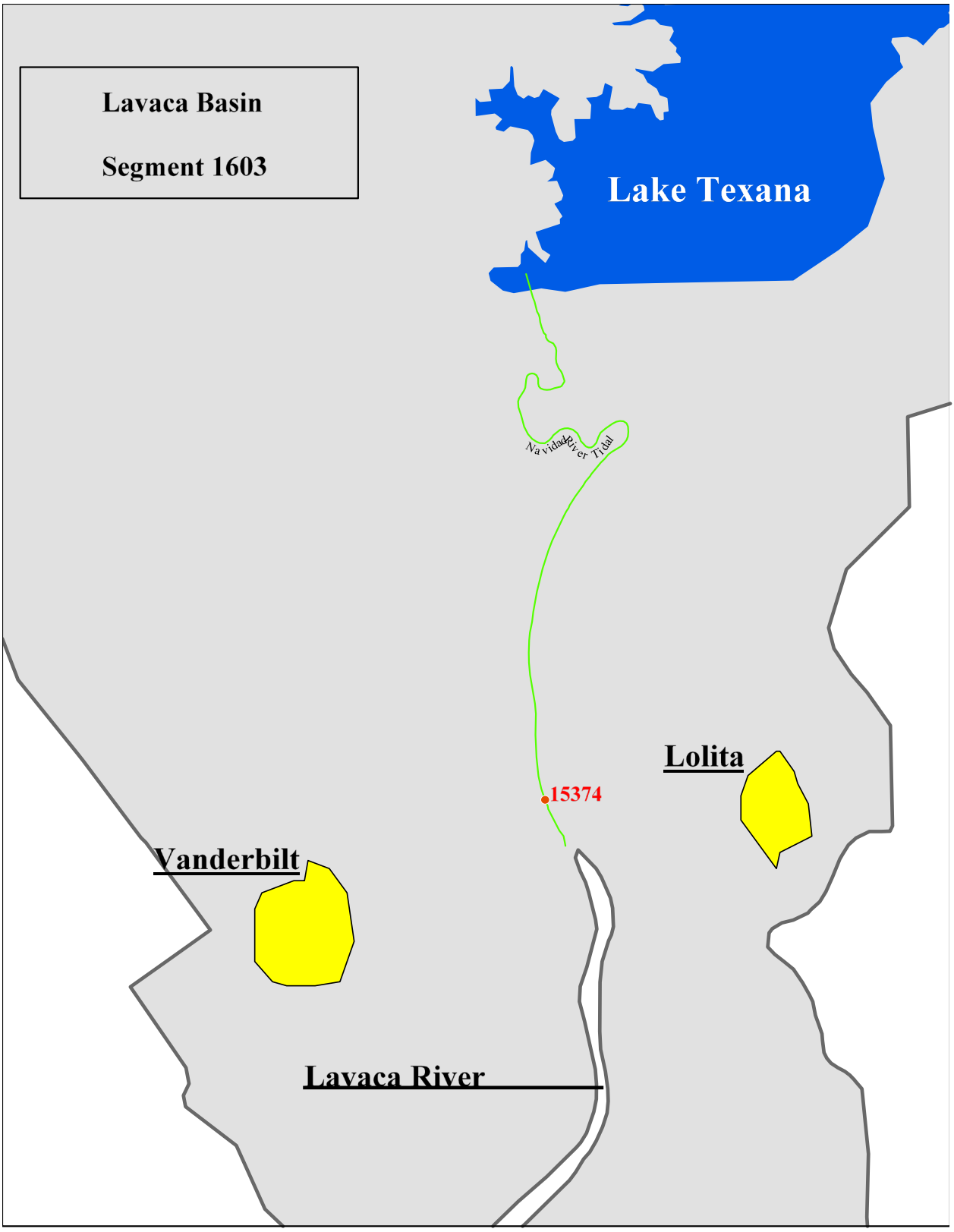

Figure 10: Segment 1603 of the Lavaca River Basin.

Segment 1604 – Lake Texana and its proximate inflows:

From Palmetto Bend Dam in Jackson County to a point 100 meters (~110 yards) downstream of FM 530 in Jackson County, up to normal pool elevation of 44 feet. Lake Texana is a 161,085-acre foot reservoir with 9,727 surface acres impounding waters from the Navidad River, East and West Mustang Creek, and Sandy Creek. Wastewater effluent from Ganado drains into Lake Texana, the city of Louise waste water drains into East Mustang Creek, Breckenridge and Texana parks discharge treated effluent directly into Lake Texana.

Assessment:

The aquatic life, contact recreation, general uses and public water supply uses are fully supported. The fish consumption use was not assessed.

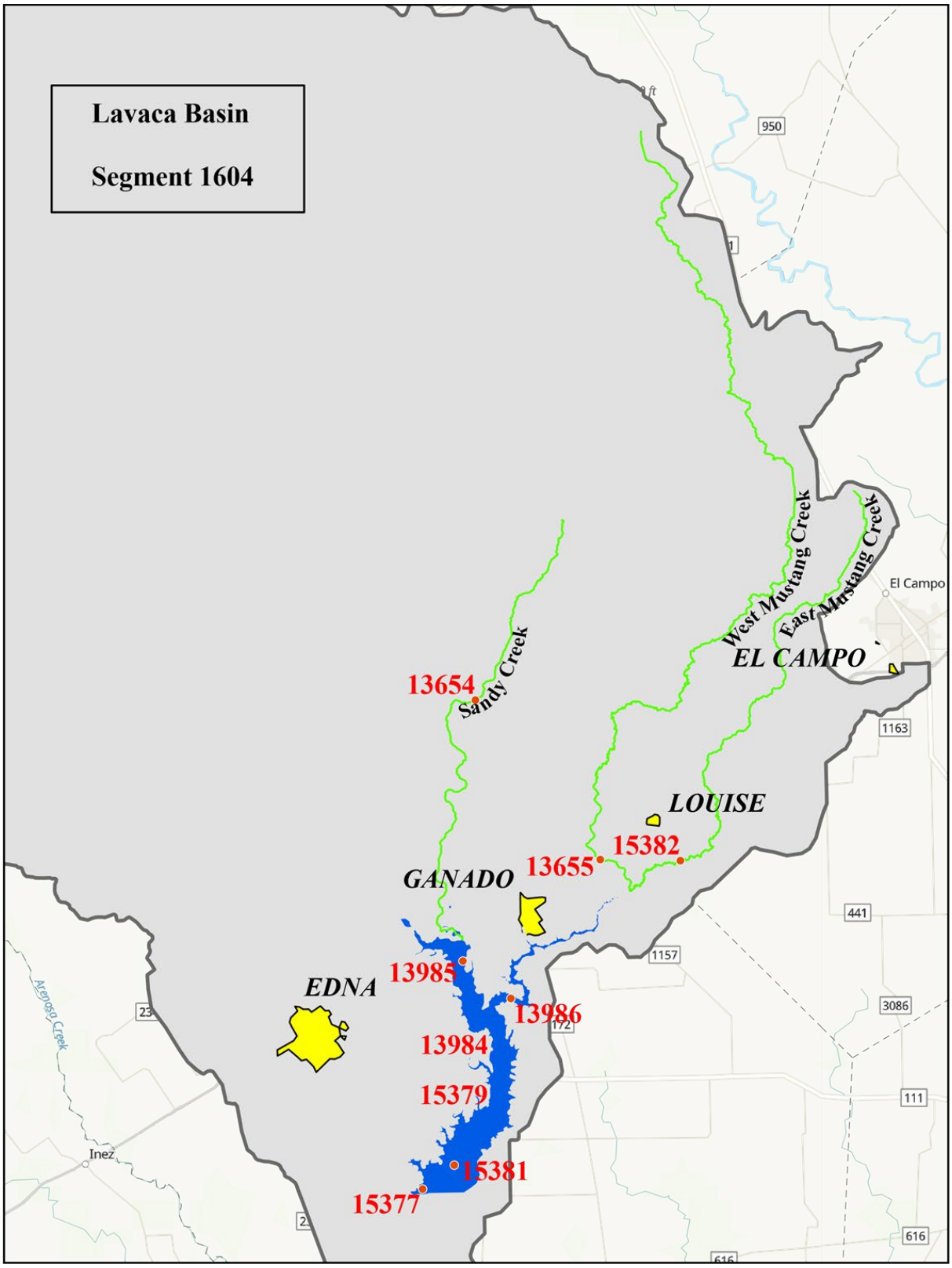

Figure 11: Segment 1604 of the Lavaca River Basin.

Segment 1605 – Navidad River above Lake Texana:

This 62-mile segment runs from above Lake Texana north to the confluence of the East Navidad River and the West Navidad River just southeast of the City of Schulenburg. Wastewater treatment plants discharging into unnamed tributaries in this segment include the communities of Schulenburg and Sheridan.

Assessment:

The aquatic life, public water supply and general uses are fully supported. Contact recreation and fish consumption were not assessed.

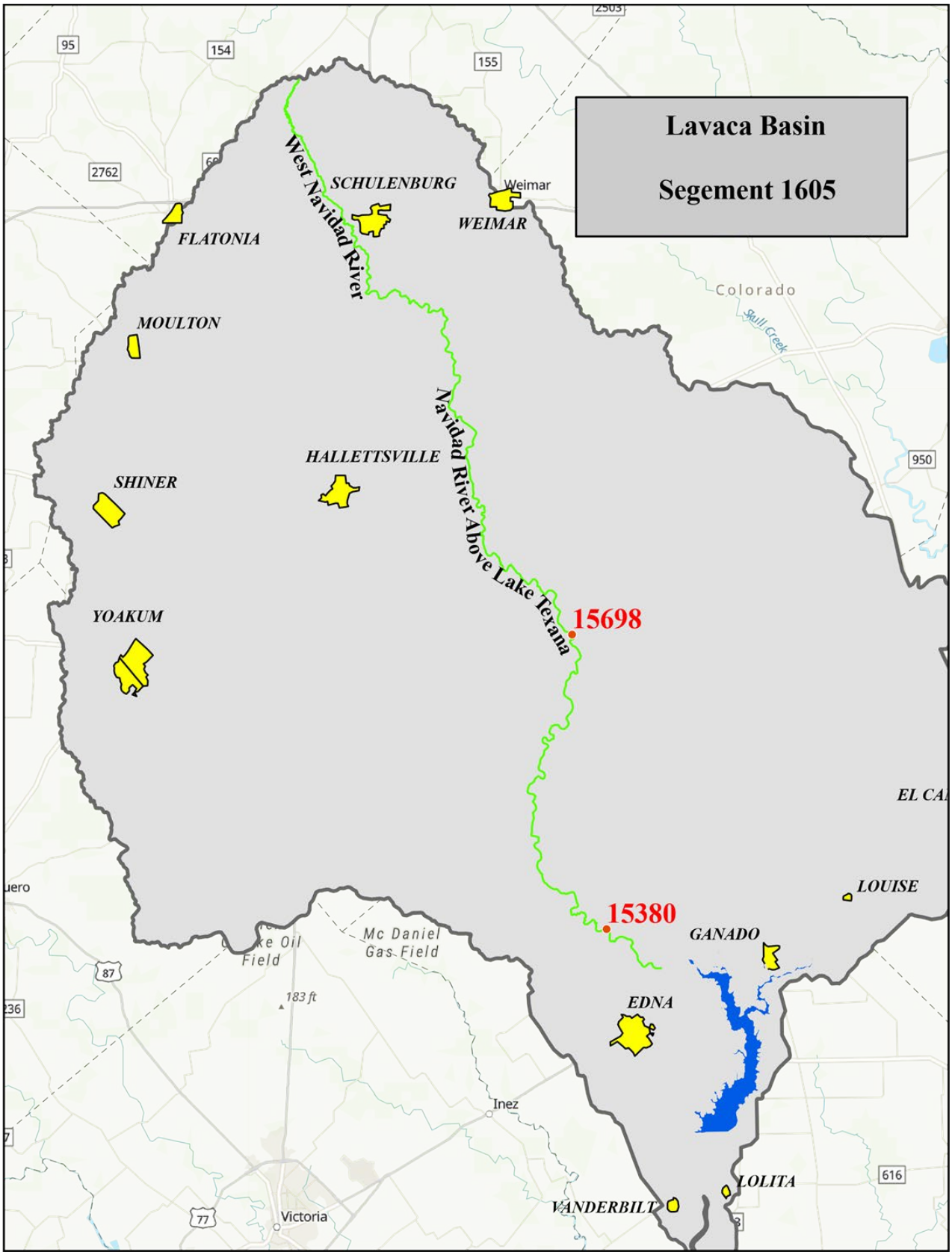

Figure 11: Segment 1605 of the Lavaca River Basin.

Stakeholder Participation and Public Outreach:

Public outreach efforts by LNRA include seeking input from the Lavaca Basin Steering Committee about water quality issues and activities, education outreach and assistance in water conservation and drought contingency planning, news releases, public meetings, attendance at water quality issues meetings, providing water education materials (*Major Rivers*) to elementary schools throughout and near the Basin, presentations to groups, and support of the Texas Stream Team volunteer water quality monitoring program. LNRA staff members are available to answer questions or give assistance with water quality information to Basin students, stakeholders, members of the public, and to respond to calls from concerned citizens. LNRA staff investigate information provided by citizens and contact the appropriate regulatory agency to address the issue. This cooperation between citizens, LNRA, and regulatory agencies has resulted in effective response to potential water quality problems in the Basin. Michael Price is available to provide public outreach services for LNRA. Michael teaches nature crafts and programs at Texana Park and is also available to travel to schools and libraries to present various environmental education programs. LNRA provides the cost of these programs. You may contact Michael Price by phone, 361-308-0153 or via e-mail at **mprice@lnra.org.**

Figure 12: Ranger Cindy Baker assisting students at nature camp

Major Rivers:

The *Major Rivers* water education program for Texas fourth-grade classrooms was revised and updated with additional activities and learning opportunities to better correlate with the state's standardized tests. LNRA provides these new materials (which include student workbooks, water conservation take-home information brochures, pre- and post-tests, teacher workbooks with color overhead transparencies, and an introductory video) to schools in Lavaca Basin.

CRP Steering Committee:

LNRA coordinates with the Clean Rivers Program (CRP) Steering Committee to seek public input, disseminate water quality information, and set priorities for water quality monitoring in the Lavaca Basin. Membership in the Committee is open to staff from state and local governments, private landowners, representatives of industry and agriculture, and interested citizens. Anyone interested in participating as a member of the Steering Committee may contact the offices of LNRA and speak to General Manager Patrick Brzozowski or Director of Environmental Services Chad Kinsfather.

Contact information:

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PO Box 429 Edna, Texas 77957	Fax: 361-782-5310
General Manager: Patrick Brzozowski, P.E.:	**pbrzozowski@lnra.org**
Environmental Department: Chad Kinsfather	**ckinsfather@lnra.org**
Environmental Technician: Brandon Byler	**bbyler@lnra.org**

The Lavaca Basin Steering Committee provides guidance on the use of resources from the Clean Rivers Program. The Steering Committee allows LNRA to gain insight from local stakeholders and expertise from such members as Texas Parks and Wildlife (TPWD), Texas Commission on Environmental Quality (TCEQ), United States Geological Survey (USGS), Natural Resources Conservation Service (NRCS), Texas Stream Team, Texas Department of Agriculture, Texas State Soil and Water Conservation Board, and the County Agricultural Extension Service. Input from the Committee allows LNRA to prioritize water quality issues and to determine the most effective water quality monitoring program.

CRP Steering Committee Meetings are held annually in the summer. Meeting notices are mailed out three weeks in advance to Committee members, and notices of the meetings are posted on the **LNRA Home Page Calendar**. Contact information and a map to the meeting site are found under the "Programs" tab then choose "Clean Rivers". Agendas and minutes of the meetings are also posted on-line. In addition, LNRA places notices of the meetings in all the Basin newspapers (Edna, Hallettsville, Moulton, Schulenburg, Shiner, Yoakum) inviting the public to attend.

Texas Stream Team (formerly Texas Watch):

LNRA provides support to the Texas Stream Team volunteer water quality monitoring program by providing equipment, monitoring supplies and reagents, quality assurance, and environmental data to the volunteers. The Texas Stream Team Program is a statewide network of concerned volunteers, partners, and institutions collaborating to promote a healthy and safe environment through environmental education, data collection, and community action.

Longtime Stream Team participant, Ken Barton, officially retired from monitoring this past year. We appreciate his dedication and service to the volunteer program. Anyone wishing to become involved with Texas Stream Team monitoring may contact Brandon Byler at LNRA or contact Texas Stream Team directly by calling toll-free 1-877-506-1401, or by visiting **the LNRA Web Site** and clicking on the Stream Team link, or by visiting the **Texas Stream Team Web Site**

LNRA Website:

Extensive water quality information for the Lavaca Basin is available via the **Lavaca-Navidad River Authority Web Site** . The LNRA home page provides links to TCEQ, to information about the Clean Rivers Program, to Stream Flow information and much more. Under the "Programs" pull-down menu at the top of the LNRA home page are links to the "Clean Rivers", "Major Rivers", and the "Water Quality" pages. Here is how the links on the "Water Quality" page will appear:

LNRA Water Quality Database

SWQMIS Data Viewer

Annual Water Quality Reports:

2018 Lavaca Basin Highlights Report

2017 Lavaca Basin Summary Report

2016 Lavaca Basin Highlights Report

2015 Lavaca Basin Highlights Report

Water Quality Links:

FY 2018 Coordinated Monitoring Schedule

FY 2018 Water Quality Monitoring Site Map

FY 2018-2019 CRP Work Plan

FY 2018 - 2019 CRP QAPP

Texas Water Quality Inventory and 303(d) List

The **"LNRA Water Quality Database"** link (listed first) connects to a dedicated server storing all state-approved water quality data for the Lavaca Basin, both historical and recent. The data may be accessed by entering a Station ID or site number (shown on map). These Station ID numbers are assigned by TCEQ and are called Surface Water Quality Monitoring (SWQM) site numbers. The sites are described under the "County" and "Segment" listings.

Water quality data can be displayed as an HTML page or as an ASCII delimited text file that can be imported into a spreadsheet or database. Once a sampling site is chosen, data can be retrieved

either by sampling date or by parameter—both of which are displayed in pull-down menus. Water quality parameters, e.g. dissolved oxygen, pH, salinity, etc. are posted with a storet code, but since the names of the parameters are listed one does not need to know the storet code to access the data. Also available in the pull-down parameter menu are the metals, herbicides and pesticides analyzed by contract with the United States Geological Survey (USGS). Once a parameter is chosen, a date range can be entered, as instructed. If no date range is entered the query will produce all available data for that site and parameter. This is an excellent tool for accessing historical or current water quality information for the Lavaca Basin.