



A WATERSHED PROTECTION PLAN FOR THE

EAST FORK SAN JACINTO RIVER WATERSHED

Photo Credit: Kendall Guidroz



EAST FORK SAN JACINTO RIVER
WATERSHED PARTNERSHIP



Houston-Galveston
Area Council



EPA

United States
Environmental Protection
Agency

East Fork San Jacinto River Watershed Protection Plan

Developed for the East Fork of the San Jacinto River, Segment 1003 of the San Jacinto River Basin, by the Houston-Galveston Area Council on behalf of the East Fork San Jacinto River Watershed Partnership.

November 2023

Water Body	Segment	Assessment Units
East Fork San Jacinto River	1003	01, 02, and 03
Winters Bayou	1003A	01
Nebletts Creek	1003B	01
Boswell Creek	1003C	01

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Abbreviations List

AgriLife Extension	Texas A&M University AgriLife Extension
AU	Assessment Unit
BIG	Bacteria Implementation Group
BMP	Best Management Practice
CAFO	Concentrated Animal Feeding Operation
CBOD5	Carbonaceous Biochemical Oxygen Demand, 5-day
CFU	Colony Forming Unit(s)
CRP	Clean Rivers Program
CWA	Clean Water Act
DMR	Discharge Monitoring Report
DO	Dissolved Oxygen
<i>E. coli</i>	<i>Escherichia coli</i>
EQIP	Environmental Quality Incentive Program
EPA	United States Environmental Protection Agency
FEMA	Federal Emergency Management Agency
FOG	Fats, Oils, and Grease
GBEP	Galveston Bay Estuary Program
GIS	Geographic Information System
H-GAC	Houston-Galveston Area Council
HOA	Homeowners Association
I-Plan	(TMDL) Implementation Plan
Texas Integrated Report	Texas Integrated Report of Surface Water Quality
LDC	Load Duration Curve
LID	Low Impact Development

MGD	Million Gallons per Day
mL	Milliliters
MS4	Municipal Separate Storm Sewer System
MST	Microbial Source Tracking
MUD	Municipal Utility District
NGO	Non-governmental Organization
NHD+	National Hydrography Dataset Plus
NRCS	(USDA) Natural Resources Conservation Service
OSSF	On-Site Sewage Facility
Partnership	East Fork San Jacinto River Watershed Partnership
SELECT	Spatially Explicit Load Enrichment Calculation Tool
SEP	Supplemental Environmental Project
SJRA	San Jacinto River Authority
SPCA	Society for the Prevention of Cruelty to Animals
SSO	Sanitary Sewer Overflow
SWCD	Soil and Water Conservation District
SWQS	Surface Water Quality Standards
TCEQ	Texas Commission on Environmental Quality
TMDL	Total Maximum Daily Load
TPWD	Texas Parks and Wildlife Department
TPDES	Texas Pollutant Discharge Elimination System
TSS	Total Suspended Solids
TSSWCB	Texas State Soil and Water Conservation Board
TST	Texas Stream Team

TWON	Texas Well Owner Network
TWRI	Texas Water Resources Institute
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USGS	United States Geological Survey
WPP	Watershed Protection Plan
WQMP	Water Quality Management Plan
WWTF	Wastewater Treatment Facility

Supporting Documents

Several supporting documents providing additional detail about the analyses and processes the Partnership undertook to develop this watershed protection plan are hosted on the project website¹. They include:

- **Quality Assurance Project Plan** – the quality assurance document indicating the manner and methods in which project modeling efforts were conducted to ensure results reflect project data quality objectives.
- **Acquired Data Analysis Summary Report** – a detailed report on analyses of various water quality data used to characterize the conditions in the project area waterways.
- **Bacteria Modeling Report** – a detailed summary of the development, implementation, and results of the bacteria modeling efforts.
- **Public Outreach Report** – a summary of the efforts and activities conducted by the Houston-Galveston Area Council to engage and inform project stakeholders, key partners, and general watershed audiences.

¹ Visit <http://www.eastforkpartnership.weebly.com/> to learn more.

Executive Summary

The East Fork San Jacinto River Watershed

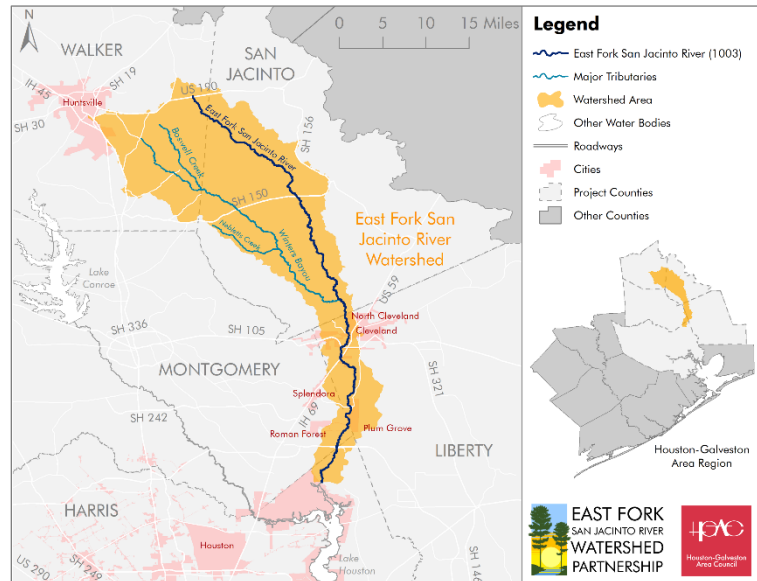
East Fork San Jacinto River (Segment 1003) runs south from headwaters in Walker County to a confluence with the Lake Houston reservoir, an important drinking water source for the region. Approximately 410 square miles of land area covering portions of Walker, San Jacinto, Montgomery, Liberty, and Harris counties, and spanning a landscape consisting mostly of forest and other natural land cover types form the watershed area. This area and its waterways represent an essential part of supporting local communities and economies, recreation, fisheries, and a diverse ecology.

Water Quality Challenges

High levels of fecal waste indicated by the presence of the indicator bacteria *Escherichia coli* (*E. coli*), are prevalent throughout the East Fork San Jacinto River watershed and are of particular concern as flows from East Fork San Jacinto River contribute to the Lake Houston reservoir. Elevated levels of fecal waste in area waterways can be a result of both human activities, such as overflow from sanitary sewers and on-site sewage facilities, as well as natural influences like waste from native wildlife and invasive species. Harmful pathogens associated with fecal waste can impact public health.

Water quality is sampled in East Fork San Jacinto River and its tributaries at least quarterly at 14 active monitoring stations, providing the basis for assessing the health of the system. As in past years, the 2022 Texas Integrated Report of Surface Water Quality (a summary of water quality in Texas waterways) indicates that East Fork San Jacinto River (1003) has a contact recreation impairment due to levels of *E. coli* that exceed the state water quality standard. Tributaries to the East Fork San Jacinto River also show high levels of bacteria, including Winters Bayou (1003A), which is impaired for contact recreation, and Boswell Creek (1003C), which has a concern for elevated *E. coli* levels.

The sources of water quality concerns and impairments in this watershed are widespread, diffuse, and diverse in origin, making them more difficult to address through traditional approaches focusing on single entities and regulation. Primary sources of concern are



livestock waste, wildlife waste, and waste from invasive feral hogs. Pollutant sources related to human activity will continue to increase as area growth drives future development in the watershed, exacerbating the existing situation. Watershed Protection Plan (WPP) project estimates indicate that necessary reductions of *E. coli* loads range from 35% to 38%.

Local concerns over the future of East Fork San Jacinto River led to the development of this WPP as a voluntary, locally-led approach to improving water quality for this area. The Houston-Galveston Area Council (H-GAC) and the Texas Commission on Environmental Quality (TCEQ) facilitated the formation and efforts of the East Fork San Jacinto River Watershed Partnership, a group of local stakeholders representing residents, government, industry, agricultural producers, community groups, and other local partners. The purpose of the WPP is to use sound science and local knowledge to identify sources of pollution and support community-led decision-making about potential solutions.



Finding Solutions

The Partnership used a variety of methods to evaluate the causes and sources of water quality issues. Interpretation of water quality monitoring data and computer modeling efforts were shaped by local knowledge. Local stakeholders reviewed and revised these results and used them to inform decisions about potential solutions. Specific focus was given to reducing fecal waste, which can directly impact human health, and precursors for low dissolved oxygen, which impacts aquatic life and recreational fishing. Activities to address fecal waste sources and other concerns were identified and discussed by members of the Partnership who worked diligently to balance local interests and ensure that solutions reflected community priorities. Because pollutant sources are diverse, the Partnership's recommendations represent a flexible range of solutions designed to adapt to changing conditions. The result of these efforts is a set of voluntary solutions that will guide efforts to improve water quality through 2040.

Implementing the Plan

Implementation of the WPP will require the continued coordination, cooperation, and commitment of the local partners. The general guidelines for implementation established by the stakeholders are that solutions should be voluntary, solutions should be cost-effective, decisions should continue to be made by local stakeholders, education should be a primary tool, due diligence should be given to avoiding unintended consequences, and that established programs or resources should be used whenever possible in place of new efforts. A crucial aspect of supporting these efforts will be an ongoing education and outreach campaign focused on increasing public awareness and participation. Successful implementation will rely on an active, engaged stakeholder group.

Ensuring Success

As the WPP is implemented, the stakeholders will review efforts periodically to ensure that progress is being made. The stakeholders established a series of milestones and measures of success to aid in determining whether progress is being made. The ultimate test of the WPP's success will be the ability of the waterways to meet state water quality standards based on water quality monitoring data. However, incremental progress will also be measured by achieving programmatic goals. The WPP will utilize adaptive management to modify approaches to meet new challenges and changing conditions. The following table is a guide to the contents of the WPP. Additional information on specific items can be found in Appendix A.

Watershed Protection Plan Content Guide

WPP Section	Description	EPA Element	Location
Section 1 – Project Background	An introduction to the watershed planning process for East Fork San Jacinto River	NA	pp. 1-7, Appendix A
Section 2 – Watershed Characterization	A summary of the physical (geography, climate, etc.), human (land use, political geography), and water quality characteristics of the watershed	NA	pp. 9-36, Appendix B
Section 3 – Identifying Pollutant Sources	An evaluation of water quality data, stakeholder knowledge and modeling results to identify and characterize causes and sources of pollution	<ul style="list-style-type: none"> Element A – Identify the causes and sources of pollution 	pp. 38-93, Appendix B
Section 4 – Improving Water Quality	Establishing the amount of reduction in pollutant source loads needed to achieve water quality goals	<ul style="list-style-type: none"> Element B – Estimate of load reductions 	pp. 95-110
Section 5 – Recommended Solutions	A description of the solutions recommended by the Partnership, including information about the selection process, and the cost and technical expertise needed to implement them	<ul style="list-style-type: none"> Element C – Description of management measures Element D - Estimate of technical and financial resources needed 	pp. 112-151, Appendices C and D
Section 6 – Education and Outreach	An outline of the education and outreach efforts that will increase public awareness of the WPP and support its implementation	<ul style="list-style-type: none"> Element E – Information and Public Education Component 	pp. 153-164
Section 7 – Implementation	The schedules for implementation, and measurable milestones for tracking progress	<ul style="list-style-type: none"> Element F – Schedule for implementation Element G – Interim measurable milestones 	pp. 166-183
Section 8 – Evaluating Success	An overview of the criteria and data that will be used to evaluate the success of implementation efforts	<ul style="list-style-type: none"> Element H – Criteria for successful implementation Element I – Monitoring component to evaluate effectiveness 	pp. 185-190