



# ***LAMPASAS RIVER WATERSHED... A PHYSIOGRAPHIC OVERVIEW THE LAMPASAS WATERSHED SYSTEM***

## ***Lampasas Watershed Assessment and Protection Project***

***May 2009***

***Presented by***

**Jason McAlister, Research Assistant**

**Blackland Research and Extension Center  
Water Science Laboratory  
Temple, Texas**



# Lampasas River Watershed... Your Watershed.

- **What is a Watershed?**
- How do We Use Watersheds?
- Lampasas Watershed Health
- Water Quality Oversight and Triggers



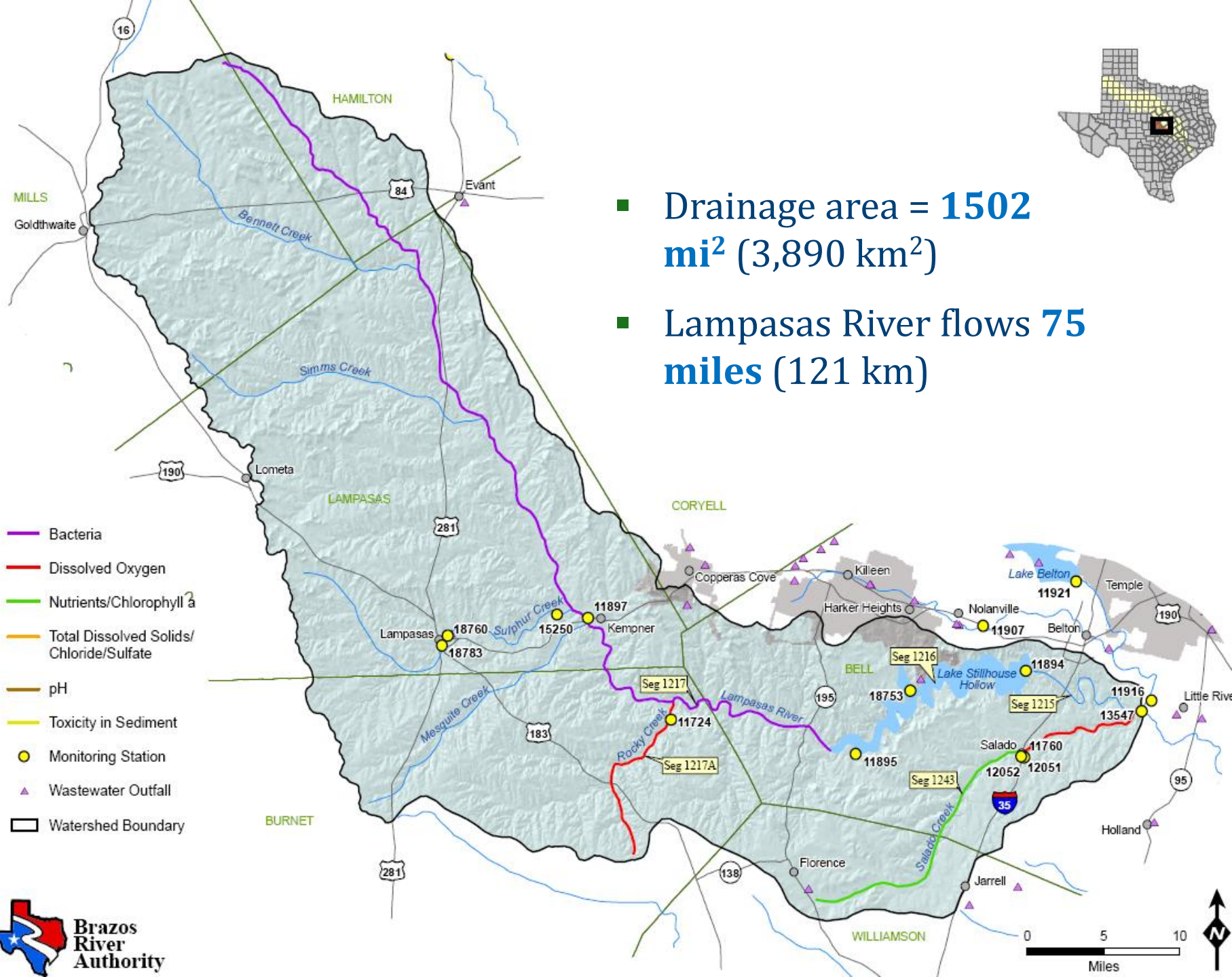
# What is a Watershed?

- Watershed is an area of land that water flows across, through, or under on its way to a stream, river, lake or ocean.
- Watersheds are nested

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



- Drainage area = **1502 mi<sup>2</sup>** (3,890 km<sup>2</sup>)
- Lampasas River flows **75 miles** (121 km)




# Lampasas Watershed Functions

- Hydrological functions:
  - Water capture
  - Water storage
  - Water release
- Ecological functions:
  - Providing diverse sites for biogeochemical reactions to take place.
  - Providing habitat for plants and animals of various kinds.





# Lampasas River Watershed... Your Watershed.

- What is a Watershed?
  - **How do We Use Watersheds?**
  - Lampasas Watershed Health
  - Water Quality Oversight and Triggers
- 



# How Do We Use Our Watershed





# Lampasas River Watershed

## Legend

### Land Cover/Use

- Barren Land
- Cultivated Crops
- Deciduous Forest
- Developed, High Intensity
- Developed, Low Intensity
- Developed, Medium Intensity
- Developed, Open Space
- Emergent Herbaceous Wetlands
- Evergreen Forest
- Hay/Pasture
- Herbaceous
- Mixed Forest
- Open Water
- Shrub/Scrub
- Woody Wetlands

Rangeland (38%)

Forest (23%)

Pasture/Hay (17%)

Cultivated Crop (12%)

Urban (8.5%)

Open Water (1%)

Bare Ground (0.5%)



San Saba

Llano

Hamilton

Burnet


Bell

Williamson

Mills

Lampasas





# Lampasas River Watershed... Your Watershed.

- What is a Watershed?
- How do We Use Watersheds?
- **Lampasas Watershed Health**
- Water Quality Oversight and Triggers

# What is Watershed Health?

- Landscape                      anatomy
- Land use                        processes
- System Function              system health

System Health determined Largely by how  
Sustainably these Socioeconomic and  
geophysical (natural resource) components  
interact



# Indicators of Watershed Health

## Hydrologic Function

- Water Quality
- Water Quantity





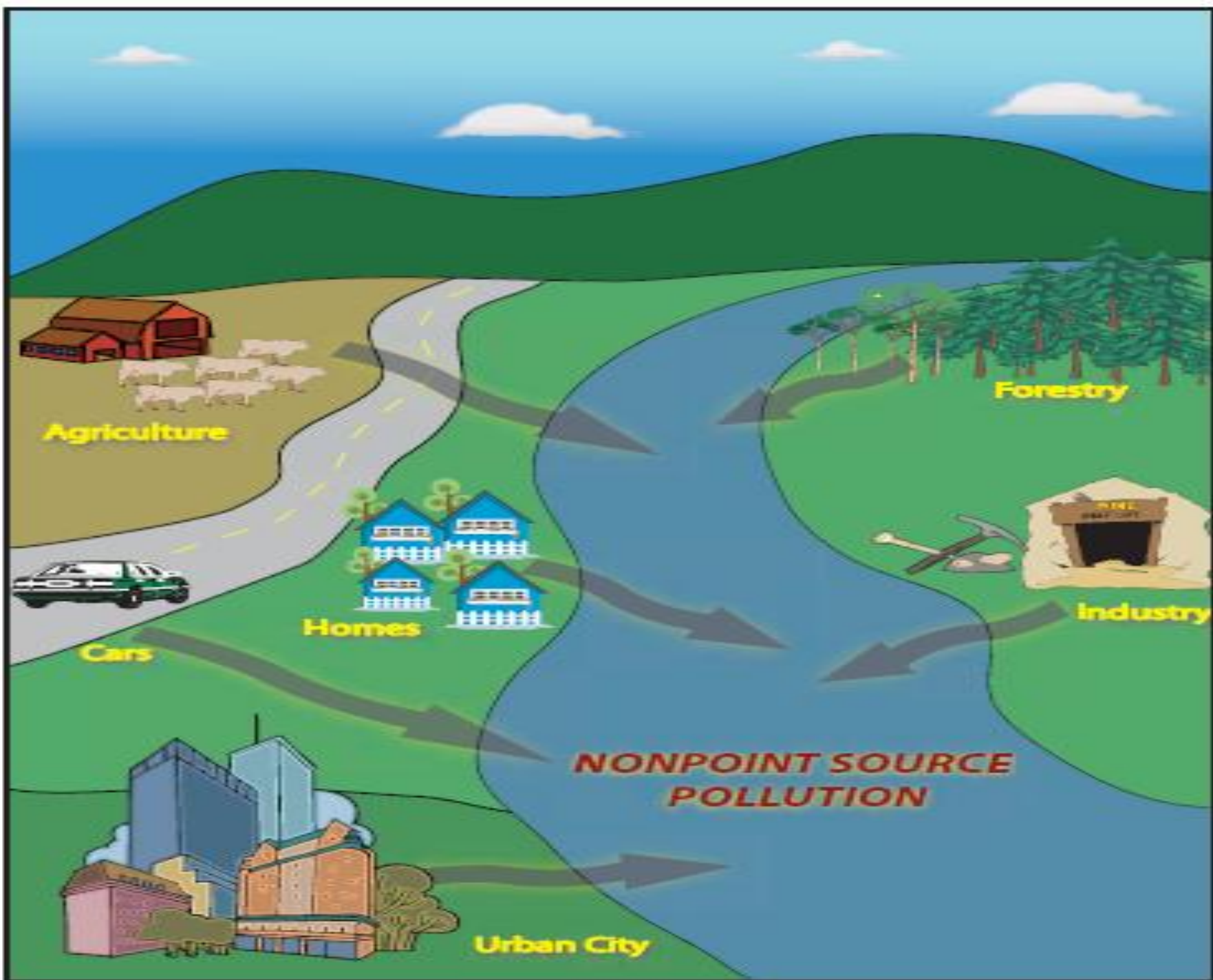
# Lampasas River Water Quality

# Point Source Pollution

- pollution that is discharged from a clearly defined, fixed point

- Pipe
- Ditch
- Channel
- Sewer
- Tunnel






# Indications of a problem...





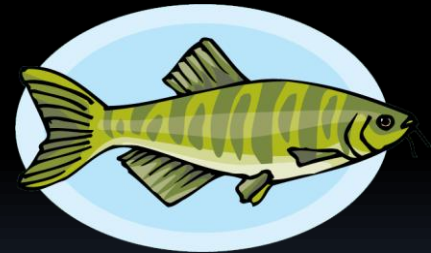


# Lampasas River Watershed... Your Watershed.

- What is a Watershed?
  - How do We Use Watersheds?
  - Lampasas Watershed Health
  - **Water Quality Oversight and Triggers**
- 

# Federal Clean Water Act

- Objective is to “restore and maintain the chemical, physical and biological integrity of the Nation’s waters”



# Federal Clean Water Act

- Interim goal is “water quality which provides for the protection and propagation of fish, shellfish, and wildlife and provides for recreation in and on the water”

# Water Quality Standards

Clean Water Act requires States to establish Water Quality Standards to achieve objective and goals of the Act

- Water Quality Standards
  - ▣ designated beneficial uses
  - ▣ water quality criteria

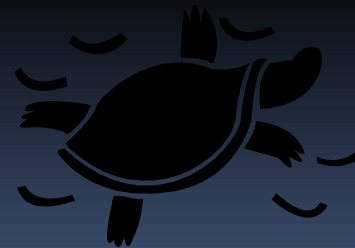


# Texas Water Quality Oversight

- Surface water in Texas is regulated by the water quality standards established in the CWA
- Three parts to Texas water quality standards
  - designated uses;
  - chemical, physical and biological criteria to protect those uses; and
  - anti-degradation policy
- TCEQ reporting

# Water Quality Standards

- Uses include contact recreation, aquatic life, domestic water supply, fish consumption, etc.
- Criteria –acceptable levels of bacteria, dissolved oxygen, salts, toxic substances



# Criteria for meeting Designated Uses

- Uses - purposes for which the water should be fit
- What are values necessary to attain and maintain use
- Can either be numeric or narrative

# Water Quality Standards (one example case)

- Use = contact recreation
- Criteria = *Escherichia coli* (*E. coli*) bacteria, for freshwater streams
  - Geometric mean (similar to the average) of samples
  - Individual, single samples



## 303(d) List

- Texas identifies waterbodies failing to meet or not expected to meet water quality standards and not supporting their designated uses
- Waterbodies are broken out into categories
- Must be submitted to USEPA for review and approval every two years

## 303(d) List

- Category 1 – all standards are attained
- Category 2 – some standards are attained
- Category 3 – insufficient or no data to evaluate uses
- Category 4 – standard is not attained, but mechanism in place to restore water quality
- Category 5 – standard is not attained



# 303(d) List

- 2008 Texas 303(d) List
- Data from December 1999 to November 2006 was assessed
- 837 waterbody-pollutant combinations
- 48% of these are for elevated bacteria

# Who does what?

- Texas Commission on Environmental Quality (TCEQ)
  - General jurisdiction and responsibility for water quality in Texas
  - Establish standards
  - Issue permits
  - Prevent and abate urban nonpoint source pollution
  - Collect, assess data, & report
  - Regulatory enforcement



# Who does what?

- Texas State Soil and Water Conservation Board (TSSWCB)
  - Lead agency in Texas for preventing and abating agricultural and silvicultural (forestry) nonpoint sources of water pollution
  - Works with the State's 217 local soil and water conservation districts (SWCDs)
  - Provides technical and financial assistance



# Surface Water Quality Monitoring (SWQM) Program

- Generates water quality assessment reports
- Follows and helps offers assessment guidance
- Develops procedural manuals





# Texas Clean Rivers Program (CRP)

- CRP = 15 partner agencies and the TCEQ
- Generates very useful water quality data
- Coordinate watershed management

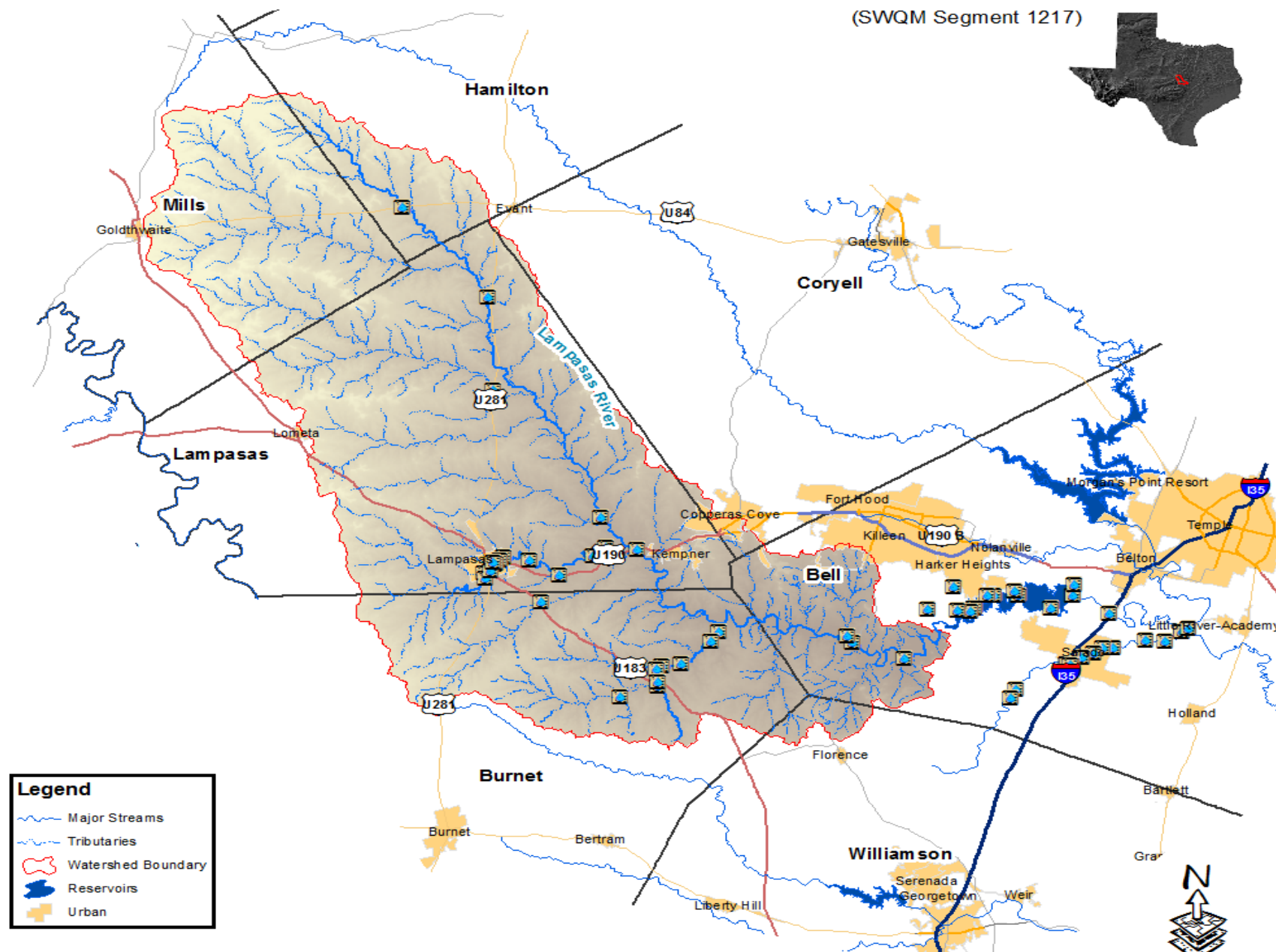


# CRP Assessed WQ Parameters

- Bacteria
- Nutrients
- Sediments
- Toxic and Hazardous Substances

# LAMPASAS RIVER WATERSHED

(SWQM Segment 1217)



# Lampasas Watershed Sampling History

Monitoring sites used:		
Assessment Area	Station ID	Station Description
From CR 117 crossing to the upper end of the segment	15762	LAMPASAS RIVER AT US84, 7 MI. NW OF EVANT
From the CR 5 crossing to the FM 1690 crossing	16404	LAMPASAS RIVER AT FM 2313, APPROX. 7 MI. NW OF KEMPNER
From the FM 1690 crossing to the CR 117 crossing	15770	LAMPASAS RIVER AT LAMPASAS CR105, 6.5 MI. NORTH OF ADAMSVILLE
From the FM 2657 crossing to the CR 5 crossing	11897	LAMPASAS RIVER AT US 190 NEAR KEMPNER
Lower 26 miles of the segment to the FM 2657 crossing	11896	LAMPASAS RIVER AT SH 195 SOUTH OF KILLEEN

Assessment Year	Assessment Method	Status of Use Support or Concern	Location	Location size	# of samples	# of exceedances	Mean
-----------------	-------------------	----------------------------------	----------	---------------	--------------	------------------	------

## Contact Recreation Use (continued)

2002	Fecal coliform single sample	Fully Supporting	From the CR 5 crossing to the FM 1690 crossing	13	15	4	
2002	Fecal coliform single sample	Not Supporting	From the FM 1690 crossing to the CR 117 crossing	18	12	6	
2002	Fecal coliform single sample	Fully Supporting	From the FM 2657 crossing to the CR 5 crossing	18	15	3	
2002	Fecal coliform single sample	Fully Supporting	Lower 26 miles of the segment to the FM 2657 crossing	26	27	5	

## Overall Use Support

2002		Fully Supporting	From CR 117 crossing to the upper end of the segment	19			
2002		Fully Supporting	From the CR 5 crossing to the FM 1690 crossing	13			
2002		Not Supporting	From the FM 1690 crossing to the CR 117 crossing	18			
2002		Fully Supporting	From the FM 2657 crossing to the CR 5 crossing	18			

## 2008 Texas Water Quality Inventory - Basin Assessment Data by Segment (March 19, 2008)

2008 Supp (level of support) and Integ Supp (integrated 303(d) level of support) identifiers: FS- Fully Supporting; CN- Concern for Near non-attainment; CS- Concern for Screening level; NS- Non-Supporting; NA- Not assessed; NC- No concern; Dataset Qualifiers: AD- Adequate Data; ID- Inadequate Data; LD- Limited Data; TR- Not Temporally Representative; SR- Not Spatially Representative; SM- Superseded by another method; JQ- Assessor Judgement; OE- Other Information Evaluated; OS- Out-of-State; AU ID - Assessment Unit ID \*Note: Carry-forward refers to impairments without sufficient information in 2008 to re-evaluate the level of support.

**Segment ID: 1217 Lampasas River Above Stillhouse Hollow Lake**

Water body type: Freshwater Stream

Water body size: 94 Miles

YEAR	AU ID	Assessment Area (AU)	# of Samples	# Assessed	# of Exc	Mean of Assessed	Criteria	Dataset Qualifier	2008 Supp	Integ Supp	Imp Category	Carry Forward
<b>General Use</b>												
<b>Water Temperature</b>												
2008	Temperature	1217_01	Lower 26 miles of the segment to the FM 2657 crossing	11	11	0	32.80	AD	FS	FS		No
2008	Temperature	1217_02	From the FM 2657 crossing to the CR 5 crossing	40	40	0	32.80	AD	FS	FS		No
<b>Recreation Use</b>												
<b>Bacteria Geomean</b>												
2008	E. coli	1217_01	Lower 26 miles of the segment to the FM 2657 crossing	4	4	0	85.69	126.00	LD	NC	NC	No
2008	E. coli	1217_02	From the FM 2657 crossing to the CR 5 crossing	26	26	0	66.95	126.00	AD	FS	FS	No
2008	Fecal coliform	1217_01	Lower 26 miles of the segment to the FM 2657 crossing	12	12	0	112.19	200.00	AD	FS	FS	No
2008	Fecal coliform	1217_02	From the FM 2657 crossing to the CR 5 crossing	18	18	0	70.60	200.00	AD	FS	FS	No
<b>Bacteria Single Sample</b>												
2008	E. coli	1217_01	Lower 26 miles of the segment to the FM 2657 crossing	4	4	1	394.00	LD	NC	NC		No
2008	E. coli	1217_02	From the FM 2657 crossing to the CR 5 crossing	26	26	4	394.00	AD	FS	FS		No
2008	E. coli	1217_04	From the FM 1690 crossing to the CR 117 crossing	0	0	0	394.00	ID	NA	NS	5c	Yes
2008	E. coli	1217_05	From CR 117 crossing to the upper end of the segment	0	0	0	394.00	ID	NA	NS	5c	Yes
2008	Fecal coliform	1217_01	Lower 26 miles of the segment to the FM 2657 crossing	12	12	2	400.00	AD	FS	FS		No
2008	Fecal coliform	1217_02	From the FM 2657 crossing to the CR 5 crossing	18	18	2	400.00	AD	FS	FS		No



# 2008 303(d)

**SegID: 1217**    **Lampasas River Above Stillhouse Hollow Lake**  
From a point immediately upstream of the confluence of Rock Creek in Bell County to FM 2005 in Hamilton County

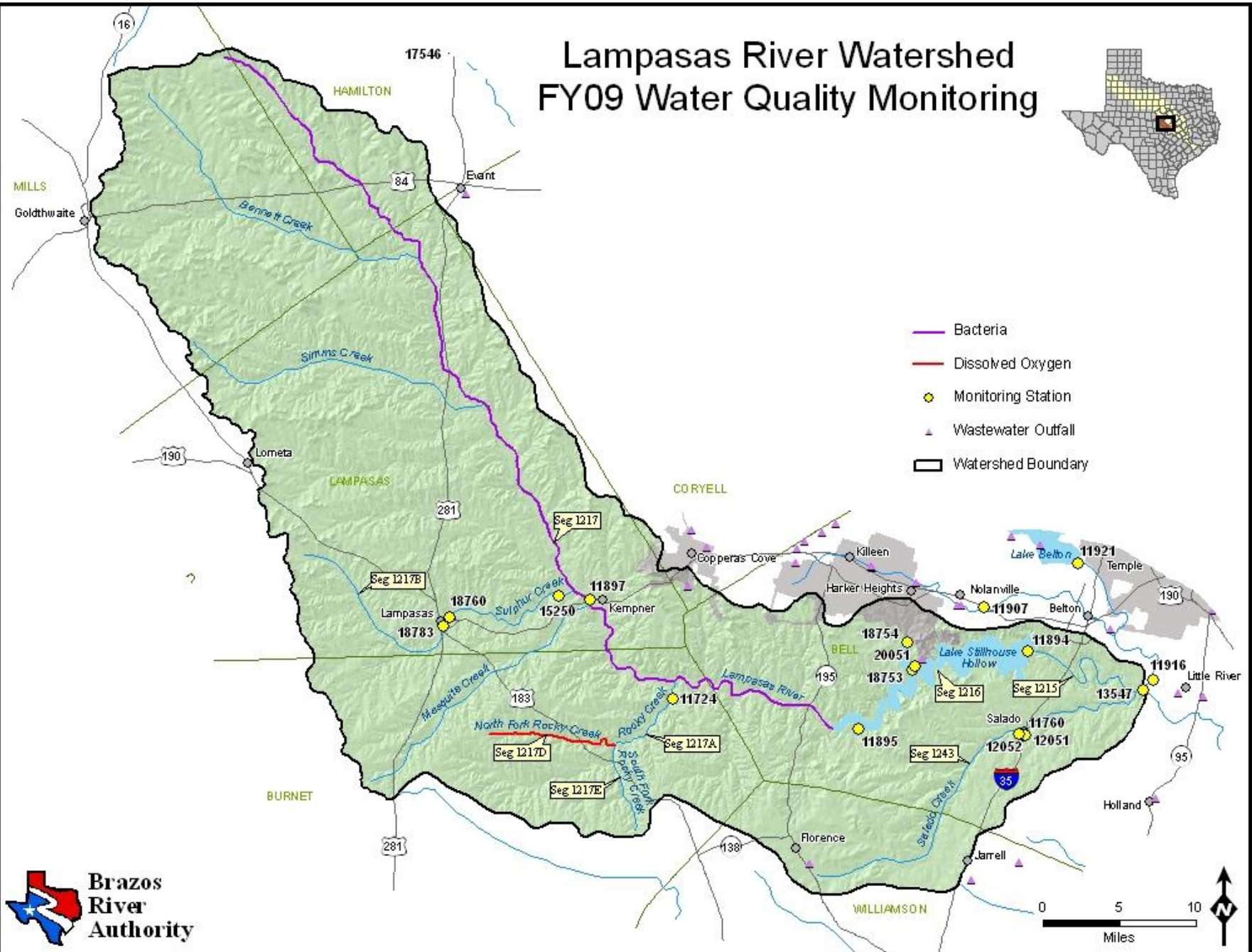
<u>Area</u>		<u>Category</u>	<u>Year First Listed</u>
1217_04	<i>From the FM 1690 crossing to the CR 117 crossing bacteria</i>	5c	2002
1217_05	<i>From CR 117 crossing to the upper end of the segment bacteria</i>	5c	2002

# Sampling Analysis/Findings

## Clean Rivers Program Basin Summary or Basin Highlights Reports

<u>Waterbody (Segment)</u>	<u>Standards not met in 2004 (parameter)</u>	<u>2007 CRP BSR</u>
Lampasas River above Stillhouse Hollow Lake	excessive bacteria	increasing trend in nitrate
Rocky Creek	depressed dissolved oxygen	

# Lamparas River Watershed FY09 Water Quality Monitoring



# Why the Lampasas Watershed is Worth the Effort

- ensuring the sustainability of our water resources for future generations
- become educated about our watersheds and understand how our activities affect them, we will act more responsibly to preserve, protect and enhance these vital resources



# Thank You.

Jason McAlister  
Blackland Research Center  
720 E. Blackland Rd.  
Temple, Texas 76502

254 774-6028  
[mcalister@brc.tamus.edu](mailto:mcalister@brc.tamus.edu)