Central and Southeast Texas Recreational Use-Attainability Analyses Project
Cedar Creek (Segment 1209G) Basic RUAA

Results Report

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Introduction

Problem Statement

Recreational Use-Attainability Analyses (RUAAs) are scientific assessments that are used to determine existing and attainable recreational use for a water body and determine if that use might be different than the presumed recreational use, as specified in the Clean Water Act. In September, 2009 a Basic RUAA was initiated on Cedar Creek, Segment 1209G. This Basic RUAA Report will provide the Texas Commission on Environmental Quality (TCEQ) Standards Group with relevant information to help determine the appropriate attainable recreation use for Cedar Creek. The completion of this Basic RUAA consisted of several important interrelated components including 1) reconnaissance and site selection, 2) Basic RUAA and 3) public outreach. The objectives of each component are listed below.

Objectives

1. Reconnaissance and Site Selection

The primary objective of this phase is to select survey sites that would be accessible to users and would most likely characterize recreational uses in the watershed. This was accomplished primarily with the input of local, state and regional agency staff familiar with the watershed, as well as aerial imagery. An initial stakeholder meeting occurred on March 9, 2010 at the Navasota Center, Navasota TX. Reconnaissance surveys were conducted on January 13, 2010 and provided the basis site selection for discussion in this meeting.

2. Basic Recreational Use Attainability Analysis

The primary objective of the Cedar Creek RUAA was to characterize the recreational use and potential impediments to use for this stream. The RUAA field surveys were conducted on the weekend of May 28, 2010, to collect information on the water body and associated uses.

During these dates, field surveys were conducted at selected sites with the highest probability of detecting recreation use. The objective was to document and characterize observed use, site conditions (hydrology, physical attributes), and weather during the survey the RUAA field surveys.

3. Public Participation

The objective of the public participation phase of the Basic RUAA was to solicit as much information from various watershed stakeholders including agency staff, citizens, recreational user groups, and other interested parties on the historical and current recreational uses in Cedar Creek. This included soliciting information on recreational uses by sending out emails to key organizations and staff familiar with the watershed. The stakeholder contact list is provided in Appendix 1. In addition, on March 9, 2010 a stakeholder meeting was held to gather information on the watershed including likely recreational access points.

Study Area

Description of Water Body

Cedar Creek is a tributary to the Navasota River Below Lake Limestone, which is located within the Brazos River Basin. Segment 1209G is an unclassified stream by the TCEQ and is approximately 23 miles in length. Beginning at the confluence with the Navasota River Below Lake Limestone in Brazos County, Segment 1209G continues to the confluence with Moores Branch and Rocky Branch in Robertson County (TCEQ, 2008). The flow in the upper portion of Cedar Creek is intermittent but increases as it travels across the moderately rolling terrain. Cedar Creek supports oak and pine forests with some mesquite and occasional grasses in its sandy and clay loam soils (Handbook of Texas online, 2010). Cedar Creek is on the state's 303(d) list for

geometric mean values that exceed the bacteria criteria associated with primary contact recreation uses (TCEQ, 2008).

Environmental Features and Population Characteristics

The climate in the Navasota River Below Lake Limestone Watershed is classified as having hot, humid summers and mild winters. Cedar Creek has been disturbed by human activities that have altered both the land use and vegetation cover of the watershed. These activities include the construction of roads and instream sewer lines, conversion of land for agriculture, and the building of commercial businesses and residential neighborhoods. The area can be described as rural with a very sparse population density.

Watershed Characterization

The Navasota River Below Lake Limestone watershed traverses flat to rolling terrain with local shallow depressions, surfaced by clay and sandy loams that support water-tolerant hardwoods, conifers, and grasses. The riparian zone is minimally impacted by development. The watershed of Cedar Creek is predominantly rural with agriculture being the primary land use. There are intermittent patches of urban activity where commercial and residential activities are the principal land use (BRA, 2003).

Permitted Discharges (Municipal, Industrial, Stormwater)

Cedar Creek is affected by stormwater runoff from agricultural, industrial, and urban areas. Under Texas Pollutant Discharge Elimination System (TPDES), the TCEQ does not have any issued permits to discharge treated wastewater to the segment 1209G watershed.

Potential Nonpoint Sources

Potential sources of nonpoint source pollution in the watershed include on-site sewage facilities and runoff from agricultural lands. For any urban collection and treatment system,

sanitary sewer overflows are possible sources of bacteria loadings to receiving waters. Cedar Creek (Segment 1209G) watershed can be described as rural with no permitted waste water treatment facilities (WWTF). This fact suggests that there are potentially a high number of on-site sewage facilities (OSSFs or septic systems) in use in the watershed. OSSFs require routine repairs and maintenance to avoid failures causing potential leaks or overflows. Poorly maintained OSSFs are a potential source of bacteria loadings into Cedar Creek watershed.

There are agriculture grazing tracts directly adjacent to Cedar Creek. These tracts at times provide livestock with direct access to the creek. Potential direct access was witnessed at field survey sites 2 and 6. Direct contact with agriculture grazing is a potential nonpoint source for Cedar Creek.

Site Reconnaissance Summary

Perspective sites were chosen based on public access and documented uses from the stakeholder response to the request for information e-mail which is included in Appendix 1. Initial reconnaissance surveys were conducted on January 13, 2010. A total of seven perspective sites were visited (Table 1). Of these, four were considered accessible enough for field survey sites (Table 2). The initial site reconnaissance did not include the upstream extent of the segment due to a map error. The first three field survey sites were added after the reconnaissance was completed, thus do not have corresponding reconnaissance site numbers. Site suggestions were submitted to the TCEQ as part of the Quality Assurance Project Plan's (QAPP) Monitoring Plan, which was approved by TCEQ on May 27, 2010.

Methodologies

RUAA Survey Site Selection and Descriptions

Cedar Creek flows through mostly rural areas held by largely private property owners. The target density of survey sites should be approximately three (3) sites per every five (5) miles of stream (TCEQ 2009). During our study, survey sites were established in areas where 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, and populated areas). A total of seven (7) field survey sites were established (Table 2 & Figure 1). These sites were chosen based on public access potential and also providing sufficient spatial coverage throughout the segment. In portions where the recommended three (3) sites per every five (5) miles of stream was not possible, supplementary information was gathered through coordination with local authorities, and using topographic maps and aerial photos.

Every effort was made to obtain supplementary recreational use information about the entire length of the segment, including areas other than the selected sites in this Basic RUAA. Topographic maps and aerial imagery were used to provide the needed geographic information about potential recreational opportunities, potential access points, and access obstacles along the Cedar Creek. Review of these resources resulted in reconnaissance site selection. The subsequent reconnaissance site visits confirmed the limited public access along the Cedar Creek. Fences, gates, and no trespassing signage are common public access limitations on the segment and resulted in less than three (3) sites for every five (5) miles of stream. Figure 2 photograph was taken at field survey site 5 and is a good representation of the general site conditions found along Cedar Creek.

Table 1. Site reconnaissance for Basic RUAA on Cedar Creek, Segment 1209G. *Site 4 not recommended due to complete lack of water access.

Recon Site	Description	Latitude	Longitude	Wadeable?	Approx width (ft)	Approx depth (ft)	Public Access	Water Access	Recommended Site
1	Cedar Creek Road @ Cedar Creek	30.90726	-96.36582	Yes	12	4	Can pull off on side of road	Relatively steep slopes but manageable, especially on right bank	Yes
2	Old Spanish Road @ Cedar Creek	30.90365	-96.35532	Yes	25	4	Can park on any side of road	Gentle slope on left bank	Yes
3	FM 974 @ Cedar Creek	30.87722	-96.30405	N/A	30	4	Can pull off on all sides	Fairly gentle slope to water on all sides	Yes
4	Dilly Shaw Tap Rd. @ Cedar Creek	30.84669	-96.27673	Yes	10	unknown	Can park along road, all sides	Fenced to the bridge on all sides, no water access	*No
5	Tauber Ranch Rd. @ Cedar Creek	N/A	N/A	N/A	N/A	N/A	Private	N/A	No
6	SH21 @ Cedar Creek (TCEQ Site: 11787)	30.83237	-96.21864	No	N/A	2 - 4	Park on all sides but upstream right bank good	Can get to edge of bank, easy slope upstream right bank	Yes
7	Megan Dr @ Cedar Creek	N/A	N/A	N/A	N/A	N/A	Private	N/A	No

Table 2. Survey sites for the Basic RUAA Survey on Cedar Creek, Segment 1209G (corresponding to Figure 1 and Table 1). Field Survey Sites 1-3 were added after the initial site reconnaissance was completed, thus they did not have corresponding recon site numbers.

Recon Site	Field Survey Site	Description	Latitude	Longitude	Approx. River Mile
N/A	1	FM 46 A @ Cedar Creek	31.005756	-96.460101	28.2
N/A	2	FM 46 B @ Cedar Creek	30.982232	-96.437340	25.3
N/A	3	CR 323 @ Cedar Creek	30.967377	-96.422040	23.2
1	4	Cedar Creek Rd @ Cedar Creek	30.907260	-96.365820	15.3
2	5	Old Spanish Rd @ Cedar Creek	30.903650	-96.355320	14.6
3	6	FM 974 @ Cedar Creek	30.877220	-96.304050	10.2
6	7	SH 21 @ Cedar Creek (TCEQ Site: 11787)	30.832370	-96.218640	3.2

Cedar Creek (Segment 1209G) Basic RUAA

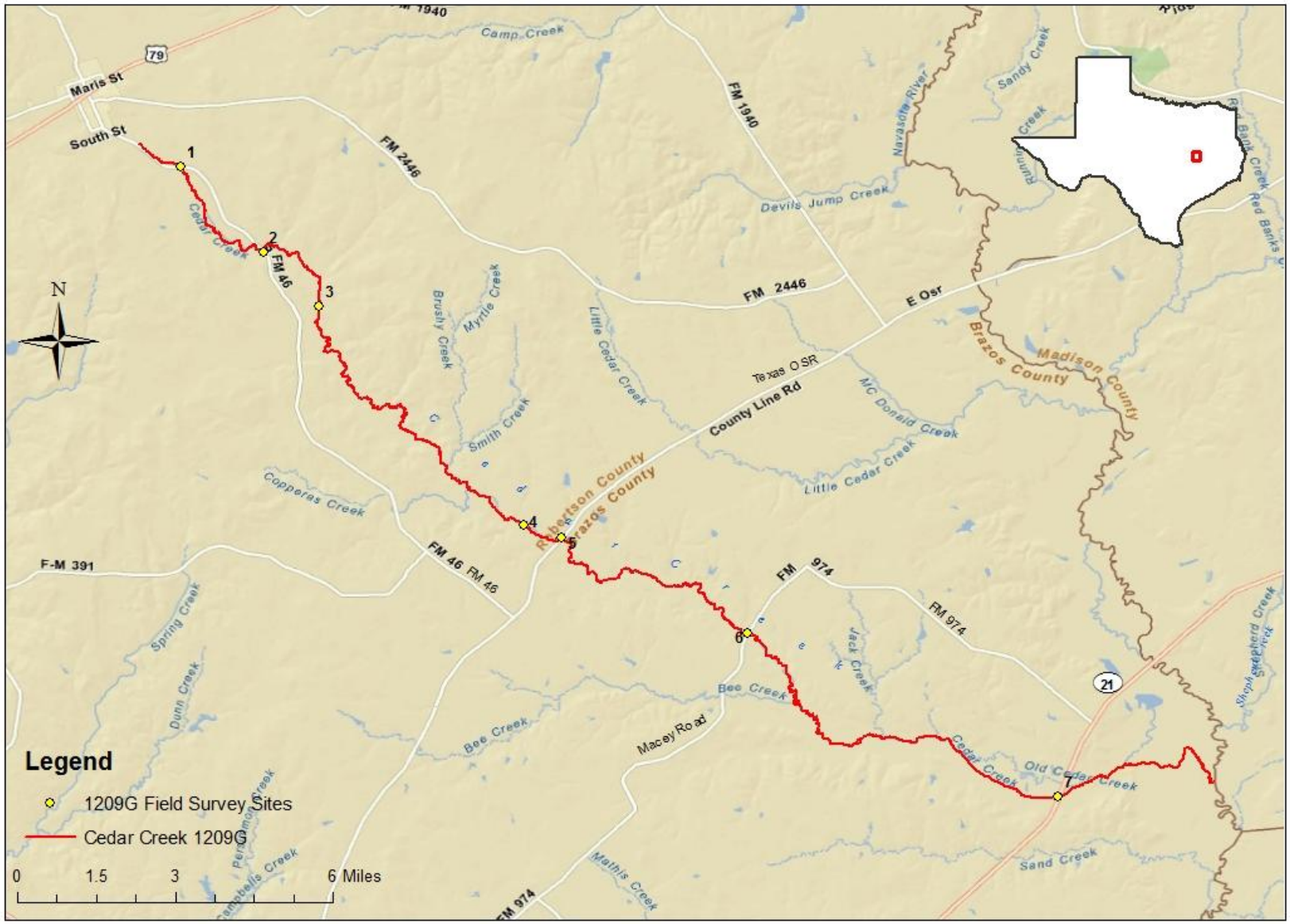

Figure 1. Basic RUAA survey sites on Cedar Creek, Segment 1209G, selections based on river mile/assessment units, accessibility, and recreational features.

Figure 2. Picture of field survey site 5, showing the general representation of the physical conditions seen on Cedar Creek, Segment 1209G

Sampling Methods

RUAAs are used to identify and assign attainable uses and criteria to individual water bodies. Applicable uses and associated criteria are defined in the Texas Surface Water Quality Standards (TSWQS). Until recently, Texas had two recreation use categories in the 2000 TSWQS: contact and noncontact recreation. These recreation use categories were expanded to include more categories: primary contact, and secondary contact recreation (1 & 2). Primary contact recreation consists of recreational activities involving a significant risk of ingestion of water including: wading by children, swimming, water skiing, diving, and surfing. Secondary contact recreation 1 is considered water recreation activities not involving a significant risk of

water ingestion: including fishing, commercial and recreational boating, and limited body contact incidental to shoreline activity. Secondary contact recreation 2 follows the same definition as secondary contact recreation 1 except that it occurs less frequently due to (1) physical characteristics of the water body and/or (2) limited public access.

According to TCEQ agency guidance, a Basic RUAA must be conducted on Cedar Creek since it is an unclassified water body (Segment 1209G). RUAA surveys were conducted during the normal warm season and periods when people would be most likely to use the water body for contact recreational purposes. RUAA Surveys were also conducted during optimal sampling conditions that are representative of the normal flow conditions of the stream (not storm-influenced). RUAA field surveys for Cedar Creek (Segment 1209G) were conducted Saturday, May 29, 2010. Weather conditions for this day and the prior 30 days can be found in Appendix 4. More specific procedures can be found in *TCEQ's RUAA Procedures Document, May 2009.*

Field Survey Descriptions

A Basic RUAA field survey begins with marking off a 300 meter (m) reach of the waterway, flagging every 30m. Sites with public accessibility limitations may not be fully assessed in this way. In instances such as these, a laser range finder was used to document the length of the stream reach that could be observed. A flow measurement (where possible) was then taken within the 300m stream reach. If the waterbody is wadeable, a depth measurement was taken every 30m and width measurements were taken at the widest, narrowest, and average width points within the 300m reach. Pictures are taken to document the survey at 30, 150, and 300m facing upstream, right bank, downstream, and left bank (Appendix 3). Air temperature, water temperature, and secchi depth were also recorded at an easily accessible location. Finally the Basic RUAA datasheets were completed to document any recreational uses, signs of

recreational use, impeding conditions, or other field notes taken during the field survey. The depth measurements for the sites that were considered non-wadeable were taken from the bridge at the deepest point accessible.

Due to impediments affecting stream access, complete field survey methods were not possible at some locations on Cedar Creek. Impediments to stream access, such as steep banks fences, log jams, and overgrown banks, at times limited the field survey team's ability to survey the complete 300m stretch of stream. In each case where this was a factor, the impediments were documented on the field data sheet and documenting pictures of these conditions were taken (Appendix 3). Specific impediments causing access constraints for each site can be found in Appendices 2 and 5.

Results

The field survey site visit was completed on each of the seven sample sites on Saturday, May 29, 2010. All field data sheets are attached (Appendix 2).

Physical Evaluation and Flow

During the field surveys the air and water temperatures fell within the range of acceptable temperatures for sampling described in the TCEQ procedures manual (Table 3). The average thalweg depth of Cedar Creek was 0.6 m and the average width was 4.9m. The average secchi tube reading taken at the field survey sites was 0.54m (Table 3). The average flow for Cedar Creek was 1.40 cubic feet per second (cfs).

Cedar Creek riparian zone can be generalized as forest (Table 4). The dominant substrate along Cedar Creek (Segment 1209G) was generally composed of mud/clay or sand.

Recreational Uses

Uses observed during field survey site visits include: fishing, standing, and sitting (Table 5, Figure 3, & Appendix 5). These observed uses occurred at site number 7. Evidence of recreational use in the form of fishing tackle was documented twice at field survey sites 5 and 7. Field survey site 7 was the only site at which no impediments to recreation were observed. Channel obstructions, most commonly fences, log jams, and steep slopes, were documented impediments at the other six sites (Table 5, Figure 3, & Appendix 5).

Table 3. Physical parameters from the basic recreational use attainability analysis field surveys conducted on Cedar Creek, Segment 1209G

Field Survey Site	Site Description	Air Temperature (°C)	Water Temperature (°C)	Average Depth (m)	Average Width (m)	Stream Flow (cfs)	Secchi Tube (m)
1	FM 46 A	29.0	24.0	0.15	1.07	0.056	0.72
2	FM 46 B	28.0	24.0	0.40	3.35	0.344	0.36
3	CR 323	28.5	24.5	0.23	6.74	0.344	0.84
4	Cedar Creek Rd @ Cedar Creek	28.5	24.5	0.52	4.95	2.312	0.46
5	Old Spanish Rd @ Cedar Creek	28.5	24.5	1.10	5.71	2.312	0.48
6	FM 974 @ Cedar Creek	27.0	25.5	0.90	7.31	2.253	0.47
7	SH 21 @ Cedar Creek	25.5	25.5	0.91	5.18	2.144	0.47
	Total Average	**27.9**	**24.6**	**0.60**	**4.90**	**1.395**	**0.54**

Table 4.Physical Characteristics of Riparian Zone and Dominant substrate of the field survey sites sampled during the Basic Recreational Use Attainability Analysis on Cedar Creek, Segment 1209G

Field Survey Site	Site Description	Left Bank Riparian Zone	Right Bank Riparian Zone	Dominant Primary Substrate
1	FM 46 A	Forest	Forest	Mud/Clay
2	FM 46 B	Forest	Forest	Sand
3	CR 323	Forest	Forest	Sand
4	Cedar Creek Rd @ Cedar Creek	Forest	Forest	Sand
5	Old Spanish Rd @ Cedar Creek	Forest	Forest	Sand
6	FM 974 @ Cedar Creek	Forest	Forest	Mud/Clay
7	SH 21 @ Cedar Creek	Forest	Forest	Mud/Clay

Table 5. Recreational uses observed and documented on Cedar Creek, Segment 1209G for the Basic Recreational Use Attainability Analysis.

Field Survey Site	Site Description	Impediments	Evidence	Observed
1	FM 46 A @ Cedar Creek	Fences, Overgrown banks		
2	FM 46 B @ Cedar Creek	Fences, Log jam		
3	CR 323 @ Cedar Creek	Fences		
4	Cedar Creek Rd @ Cedar Creek	Fences, Log jam		
5	Old Spanish Road @ Cedar Creek	Log jam	Fishing tackle	
6	FM 974 @ Cedar Creek	Steep slopes, Log jam		
7	SH 21 @ Cedar Creek		Fishing tackle	Fishing, Standing, Sitting

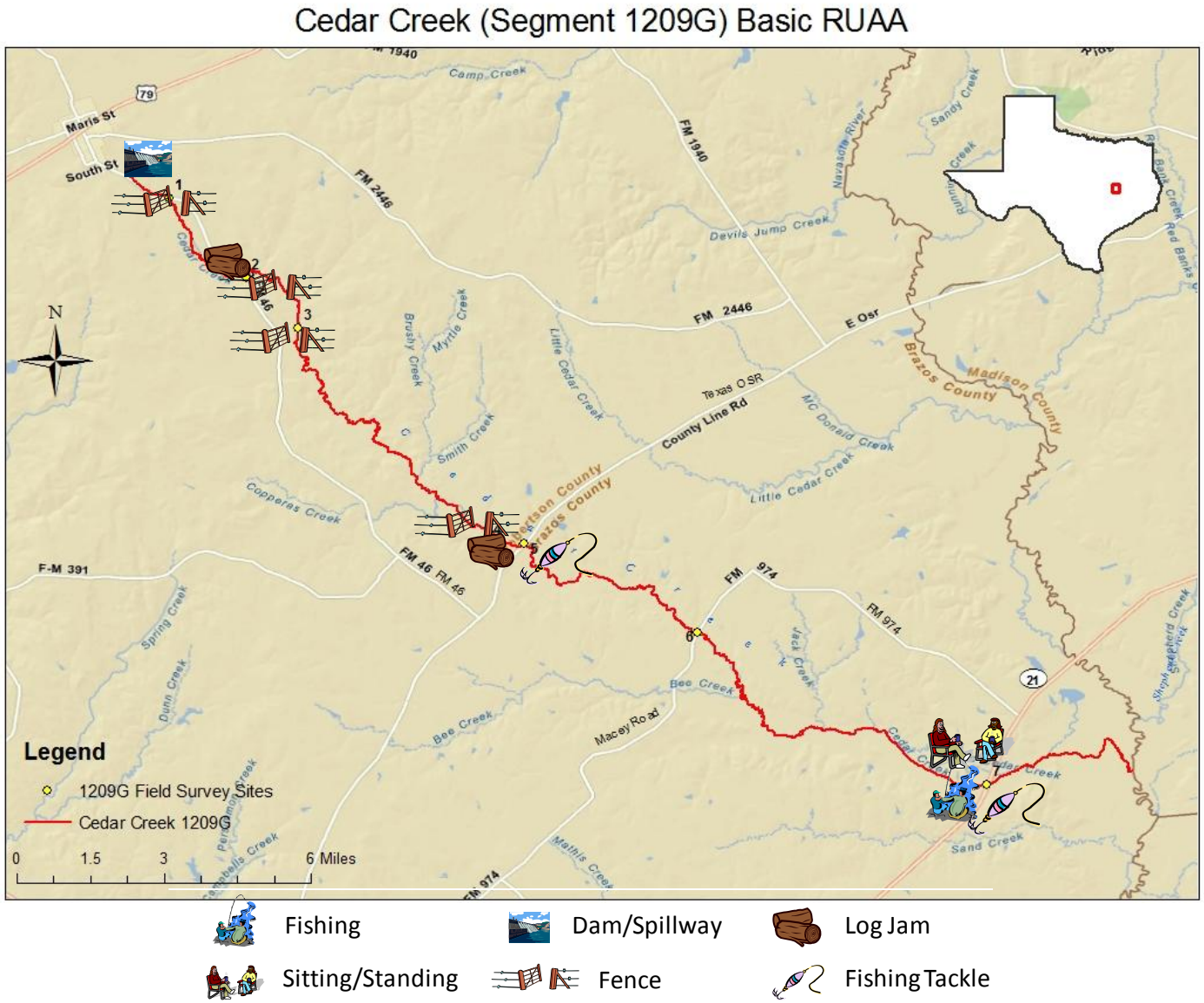

Figure 3. Basic RUAA survey sites on Cedar Creek, Segment 1209G with depictions of observed recreational uses, evidence of recreational uses, and impediments. Locations are approximate. See Appendix 5: Google Earth Interactive Map for exact locations of uses, evidence, and impediments.

Summary

Seven (7) field surveys on Cedar Creek (Segment 1209G) in the Brazos River Basin were completed in this RUAA to evaluate whether the existing and/or attainable recreational uses of Cedar Creek might be different than the current presumed recreational use designation. Important data collected in this RUAA included general stream characteristics, observations and evidence of recreational use, surrounding conditions that promote recreation, and surrounding conditions that impede recreation, including channel obstructions.

While Cedar Creek had several impediments to recreational use, such as fences and log jams, the RUAA documented various recreation activities. During the field surveys, staff observed one instance of secondary contact recreation (fishing) on Cedar Creek (Segment 1209G). Other evidence of water related activities included fishing gear at two field survey sites. No primary contact recreation was documented during this basic RUAA. The average thalweg depth was 0.6m and the average width was 4.9m. The average flow of Cedar Creek during the field survey was 1.395cfs. No public recreation areas in the form of maintained parks were found as part of this RUAA. Basic RUAA summary analysis indicates that secondary contact (1 & 2), and non-contact recreation activities occur on Cedar Creek (Segment 1209G).

Literature Cited

Brazos River Authority (BRA). 2003. Basins Highlight Report.

Handbook of Texas Online. 2010. Texas State Historical Association (TSHA) web resource: http://www/tshaonline.org.

Texas Commission on Environmental Quality (TCEQ). 2008. Texas 303(d) list (March 19, 2008). TCEQ, Austin, Texas.

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RUAA Summary Form

RUAA Summary

This form should be filled out after RUAA data collection is completed. Use the Contact Information Form, Field Data Sheets from all sites, Historical Information Review, and other relevant information to answer the following questions on the water body.

Name of water body: *Cedar Creek*
Segment No. or Nearest Downstream Segment No.: *1209G*
Classified?: *No*
County: *Robertson and Brazos*

1. Observations on Use
   a. Do primary contact recreation activities occur on the water body?
      ☐ frequently ☐ seldom ☐ not observed or reported ☐ unknown

   b. Do secondary contact recreation 1 activities occur on the water body?
      ☐ frequently ☐ seldom ☐ not observed or reported ☐ unknown

   c. Do secondary contact recreation 2 activities occur on the water body?
      ☐ frequently ☐ seldom ☐ not observed or reported ☐ unknown

   d. Do noncontact recreation activities occur on the water body?
      ☐ frequently ☐ seldom ☐ not observed or reported ☐ unknown

2. Physical Characteristics of Water Body
   a. What is the average thalweg depth? *0.6* meters

   b. Are there substantial pools deeper than 1 meter? ☐ yes ☐ no N/A

   c. What is the general level of public access?
      ☐ easy ☐ moderate ☐ very limited

3. Hydrological Conditions (Based on Palmer Drought Severity Index)
☐ Mild-Extreme Drought ☐ Incipient dry spell ☐ Near Normal ☐ Incipient wet spell ☐ Mild-Extreme Wet