

East Texas Recreational Use Attainability Analyses Project Comprehensive Report

Sabine River Basin – South Fork of the Sabine River (Segment 0507G); Elm Creek (Segment 0512B); Running Creek (Segment 0512A); Caney Creek (Segment 0502B)
Contract No. 582-9-90439-11



Caney Creek at Site CC003

Prepared for:

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY



Prepared by:

Texas AgriLife Research and Parsons



AUGUST 2011

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August 2011

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Preparation of this report was financed through grants from the U.S. Environmental Protection Agency through the Texas Commission on Environmental Quality Federal Grant #07-09 106 Categorical Water Pollution Control 98665304 (State USAS Grant #998807) and Federal Grant #09-11 106 Categorical Water Pollution Control 98665305 (State USAS Grant #998810)

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ACRONYMS AND ABBREVIATIONS

ATV	all-terrain vehicle
cfs	cubic feet per second
FM	farm to market
GIS	Geographic Information System
GPS	Global Positioning System
m	meter
NHD	National Hydrography Dataset
PDI	Palmer Drought Index
QAPP	Quality Assurance Project Plan
RUAA	Recreational Use Attainability Analysis
SRA	Sabine River Authority
SS-QAP	Site Specific Project Quality Assurance Plan
SWQM	surface water quality monitoring
TCEQ	Texas Commission on Environmental Quality
TPDES	Texas Pollutant Discharge Elimination System
TSHA	Texas State Historical Association
TSWQS	Texas Surface Water Quality Standards
UAA	Use Attainability Analysis
USEPA	U.S. Environmental Protection Agency
USGS	U.S. Geological Survey
WWTP	wastewater treatment plant

SECTION 1 INTRODUCTION

This study was performed in East Texas on portions of the Sabine River basin to quantify characteristics of a select group of water bodies to assist the Texas Commission on Environmental Quality (TCEQ) in the development of appropriate use classifications. Use Attainability Analyses (UAA) are assessments of the physical, chemical, biological, and economic conditions affecting attainment of a water body use. Recreational UAAs (RUAA) assess existence and level of recreation use on the segment. Several water bodies in Texas are identified as not meeting water quality criteria for the contact recreation use assigned to them. In addition, concerns have been raised by stakeholders statewide as to the appropriateness of the current recreational uses and criteria based on the U.S. Environmental Protection Agency's (USEPA) *Ambient Water Quality Criteria for Bacteria – 1986*. This RUAA report covers four unclassified water bodies of the Sabine River basin, and was commissioned by TCEQ to collect data that will assist it in addressing these issues.

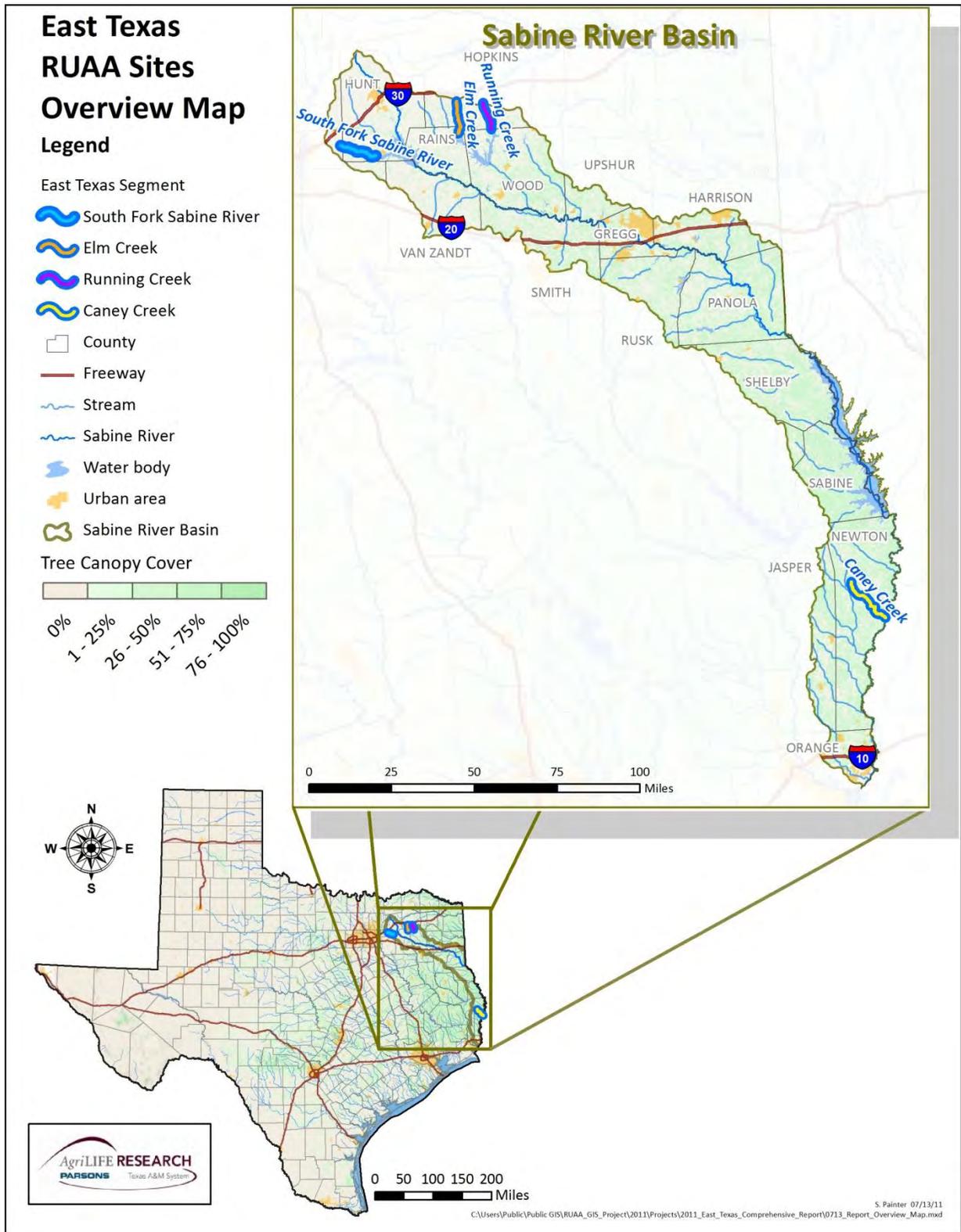
1.1 Project Description

The purpose of this project was to conduct Comprehensive RUAA surveys on the water bodies listed in Table 1.1 and illustrated in Figure 1.1, which are on the Texas 2008 303(d) List of Impaired Waters. Table 1.1 identifies both the portion of each water body considered impaired, as defined in the Texas 2008 303(d) list, and the entire length based on the National Hydrography Dataset (NHD). RUAA surveys were conducted on the length of each water body as defined in the NHD in an effort to characterize the entire stream. This investigation provides information necessary for TCEQ to evaluate, and if appropriate, modify contact recreation use designations.

Table 1.1 Water Bodies Targeted for RUAA

Assessment Unit	Water Body Name	TCEQ 303(d) List Description	Stream Type	303(d) Listed Assessment Miles	NHD Stream Miles
0507G	South Fork of the Sabine River	From the confluence with Lake Tawakoni upstream to the confluence with Klutts and Sabine Creek.	Perennial	16.6	18.5
0512B	Elm Creek	From the confluence with Lake Fork Reservoir in Rains County to the headwaters northwest of Shirley in Hopkins County.	Intermittent with Perennial Pools	9.8	12.8
0512A	Running Creek	From the confluence with Lake Fork Reservoir to the headwaters southeast of Martin Springs in Hopkins County.	Perennial	11.6	14.2
0502B	Caney Creek	Perennial stream from the Sabine River upstream to the confluence with Martin Branch.	Perennial	24.7	24.8
Total Miles				62.7	70.3

Figure 1.1 Water Bodies in the Sabine River Basin Targeted for RUAA



1.2 TCEQ Guidelines for RUAA's

The TCEQ guidance outlined in *Recreational Use-Attainability Analyses (RUAA): Procedures for a Comprehensive RUAA and a Basic RUAA Survey* provided the guidelines for design of this study (TCEQ 2009a). The general concept behind RUAA's is to evaluate if an alternative recreational use should be assigned to classified or unclassified streams other than the designated or presumed recreational uses identified in the in the Texas Surface Water Quality Standards (TSWQS) 30 Texas Administrative Code 307.1-307.10. A recreational use that is less stringent than applicable presumed uses can only be assigned to a water body for regulatory purposes after that use is designated for an individual water body in the TSWQS and approved by USEPA (TCEQ 2009a).

Designated recreational uses for classified water bodies, as found in Appendix A of the TSWQS document, include:

- Contact recreation: Recreational activities involving a significant risk of ingestion of water, including wading by children, swimming, water skiing, diving, and surfing.
- Noncontact recreation: Aquatic recreational pursuits not involving a significant risk of water ingestion; including fishing, commercial and recreational boating, and limited body contact incidental to shoreline activity.

Contact recreation is presumed as a use for all unclassified waters. Based on the 2010 TSWQS approved by TCEQ in June 2010, recreational uses that can now be considered for classified and unclassified streams include:

- Primary Contact Recreation: Water recreation activities, such as wading by children, swimming, water skiing, diving, tubing, surfing, and whitewater kayaking, canoeing, and rafting, involving a significant risk of ingestion of water.
- Secondary Contact Recreation 1: Commonly occurring water recreation activities, such as fishing, commercial and recreational boating, and limited body contact incidental to shoreline activity, not involving a significant risk of water ingestion.
- Secondary Contact Recreation 2: Water recreation activities, such as fishing, commercial and recreational boating, and limited body contact incidental to shoreline activity, not involving a significant risk of water ingestion but that occur less frequently than for Secondary Contact Recreation 1 due to (1) physical characteristics of the water body, and/or (2) limited public access.
- Noncontact Recreation: Activities such as ship and barge traffic, birding, and using hike and bike trails near a water body, not involving a significant risk of water ingestion, and where Primary and Secondary Contact Recreation should not occur because of unsafe conditions.

A change to a designated use requires a revision in the TSWQS adopted by TCEQ and approved by USEPA. RUAA's are the documentation required by TCEQ to evaluate and consider a change to a designated or presumed use.

A Basic RUAA Survey is conducted to (1) collect information on a water body, such as the presence or absence of water recreation activities, stream flow type, and stream depth, (2) establish/verify a presumed use, or (3) provide core information to be included in a

Comprehensive RUAA. A Basic RUAA survey can be conducted on an unclassified water body that is evaluated during conditions amenable for contact recreation and can often be accomplished on a single sampling date. A Comprehensive RUAA, which includes information from a Basic RUAA Survey, is required for classified water bodies or where presumed uses for unclassified water bodies may be inappropriate. A Comprehensive RUAA is an expanded effort requiring two or more field observation trips and a historical data review.

SECTION 2

SITE RECONNAISSANCE AND SELECTION

The process of developing a survey site list began by using a combination of Geographic Information System (GIS) data, review of historical information, meetings and phone conversations with local entities, and field reconnaissance. The Site Specific Project Quality Assurance Plan (SS-QAP) and Monitoring Plan for this investigation was used to present detailed information on site selection, maps of the water bodies and proposed survey sites, survey and interview procedures, field survey equipment, and data handling and reporting.

2.1 Site Selection Criteria

The TCEQ guidance outlined in *Recreational Use-Attainability Analyses (RUAA): Procedures for a Comprehensive RUAA and a Basic RUAA Survey* (TCEQ 2009a) recommends surveys be performed on three sites for every five stream miles to collect information to support the RUAA. With the 70 stream miles covered by the four water bodies listed in Table 1.1 this equates to 42 recommended survey sites. Using this as a guideline, specific criteria were established to evaluate this recommended population of survey sites and determine which of these could be effectively surveyed. Key criteria used in this investigation to aid survey site selection included:

- Locating areas in which the water body is accessible to the public and has the highest potential for recreational use (road crossings, public lands/parks located near the water body, populated areas, federal and state parks, parks operated by the U.S. Army Corps of Engineers, river authorities, counties, cities, and private organizations).
- Utilizing GIS tools to compile supplemental information, including locations of Texas Pollution Discharge Elimination System (TPDES) wastewater treatment plants (WWTP), other pertinent jurisdictional information, and roads crossing streams.
- Riparian corridor characteristics.
- Hydrologic characteristics, such as stream type, stream flow, hydrologic alterations, etc.
- Landowner or tenant permission to access private lands was acquired before conducting surveys.
- When possible, sites were selected at or near existing stream flow gages and existing surface water quality monitoring stations.

Survey site selection was prioritized using the following scheme: public road crossings, publicly accessible locations, then privately owned access points that might be used by the public, which resulted in a draft list of 49 potential survey sites. To the degree possible the information listed in the criteria above was integrated into GIS maps and proposed survey sites were displayed. Using GIS, each stream was divided into 5-mile subsegments to aid the visual assessment of attempting to have three survey sites for every five stream miles. GIS maps and a draft list of survey sites were produced and used by a field crew to conduct site reconnaissance to verify if each proposed site could in fact be surveyed. Site reconnaissance maps are provided in Appendix A, and Table 2.1 provides the list of survey sites considered. The potential survey sites in Table 2.1 are listed upstream to downstream for each stream.

Table 2.1 Potentially Accessible Sites Evaluated by Reconnaissance Team Prior to Survey Data Collection

Count	Stream Name	Road Name	Alternate Road Name	Site ID Number ¹	Assessment Unit	5 mile Subsegment Unit	USGS Flow Location Within 2 Miles	TCEQ SWQM Location
1	South Fork Sabine River	Private Road 2030		SF001	0507G	0507G_04		
2	South Fork Sabine River	Sabine Circle		SF002	0507G	0507G_04		
3	South Fork Sabine River	State Hwy 276		18	0507G	0507G_04		
4	South Fork Sabine River	FM 1565		17	0507G	0507G_03	08017300	14697
5	South Fork Sabine River	County Road 2426		SF003	0507G	0507G_03		
6	South Fork Sabine River	County Road 2426		SF004	0507G	0507G_03		
7	South Fork Sabine River	County Road 2400		15	0507G	0507G_02		
8	South Fork Sabine River	Sally Goodin Lane		SF005	0507G	0507G_02		
9	South Fork Sabine River	County Road 2316		16	0507G	0507G_02		
10	South Fork Sabine River	State Highway 34 S		SF006	0507G	0507G_01		
11	South Fork Sabine River	State Highway 34 S		14	0507G	0507G_01		10436
12	South Fork Sabine River	State Highway 34 S		SF007	0507G	0507G_01		
13	Elm Creek	County Road 1110		49	0512B	0512B_03		
14	Elm Creek	County Road 1171		47	0512B	0512B_03		
15	Elm Creek	County Road 1116		48	0512B	0512B_03		
16	Elm Creek	County Road 1170		46	0512B	0512B_02		
17	Elm Creek	State Hwy 19		44	0512B	0512B_02		
18	Elm Creek	FM 1567 W		45	0512B	0512B_02		14479
19	Elm Creek	County Road 1167		43	0512B	0512B_02		
20	Elm Creek	County Road 1163	County Road 1184	40	0512B	0512B_01		14263
21	Elm Creek	County Road 3425		41	0512B	0512B_01		

Count	Stream Name	Road Name	Alternate Road Name	Site ID Number ¹	Assessment Unit	5 mile Subsegment Unit	USGS Flow Location Within 2 Miles	TCEQ SWQM Location
22	Elm Creek	FM 514		42	0512B	0512B_01		14478
23	Running Creek	County Road 2174		55	0512A	0512A_03		
24	Running Creek	Elberta Lake Road		RC001	0512A	0512A_03		
25	Running Creek	County Road 2322		RC002	0512A	0512A_03		
26	Running Creek	County Road 2322		53	0512A	0512A_02		14275
27	Running Creek	FM 1567 E		54	0512A	0512A_02		14264
28	Running Creek	County Road 2436		RC003	0512A	0512A_02		
29	Running Creek	County Road 2436		50	0512A	0512A_01		
30	Running Creek	County Road 1439		RC004	0512A	0512A_01		
31	Running Creek	County Road 2432		RC005	0512A	0512A_01		
32	Running Creek	County Road 2432		RC006	0512A	0512A_01		
33	Caney Creek	FM 1012		CC001	0502B	0502B_05		
34	Caney Creek	FM 1012		CC002	0502B	0502B_05		
35	Caney Creek	County Road 1001		CC003	0502B	0502B_05		
36	Caney Creek	State Hwy 87		64	0502B	0502B_04		
37	Caney Creek	US Hwy 190	E Court St	62	0502B	0502B_04		
38	Caney Creek	State Loop 505		61	0502B	0502B_04		
39	Caney Creek	US Hwy 190	Rusk St	63	0502B	0502B_04		
40	Caney Creek	State Loop 505	Kaufman St; Weiss St.	65	0502B	0502B_04		17464
41	Caney Creek	Lee's Mill Road		CC004	0502B	0502B_03		
42	Caney Creek	Lee's Mill Road		CC005	0502B	0502B_03		
43	Caney Creek	Unnamed Street		60	0502B	0502B_03		

Count	Stream Name	Road Name	Alternate Road Name	Site ID Number ¹	Assessment Unit	5 mile Subsegment Unit	USGS Flow Location Within 2 Miles	TCEQ SWQM Location
44	Caney Creek	FM 2626		59	0502B	0502B_02		
45	Caney Creek	Lee's Mill Road		CC006	0502B	0502B_02		
46	Caney Creek	Lee's Mill Road		CC007	0502B	0502B_01		
47	Caney Creek	Jones Road	CR 2001	58	0502B	0502B_01		
48	Caney Creek	US Hwy 190		56	0502B	0502B_01		14491
49	Caney Creek	Sabine Sands Road		57	0502B	0502B_01		

¹ All sites using the five-character nomenclature (e.g., CC007) are located on private property.

2.2 Agency and Landowner Input

Input from the Sabine River Authority (SRA), Texas Parks and Wildlife Department regional staff, TCEQ regional staff, Texas State Soil and Water Conservation Board and other local agencies and stakeholders is recognized as the key source of information that can lead to the improvement of the prioritization of selecting survey sites. Therefore, two meetings with state agencies, river authority representatives, local officials, and stakeholders were held to obtain input on the proposed survey sites prior to field data collection. Given the highly rural nature and the limited number of stream road crossings in some of the subsegments, feedback obtained from the meetings proved invaluable to the field crews.

The first meeting targeted local and state agencies in an effort to inform them of the goals and objectives associated with conducting RUAs. At the same time input was sought on the proposed sampling survey sites being recommended for the four Sabine River tributaries. Appendix B provides a list of individuals who were invited to this meeting, which was held at the SRA facility located at Lake Fork, near Quitman, TX on August 26, 2009.

A second stakeholder meeting targeted landowners, land managers, community leaders and the general public. This was held on May 20, 2010, also at the SRA facility near Quitman, TX. Watershed stakeholders were invited to attend the public meeting through public announcements (newspapers and TCEQ webpage), and individual phone calls. Lists of those invited to attend the second meeting are provided in Appendix B.

Two additional stakeholder meetings were held to present a summary of the information provided in this report and gather other information from citizens on the recreational uses of these water bodies. The first meeting was held on August 23, 2011 in Sulphur Springs, TX and the second on August 24, 2011 in Jasper, TX.

2.3 Site Reconnaissance

Using the site reconnaissance maps (Appendix A) and the draft list of survey sites (Table 2.1), a pair of teams consisting of two members each attempted to reach the potential sites. The teams recorded the accessibility (public, private), descriptions for survey teams of how to access each water body, recreational evidence, stream type (perennial, intermittent, etc.), stream flow, hydrologic modifications, and Global Positioning System (GPS) data. Not all sites were accessible to the public or the team. Attempts to contact property owners through local contacts such as the Hopkins County AgriLife Extension office, Texas Parks and Wildlife, the Hopkins, Hunt, and Newton County Central Appraisal District offices resulted in access to a few additional survey sites. Efforts were made to evaluate a 300 meter (m) stretch of the creek bed at each of the survey sites.

Field team members did not enter into fenced or designated private properties without landowner/tenant permission for the safety of team members. Sites that field teams could access from public points of interest and/or through landowner/tenant approved locations were the only ones surveyed. Verification of limited access decreased the total number of sites that could be surveyed; however, site reconnaissance did prove to be a valuable and necessary step to prepare the field teams for conducting the actual surveys to support the RUAs. Site reconnaissance resulted in the determination that of the original 49 potential sites listed in Table 2.1, 43 of those sites were considered candidates for conducting site surveys. Those sites

would serve as the basis for the comprehensive RUAs for the four streams addressed in this report. The 43 survey sites are listed in Table 2.2. Sites for each stream are arranged in Table 2.2 from upstream to downstream.

Table 2.2 List of Survey Sites for the Sabine River Basin RUAA

Count	Stream Name	Road Name	Site ID	Assessment Unit	5 Mile Subsegment Unit	Scheduled Monitoring Frequency FY 2011	USGS Flow Location Within 2 Miles	TCEQ SWQM Location	X Coordinate	Y Coordinate
1	South Fork Sabine River	Private Road 2030	SF001	0507G	0507G_04	Twice			96° 18' 26.92" W	32° 54' 51.57" N
2	South Fork Sabine River	Sabine Circle	SF002	0507G	0507G_04	Twice			96° 17' 57.86" W	32° 54' 38.66" N
3	South Fork Sabine River	State Hwy 276	18	0507G	0507G_04	Twice			96° 17' 1.70" W	32° 54' 17.45" N
4	South Fork Sabine River	FM 1565	17	0507G	0507G_03	Twice	08017300	14697	96° 15' 11.47" W	32° 53' 52.14" N
5	South Fork Sabine River	County Road 2426	SF003	0507G	0507G_03	Twice			96° 14' 11.25" W	32° 53' 30.22" N
6	South Fork Sabine River	County Road 2426	SF004	0507G	0507G_03	Twice			96° 13' 7.86" W	32° 53' 3.40" N
7	South Fork Sabine River	County Road 2400	15	0507G	0507G_02	Twice			96° 12' 53.25" W	32° 52' 58.68" N
8	South Fork Sabine River	Sally Goodin Lane	SF005	0507G	0507G_02	Twice			96° 12' 1.77" W	32° 53' 9.63" N
9	South Fork Sabine River	County Road 2316	16	0507G	0507G_02	Twice			96° 10' 44.31" W	32° 52' 51.70" N
10	South Fork Sabine River	State Highway 34 S	SF006	0507G	0507G_01	Twice			96° 9' 20.15" W	32° 51' 50.64" N
11	South Fork Sabine River	State Highway 34 S	14	0507G	0507G_01	Twice		10436	96° 8' 56.03" W	32° 51' 40.54" N
12	South Fork Sabine River	State Highway 34 S	SF007	0507G	0507G_01	Twice			96° 8' 6.32" W	32° 51' 48.74" N
13	Elm Creek	County Road 1170	46	0512B	0512B_02	Twice			95° 41' 38.76" W	33° 02' 42.00" N
14	Elm Creek	State Hwy 19	44	0512B	0512B_02	Twice			95° 41' 38.98" W	33° 02' 41.98" N
15	Elm Creek	Farm Rd 1567 W	45	0512B	0512B_02	Twice		14479	95° 41' 23.04" W	33° 01' 20.66" N
16	Elm Creek	County Road 1167	43	0512B	0512B_02	Twice			95° 41' 23.83" W	33° 00' 30.43" N
17	Elm Creek	County Road 1163	40	0512B	0512B_01	Twice		14263	95° 41' 09.17" W	32° 59' 49.24" N

Count	Stream Name	Road Name	Site ID	Assessment Unit	5 Mile Subsegment Unit	Scheduled Monitoring Frequency FY 2011	USGS Flow Location Within 2 Miles	TCEQ SWQM Location	X Coordinate	Y Coordinate
18	Elm Creek	County Road 3425	41	0512B	0512B_01	Twice			95° 41' 34.44" W	33° 00' 38.49" N
19	Elm Creek	FM 514	42	0512B	0512B_01	Twice		14478	95° 40' 56.57" W	32° 58' 19.31" N
20	Running Creek	Elberta Lake Road	RC001	0512A	0512A_03	Twice			95° 33' 16.97" W	33° 3' 9.34" N
21	Running Creek	County Road 2322	RC002	0512A	0512A_03	Twice			95° 32' 56.00" W	33° 2' 50.78" N
22	Running Creek	County Road 2322	53	0512A	0512A_02	Twice		14275	95° 32' 09.96" W	33° 01' 40.54" N
23	Running Creek	FM 1567 E	54	0512A	0512A_02	Twice		14264	95° 31' 37.32" W	33° 00' 34.90" N
24	Running Creek	County Road 2436	RC003	0512A	0512A_02	Twice			95° 31' 7.16" W	32° 59' 48.95" N
25	Running Creek	County Road 2436	50	0512A	0512A_01	Twice			95° 31' 5.98" W	32° 59' 41.34" N
26	Running Creek	County Road 1439	RC004	0512A	0512A_01	Twice			95° 31' 21.78" W	32° 59' 23.31" N
27	Running Creek	County Road 2432	RC005	0512A	0512A_01	Twice			95° 31' 13.21" W	32° 58' 32.02" N
28	Running Creek	County Road 2432	RC006	0512A	0512A_01	Twice			95° 31' 16.91" W	32° 58' 8.98" N
29	Caney Creek	FM 1012	CC001	0502B	0502B_05	Twice			93° 46' 52.92" W	30° 53' 22.05" N
30	Caney Creek	FM 1012	CC002	0502B	0502B_05	Twice			93° 46' 57.54" W	30° 53' 02.80" N
31	Caney Creek	County Road 1001	CC003	0502B	0502B_05	Twice			93° 46' 29.00" W	30° 51' 45.00" N
32	Caney Creek	State Hwy 87	64	0502B	0502B_04	Twice			93° 45' 56.51" W	30° 51' 0.00" N
33	Caney Creek	US Hwy 190	62	0502B	0502B_04	Twice			93° 45' 46.53" W	30° 50' 52.13" N
34	Caney Creek	State Loop 505	61	0502B	0502B_04	Twice			93° 45' 36.24" W	30° 50' 35.43" N
35	Caney Creek	US Hwy 190	63	0502B	0502B_04	Twice			93° 45' 26.90" W	30° 50' 25.78" N
36	Caney Creek	Lee's Mill Road	CC004	0502B	0502B_03	Twice			93° 42' 50.50" W	30° 49' 26.55" N
37	Caney Creek	Lee's Mill Road	CC005	0502B	0502B_03	Twice			93° 42' 36.56" W	30° 49' 16.10" N
38	Caney Creek	FM 2626	59	0502B	0502B_02	Twice			93° 40' 3.59" W	30° 46' 33.02" N
39	Caney Creek	Lee's Mill Road	CC006	0502B	0502B_03	Twice			93° 40' 07.00" W	30° 46' 17.00" N
40	Caney Creek	Lee's Mill Road	CC007	0502B	0502B_02	Twice			93° 39' 47.00" W	30° 45' 03.00" N
41	Caney Creek	Jones Rd	58	0502B	0502B_01	Twice			93° 38' 46.61" W	30° 44' 46.81" N
42	Caney Creek	US Hwy 190	56	0502B	0502B_01	Twice		14491	93° 38' 4.25" W	30° 44' 26.19" N
43	Caney Creek	Sabine Sands Rd	57	0502B	0502B_01	Twice			93° 37' 9.68" W	30° 43' 54.60" N

SECTION 3 RUAA TECHNICAL APPROACH

3.1 Experimental Design

Initially, Basic RUAA surveys were conducted on each water body to focus on documenting the presence and/or absence of water recreation activities, stream flow type, and stream depth in accordance with TCEQ guidance. Basic RUAA surveys were initially performed on weekends during the months of May, June and July 2010. Based on data collected during the basic surveys, a second set of surveys were conducted for the four tributaries to meet the guidance requirements stipulated for comprehensive RUAs. The second set of RUAA surveys was conducted on weekends during May and June 2011 to collect additional data and verify that characteristics documented in 2010 had not changed. Basic and Comprehensive RUAA surveys are performed using the TCEQ *Recreational Use-Attainability Analyses (RUAA) Procedures for a Comprehensive RUAA and a Basic RUAA Survey* (May 2009 version) and according to the following requirements described in the most current TCEQ TMDL RUAA Quality Assurance Project Plan (QAPP):

- Data Representativeness - TCEQ TMDL RUAA QAPP Section A7
- Field measurement techniques found in the Surface Water Quality Monitoring (SWQM) Procedures Manual – TCEQ TMDL RUAA QAPP Section B2 (TCEQ 2009b)
- Data Management - TCEQ TMDL RUAA QAPP Section B10

Field measurements and data collection were performed according to TCEQ SWQM Procedures Manual (TCEQ RG-415) (TCEQ 2008a).

3.2 Sampling Conditions

The RUAA surveys were conducted during normal warm season conditions (air temperature greater than or equal to 70 degrees Fahrenheit) under baseflow conditions when people are most likely to use the water bodies for recreation. Baseflow conditions are defined as sustained or typical warm-weather flows between rainfall events, excluding unusual antecedent conditions of drought or wet weather. When discussions with local entities or users revealed that recreational use timing differs from the normal conditions, attempts were made to conduct RUAA surveys at those times of use.

3.3 Field Tasks

Field Survey Forms were obtained from *Recreational Use-Attainability Analyses (RUAA): Procedures for a Comprehensive RUAA and a Basic RUAA Survey* (TCEQ 2009a). These forms were used to document, define, and organize the data collected and observations made at each survey site. Field Survey Forms for each survey site along with Interview Forms are provided in Appendix C. For reconnaissance sites that were not surveyed, photographs were taken from the roadside where possible to demonstrate the inaccessible conditions. The focus of the data collection effort was on the stream corridor and to observe recreational uses or to document evidence showing possible uses.

Field collection of data was performed using a combination of the following:

- Hardcopy of TCEQ RUAA Procedures (May 2009 version) Data Collection Sheets;
- Field Logbook;
- GPS unit meeting TCEQ GPS Requirements. This Garmin GPSMAP 76CSX unit was also utilized to input field data for the RUAA survey forms directly into digital format for electronic download to a computer database format;
- Digital camera for all photographs taken; and
- Measurement equipment (measuring tapes, measuring survey rods, water velocity meter, compass, water thermometer, air thermometer).

The field surveys began as the field team approached the survey area, looking for signs of recreational use and ways of access to the streambed. Initial observations at each survey site were made to find a 300 meter (m) section of the stream with the most potential for recreational use, which was wadeable, and had public or permitted access.

The tasks performed at each survey site consisted of collecting measurements (stream or pool dimensions, instantaneous stream flow, air and water temperature), documenting streambed and adjacent area conditions, completing the survey forms, documenting uses or possible uses of the water body, talking with local people on known uses of the water body, and collecting GPS coordinates and a standard set of photographs. As instructed in the RUAA procedures manual (TCEQ 2009a) and to the degree measurements were possible, a 300m reach at each station was evaluated to determine average depth at the thalweg. For most sites, photographs were taken facing upstream, downstream, left bank, and right bank at the 30m, 150m, and 300m transect. Photographs were also taken to document other key characteristics or evidence of recreational use when undertaking each survey. An index of the photographs taken at each RUAA site is provided in Appendix D. If for some reason safe access was not possible at the 30m, 150m, or 300m transects, photographs were taken to document the reasons why they were not surveyed.

SECTION 4 PROJECT RESULTS

Section 4 organizes and summarizes the data collected from the field surveys, interviews, and historical information search for each stream. A historical perspective of recreational use for each water body is summarized first. Archival research of local newspapers, web sites, and libraries was performed for historical documentation of recreational use occurring on each stream since 1975. In addition, local coffee shops, bait and hunting shops, nearby residences, retirement homes, community leaders and government functionaries, and anyone present at the sites were interviewed in an effort to garner historical evidence of recreational use on each stream. The remainder of Section 4 summarizes the site survey data collected and observations made for each of the four different water bodies.

4.1 General Subwatershed Characteristics

The four unclassified streams addressed in this RUAA report are located in the Sabine River basin. The Sabine River weaves through 15 counties, starting with Hunt County to the northwest and ending in Orange County to the extreme south. The four tributaries addressed in this report, South Fork of the Sabine River, Elm Creek, Running Creek, and Caney Creek, are located in Hunt, Hopkins (Elm and Running Creek), and Newton Counties, respectively. A portion of the Elm Creek subwatershed lies in Rains County. Table 4.1 provides the area of each subwatershed.

Table 4.1 Subwatershed Area

Assessment Unit	Water Body Name	Subwatershed Area (square miles)
0507G	South Fork of the Sabine River	148.1
0512B	Elm Creek	22.4
0512A	Running Creek	26.3
0502B	Caney Creek	47.8

The land within the four subwatersheds is almost entirely private land. South Fork of the Sabine River flows into Lake Tawakoni while Elm Creek and Running Creek flow into Lake Fork. Caney Creek flows into the Sabine River; consequently, the downstream portion of each stream is influenced by the hydrologic variation of its respective receiving water. Both Elm Creek and Running Creek run through flat to rolling terrain with clay loam and sandy loam soil that supports water-tolerant hardwoods, conifers, and grasses and terminates at Lake Fork Reservoir (TSHA 2011a). Caney Creek flows through flood-prone area of deciduous forest and canebrakes (TSHA 2011b). The region drained by the South Fork of the Sabine River is generally flat and marked with occasional local shallow depressions; its soil consists largely of clay loam, sandy loam, and moderately shallow to deep sandy and clay loam. Water-tolerant

hardwoods, conifers, and grasses are common along the stream's course (TSHA 2011c). The subwatersheds of all four streams are primarily rural and only a short stretch of Caney Creek runs through an urban area (Newton, TX).

4.2 Climatic Conditions

At the time of the initial surveys on South Fork of the Sabine River, Elm Creek and Running Creek the Palmer Drought Index (PDI) (http://www.drought.unl.edu/dm/6_week.gif) indicated near normal conditions. Average rainfall for the 30 days preceding the survey dates was 0.24 inches (April 20 through May 20, 2010). During the 30 days preceding the initial surveys on Caney Creek, the PDI indicated drought like conditions. The average rainfall recorded during this 30 day period (June 16 through July 16, 2010) was 0.19 inches.

In 2011, prior to the first set of surveys for the additional sites selected for South Fork of the Sabine River and Running Creek, the PDI indicated drought conditions of moderate to extreme, with an average rainfall of 0.56 inches (April 19 through May 19, 2011). The PDI for Caney Creek ranged from extreme to exceptional drought like conditions, with an average rainfall of 0.95 inches (April 20 through May 20, 2011).

At the time of the second surveys on South Fork of the Sabine River, Elm Creek and Running Creek the PDI indicated conditions were abnormally dry to extremely dry with an average rainfall of 0.73 inches (May 3 through June 12, 2011). The PDI for Caney Creek indicated conditions were exceptionally dry. Average precipitation during the 30 days preceding the survey (May 21 through June 21, 2011) was 0.39 inches. Appendix E provides daily data for the climatic conditions recorded at Greenville, Sulphur Springs, and Jasper, TX for the time periods described above.

4.3 South Fork of the Sabine River (0507G)

4.3.1 Historical Recreation Evidence

Various websites describe fishing opportunities on the South Fork of the Sabine River near Quinlan, TX. The Hook and Bullet (<http://www.hookandbullet.com/fishing-south-fork-sabine-river-quinlan-tx/>) describes several creeks that flow into the South Fork of the Sabine River. However, few details about the frequency of local fishing success were posted. Although specific sites were not mentioned, several fish are listed as species of interest in the South Fork of the Sabine River.

4.3.2 Subwatershed Characteristics

The segment of South Fork of the Sabine River in this survey starts at the confluence of Klutts and Sabine Creeks and runs 18.5 miles to the confluence with Kitsee Inlet on Lake Tawakoni. South Fork of the Sabine River is a perennial body of water with some of the upstream flow contributed by Royse City WWTP (TX0021687) discharge from Royse City.

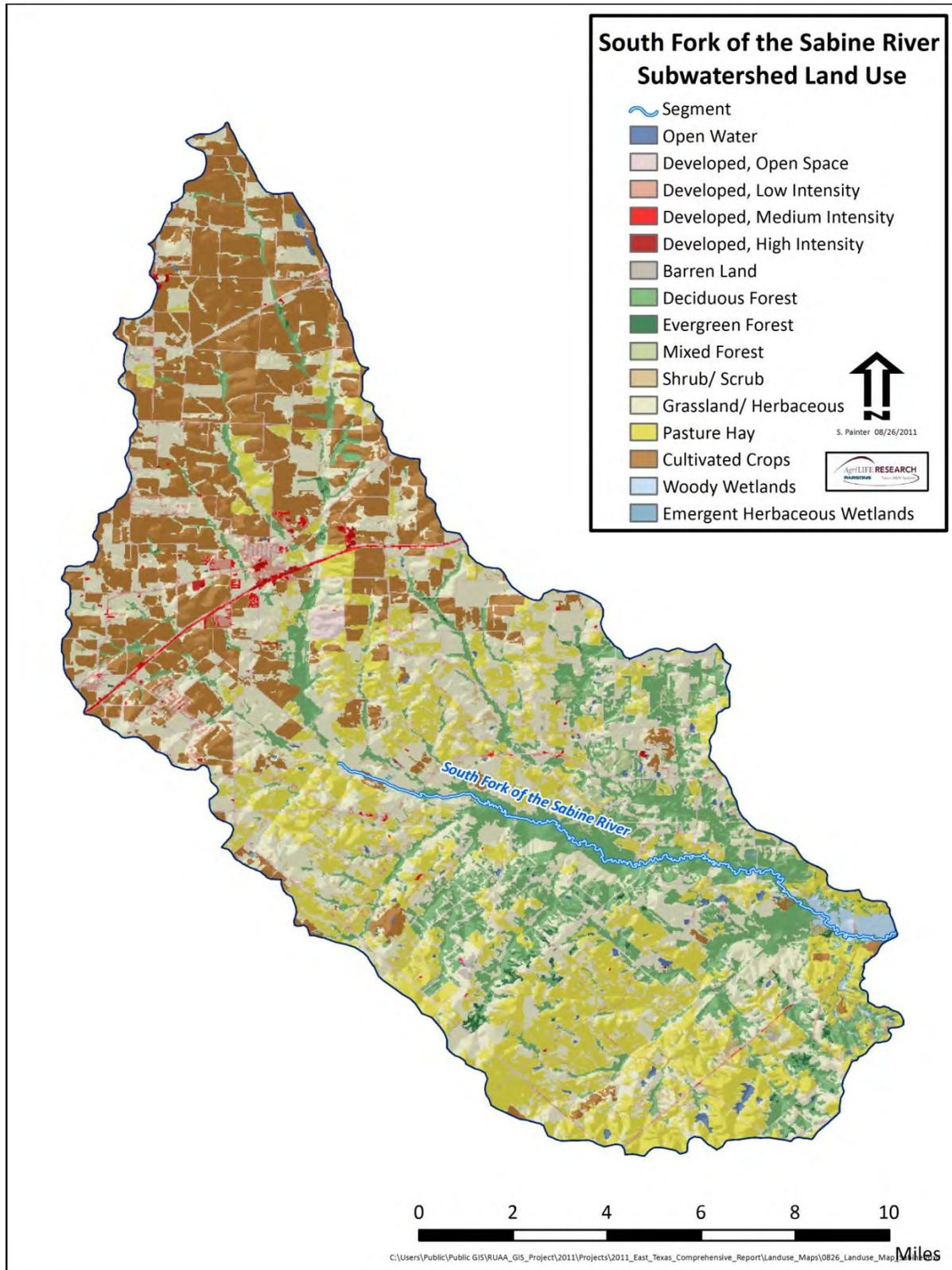
The primary land use category of the South Fork of the Sabine River subwatershed is pasture/hay and grassland/herbaceous, which combined, account for 53 percent. Cultivated cropland accounts for 21 percent of the land surface in the subwatershed. The South Fork of the Sabine River subwatershed is rural with less than eight percent of the surface area classified as developed. Approximately 18 percent of the land area remains forested and only a small

fraction of this is evergreen pine plantation. Table 4.2 and Figure 4.1 provide a summary of the land use/land cover characteristics of the South Fork of the Sabine River subwatershed, based on the U.S. Geological Survey (USGS) 2001 National Land Cover Dataset (USGS 2007).

Table 4.2 South Fork of the Sabine River Subwatershed: Land Use Summary by Category

Category	Acres	Percent
Open Water	483	0.5%
Developed, Open Space	4,606	4.9%
Developed, Low Intensity	1,790	1.9%
Developed, Medium Intensity	469	0.5%
Developed, High Intensity	136	0.1%
Barren Land (Rock/Sand/Clay)	94	0.1%
Deciduous Forest	14,597	15.4%
Evergreen Forest	390	0.4%
Mixed Forest	575	0.6%
Shrub/Scrub	925	1.0%
Grassland/Herbaceous	31,185	32.9%
Pasture/Hay	19,399	20.5%
Cultivated Crops	19,507	20.6%
Woody Wetlands	597	0.6%
Emergent Herbaceous Wetlands	30	0.0%
Total	94,782	100.0%

Figure 4.1 South Fork of the Sabine River Subwatershed Land Use Map



4.3.3 RUAA Survey Results for South Fork of the Sabine River

The 2008 §303(d) List identifies 16.6 miles of the stream as not supporting the contact recreation use because of elevated bacteria levels. The South Fork of the Sabine River subwatershed map (Figure 4.2) displays the RUAA survey sites, recreational evidence from surveys and interviews, and wastewater treatment plant outfalls. In this report, South Fork of the Sabine River was subdivided into four subsegments for assessment purposes: 0507G_01, 0507G_02, 0507G_03 and 0507G_04. These subsegment boundaries are displayed on Figure 4.2. A table inset in Figure 4.2 summarizes the average thalweg depth (where measurement was possible), locations where evidence of recreational activities were observed, and availability of public access documented at the sites surveyed along South Fork of the Sabine River.

A total of 12 sites were surveyed along South Fork of the Sabine River. Initially in 2010, public access was only possible at five sites, all of which were surveyed by the team in 2010 and again in 2011. Although the first surveys recorded no primary contact recreation, indirect evidence, namely discarded fishing tackle and interviews, provided evidence of secondary contact. Furthermore, data collected in 2010 on segment 0507G indicate an average thalweg depth greater than 0.5m. Consequently, a comprehensive RUAA was necessary for the South Fork of the Sabine River requiring second visits to the initial five public access sites and two visits to each of the additional private property sites. The new sites were used to verify that data collected at all public road crossings provided an accurate summation of the physical attributes of the stream and to find any additional evidence of recreational use. Data collected at each survey site is summarized below from upstream to downstream.

Water flow was measured along the entire length of the South Fork of the Sabine River. Three sites – SF001, SF002, and 18 - were surveyed along subsegment 0507G_04. At Site SF001 a flow of 5.91 cubic feet per second (cfs) was measured in 2011. Average thalweg depth measured during the first survey was 1.14m and 1.02m during the second survey. No pools greater than 1.0m in depth were recorded. Neither primary nor secondary contact recreation was observed at Site SF001. Figure 4.3 displays the riparian characteristics of the private property along the stream at Site SF001.

At Site SF002 a flow of 2.11 cfs was measured during the first survey and 1.36 cfs during the second survey. Average thalweg depths of 1.02m and 0.89m were calculated during the two site surveys. No pools greater than 1.0m in depth were recorded. The river bed was strewn with large tires and garbage and no evidence, direct or indirect, of recreation was recorded. Steep banks, log jams, western cottonmouth water moccasins (*Agkistrodon piscivorus*), and the presence of fish were recorded. The Sabine Creek Ranch had a swimming pool and paddle boats within a mile of the river but it is not in any way connected to the river.

The first publicly accessible site along the South Fork of the Sabine River is Site 18 at State Highway 276. Transects for Site 18 were surveyed downstream of State Highway 276. Water flow measurements recorded in 2010 and 2011 were 1.28 cfs and 1.31 cfs respectively. Thalwegs averaged 0.25m in both 2010 and 2011. No pools greater than 1.0m in depth were recorded in the 2010 or 2011 survey. At this site shallow water, large log jams, numerous snakes, and steep, heavily vegetated banks were documented. No primary or secondary contact recreation was observed and no evidence of recreation use was recorded at Site 18.

Figure 4.2 Map of the South Fork of the Sabine River

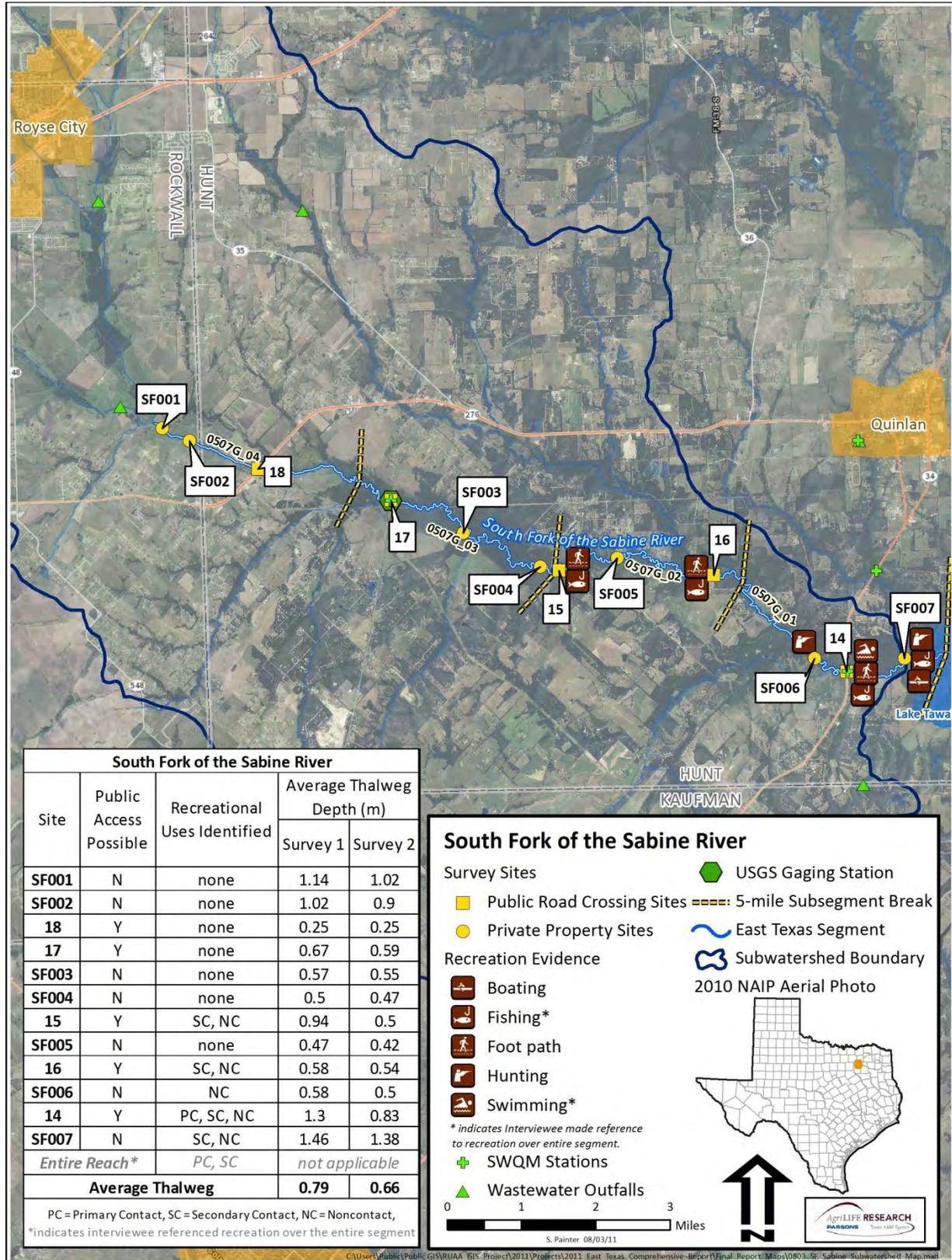


Figure 4.3 South Fork of the Sabine River, Survey Site SF001**Site SF001 Private Property off Private Road 2030
Upstream View****Site #SF001 Private Property off Private Road 2030
Downstream View**

Three sites – 17, SF003, and SF004 - were surveyed along subsegment 0507G_03. At Site 17, which is publicly accessible from FM (farm to market) 1565, flow ranged from 2.41 to 4.385 cfs. Transects for Site 17 were surveyed upstream of FM 1565. During the 2011 survey a pool with a depth of 1.10m was recorded. The average thalweg depths recorded were 0.67m during the 2010 site visit and 0.64m during the 2011 site visit. No primary or secondary contact recreation was observed and no evidence of recreation use was recorded at Site 17.

Sites SF003 and SF004 are both located on private property owned by one individual with no public access. Flow ranged from 1.77 to 1.95 cfs when measured at these two sites. Average thalweg depths recorded during the two surveys at Site SF003 were 0.57m and 0.55m. The average thalweg depths at SF004 were 0.50m and 0.47m. A pool with a depth of 1.5m was recorded at Site SF004 during the first survey visit in 2011. No primary or secondary contact recreation was observed and no evidence of recreation use was recorded at either Site SF003 or SF004. There was considerably less household debris in the stream throughout subsegment 0507G_03 and evidence of fish and other aquatic life forms were abundant. The surrounding riverine forest was mature and, other than some grazing, was relatively pristine close to the banks.

Three sites – 15, SF005, and 16 - were surveyed along subsegment 0507G_02. Site 15 is publicly accessible from County Road 2400. Transects for Site 15 were surveyed upstream of County Road 2400. At this site flow measured 5.89 cfs in 2010 and 2.43 cfs in 2011. No pools greater than 1.0m in depth were recorded in the 2010 or 2011 survey (however, some stretches were too deep to measure in 2010). From the 2010 survey, the average thalweg depth was 0.94m and the 2011 survey recorded an average thalweg depth of 0.5m. Figure 4.4 displays the road crossing and

**Snake in the South Fork of the Sabine River**

the thickly vegetated stream banks at Site 15. Site characteristics recorded at this site included log jams, abundant garbage, pungent odors emanating from the water, muddy bottom, and steep banks. Dense stream bank vegetation and no trespassing signs adjacent to the road were observed but there was indirect evidence of secondary and noncontact recreation.

Figure 4.4 South Fork of the Sabine River, Survey Site #15



Site #15 (above bridge) at CR 2400 Downstream View



Site #15 (below bridge) at CR 2400 Downstream View

The next Site SF005, located on private property, reverted to clearer water and more pristine forest and river bottom. At this site in 2011 flow measured 1.95 cfs. The average thalweg depth was 0.47m and 0.42m in the first and second survey, respectively. No pools greater than 1.0m in depth were recorded during either survey. Other site conditions recorded included steep incised banks with thick brush and trees along the riparian corridor on both sides, and garbage strewn in the river. No primary or secondary contact recreation was observed and there was no evidence of recreational activity recorded.

Site 16, which is publicly accessible from County Road 2316, was very similar to Site 15 in that physical characteristics were almost identical but public access resulted in greater presence of garbage, worn footpaths, and evidence of previous fishing activity (catfish carcasses). Transects for Site 16 were surveyed downstream of County Road 2316. Perennial flows at this site in 2010 and 2011 were 4.14 cfs and 1.69 cfs, respectively. Average thalweg depths in 2010 and 2011 were 0.58m and 0.54m, respectively. A pool depth of 1m was recorded at Site 16 during the second survey visit in 2011. Woody debris was found in the river along the 300m reach surveyed, and the stream banks were irregular and densely vegetated. While there was no primary or secondary contact recreation observed at this site there was evidence of both secondary and noncontact recreation.

The three most downstream sites – SF006, 14, and SF007 – were surveyed along subsegment 0507G_01. Site SF006, located on private property, was similar to other private sites along this subsegment. Water flow measured during the second 2011 survey was 2.43 cfs. The average thalweg depth recorded during the first survey was 0.58m and 0.5m during the second survey. No pools greater than 1.0m in depth were recorded during either survey. No evidence of primary or secondary recreation use was documented at this site.

Site 14, which is publicly accessible, had evidence of a considerable amount of human traffic. Transects for Site 14 were surveyed downstream of State Highway 34. In 2010 this site was too deep to measure while in 2011 flow was 1.25 cfs. The average thalweg depth recorded during the first survey was 1.3m and 0.83m during the second survey. A pool depth of 1.5m was recorded at Site 14 during the second survey visit in 2011. Other characteristics recorded at this site included steep banks, heavy stream bank vegetation, murky water, obstructed channels and the presence of western cottonmouth water moccasins. Although no recreation was witnessed during the survey, indirect evidence of fishing (discarded tackle) and picnicking (discarded food wrappings) were registered in 2011 at Site 14. Swimming at the State Highway 34 bridge was reported through an interview with a local stakeholder.

Site SF007, located on private property, is the most downstream survey site on the South Fork of the Sabine River where Lake Tawakoni backs up the flow, thereby changing the dynamics of the water body. The flow was impossible to measure due to occasional extreme depth (>2.0m) and stream widths up to 10m. The thalweg averaged 1.42m during the two visits. The property owner stated that fishing and boating (including the public from Lake Tawakoni) occur on this segment, although the individual interviewed had never witnessed anyone voluntarily swimming. Despite sufficient water depth and the general ambiance of the area, swimming or other recreational use would appear to be hampered by murky water, steep edges, large logs, and aggressive aquatic fauna. Photographs in Figure 4.5 display the difficult, limited access to the water body caused by the dense riparian vegetation at Site SF007.

Figure 4.5 South Fork of the Sabine River, Survey Site SF007



**Site SF007 Private Property off State Highway 34 S
Upstream View**



**Site SF007 Private Property off State Highway 34 S
Downstream View**

Interviewees (2) reported having witnessed fishing, boating, and swimming in the South Fork of the Sabine River; however, very few admitted to having undertaken anything more than hunting alongside the river. Interviewees surmised that recreation activity on the river did not occur for various reasons, including that the river had silted in and flowed intermittently, farmers dumped dead animals, and hunters dropped deer carcasses in the water, snapping turtles were common, and alligators were known to inhabit the waters. Several interviewees had never witnessed any recreation on the river despite having lived on or near it for many years.

The South Fork of the Sabine River can be summarized as a perennial stream with an overall average thalweg of 0.79m (Table 4.3) in 2010 and 0.66m in 2011. Indirect evidence and interviews indicate that secondary contact recreation was fairly common but only indirect eyewitness accounts indicated that primary contact occurred occasionally. Table 4.3 summarizes measurement data for pool and thalweg depth for each survey site on South Fork of the Sabine River. Evidence of foot paths and fishing were present along the downstream subsegments 0507G_01 and 0507G_02 despite thick shrubs, mature trees and soft, muddy bottoms rich in sediment. The river deepened as it neared Lake Tawakoni where it was surrounded by wetland forest and denser bank vegetation. It was revealed during interviews that boats access the lower stretches during high water for fishing; swimming was reported by interviewees at the State Highway 34 bridge (Site 14).

Table 4.3 South Fork of the Sabine River: Average Thalweg

Site	First Surveys					Second Surveys					
	Date	Year	Observed PCR	Pools > 1.00 meter	Avg. Thalweg Depth (m)	Date	Year	Observed PCR	Pools > 1.00 meter	Avg. Thalweg Depth (m)	
SF001	May 19	2011	None	None	1.14	June 03	2011	None	None	1.02	
SF002	May 19	2011	None	None	1.02	June 04	2011	None	None	0.89	
18	June 27	2010	None	None	0.25	June 03	2011	None	None	0.25	
17	May 22	2010	None	None	0.67	June 03	2011	None	Yes	0.64	
SF003	May 19	2011	None	None	0.57	June 04	2011	None	None	0.55	
SF004	June 04	2011	None	Yes	0.5	June 04	2011	None	None	0.47	
15	May 22	2010	None	None	0.94	June 03	2011	None	None	0.5	
SF005	May 19	2011	None	None	0.47	June 04	2011	None	None	0.42	
16	May 22	2010	None	None	0.58	June 03	2011	None	Yes	0.54	
SF006	May 19	2011	None	None	0.58	June 04	2011	None	None	0.5	
14	May 22	2010	None	None	1.3	June 03	2011	None	Yes	0.83	
SF007	May 19	2011	None	None	1.46	June 04	2011	None	None	1.38	
Overall Thalweg Average					0.79	Overall Thalweg Average					0.66

4.4 Elm Creek (0512B)

4.4.1 Historical Recreation Evidence

Information on historical contact recreation is limited for Elm Creek. The Hook and Bullet website (<http://www.hookandbullet.com/fishing-deep-elm-creek-graham-tx/>) indicates that fishing is possible on Elm Creek. However, the reports do not include any individual fishermen contributions and the reports may refer more to Elm Creek's mouth on Lake Fork Reservoir, rather than upstream.

4.4.2 Subwatershed Characteristics

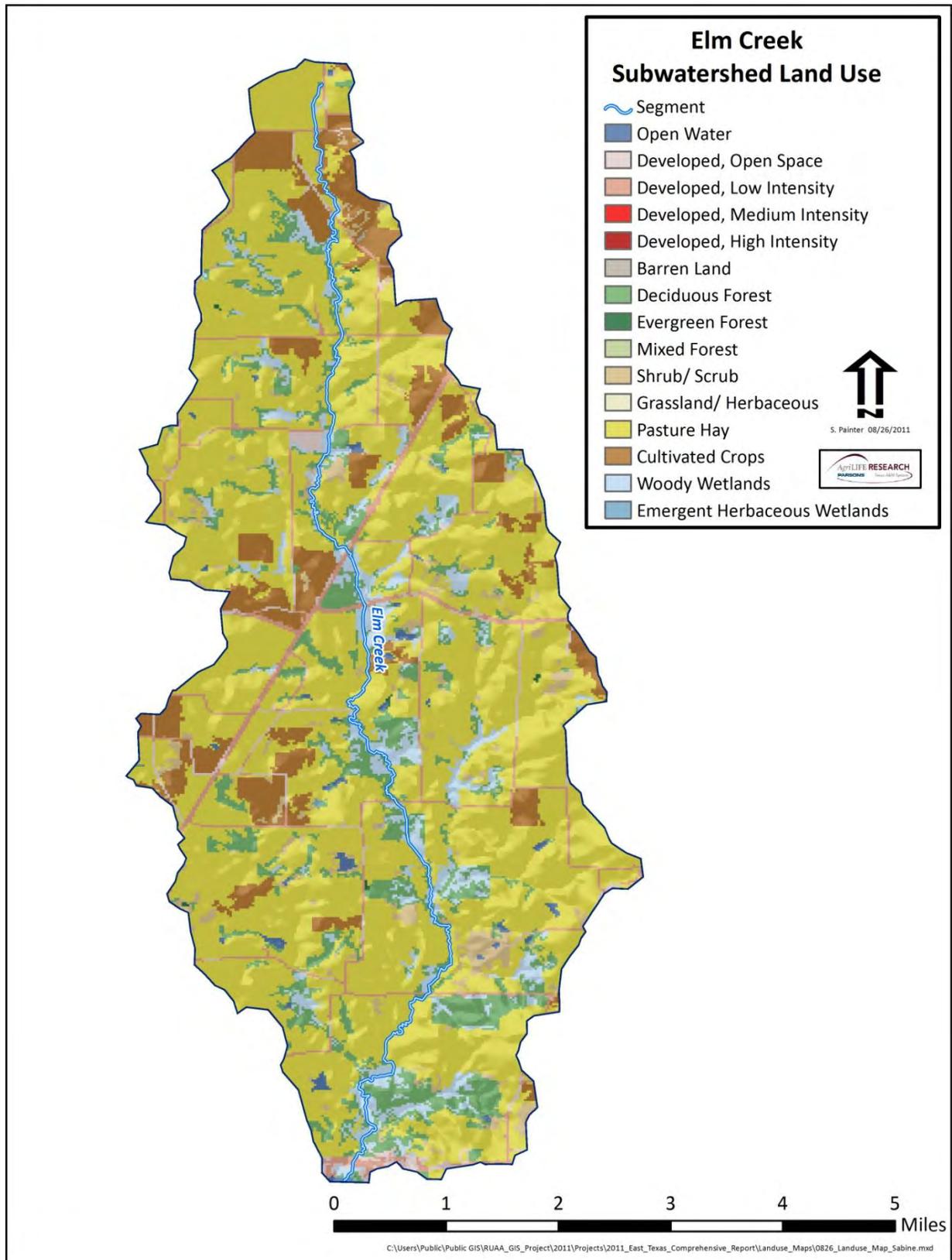
Headwaters of Elm Creek are located northeast of Shirley, TX in Hopkins County just north of County Road 1110. The creek runs 12.8 miles to its confluence with Lake Fork Reservoir and 9.8 miles are identified on the Texas 2008 §303(d) list as not supporting contact recreation use because of high levels of bacteria. TCEQ describes Elm Creek as intermittent with perennial pools (TCEQ 2010). Mixed stands of deciduous riverine woodland were protected from clear-cutting in and immediately adjacent to the streambed. The middle subsegment is dominated by grasslands and pasture. Vegetation near the creek is wetland deciduous forest that supports rich fauna. Along the southern subsegment near the confluence with Lake Fork Reservoir, the bottomland vegetation becomes dense riverine deciduous forest bordered by mixed pine and deciduous forest. Before 1970 Elm Creek ended at Lake Fork Creek, but since creation of that lake, its influence on the lower reaches of Elm Creek is discernible.

The primary land use category in the Elm Creek subwatershed is pasture/hay, totaling approximately 65 percent. The second and third largest land use category is deciduous forest (10%) and cultivated crops (9%). Less than six percent of the Elm Creek subwatershed surface area is classified as developed, which coincides with its rural character. Approximately 20 percent of the land area is covered by some form of forest or perennial woody vegetation, but only a small fraction is evergreen pine plantation. Table 4.4 and Figure 4.6 provide a summary of the land use/land cover characteristics of the Elm Creek subwatershed, derived from the USGS 2001 National Land Cover Dataset (USGS 2007).

Table 4.4 Elm Creek Subwatershed: Land Use Summary by Category

Elm Creek Land Use		
Category	Acres	Percent
Open Water	87	0.6%
Developed, Open Space	223	1.5%
Developed, Low Intensity	562	3.9%
Developed, Medium Intensity	0	-
Developed, High Intensity	0	-
Barren Land (Rock/Sand/Clay)	4	0.0%
Deciduous Forest	1,447	10.1%
Evergreen Forest	8	0.1%
Mixed Forest	8	0.1%
Shrub/Scrub	449	3.1%
Grassland/Herbaceous	0	-
Pasture/Hay	9,386	65.3%
Cultivated Crops	1,315	9.1%
Woody Wetlands	887	6.2%
Emergent Herbaceous Wetlands	2	0.0%
Total	14,380	100.0%

Figure 4.6 Elm Creek Subwatershed Land Use Map



4.4.3 RUAA Survey Results for Elm Creek

The Elm Creek subwatershed map (Figure 4.8) displays the RUAA survey sites, subsegment boundaries, and locations of recreational evidence from surveys and interviews. In this report, Elm Creek subwatershed was subdivided into three subsegments for assessment purposes: 0512B_01, 0512B_02, and 0512B_03. A table insert in Figure 4.8 summarizes the average thalweg depth (where measurement was possible), locations where evidence of recreational activities were observed, and availability of public access documented at the sites surveyed along Elm Creek. A total of seven sites were surveyed along Elm Creek. All seven sites are located at road crossings; however, public access from each road down to the creek was only possible at six of the sites.

Following the surveys completed during the summer of 2010 at public road crossings, the data collected on segment 0512B indicated evidence of secondary contact recreation and an average thalweg depth of 0.72m. These two characteristics triggered the need for a second round of site surveys on Elm Creek, which were carried out in 2011. Data collected at each survey site are summarized below from upstream to downstream.

Surveys were considered at three different sites - 49, 47, and 48 - along the upstream most subsegment 0512B_03. However, because access was restricted by fencing at all three sites it was not possible to conduct the RUAA surveys. From the first site survey attempted in May 2010, RUAA field data summary sheets were completed based on whatever data could be gleaned adjacent to each road crossing and are provided for informational purposes in Appendix C. Where possible, flow or thalweg depths were recorded if water was present adjacent to the road crossing. Site 49, located on private property at County Road 1110, had no measureable flow and a shallow pool with a 0.24m thalweg depth at the time of the 2010 site visit. In 2011 the creek was dry at this site. Access from the road both up and downstream at this site was impeded by private fencing and woody debris throughout the stream bed. The creek is surrounded by pasture and grassland. The only human use recorded was household garbage, with no evidence of primary or secondary recreation observed. Figure 4.7 displays the headwaters of Elm Creek and the fence that restricted access at Site 49.

Figure 4.7 Elm Creek, Survey Site #49



Site #49 at County Road 1110 Upstream View

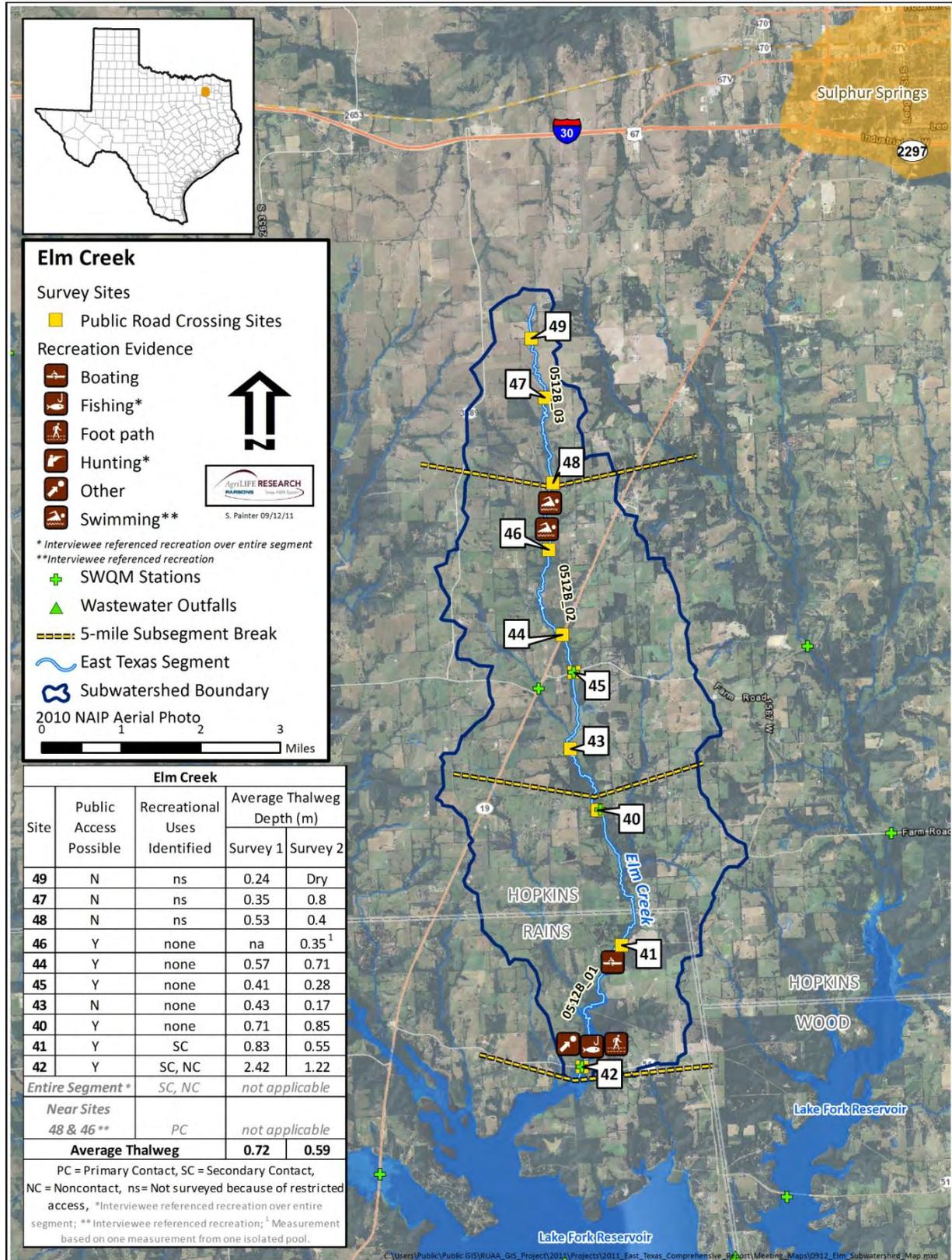


Site #49 at County Road 1110 Downstream View

The next downstream site on subsegment 0512B_03 is Site 47 located at County Road 1171 where public access is restricted by steep banks and private fences across the creek bed, both up and downstream. Site conditions recorded include a single perennial pool (0.35m deep in 2010 and 0.80m deep in 2011), 0.412 cfs flow in 2010, and an average thalweg depth of 0.58m. In 2011 there was no flow that could be measured, the water had a thin scum, a dead calf was discarded on the bank, and vultures were the only wildlife sighted.

Access at Site 48 was likewise blocked by private fencing and steep vegetated banks both upstream and downstream of County Road 1116. Site conditions recorded include 1.36 cfs flow in 2010, but no flow in 2011 and a shallow isolated pool (0.53m depth in 2010, and 0.40m depth in 2011). No primary or secondary contact recreation activity or signs of previous activity were observed in the pools on either side of the culvert although the site had been used to discard significant amounts of household garbage. Restricted access only permitted site photos and a single thalweg depth to be obtained from the roadway at each site. An interview from one stakeholder indicated that children had been seen wading in the vicinity of this location after heavy rain events.

Figure 4.8 Map of Elm Creek



Along the middle subsegment 0512B_02, sites 46, 44, 45, and 43 were surveyed. Where County Road 1170 crossed Elm Creek at Site 46, access upstream was prohibited by a fence whereas downstream access, despite steep vegetated banks, was possible. During both surveys at this site Elm Creek was not flowing so flow was not measured. Only one thalweg measurement of 0.35m was recorded at the 120m transect where a small isolated pool was encountered. No pools greater than 1.0m in depth were recorded during either survey. This isolated stagnant pool contained anoxic and odiferous water and was separated by dry gravel stretches containing numerous shards and sharp metallic objects that appeared to have been accumulated from repeated discarding of burn barrel remnants. No other thalweg depths were possible at this site since the majority of it was dry during both events. Signs of wildlife (tracks) were visible on the creek bed and bank. Vegetation was mature riverine forest with thick brushy vegetation on the banks. No primary or secondary contact recreation activity or signs of recreation were observed. One stakeholder's interview stated that they had witnessed children wading in the creek near this location after heavy rainfall events, but not at the road crossing.

The first consistent water flow (2.38 cfs in 2010 but only a trickle that was not measureable in 2011) was observed at Site 44 where State Highway 19 crosses Elm Creek. This is also where the first aquatic life was observed. Site conditions recorded include occasional pools measured at 2.3m deep in 2010 and 1.2m in 2011, intermittent shallow depth, steep banks covered in thick vegetation, log jams, and western cottonmouth water moccasins. The average thalweg depth of 0.57m in 2010 was derived from five transect measurements; whereas in 2011 shallower depths permitted measurements from all ten transects resulting in an average thalweg depth of 0.71m. Site photos were not collected at the 300m transect in 2010 because beyond the 150m transect the creek was too deep to wade. Vegetation continued to be mature bottomland deciduous forest with brushy undercover wherever the canopy opened sufficiently. No primary or secondary contact recreation activities or evidence of previous activity were observed at this site.



Water snake

Site 45, located at FM 1567 was identical in almost all aspects to Site 44. Steep, heavily vegetated banks, minimal water flow that was not measurable, household garbage and large, and numerous western cottonmouth water moccasins were recorded. The average thalweg depth measured in 2010 was 0.41m and 0.28m in 2011. No pools greater than 1.0m in depth were recorded during either survey. No primary or secondary contact recreation was observed and no evidence of previous recreation was likewise identified. Figure 4.9 displays the steep banks and thick vegetation of the Elm Creek riparian area along Site 45.

Figure 4.9 Elm Creek, Survey Site #45**Site #45 at FM 1567 Upstream View****Site #45 at FM 1567 Downstream View**

Site 43 is located on private property. Permission for access from County Road 1167 was obtained by the field crew. Flow was measurable in 2010 (1.07 cfs) but there was no flow in 2011. Thalweg depth averaged 0.43m and 0.17m in 2010 and 2011, respectively. No pools greater than 1.0m in depth were recorded during either survey. Other site conditions recorded included log jams, thick vegetation, a fence across the creek at approximately 250m downstream, and western cottonmouth water moccasins. No primary or secondary recreation was observed and no evidence of previous recreation was recorded. During an interview with the adjacent property owner, he stated that he and his family did not use Elm Creek for recreation.

Along subsegment 0512B_01, sites 40, 41, and 42 were surveyed. Site 40, located at County Road 1163, marks the beginning of the lower subsegment where there is sufficient water to support primary recreational activity. Aquatic life was abundant, flow ranged up to 1.86 cfs in 2010 and 0.26 cfs in 2011, thalwegs ranged up to 0.85m, and pools had a depth up to 1.5m. No primary or secondary contact recreation activities were observed and no evidence of previous recreational activities was recorded. This may be because banks were steep and heavily vegetated, there were occasional logs in the channel, and the creek bottom was slippery and uneven, with murky water. Western cottonmouth water moccasins were present on both visits. Riparian vegetation was mature bottomland forest with no evidence of agricultural activity near the creek.

Farther downstream at County Road 3425, Site 41 was very similar to Site 40 with water sufficient to support primary contact recreation. The average thalweg depth recorded during the 2010 survey was 0.83m and 0.55m during the 2011 survey. Flow measurements recorded were 3.00 cfs in 2010 and 0.29 cfs in 2011. A pool depth of 1m was recorded at Site 41 during the second survey visit in 2011. Impediments to recreation were similar to Site 40 and no primary or secondary recreation activity was observed at Site 41. Information obtained from an interview indicated that secondary contact recreation (boating) has occurred at this site.

Site 42, located at FM 514, is the most downstream site surveyed on Elm Creek. This site was the first to be classified as perennial. The considerable flow and deep pools of the creek at this site during the 2010 survey restricted wading and, therefore, limited the amount of data that

could be collected. In 2010 one measurement was taken at the 30m transect, which recorded the stream depth at 2.42m. From the 2011 survey, the thalweg depth averaged 1.22m, and flow was measured at 3.45 cfs, which was considerably greater than any upstream sites. No pools greater than 1.0m depth were recorded during either survey. Public accessibility was possible from an unimproved parking area beside the FM 514 bridge. No primary or secondary contact recreation was observed during either site survey. Evidence of recreation activities were evident from fire pits, foot paths leading to the creek, and discarded fishing tackle. Other site conditions recorded included garbage, slippery creek bed, and the presence of western cottonmouth water moccasins.

Figure 4.10 Elm Creek, Survey Site #42



Site #42 at FM 514 Upstream View



Site #42 at FM 514 Downstream View

Some interviewees indicated they had never witnessed recreational activity on Elm Creek and would not recommend such activities to anyone because it was too shallow, filled with snakes, and bordered by private property. “To my knowledge, the creek only serves as a drainage way for excess rainfall” was how one individual put it. A single interviewee who had grown up along the creek reported fishing by him and others but noted that access was often difficult. One stakeholder, familiar with Elm Creek, commented at the August 23, 2011 meeting in Sulphur Springs, TX that they had observed children wading in the vicinity of sites #48 and #46, after rainfall events. The children appeared to be accessing the creek from their homes, but had not been seen doing so near the public road crossings. Another stakeholder, who has lived in the area for 60 years, stated that they had never seen any swimming, fishing, or hunting around the creek. The stakeholder further stated that the creek is only used by wildlife. In summary, the surveys recorded a creek without water flow in the upper subsegment, intermittent weak flow in the middle subsegment and consistent flows in the lower subsegment where, not coincidentally, indirect evidence of recreational activities were recorded. Table 4.5 summarizes the pool and thalweg depth measurements collected from each survey site for Elm Creek. Site surveys and interviews provided evidence of primary and secondary contact recreation at various locations along Elm Creek. Remnants of secondary contact activities were evident in the lower subsegment, associated primarily with access from Lake Fork Reservoir.

Table 4.5 Elm Creek: Average Thalweg

Site	First Surveys					Second Surveys					
	Date	Year	Observed PCR	Pools > 1.00 meter	Avg. Thalweg Depth (m)	Date	Year	Observed PCR	Pools > 1.00 meter	Avg. Thalweg Depth (m)	
49	May 21	2010	NS	NS	0.24	June 05	2011	NS	NS	Dry	
47	May 21	2010	NS	NS	0.35	June 05	2011	NS	NS	0.80	
48	May 21	2010	NS	NS	0.53	June 05	2011	NS	NS	0.40	
46	May 21	2010	Not accessible			June 05	2011	None	None	0.35 ¹	
44	May 21	2010	None	None	0.57	June 05	2011	None	Yes	0.71	
45	May 21	2010	None	None	0.41	June 05	2011	None	None	0.28	
43	May 22	2010	None	None	0.43	July 08	2011	None	None	0.17	
40	May 22	2010	None	None	0.71	June 05	2011	None	Yes	0.85	
41	May 22	2010	None	None	0.83	June 10	2011	None	Yes	0.55	
42	May 22	2010	None	None	2.42	June 10	2011	None	None	1.22	
Overall Thalweg Average					0.72	Overall Thalweg Average					0.59

NS= Not surveyed because of restricted access.

¹ Measurement based on one measurement from one isolated pool.

4.5 Running Creek (0512A)

4.5.1 Historical Recreation Evidence

Very little is available on historical recreational activities on Running Creek. The Hook and Bullet (<http://www.hookandbullet.com/edit/fishing-running-creek-gunter-tx/>) indicated that fishing was possible on Running Creek but this may have been more directed at its mouth on the Lake Fork Reservoir than on the creek bed upstream from the mouth.

4.5.2 Subwatershed Characteristics

Running Creek has its headwaters southeast of Sulphur Springs, TX in Hopkins County and runs 14.2 miles to its confluence with Lake Fork Reservoir (Figure 4.12). The Texas 2008 §303(d) list identifies 11.6 miles as not supporting the contact recreation use because of high levels of instream bacteria. TCEQ describes Running Creek as an unclassified perennial stream (TCEQ 2008b). Vegetation at the headwaters of Running Creek was mostly shrub dominated with mature wetland deciduous forest. This area had little flowing water and most of the adjacent property was private. Elberta Lake (also referred to as Lake Elberta, and Lake Alberta on USGS maps), near the headwaters, was built in 1901 and interviews disclosed that it is used for recreation despite being completely surrounded by private land. For the purposes of this RUAA study, which is focused only on unclassified streams, Elberta Lake was not surveyed.

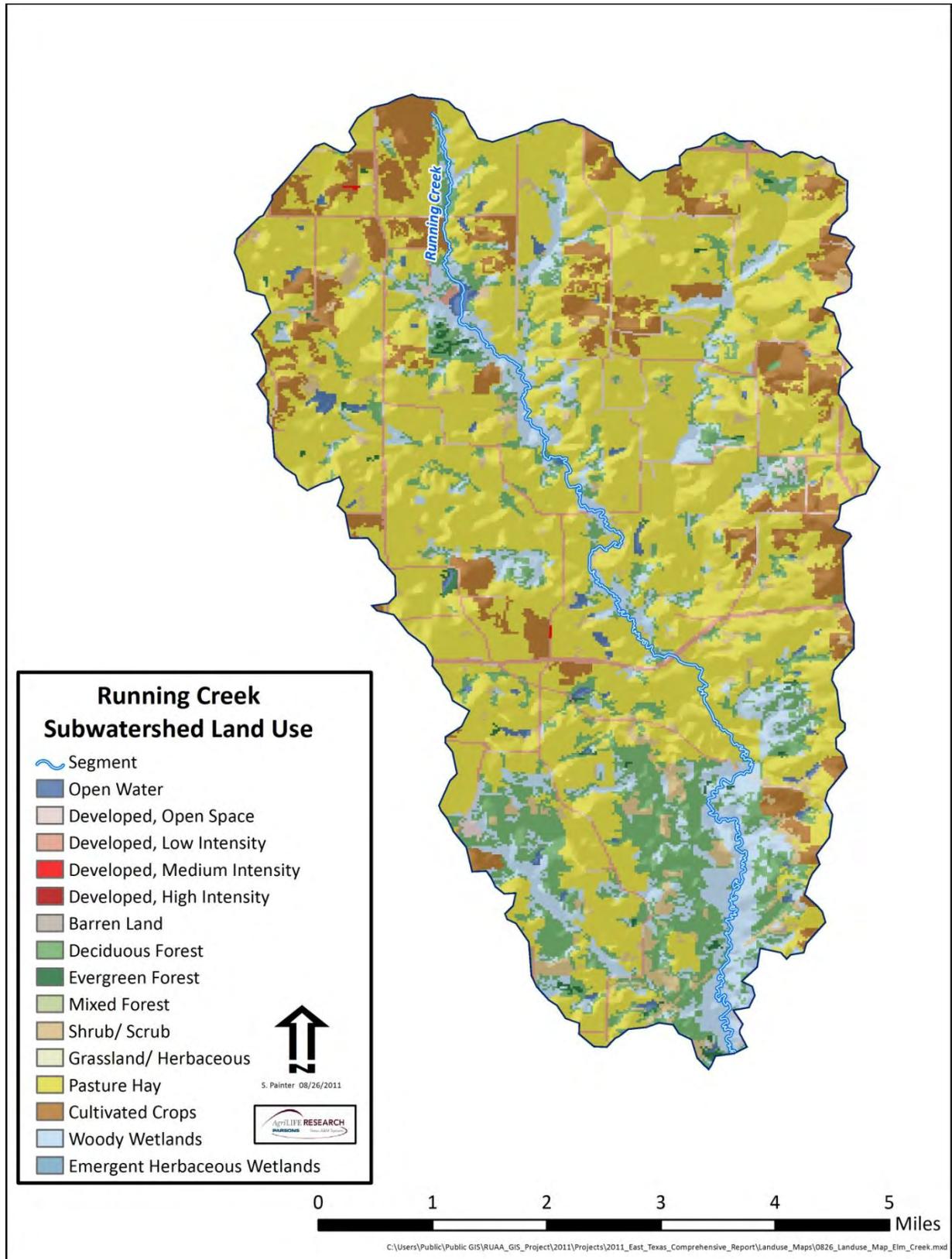
In the middle subsegment of the subwatershed, pasture and grassland are the primary land covers. Numerous beaver ponds have had a significant influence on the flow and physical characteristics of the stream bed in the middle subsegment. The riparian vegetation is wooded with heavy shrubs. The downstream subsegment is influenced significantly by Lake Fork Reservoir. Riparian vegetation along the downstream subsegment is primarily deciduous trees. Before creation of the reservoir, Running Creek emptied into Caney Creek in Wood County.

Running Creek is a rural subwatershed with no WWTP dischargers and no municipalities within its boundaries. The primary land use category is pasture/hay totaling 57 percent with deciduous forest the second most prevalent land use category at 12 percent. Only 10 percent of the land surface is cultivated and a mere four percent of its surface area is developed (low intensity or open space). Table 4.6 and Figure 4.11 provide a summary of the land use/land cover characteristics of the Running Creek subwatershed derived from the USGS 2001 National Land Cover Dataset (USGS 2007).

Table 4.6 Running Creek Subwatershed: Land Use Summary by Category

Running Creek Land Use		
Category	Acres	Percent
Open Water	176	1.0%
Developed, Open Space	209	1.2%
Developed, Low Intensity	493	2.9%
Developed, Medium Intensity	4	0.0%
Developed, High Intensity	0	-
Barren Land (Rock/Sand/Clay)	4	0.0%
Deciduous Forest	2,104	12.5%
Evergreen Forest	76	0.5%
Mixed Forest	9	0.1%
Shrub/Scrub	578	3.4%
Grassland/Herbaceous	0	-
Pasture/Hay	9,615	57.2%
Cultivated Crops	1,688	10.0%
Woody Wetlands	1,844	11.0%
Emergent Herbaceous Wetlands	3	0.0%
Total	16,803	100.0%

Figure 4.11 Running Creek Subwatershed Land Use Map



4.5.3 RUAA Survey Results for Running Creek

The Running Creek subwatershed map (Figure 4.12) displays the RUAA survey sites, subsegment boundaries, and locations of recreational evidence from surveys and interviews. In this report, Running Creek subwatershed was subdivided into three subsegments for assessment purposes: 0512A_01, 0512A_02, and 0512A_03. A table insert in Figure 4.12 summarizes the average thalweg depth (where measurement was possible), locations where evidence of recreational activities were observed, and availability of public access documented at the sites surveyed along Running Creek. A total of nine sites were surveyed along Running Creek. Only three of the nine sites are located at road crossings; the other six sites were accessed from private property.

Following the surveys completed during the summer of 2010 at public road crossings, the data collected on segment 0512A indicated evidence of secondary contact recreation and an average thalweg depth of 0.65m. These two characteristics triggered the need for a second round of site surveys on Running Creek, which was carried out in 2011. Private access sites were added in 2011. The new sites were used to supplement the data collected at public road crossings to provide a more accurate summation of the physical attributes and recreational uses of the stream. During exploration of additional sites in the spring of 2011, Texas AgriLife Research identified that Elberta Lake is located in the upper subsegment, 0512A_03. Since TCEQ's RUAA procedures do not provide for conducting RUAAs on lakes/reservoirs, Site 55 located upstream of Elberta Lake, was eliminated and the RUAA for Running Creek only addresses the portion of Running Creek that lies below Elberta Lake's dam (see Figure 4.12). Data collected at each survey site are summarized below from upstream to downstream.

Along the upper most subsegment 0512A_03, surveys were conducted at two different sites – RC001 and RC002. The most upstream site surveyed on Running Creek was Site RC001, which is located on private property (Elberta Lake Club) immediately downstream from Elberta Lake. The creek just below Elberta Lake is perennial and water flow at this site was measured at 0.83 cfs in 2010 and 0.46 cfs in 2011. During the surveys the average thalweg depths were 0.25m and 0.19m. Pool depths measured were 0.78m and 0.5m. Site conditions recorded included aquatic life, garbage, log jams, and very steep, vegetated slopes with mature trees and dense canopy. Figure 4.13 displays the steep banks and dense vegetation typical of the private property that borders Running Creek at Site RC001. Public access at this site is not possible and no primary or secondary contact recreation was observed and no evidence of recreational use was recorded.

Figure 4.12 Map of Running Creek

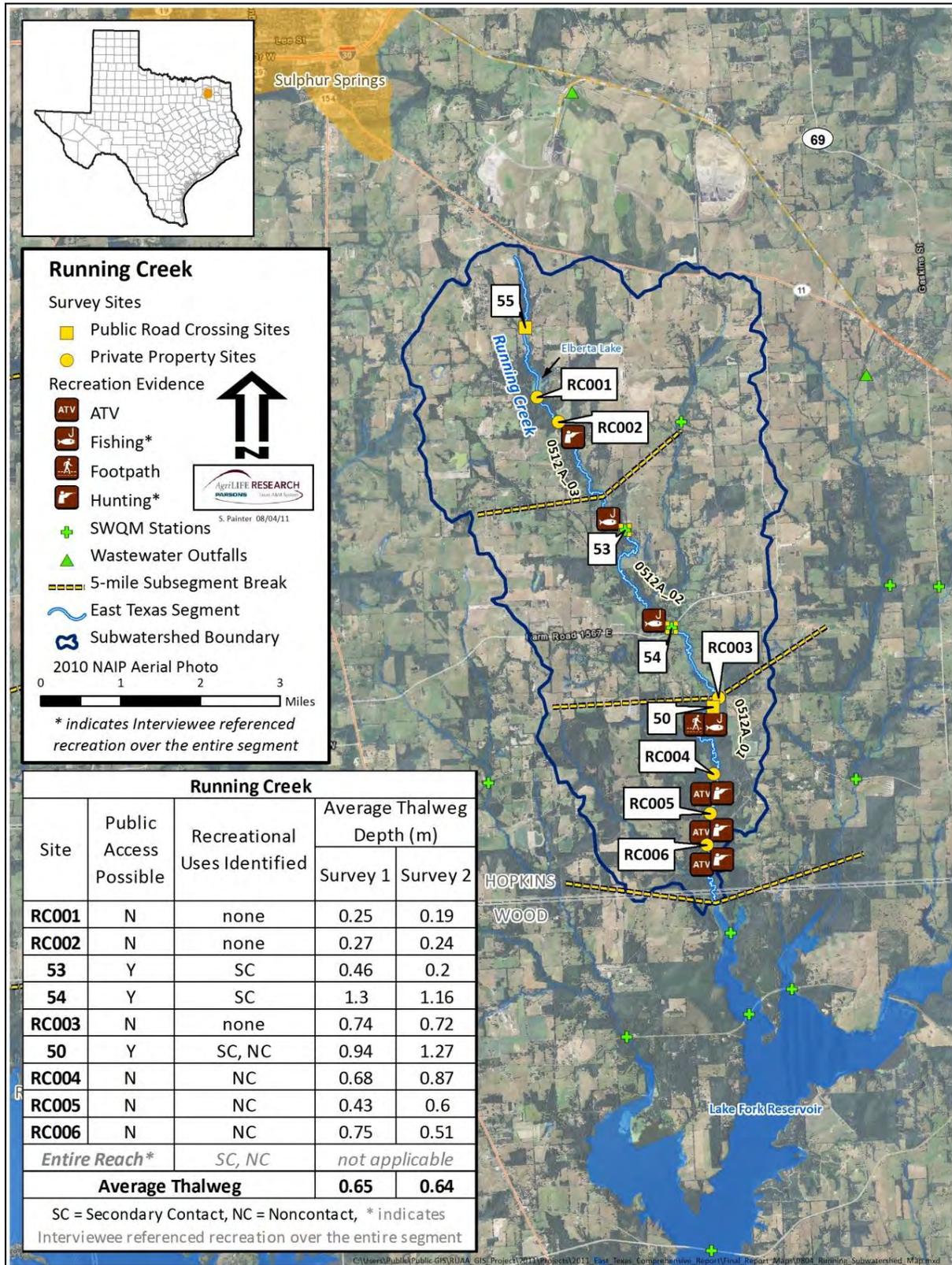


Figure 4.13 Running Creek, Survey Site RC001**Site RC001 Private Property Upstream View****Site RC001 Private Property Downstream View**

Site RC002 is also located on private property and differed very little from Site RC001. Flow was measured at 0.89 cfs and 0.33 cfs in 2011. Thalweg depth averaged 0.27m and 0.24m, respectively, during the two surveys conducted in 2011. A pool at the 150m transect was measured at 0.75 m. No primary or secondary contact recreation was observed at this site and no signs of previous recreation activity were recorded. Site conditions recorded included dense, shrub dominated stream banks, fallen trees in and across the creek, and muddy substrate. A western cottonmouth water moccasin was observed at this site. Interviewees stated that seasonal hunting occurs along the riparian corridor of subsegment 0512A_03.

Three sites, 53, 54, and RC003, were surveyed along subsegment 0512A_. Site 53 was the first site surveyed on Running Creek that was accessible from a public road (County Road 2322). Transects for Site 53 were surveyed upstream of County Road 2322. At this site stream flow measured at 6.67 cfs during the 2010 survey. At the time of the 2011 survey flow was only 0.39 cfs. The average thalweg depth of the first survey was 0.46m and 0.2m for the second survey. No pools greater than 1.0m in depth were recorded during either survey. Site conditions recorded included lack of roadside parking, steep, incised overgrown banks, log jams, and flotsam. Neither primary nor secondary contact recreation was observed at Site 53. However, fish nets, fishing lines, and filleted fish carcasses were found along the creek banks.

The next downstream site located at the crossing of FM 1567E is Site 54. This site was also publicly accessible from the road; however, there was no defined roadside parking area and there are steep banks from the road to the creek bed. Transects conducted at Site 54 were taken downstream of FM 1567E. Water depth and flow conditions during both survey events at this site prohibited wading. During the second survey event a kayak was used to aid data collection and the average thalweg depth was recorded at 1.16m. No pools greater than 1.0m in depth were recorded during either survey. Site conditions recorded included lack of roadside parking, steep, incised overgrown banks, log jams, flotsam, water snakes, and mature trees throughout the riparian corridor. Private property borders Running Creek at this site. Neither primary nor secondary contact recreation was observed at Site 54. Fishing lines were found along the creek banks.

Site RC003 is located on private property and was accessed from County Road 2436. This site is surrounded by mature bottomland forest. Stream flow was measured at 1.4 cfs during a May 2011 visit and no flow was encountered during the second survey in June 2011. Average thalweg depths were 0.74m during the first survey and 0.72m during the second survey. No pools greater than 1.0m in depth were recorded during either survey. The landowner explained during the interview that beaver dams up and downstream cause stream flow and depth to vary. Primary and secondary contact recreation was not observed during either site survey and evidence of recreation was not recorded. Site conditions recorded included lack of public access, steep banks, overhanging tree branches, household garbage, log jams, and the presence of western cottonmouth water moccasins.



Beaver activity on Running Creek

Surveys were conducted at four different sites along subsegment 0512A_01 – sites 50, RC004, RC005, and RC006. Transects conducted at Site 50 located at County Road 2436 were taken downstream of the road. Stream flow was 6.71 cfs in May 2010; in June 2011, by contrast, there was no stream flow. The average thalweg depth in 2010 was 0.94m and 1.27m in 2011. No pools greater than 1.0m in depth were recorded during either survey. Despite sufficient water to support recreational contact, none was observed and public access was difficult. Lack of parking along County Road 2436, privately owned banks, steep, slippery banks, large household garbage, oil slicks, beaver dams, and log jams across the entire stream bed were documented. Photographs in Figure 4.14, taken downstream of County Road 2436 display the dense riparian vegetation, fallen trees, and water surface conditions. Foot paths and fishing gear provided evidence of secondary and noncontact recreation activity at Site 50.

Figure 4.14 Running Creek, Survey Site #50



Site #50 at County Road 2436 Upstream View



Site #50 at County Road 2436 Downstream View

Downstream of Site 50, access to Running Creek was exclusively through private property. Site RC004, located on private property was accessed by the field crew from County

Road 1439. The average thalweg depth of the first survey was 0.68m and 0.87m during the second survey. Stream characteristics at this site differed considerably from previous sites because, according to the landowner, an upstream beaver dam had interrupted water flow. Hence there was no measureable stream flow at this site. Stream bank vegetation included thick shrubs, mature trees, and both open and dense overhead canopy. Along the riparian corridor livestock, hunting blinds, wildlife tracks, ATV (all-terrain vehicle) tracks, and water snakes were observed. The lack of flow created stagnant, scummy pools, a concentration of snakes (six on one visit), and a slippery muddy creek bottom. Neither primary nor secondary contact recreation was observed during surveys. Evidence of noncontact recreation activity was identified at Site RC004.



Western cottonmouth water moccasin

The last two sites surveyed, Sites RC005 and RC006, are located on private property. As with Site RC004, Sites RC005 and RC006 had variable water flow (none the first visit and up to 1.54 cfs on the second). The average thalweg depth at Site RC005 was 0.43m and 0.6m on the first and second visits, respectively. The average thalweg depth measured at Site RC006 was 0.75m from the first survey and 0.51m from the second survey. Exclusion of the general public on private property, steep vegetated banks, thick, overhanging branches, thick algal mats, log-strewn stream bottom and the presence of western cottonmouth water moccasins all discouraged human contact with the water. The photographs in Figure 4.15 display the dense algal mat and woody debris on the water surface, which is prevalent throughout Site RC005 and the thick riparian vegetation along both stream banks. Neither primary nor secondary contact recreation was observed during surveys. The only evidence of noncontact recreation activities included ATV trails and duck and deer hunting blinds from the previous hunting season.

Figure 4.15 Running Creek, Survey Site RC005



Site RC005 Private Property off County Road 2432
Upstream View



Site RC005 Private Property off County Road 2432
Downstream View

The majority of interviewees stated that thick forest and private property impede any primary contact recreation in Running Creek and that they had never witnessed any. Interviews also revealed that fishing and waterfowl hunting do take place on private land and from boats that access the lower reaches from Lake Fork Reservoir. Other interviewees were unfamiliar with the creek because they never had cause to enter it or talk to someone who had despite living close to it. Only two interviewees had witnessed someone fishing in the creek and none had ever witnessed anyone boating, wading, or swimming in Running Creek except to pursue game while hunting. In summary, the surveys recorded flowing or standing water conditions throughout the entire length of the Running Creek. Public access is possible, albeit difficult, at three of the nine sites surveyed. However, whether the site was at a public road crossing or on private property, access to the creek bed was difficult and cumbersome along each survey site. Table 4.7 summarizes the pool and thalweg depth measurements collected from each survey site for Running Creek. Site surveys and interviews provided evidence of secondary and noncontact recreation at six of the nine sites.

Table 4.7 Running Creek: Average Thalweg

Site	First Surveys					Second Surveys					
	Date	Year	Observed PCR	Pools > 1.00 meter	Avg. Thalweg Depth (m)	Date	Year	Observed PCR	Pools > 1.00 meter	Avg. Thalweg Depth (m)	
RC001	May 20	2011	None	None	0.25	June 11	2011	None	None	0.19	
RC002	May 20	2011	None	None	0.27	June 11	2011	None	None	0.24	
53	May 21	2010	None	None	0.46	June 11	2011	None	None	0.2	
54	May 22	2010	None	None	1.3	June 10	2011	None	None	1.16	
RC003	May 20	2011	None	None	0.74	June 11	2011	None	None	0.72	
50	May 21	2010	None	None	0.94	June 10	2011	None	None	1.27	
RC004	May 20	2011	None	None	0.68	June 11	2011	None	None	0.87	
RC005	May 20	2011	None	None	0.43	June 11	2011	None	None	0.6	
RC006	May 20	2011	None	None	0.75	June 11	2011	None	None	0.51	
Overall Thalweg Average					0.65	Overall Thalweg Average					0.64

4.6 Caney Creek (0502B)

4.6.1 Historical Recreation Evidence

Little information is available on historical recreational use of Caney Creek. According to an outdoorsmen's website, The Hook and Bullet (<http://www.hookandbullet.com/fishing-caney-creek-marshall-tx/>), fishing for over a dozen distinct fish is possible on this segment (Hook, Caney 2011). Caney Creek Park (<http://www.newtontexas.org/parks.htm>), created in the City of Newton in 1994, offers non-contact recreation activities adjacent to Caney Creek (Newton 2011). There are signs posted in the park that prohibit swimming and fishing. The Caney Creek Park Improvement Project funded by Natural Resources Conservation Service (NRCS) recently focused on park improvements (http://www.tx.nrcs.usda.gov/news/lonestalink/archives/06/wind_pwr.html).

4.6.2 Subwatershed Characteristics

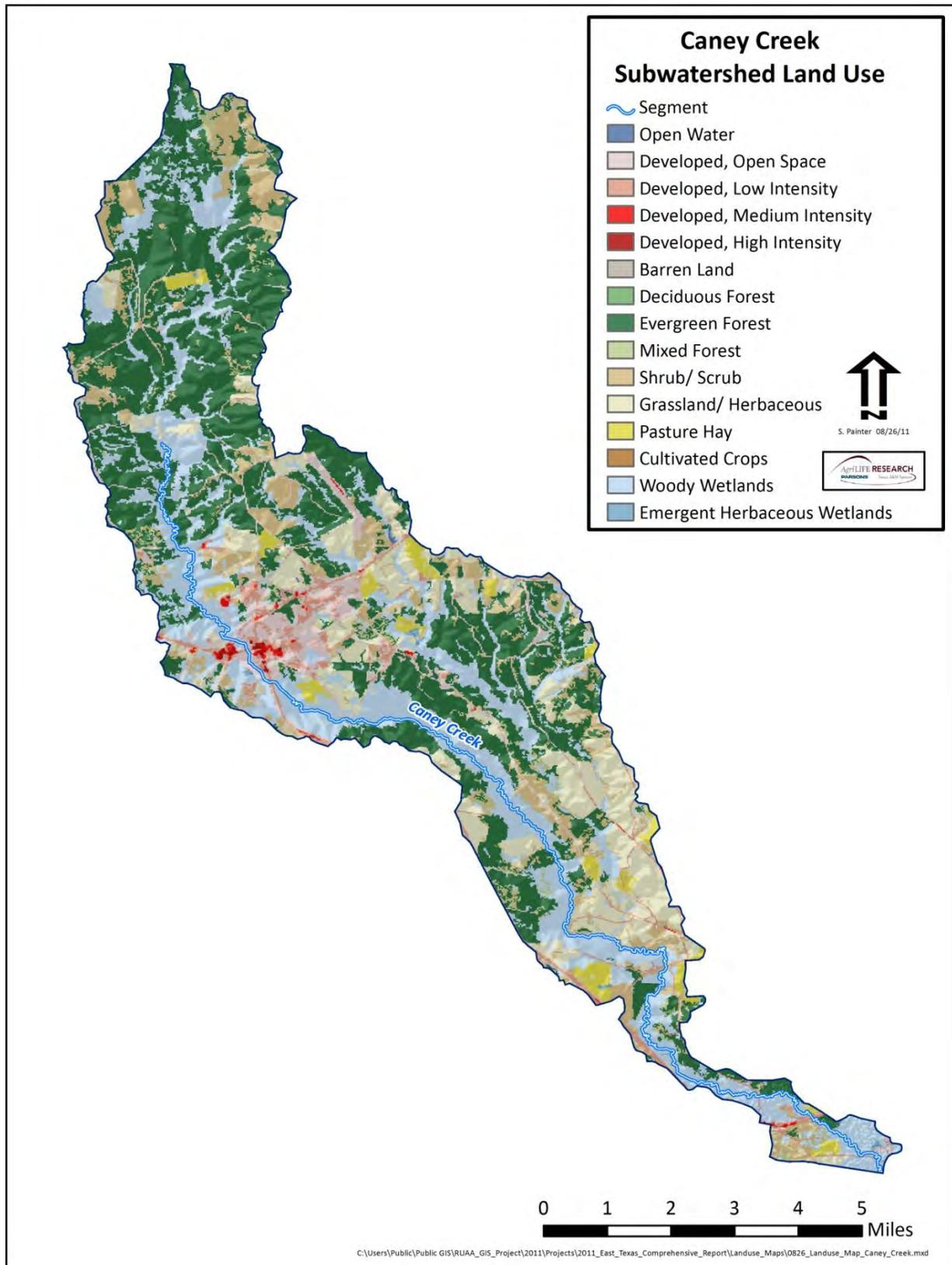
Caney Creek originates seven miles north of Newton, TX and runs for 24.7 miles to its confluence with the Sabine River. Caney Creek has no headwaters because it starts at the confluence with Martin Branch. The entire Caney Creek subwatershed is found exclusively within Newton County. The Texas 2008 §303(d) List identifies the entire length of Caney Creek as not supporting primary contact recreation use because of elevated levels of bacteria. The corridor of Caney Creek is dominated by mature deciduous vegetation. Crown Pine Lumber Company owns much of the land along the creek from Newton to the confluence with the Sabine River. Along this stretch the vegetation on the creek bottom is mature deciduous forest close to the stream and pine plantation farther from the creek.

The Caney Creek subwatershed is primarily wooded. Thirty-six percent is evergreen pine for lumber production while nearly 40 percent consists of other non-harvestable woodland, including wet woodland and deciduous uplands. Only 2.4 percent of the surface area is utilized for pasture or hay production and essentially no land are cultivated. Although 10 percent of the land is classified as developed, only 0.4 percent of this is under medium or high intensity development. Table 4.8 and Figure 4.16 provide a summary of the land use/land cover characteristics of the Caney Creek subwatershed, derived from the USGS 2001 National Land Cover Dataset (USGS 2007).

Table 4.8 Caney Creek Subwatershed: Land Use Summary by Category

Caney Creek Land Use		
Category	Acres	Percent
Open Water	13	0.0%
Developed, Open Space	1,861	6.1%
Developed, Low Intensity	998	3.3%
Developed, Medium Intensity	88	0.3%
Developed, High Intensity	32	0.1%
Barren Land (Rock/Sand/Clay)	11	0.0%
Deciduous Forest	5	0.0%
Evergreen Forest	11,095	36.3%
Mixed Forest	632	2.1%
Shrub/Scrub	3,433	11.2%
Grassland/Herbaceous	3,778	12.4%
Pasture/Hay	742	2.4%
Cultivated Crops	0	-
Woody Wetlands	7,831	25.6%
Emergent Herbaceous Wetlands	51	0.2%
Total	30,568	100.0%

Figure 4.16 Caney Creek Subwatershed Land Use Map



4.6.3 RUAA Survey Results for Caney Creek

The Caney Creek subwatershed map (Figure 4.17) displays the RUAA survey sites, recreational evidence from surveys and interviews, and other relevant information that may influence the potential for recreation activities along the river corridor, and includes cities and wastewater treatment plant outfalls. Within the map is a table that summarizes the average thalweg depth (where measurement was possible), identified uses, and availability of public access documented at the sites surveyed along Caney Creek. A total of 15 sites were surveyed along Caney Creek; seven of the 15 sites were on private property. The Caney Creek subwatershed was subdivided into five subsegments for assessment purposes: 0502B_01, 0502B_02, 0502B_03, 0502B_04, and 0502B_05.

Following the eight site surveys completed during the summer of 2010 at public road crossings, an additional seven new sites were planned for surveys in the summer 2011. These additional sites are located on private properties owned by either individual landowners or timber companies. Data collected in 2010 on segment 0502B indicates evidence of secondary contact recreation and an average thalweg depth greater than 0.53m. These two characteristics triggered the need for a second round of site surveys on Caney Creek. Private access sites were added in 2011 to supplement the data collected at public road crossings to provide a more accurate summation of the physical attributes and recreational uses of the stream. Follow-up visits to all survey sites were carried out in 2011 as part of a comprehensive RUAA and the descriptions below incorporate both 2010 and 2011 visits.

Surveys were conducted at three sites – CC001, CC002, and CC003 – along the upstream most subsegment 0502B_05. Site CC001 was accessed from private land owned by Crown Pine Timber, LLC and marked the beginning of the upper subsegment. Stream flow recorded during the two visits was 0.88 cfs on the first visit and 0.85 cfs on the second visit. Average thalweg depth was 0.6m during the first survey and 0.29m during the second survey. Pools ranged up to 20m in length, 10m in width and 1.5m in depth. Vegetation immediately around the creek was deciduous riverine forest with pine plantations farther from the bank. Despite the presence of fish, there was no primary or secondary contact recreation observed nor was there evidence of previous recreation activity. Figure 4.18 displays the key site characteristics recorded, including no public access, steep vegetated stream banks, and frequent log jams that impede free movement in the water.

Figure 4.18 Caney Creek, Survey Site CC001**Site CC001 Private Property Upstream View****Site CC001 Private Property Downstream View**

Site CC002, which is also located on Crown Pine Timber, LLC land, differed little from Site CC001 except for slightly diminished flow, shallower pools, and the presence of more household garbage. Average thalweg depth on the first visit was 0.44m and 0.40m on the second visit. Stream flow was 0.81cfs and 0.21cfs during the first and second surveys. No primary or secondary contact recreation was observed and there was no evidence of previous recreation activity.

Site CC003, located on private property, was accessed by the field crew from County Road 1001. Stream flow when surveyed on the first visit was 1.89 cfs and 0.14 cfs on the second visit. Average thalweg depths were 0.45m during the first survey and 0.44m during the second survey. Pool measurements recorded were up to 20m in length, 15m in width and up to 1.3m in depth. Other than a nearby ATV trail and deer stand, no water-related recreation or evidence of previous recreation was observed. Access along the adjacent private land was extremely difficult because of very steep stream banks and dense vegetation. The stream was intermittently shallow and the bed was frequently littered with large logs that harbored western cottonmouth water moccasins.

Surveys were conducted at four sites – 64, 62, 61, and 63 – along subsegment 0502B_04. Site 64 located at State Highway 87 was the uppermost publicly accessible site on Caney Creek. Transects for Site 64 were surveyed downstream of State Highway 87. Stream flow was obstructed upstream by a beaver dam resulting in no flow measurement during the first visit and had 1.38 cfs flow on the second visit. The average thalweg depths derived from the 2010 and 2011 surveys were 0.48m and 1.06m, respectively. Pools were wide (up to 15m); no pools greater than 1.0m deep were recorded during either survey; however, some parts could not be waded. The streambed was easily accessible from Highway 87 and, although no primary or secondary contact recreation was

**Discarded fishing bobber**

observed, there was evidence of previous recreation activity, including discarded fishing tackle and items of clothing. Other site characteristics recorded include steep stream banks with dense vegetation, frequent log jams, lack of water flow, and debris in the channel.

Site 62 at the intersection with U.S. Highway 190 is the survey site closest to an urban area located on the west side of Newton, TX just upstream of Caney Creek Park. Transects for Site 62 were surveyed downstream of U.S. Highway 190. Flow measurements taken in 2010 and 2011 at Site 62 were 0.97 and 3.86 cfs, respectively. The average thalweg depth in 2010 was 0.69m and 0.52m in 2011. No pools greater than 1.0m in depth were recorded during either survey. Site 62 is accessible from Caney Creek Park, which is maintained by the town of Newton. City signs prohibit fishing and swimming. Although no primary contact recreation was observed, bicyclists carrying fishing poles over the highway bridge and fishing debris within the stream bed were documented. Figure 4.19 displays the stream conditions upstream of Caney Creek Park in Newton, TX.

Figure 4.19 Caney Creek, Survey Site #62



Site #62 at U.S. Hwy 190 Upstream View



Site #62 at U.S. Hwy 190 Downstream View

Site 61 was accessed from State Loop 505 in Newton. There was no stream flow the first visit and 1.66 cfs during the second survey. Transects for Site 61 were performed downstream of State Loop 505. Thalweg depths averaged 0.95m in 2010 and 0.97m in 2011. Pools were large with measurements up to 35m long and 20m wide and greater than 1.0m in depth. Neither primary nor secondary contact recreation was observed and no evidence of recreation activity was found at this site. Household trash, steep creek banks with dense vegetation, utility pipes crossing the creek, and alligator spoor were recorded. Interviews with adjacent homeowners revealed that a large pool was at one time used as a swimming hole but that residents now preferred to drive to Cow Creek to swim.

Site 63 was accessed from U.S. Highway 190 and likewise had no stream flow the first visit and 2.59 cfs the second visit despite large pools, some stretches of which were too deep for the survey crew to wade. Transects for Site 63 were performed downstream of U.S. Highway 190. The average thalweg depth recorded in 2010 was 1.07m and 1.2m in 2011. No pools greater than 1.0m in depth were recorded during either survey. Steep, heavily vegetated banks, numerous logs, utility pipes crossing the creek, and household garbage were recorded at this site. Primary and secondary contact recreation was not observed during the second survey.

At the time of the first survey in 2010 field crews witnessed teenagers fishing below the bridge. Other evidence of recreation activity at this site included a foot path from the parking area near the bridge to the creek and discarded fishing tackle documented at the second visit.

The next subsegment, 0502B _03, had only two survey sites – CC004 and CC005 - that were accessed from the same property off Lee’s Mill Road. Site CC004 was accessed by foot from Crown Pine Timber, LLC property and was not accessible to the public. Stream flow was 3.18 cfs at the time of the first visit and 1.67 cfs at the time of the second visit. Thalweg depths averaged 0.39m for the first survey and 0.34m for the second survey. Pools were large 20m in length, up to 8m wide and up to 1.1m deep. Neither primary nor secondary contact recreation was observed. However, evidence of noncontact recreation activity included footpaths and a deer blind. Factors that would discourage contact recreation included remote location, private property on both banks, household garbage from upstream, logs in the stream bed, and snakes. Characteristics of Site CC005 were very similar to Site CC004 given their proximity; however, no evidence of recreation activity was documented from this site. Figures 4.20 and 4.21 provide photographs of both sites CC004 and CC005.

Figure 4.20 Caney Creek, Survey Site #CC004



**Site CC004 Private Property off of Lee’s Mill Road
Upstream View**



**Site CC004 Private Property off of Lee’s Mill Road
Downstream View**

Figure 4.21 Caney Creek, Survey Site CC005



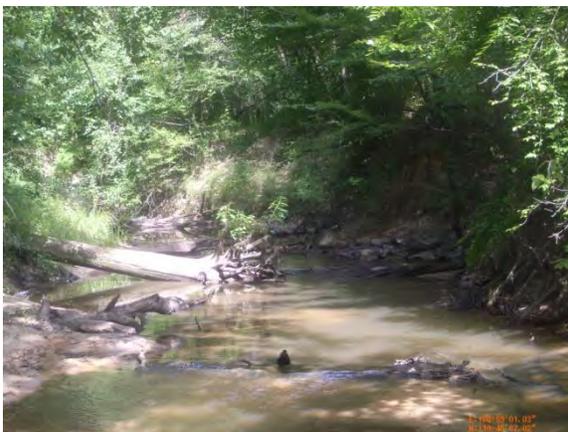
**Site CC005 Private Property off of Lee's Mill Road
Upstream View**



**Site CC005 Private Property off of Lee's Mill Road
Downstream View**

The next subsegment, 0502B_02, had two survey sites – 59 and CC006. Site 59 was accessible to the public from FM 2626 with some residences close by. Transects for Site 59 were performed upstream of FM 2626. Flow was 3.84 cfs the first visit and 1.31 cfs the second visit. Thalweg depths averaged 0.54m for the 2010 survey and 0.27m for the 2011 survey. Pools were over 20m long and up to 1.1m deep, and mature riverine forests were present along both banks. Primary contact recreation was not observed during either survey. Evidence of previous fishing was documented, including discarded tackle and fishing poles on the bank of one adjoining home. Figure 4.22 displays the frequent fallen trees and debris in the creek, steep banks with heavy vegetation and fishing poles anchored in the stream bank.

Figure 4.22 Caney Creek, Survey Site #59



Site 59 at FM 2626 Upstream View



Site 59 at FM 2626 Downstream View

Site CC006, which is on private property, was accessed from Lee's Mill Road. Stream flow was measured at 2.68 cfs on the first survey and 1.18 cfs on the second survey. Average thalweg depths were 0.35m from measurements taken on the first visit and 0.26m on the second visit. Pools were large and up to 1.1m deep. No primary or secondary contact recreation was

witnessed and no evidence of recreation activities was found although there was a deer stand close by. Characteristics at Site CC006 were similar to Site 59 and numerous western cottonmouth water moccasins were seen.

For the downstream most subsegment, 0502B_01, four sites were surveyed – CC007, 58, 56, and 57. Subsegment 0502B_01 of Caney Creek was characterized by heavy bottomland forest and greater stream flows. Access to Site CC007, which is on private property, was obtained off of Lee’s Mill Road by the field crew through Crown Pine Timber, LLC. Flows at Site CC007 increased to 2.79 and 3.16 cfs on the two survey visits and the creek water was used to irrigate deer food plots close to the bank where a deer stand was located. Average thalweg depth measured from the first survey was 0.58m and 0.49m from the second survey. Pools greater than 1.0m in depth were recorded during both surveys. There was no primary or secondary contact recreation observed and no evidence of recreation activity was recorded during either survey.



Kids at a popular swimming hole at Site #58

Site 58, located at Jones Road, had measured flows of 3.55 cfs during the first visit and 7.25 cfs the second visit. Transects for Site 58 were performed upstream of Jones Road. Average thalweg depths were 0.33m from the 2010 survey and 0.48m from the 2011 survey. Pools up to 35m long, 20m wide, and up to 1.2m deep were recorded. Houses were located nearby, an unimproved parking area was observed, and signs of swimming were apparent at a site, including a rope swing. On a subsequent visit, swimming was witnessed by the team during a drive by. Easy public access, footpaths, and discarded flotation devices were also documented around this site. Fishing appears to be common, as documented by field team observations and indicated by interviews. Figure 4.23 provides photographs of the Caney Creek at Site 58.

Figure 4.23 Caney Creek, Survey Site #58



Site #58 at Jones Road Upstream View



Site #58 at Jones Road Downstream View

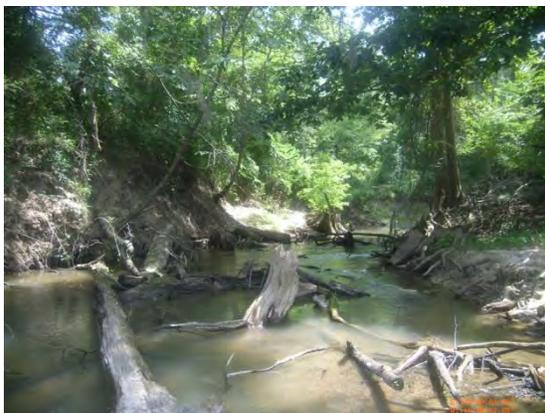
Site 56 is located at the intersection of U.S. Highway 190 near Bon Wier with some surrounding residences. Transects for Site 56 were performed upstream of U.S. Highway 190. Stream flow measured during the 2010 survey was 7.40 cfs and 3.37 cfs during the 2011 survey. Average thalweg depths were 0.38m from the 2010 survey and 0.49m from the 2011 survey. Pools were large and up to 1.4m deep. Parking and public access were fairly easy from the highway. Neither primary nor secondary contact recreation was observed at this site, but evidence of fishing and other noncontact recreation activity was documented. Other characteristics of this site recorded include steep banks covered with dense shrub and trees, significant quantities of logs in the stream bed, and discarded refuse.

The most downstream site surveyed was Site 57, which is publicly accessible from Sabine Sands Road. Transects for Site 57 were performed upstream of Sabine Sands Road. This site is located very close to the confluence with the Sabine River. Stream flow measured during the 2010 survey was 9.32 cfs and 3.21 cfs during the 2011 survey. Average thalweg depths were 0.39m from the 2010 survey and 0.3m from the 2011 survey. Pool lengths went to 24m, widths up to 18m and depths up to 1.6m. No recreation activity was observed and no evidence of recreation was recorded at Site 75. This site had large log jams and was used as a garbage dump. Sewage treatment plant effluent flowed into the stream nearby and no trespassing signs were located on either side of the creek bank. Figure 4.24 displays the degraded physical characteristics of Caney Creek and the rough terrain of the riparian corridor.



Trash dump along stream bank at Site #57

Figure 4.24 Caney Creek, Survey Site #57



Site #57 at Sabine Sands Road Upstream View



Site #57 at Sabine Sands Road Downstream View

Interviews confirmed that fishing, trapping, hunting, canoeing, tubing, wading, and swimming occur regularly on Caney Creek. Three interviewees stated that more boating and swimming, especially in the upper subsegments near Newton, used to occur but that the WWTP discharge from Newton had discouraged many, including the interviewees, from water contact. Interviewees also stated that swimming does not occur in Newton. To summarize, interviews,

observations of primary contact recreation (rope swings, flotation devices, swimming) and evidence of secondary recreation (fishing tackle) and noncontact recreation (footpaths, ATV trails, graffiti) were documented on Caney Creek, especially close to the confluence with the Sabine River. Indirect evidence of noncontact recreation was also evident near Newton, TX. Rapid water flow, log jams, and extensive garbage in the downstream subsegment make recreation difficult, especially with the evidence of alligators (*Alligator mississippiensis*) and poisonous western cottonmouth water moccasin discouraging public use. Interviews indicated general concern with water quality and safety that discouraged wading and fishing. Public access is possible at eight of 15 sites surveyed. However, whether the site was at a public road crossing or on private property, access to the creek bed is difficult and cumbersome along each and every survey site. Table 4.9 summarizes the pool and thalweg depth measurements collected from each survey site for Caney Creek. Site surveys and interviews provided evidence of primary, secondary or noncontact recreation at 10 of the 15 sites.

Table 4.9 Caney Creek: Average Thalweg

Site	First Surveys					Second Surveys					
	Date	Year	Observed PCR	Pools > 1.00 meter	Avg. Thalweg Depth (m)	Date	Year	Observed PCR	Pools > 1.00 meter	Avg. Thalweg Depth (m)	
CC001	May 21	2011	None	Yes	0.6	June 24	2011	None	Yes	0.29	
CC002	May 21	2011	None	None	0.44	June 24	2011	None	Yes	0.4	
CC003	May 21	2011	None	Yes	0.45	June 24	2011	None	Yes	0.44	
64	July 16	2010	None	None	0.48	June 24	2011	None	None	1.06	
62	July 16	2010	None	None	0.69	June 24	2011	None	None	0.52	
61	July 16	2010	None	None	0.95	June 24	2011	None	Yes	0.97	
63	July 16	2010	None	None	1.07	June 24	2011	None	None	1.2	
CC004	May 22	2011	None	Yes	0.39	June 25	2011	None	Yes	0.34	
CC005	May 22	2011	None	None	0.44	June 25	2011	None	Yes	0.36	
59	July 16	2010	None	None	0.54	June 25	2011	None	Yes	0.27	
CC006	May 21	2011	None	Yes	0.35	June 25	2011	None	Yes	0.26	
CC007	May 21	2011	None	Yes	0.58	June 25	2011	None	Yes	0.49	
58	July 17	2010	None	None	0.33	June 25	2011	Yes	Yes	0.48	
56	July 17	2010	None	None	0.38	June 25	2011	None	Yes	0.49	
57	July 17	2010	None	None	0.39	June 25	2011	None	Yes	0.3	
Overall Thalweg Average					0.54	Overall Thalweg Average					0.52

4.7 Summary of Recreation Evidence

Table 4.10 provides a summary of the observations documented from the accessible sites along each of the four Sabine River tributaries addressed in this report. These surveys were completed to establish and verify whether the existing contact recreation uses were different from the designated and presumed recreational uses. Data collected at the sites included general stream characteristics, observations, evidence of recreational uses, and surrounding conditions that promoted and/or impeded recreation in the riparian corridor, such as channel obstructions. The field teams witnessed only one specific occurrence of primary contact recreation at Site 58 on Caney Creek. Observations of secondary and noncontact recreation were recorded. Recreational use and public accessibility to these water bodies are heavily influenced by forestry activity and large tracts of private land that preclude public access. Even where public access is possible, conditions at very few sites allow easy access to the water. According to the interviews and other evidence collected, primary contact recreation occurs at sites on the South Fork of the Sabine River, Elm and Caney Creek. Interviews and evidence collected confirmed that secondary contact recreation occurs at various sites on all four water bodies.

Table 4.11 provides detailed information collected on the individual sites surveyed. Table 4.12 further quantifies evidence of recreational activities collected from the surveys and interviews on all four water bodies. Finally, Table 4.13 provides additional descriptions of the types of recreation activities and evidence documented at specific survey sites, including the number of people observed in the activity.

Two Summary of Findings meetings were conducted in Sulphur Springs and Jasper, TX on August 23 and August 24, 2011, respectively. The meetings were intended to share preliminary results of the Sabine River Basin Basic and Comprehensive RUAA surveys with local stakeholders and obtain any additional information related to the recreational use of the streams being surveyed. At the Sulphur Springs meeting, a stakeholder from Hopkins County recalled seeing children playing in Elm Creek behind private residences at two separate locations. An interview form was completed by the stakeholder. TCEQ staff advised the stakeholders attending both meetings that they would have an additional opportunity for comment during a 30 day public comment period before any TCEQ action is taken.

Table 4.10 Summary of Observations by Water Body Segment Name

Segment Name / #	Count of Sites Accessed (Complete RUAA was Performed)	Average Thalweg Depth >0.5 m During Both Surveys	Pool Depths >1.0 m	Public Access	Observation	Observed Use			
					Type	(Yes/No)			
						PCR	SC1	SC2	NCR
South Fork Sabine River 0507G	12	Yes	Yes	5 of 12	Interviews	Yes	Yes	Yes	Yes
					Evidence	No	Yes	Yes	Yes
Elm Creek 0512B	7	Yes	Yes	6 of 7	Interviews	Yes	Yes	Yes	Yes
					Evidence	No	Yes	No	No
Running Creek 0512A	9	Yes	No	3 of 9	Interviews	No	Yes	Yes	Yes
					Evidence	No	Yes	No	Yes
Caney Creek 0502B	15	Yes	Yes	8 of 15	Interviews	Yes	Yes	Yes	Yes
					Evidence	Yes	Yes	No	Yes

Table 4.11 RUAA Summary by Site of Information Collected by Field Teams

Count (U/S to D/S)	Stream Name	Road or Property Name	Site ID	# of People Observed	Ease of Access	Actual Primary Recreation Observed	Actual Secondary Recreation Observed	Frequency (Based on interviews and evidence)	Evidence of Recreational Use Yes/No	Evidence
1	South Fork Sabine	Private Road 2030	SF001	0	MD	No	No	Never	No	–
2	South Fork Sabine	Sabine Circle	SF002	0	MD	No	No	Never	No	–
3	South Fork Sabine	TX Hwy 276	18	0	MD	No	No	I/U	No	–
*4	South Fork Sabine	FM 1565	17	0	MD	No	No	I/U	No	–
5	South Fork Sabine	County Road 2426	SF003	0	D	No	No	Never	No	–
6	South Fork Sabine	County Road 2426	SF004	0	D	No	No	Never	No	–
7	South Fork Sabine	County Road 2400	15	0	MD	No	No	I/U	Yes	Fishing line
8	South Fork Sabine	Sally Goodin Lane	SF005	0	MD	No	No	Never	No	–
9	South Fork Sabine	County Road 2316	16	0	ME	No	No	I/U	Yes	Fishing line, catfish carcasses, footpaths/prints
10	South Fork Sabine	State Hwy 34 S	SF006	0	ME	No	No	Never	Yes	Deer and duck blinds
11	South Fork Sabine	State Hwy 34 S	14	0	ME	No	No	Weekly	Yes	Bait boxes, bobbers, hooks, weights, footpaths/prints
12	South Fork Sabine	State Hwy 34 S	SF007	0	MD	No	No	Weekly	No	-
1	Elm Creek	County Road 1110	49	0	MD	No	No	Never	No	–

Count (U/S to D/S)	Stream Name	Road or Property Name	Site ID	# of People Observed	Ease of Access	Actual Primary Recreation Observed	Actual Secondary Recreation Observed	Frequency (Based on interviews and evidence)	Evidence of Recreational Use Yes/No	Evidence
2	Elm Creek	County Road 1171	47	0	D	No	No	Never	No	-
3	Elm Creek	County Road 1116	48	0	MD	No	No	I	No	-
4	Elm Creek	County Road 1170	46	0	MD	No	No	I	No	-
5	Elm Creek	TX Hwy 19	44	0	MD	No	No	I/U	No	-
6	Elm Creek	FM 1567	45	0	MD	No	No	I/U	No	-
7	Elm Creek	County Road 1167	43	0	MD	No	No	Never	No	-
8	Elm Creek	County Road 1163	40	0	MD	No	No	I/U	No	Graffiti
9	Elm Creek	FM 514	42	0	ME	No	No	Weekly	Yes	Bait and lure packages, pole stand, fire pit, footpaths/ prints
10	Elm Creek	County Road 3425	41	0	MD	No	No	I/U	No	-
1	Running Creek	Elberta Lake Road	RC001	0	MD	No	No		No	-
2	Running Creek	County Road 2322	RC002	0	MD	No	No		No	-
3	Running Creek	County Road 2322	53	0	ME	No	No	I/U	Yes	Fish netting/fish carcasses
4	Running Creek	FM 1567 E	54	0	ME	No	No	I/U	Yes	rot line, bobber
5	Running Creek	County Road 2436	RC003	0	MD	No	No		No	-
6	Running Creek	County Road 2436	50	0	MD	No	No	I/U	No	Footpath

Count (U/S to D/S)	Stream Name	Road or Property Name	Site ID	# of People Observed	Ease of Access	Actual Primary Recreation Observed	Actual Secondary Recreation Observed	Frequency (Based on interviews and evidence)	Evidence of Recreational Use Yes/No	Evidence
7	Running Creek	County Road 1439	RC004	0	ME	No	No		No	ATV trail, deer blind/ feeder
8	Running Creek	County Road 2432	RC005	0	MD	No	No		No	ATV trail, duck blind
9	Running Creek	County Road 2432	RC006	0	MD	No	No		No	ATV trail, deer blind
1	Caney Creek	Crown Pine	CC001	0	D	No	No	Never	No	–
2	Caney Creek	Crown Pine	CC002	0	MD	No	No	Never	No	–
3	Caney Creek	County Road 1001	CC003	0	MD	No	No	I/U	No	ATV trail, deer blind
4	Caney Creek	SH 87	64	0	ME	No	No	I/U	Yes	Swim trunks, underwear, bobber, fishing line
5	Caney Creek	US Hwy 190	62	0	ME	No	No	I/U	Yes	Footpath to siphon, walking trail, bobbers, bicyclists
6	Caney Creek	State Loop 505	61	0	MD	No	No	I/U	No	–
7	Caney Creek	US Hwy 190	63	2	MD	No	Yes	Monthly	Yes	Worm container, footpath
8	Caney Creek	Crown Pine	CC004	0	D	No	No	I/U	No	Foot path, deer blind/ feeder
9	Caney Creek	Crown Pine	CC005	0	D	No	No	I/U	No	–
10	Caney Creek	FM 2626	59	0	MD	No	No	I/U	Yes	Bamboo fishing poles
11	Caney Creek	Lee's Mill Road	CC006	0	ME	No	No	I/U	No	–

Count (U/S to D/S)	Stream Name	Road or Property Name	Site ID	# of People Observed	Ease of Access	Actual Primary Recreation Observed	Actual Secondary Recreation Observed	Frequency (Based on interviews and evidence)	Evidence of Recreational Use Yes/No	Evidence
12	Caney Creek	Crown Pine	CC007	0	D	No	No	I/U	Yes	Deer blind/ feeder, food plot
13	Caney Creek	Jones Road	58	3	ME	Yes	No	Daily	Yes	ATV trail, ATV, kids swimming, rope swing, inner-tubes, condom wrapper, swim trunks, fishing tackle, foot path
14	Caney Creek	US Hwy 190	56	0	MD	No	No	I/U	Yes	Graffiti, bobber
15	Caney Creek	Sabine Sands Rd	57	0	MD	No	No	I/U	No	–

DI = Difficult, E = Easy, F = Frequent, I = Infrequent, MD = Moderately Difficult, ME = Moderately Easy, U = Unknown, U/I = Unknown/ Infrequent, W = Weekly, 1 = Information gathered in interview near site. * = USGS Gauging Station 08017300

Table 4.12 Sabine River RUAA 2010 - 2011: Recreation Summary

Activity	Observed by Surveyors				Reported (by Interviews)											
	SF Sabine	Elm	Running	Caney	Personal				Observed				Secondhand Knowledge			
					SF Sabine	Elm	Running	Caney	SF Sabine	Elm	Running	Caney	SF Sabine	Elm	Running	Caney
# Surveys	12	7	9	15												
# Interviews	7	11	11	9												
Bicycling	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
Boating	-	-	-	-	-	-	-	1	1	-	-	-	-	1	-	-
Canoeing	-	-	-	-	-	-	-	1	-	-	-	1	-	-	-	1
Fishing	-	-	-	-	1	1	-	4	2	2	2	5	3	1	2	5
Fishing tackle	3	1	2	6	-	-	-	-	-	-	-	-	-	-	-	-
Graffiti	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-
Hunting	-	-	-	-	1	1	2	2	-	1	2	3	1	1	1	3
Hunting blind	1	-	3	3	-	-	-	-	-	-	-	-	-	-	-	-
Swimming	-	-	-	4	-	-	-	4	2	-	-	6	-	-	-	3
Trapping	-	-	-	-	-	-	-	1	-	-	-	2	-	-	-	1
Tubing	-	-	-	-	-	-	-	1	-	-	-	2	-	-	-	1
Wading Adults	-	-	-	-	-	-	-	3	-	-	-	2	-	-	-	4
Wading Children	-	-	-	4	-	-	-	3	-	1	-	4	-	-	-	4

Table 4.13 Sabine River Summary of Contact Recreation Reported by Field Teams and Interviews

Stream	Site #	# of People observed	Field Team			Interviews		
			PCR	SCR	Other	PCR	SCR	Other
South Fork Sabine River	15	0	-	Fishing line	Foot path	-	-	-
South Fork Sabine River	16	0	-	Fishing line, catfish carcasses	Foot paths/ prints;	-	-	-
South Fork Sabine River	SF006	0	-	-	Deer/duck blinds	-	-	Hunting
South Fork Sabine River	14	0	-	Bait boxes, bobbers, hooks, weights	Foot paths/ prints	Swimming	-	-
South Fork Sabine River	SF007	0	-	-	-	-	Boating, fishing	Hunting
South Fork Sabine River	Entire Reach ¹	<i>not applicable</i>				Swimming	Fishing	
Elm Creek	41	0	-	-	-	-	Boating	-
Elm Creek	42	0	-	Bait and lure packages, pole stand	Foot paths/ prints, fire pit, graffiti	-	Fishing	-
Elm Creek	Entire Reach ¹	<i>not applicable</i>				-	Fishing	Hunting
Elm Creek	Near sites #48 and #46	<i>not applicable</i>				Wading by Children	-	-
Running Creek	RC002	-	-	-	-	-	-	Hunting
Running Creek	53	0	-	Fish netting/ carcasses	-	-	-	-
Running Creek	54	0	-	Bobber, trot line	-	-	-	-

Stream	Site #	# of People observed	Field Team			Interviews		
			PCR	SCR	Other	PCR	SCR	Other
Running Creek	50	0	-	-	Foot path	-	Fishing	-
Running Creek	RC004	0	-	-	ATV trail, deer blind/ feeder	-	-	-
Running Creek	RC005	0	-	-	ATV trail, duck blind	-	-	-
Running Creek	RC006	0	-	-	ATV trail, deer blind	-	-	-
Running Creek	Entire Reach ¹	<i>not applicable</i>				-	Fishing	Hunting
Caney Creek	CC003	0	-	-	ATV Trail, deer blind	-	-	ATV riding, hunting
Caney Creek	64	0	Swim trunks, underwear	Bobber, fishing line	-	-	-	-
Caney Creek	62	0	-	Bobbers	Foot path to siphon, walking trail, bicyclists	-	-	-
Caney Creek	63	2	-	Fishing, worm Container	Foot path, human feces	-	Fishing	-
Caney Creek	CC004	0	-	-	Foot path, deer blind/ feeder	-	-	-
Caney Creek	59	0	-	Bamboo fishing poles	-	-	-	-
Caney Creek	CC007	0	-	-	Deer blind/ feeder, food plot	-	-	-
Caney Creek	58	4	Kids swimming, rope swing, inner-tubes, swim trunks	Fishing tackle	ATV trail, ATV, condom wrapper, human feces, foot path	Swimming, wading	Fishing	Hunting

Stream	Site #	# of People observed	Field Team			Interviews		
			PCR	SCR	Other	PCR	SCR	Other
Caney Creek	56	0	-	Bobber	Graffiti	-	Fishing	Hunting
Caney Creek	57	0	-	-	-	Swimming, tubing, wading	Fishing, boating	Hunting
Caney Creek	Entire Reach ¹	<i>not applicable</i>				Swimming, tubing, wading	Canoeing	Trapping, hunting

¹ Interviewee made reference to recreation over entire reach.

SECTION 5 REFERENCES

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