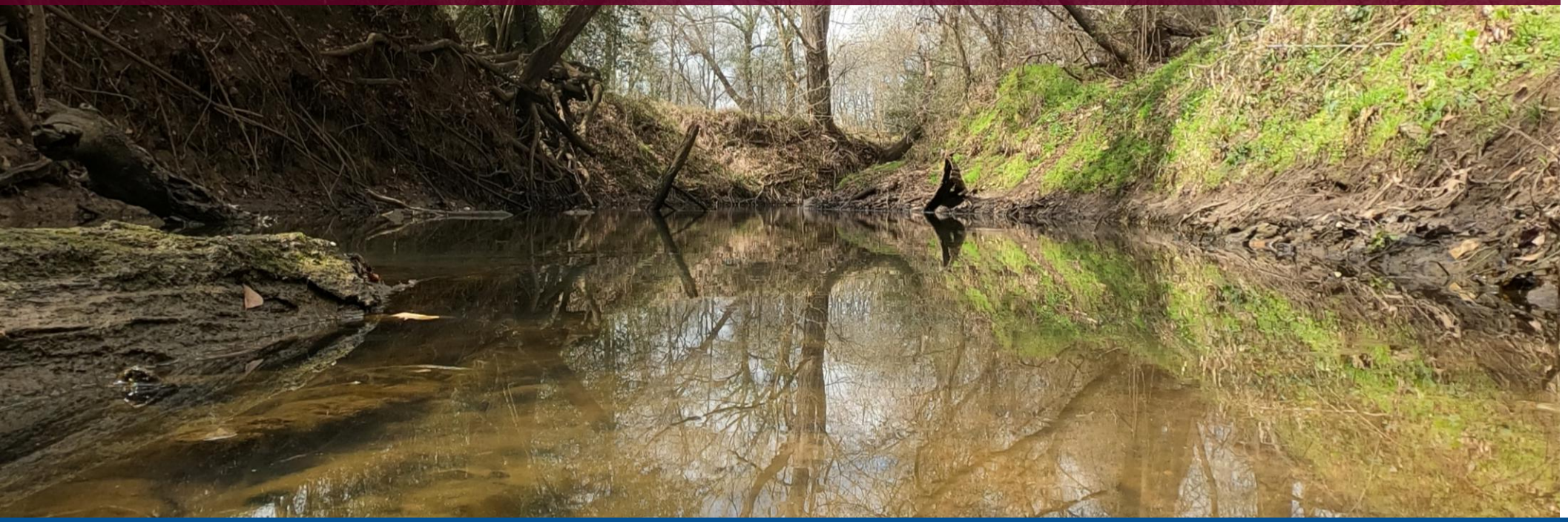
July 1st, 2025

Davidson Creek

Watershed Protection Plan Development



Texas A&M AgriLife

Texas State Soil & Water Conservation Board

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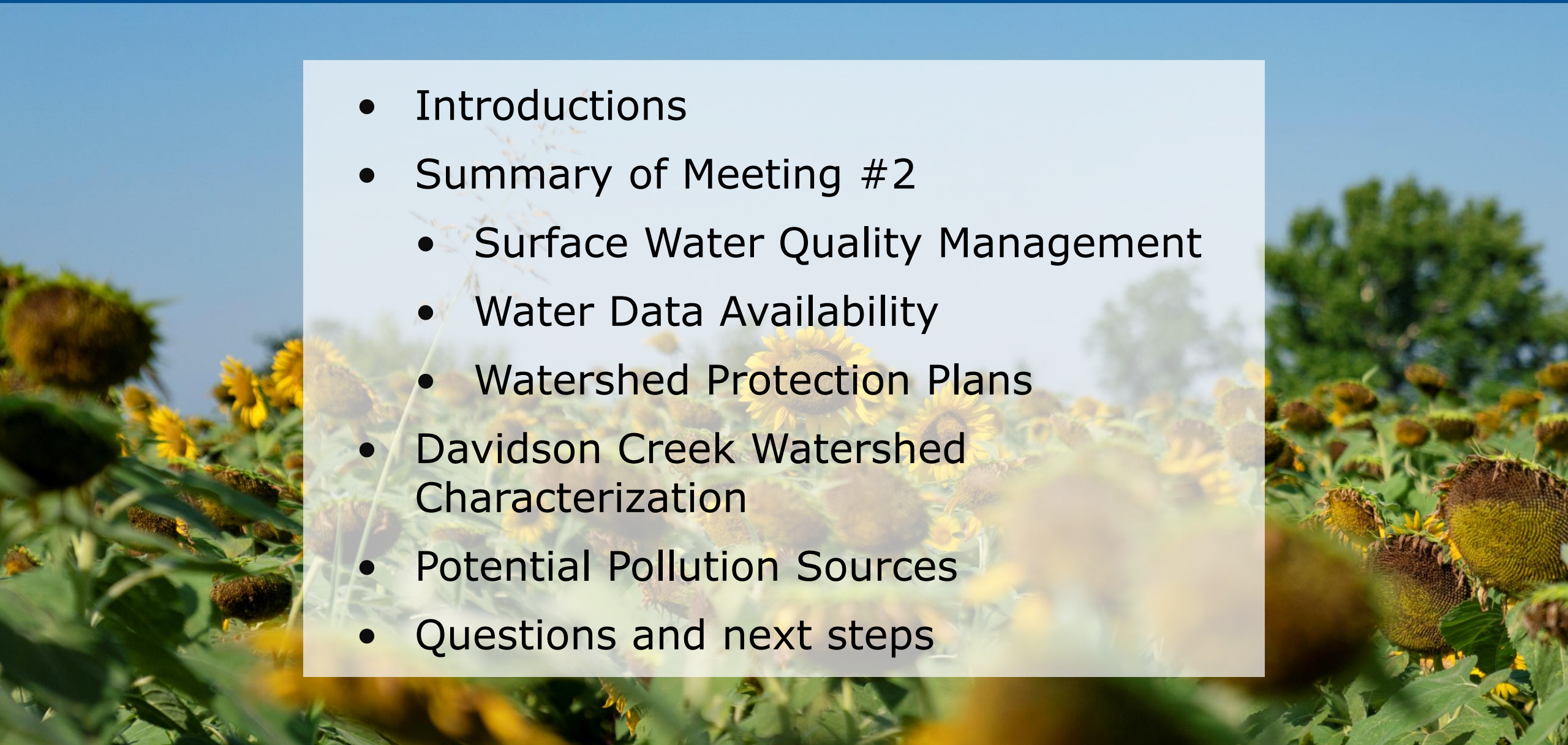
Funding provided by the Texas State Soil and Water Conservation Board through the State Nonpoint Source Grant Program

Meeting Agenda



- Introductions
- Summary of Meeting #2
  - Surface Water Quality Management
  - Water Data Availability
  - Watershed Protection Plans
- Davidson Creek Watershed Characterization
- Potential Pollution Sources
- Questions and next steps

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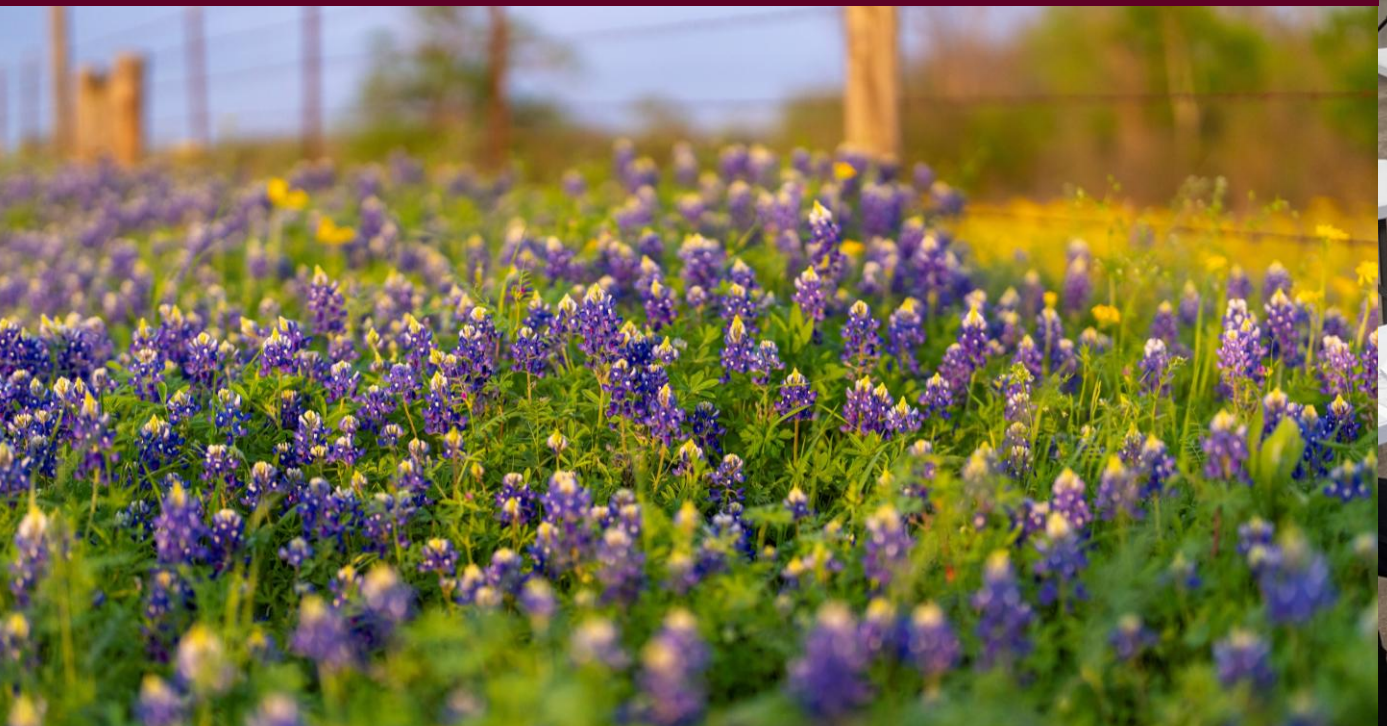
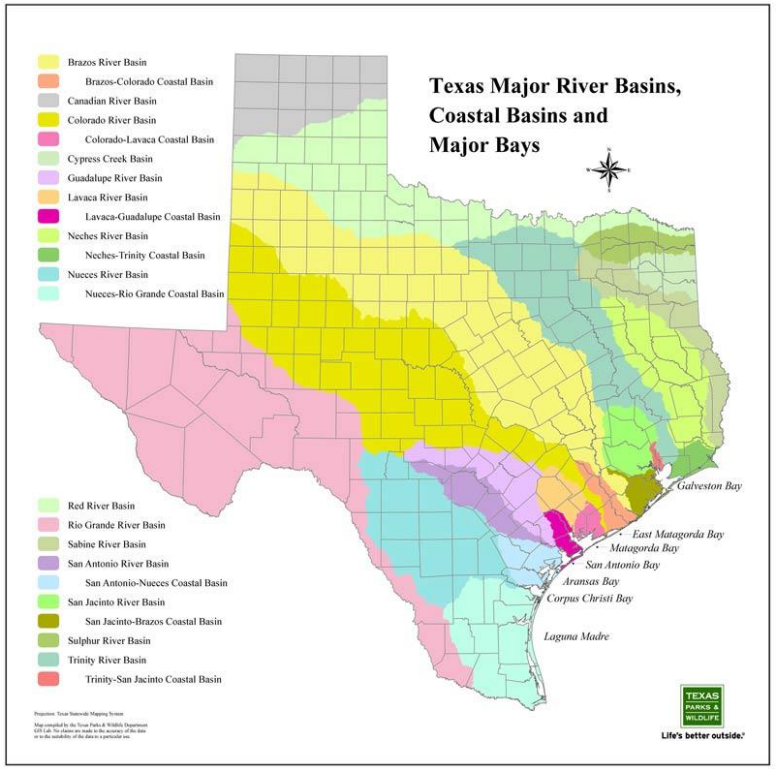
Meeting #2 Recap



What is a watershed?

https://czo-archive.criticalzone.org/national/blogs/post/what-can-the-watershed-approach-tell-us-about-the-critical-zone/

- An area of land where water flows across or through to a specific point in a stream or lake
- Everything that happens on land affects the waterbody
- Does not follow political boundaries
- Can be split into smaller subwatersheds



Texas Parks and Wildlife Department

Missouri Department of Conservation

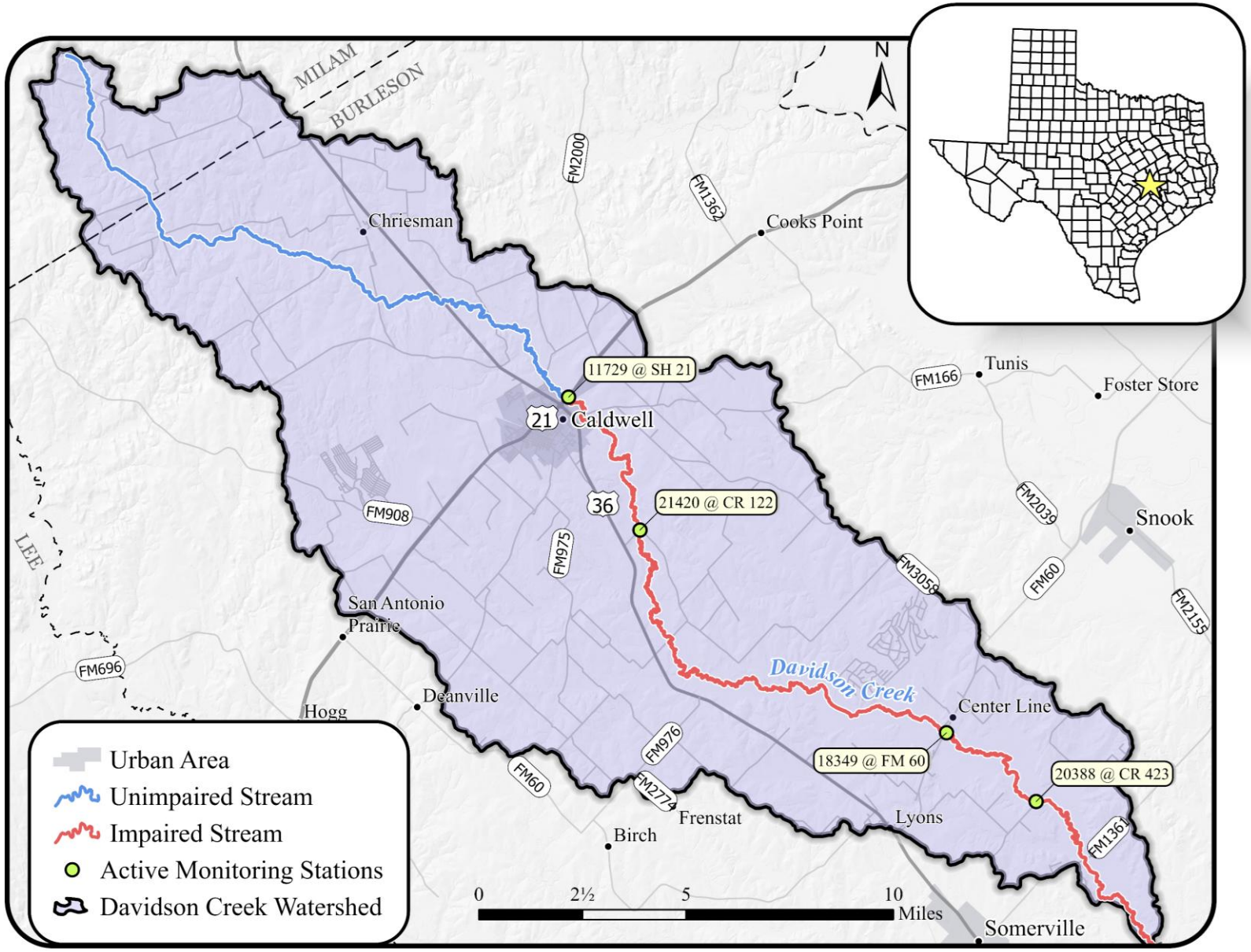
Davidson Creek

Watershed

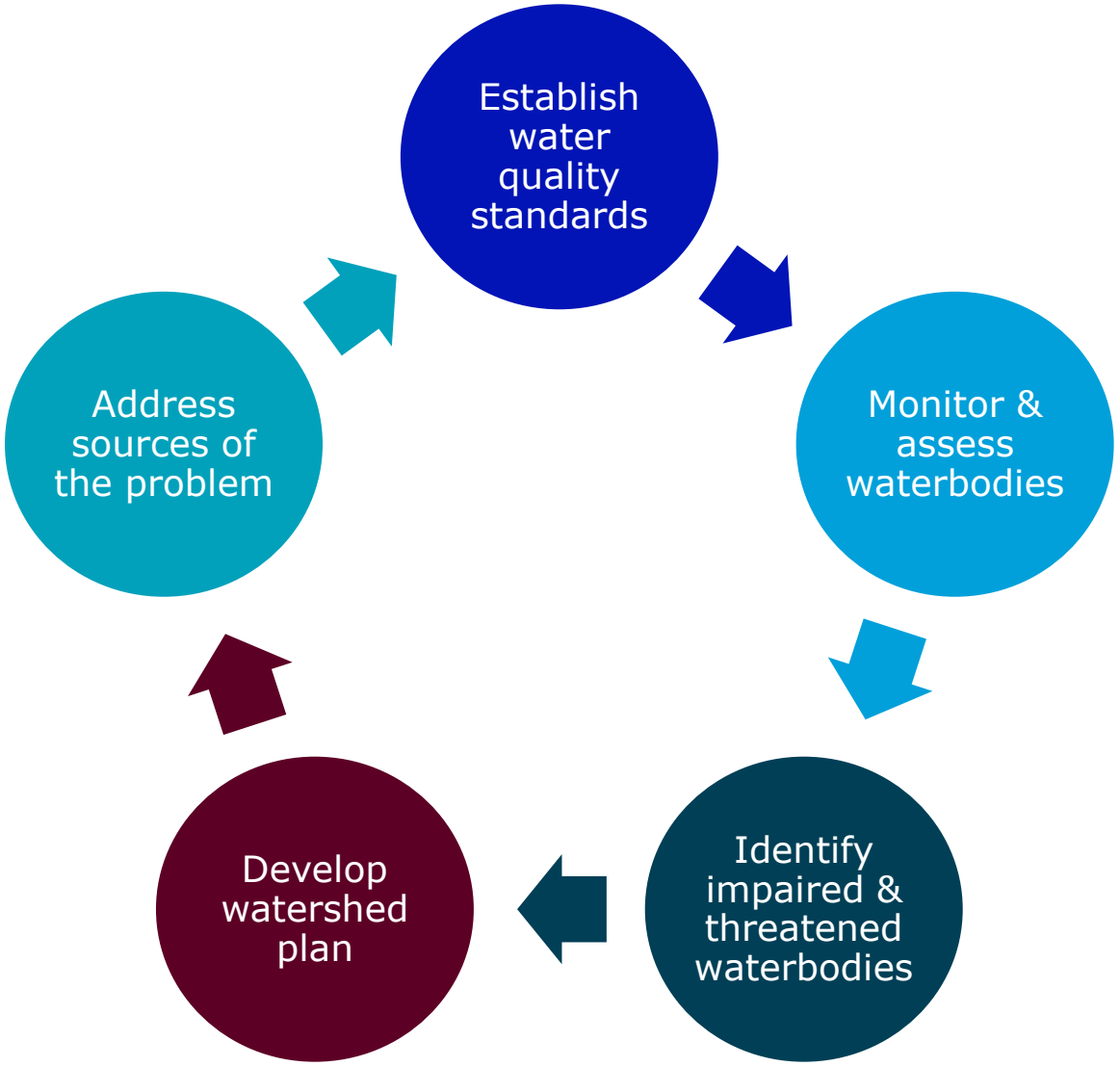
- Approximately 218 square miles
- Includes portions of Burleson and Milam Counties

Water Quality

- Elevated bacteria – risk to human health
- Low dissolved oxygen – risk to fish & aquatic life



Surface Water Quality Management in Texas



Strategy for Improving Water Quality:

Watershed Protection Plan (WPP)

- Stakeholder driven plan that holistically addresses all impairments and concerns in a watershed through voluntary measures

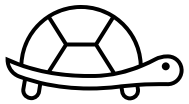
Surface Water Quality Standards

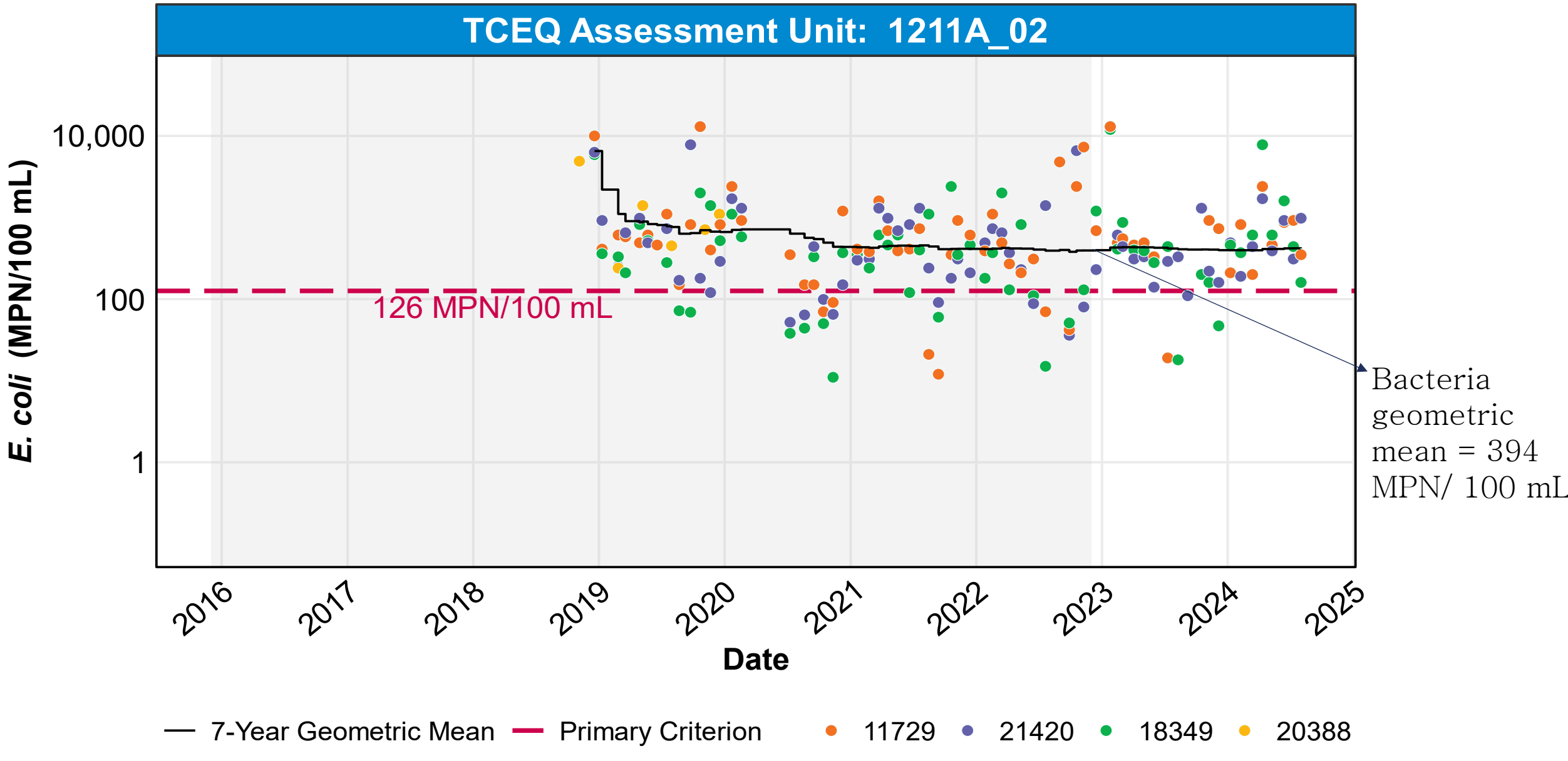
Recreational Use

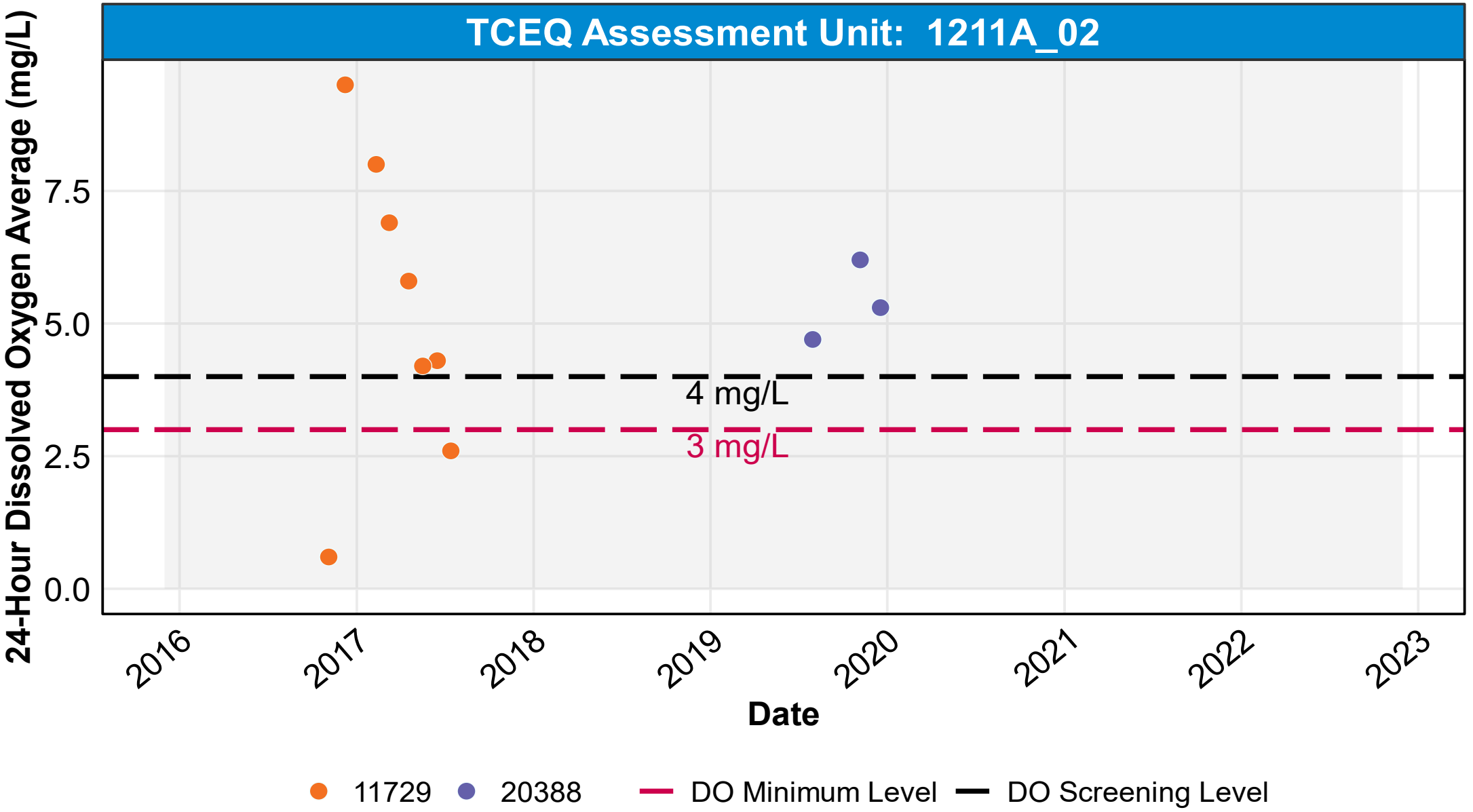
- Primary contact – swimming, water skiing, etc., likely to result in ingestion of water.
- Water quality indicator = Bacteria (*E. coli)*
  - Goal of geometric mean126 CFU/100 mL of *E. coli*

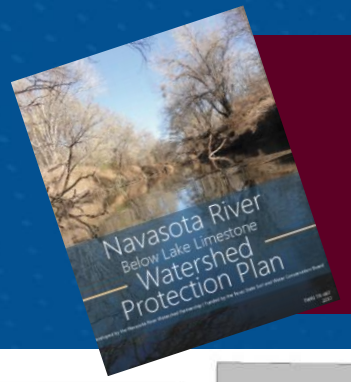
Aquatic Life Use

- Intermediate – moderately diverse habitat, diversity, and imbalanced trophic structure
- Water quality indicator = Dissolved oxygen
  - mean of 4.0 mg/L of dissolved oxygen over a 24-hour period, minimum of 3.0 mg/L

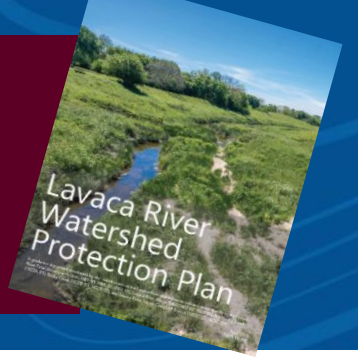


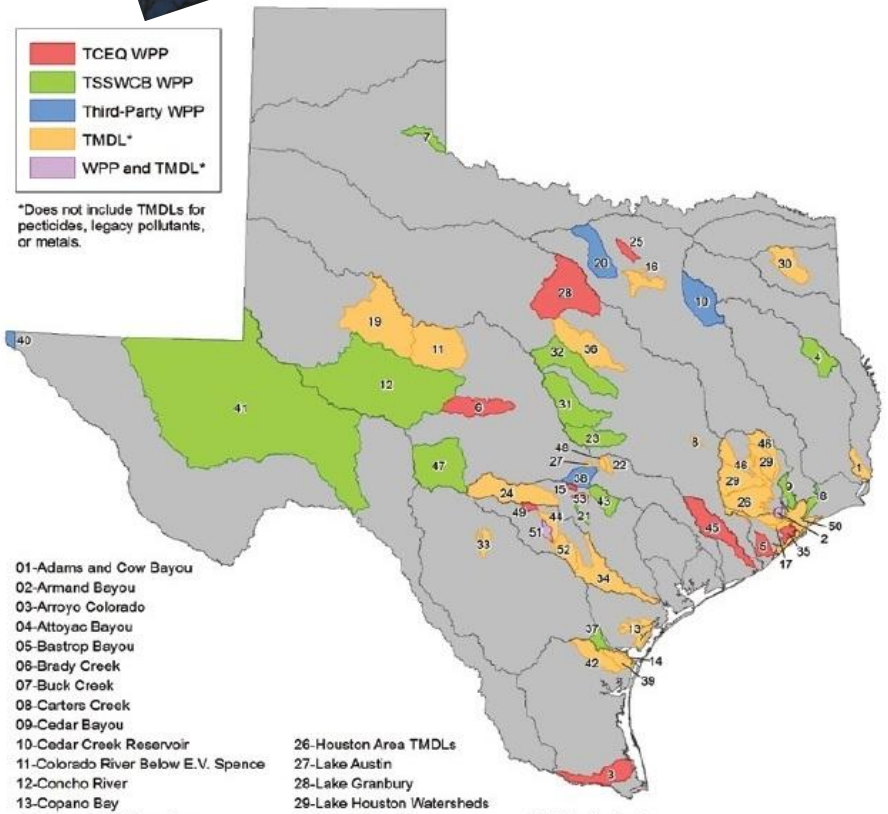

TCEQ Assessment Unit: 1211A_02
10,000
100
1
E. coli (MPN/100 mL)
126 MPN/100 mL
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
Date
Bacteria geometric mean = 394 MPN/ 100 mL
7-Year Geometric Mean
Primary Criterion
11729
21420
18349
20388


TCEQ Assessment Unit: 1211A_02
24-Hour Dissolved Oxygen Average (mg/L)
7.5
5.0
2.5
0.0
4 mg/L
3 mg/L
2016
2017
2018
2019
2020
2021
2022
2023
Date
11729
20388
DO Minimum Level
DO Screening Level



What is a Watershed Protection Plan?





01-Adams and Cow Bayou
02-Armand Bayou
03-Arroyo Colorado
04-Attoyac Bayou
05-Bastrop Bayou
06-Brady Creek
07-Buck Creek
08-Carters Creek
09-Cedar Bayou
10-Cedar Creek Reservoir
11-Colorado River Below E.V. Spence
12-Concho River
13-Copano Bay
14-Corpus Christi Beaches
15-Cypress Creek
16-Greater Trinity TMDLs
17-Dickinson Bayou
18-Double Bayou
19-E.V. Spence Reservoir
20-Eagle Mountain Reservoir
21-Geronimo Creek
22-Gilleland Creek
23-Granger Lake
24-Guadalupe River Above Canyon Lake
25-Hickory Creek
26-Houston Area TMDLs
27-Lake Austin
28-Lake Granbury
29-Lake Houston Watersheds
30-Lake O' the Pines
31-Lampasas River
32-Leon River
33-Lower Sabinal River
34-Lower San Antonio River
35-Moses-Karankawa Bayous
36-North Bosque River
37-Lower Nueces River
38-Onion & Barton Springs
39-Oso Bay and Oso Creek
40-Paso del Norte
41-Pecos River
42-Petronila Creek
43-Plum Creek
44-Salado Creek
45-San Bernard
46-San Jacinto River
47-Upper Llano River
48-Spicewood Springs and Walnut Creek
49-Upper Cibolo Creek
50-Upper Coast Oyster Waters
51-Upper San Antonio River
52-Upper San Antonio River
53-Upper San Marcos

- Stakeholder-driven plan to address all water body impairments
- Voluntarily address complex water quality issues and coordinate management strategies that cross multiple jurisdictions
- Prioritizes strategies based on technical merit and benefits to the community
- Typically focused on 10-year goals

Stakeholders

A stakeholder is anyone who ***lives***, ***works***, or ***has interest*** within the watershed or may be ***affected*** by efforts to address water quality issues.

Stakeholder Roles

- Provide guidance and input
- Set goals and objectives
- Identify reasonable strategies
- Identify community needs

Ground Rules

Informal

- No formal voting committee/representative
- Speak up
- Disagree respectfully
- Silence is presumed consent
- Listen during discussion
- Respect opinions and don’t criticize people
- Be open to new ideas
- Silence cell phones
- Have fun

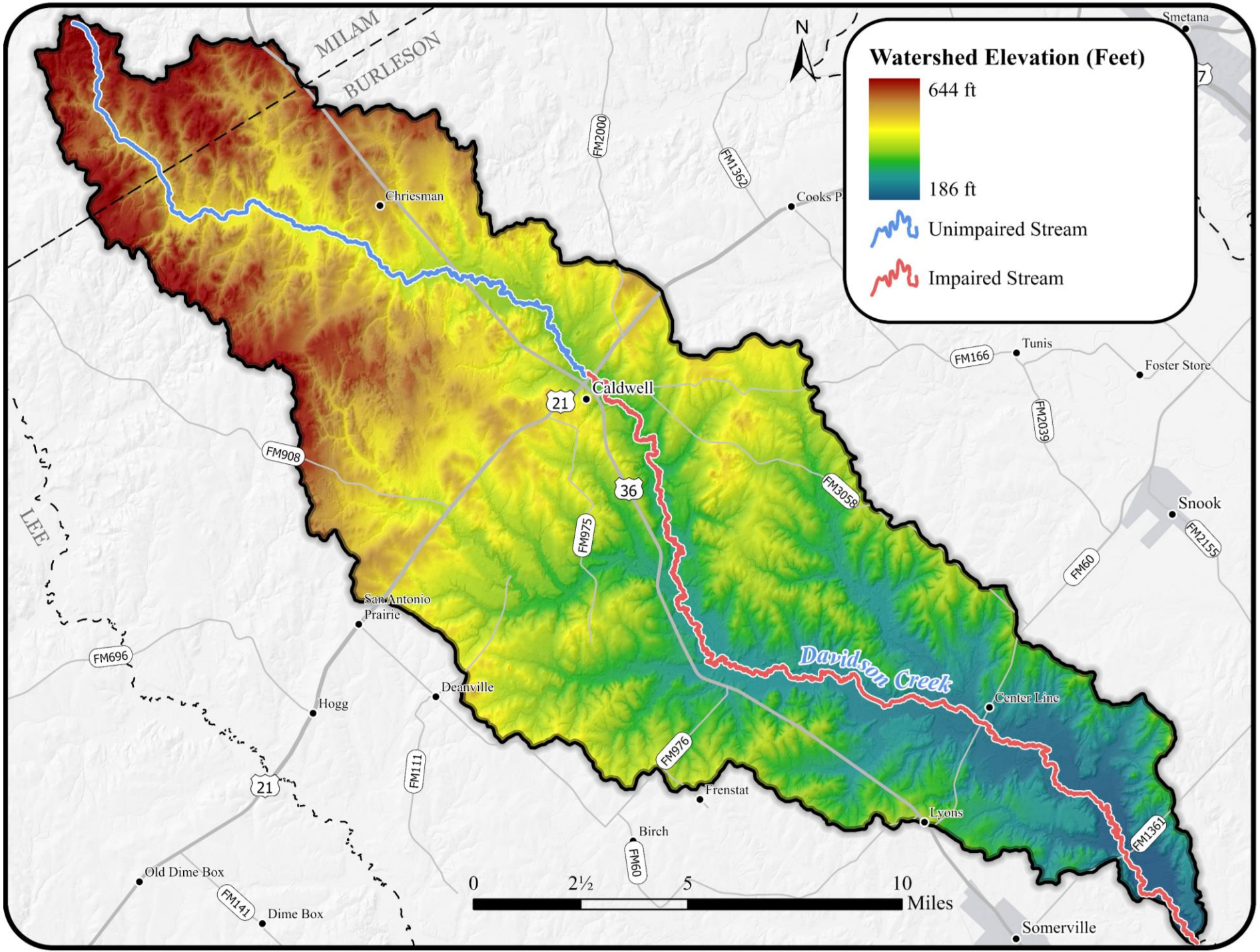
Decision-Making

Informal

- Use ground rules to govern coordination committee and work groups
- Strive to have most stakeholder groups represented in meeting
  - Will also see feedback via email
- Decision making via consensus building

Watershed Characterization

Elevation



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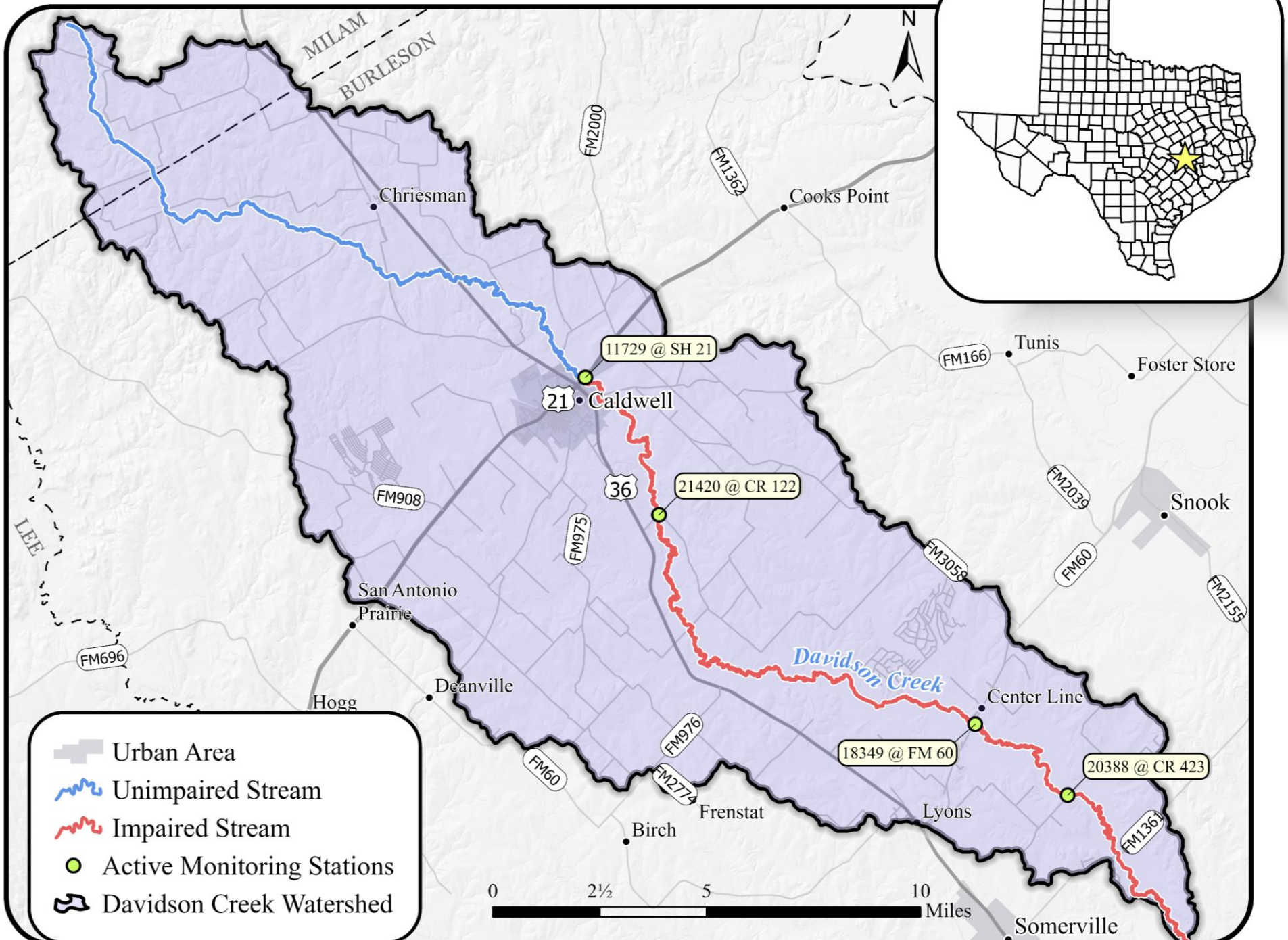
Watershed Overview



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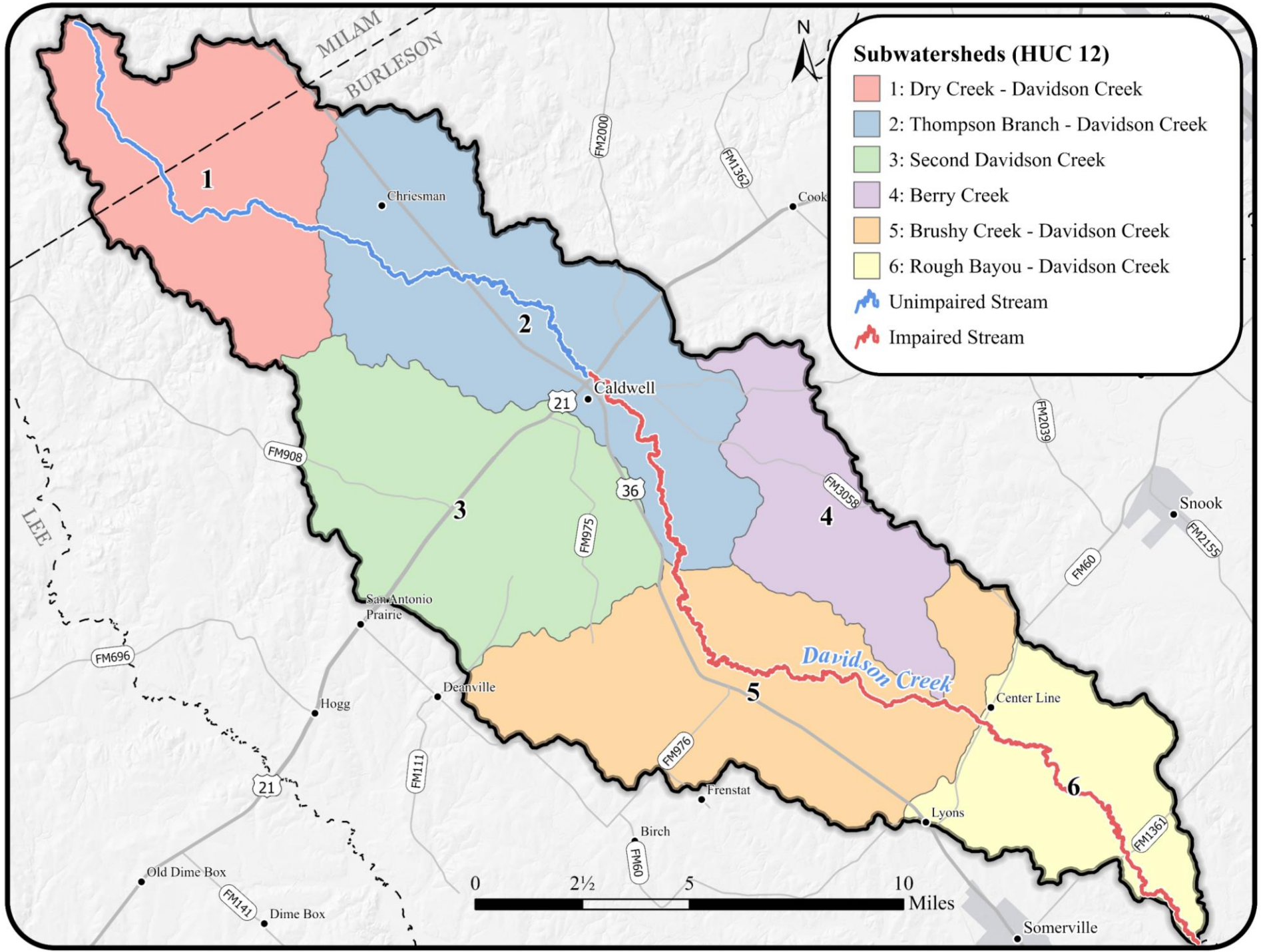
Subwatersheds



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2023 Land Use

	Percent of Watershed
	63.71%
	18.55%
	7.48%
	5.10%
	2.65%
	1.18%
	0.95%
	0.23%
	0.16%
Total=	**100.00%**

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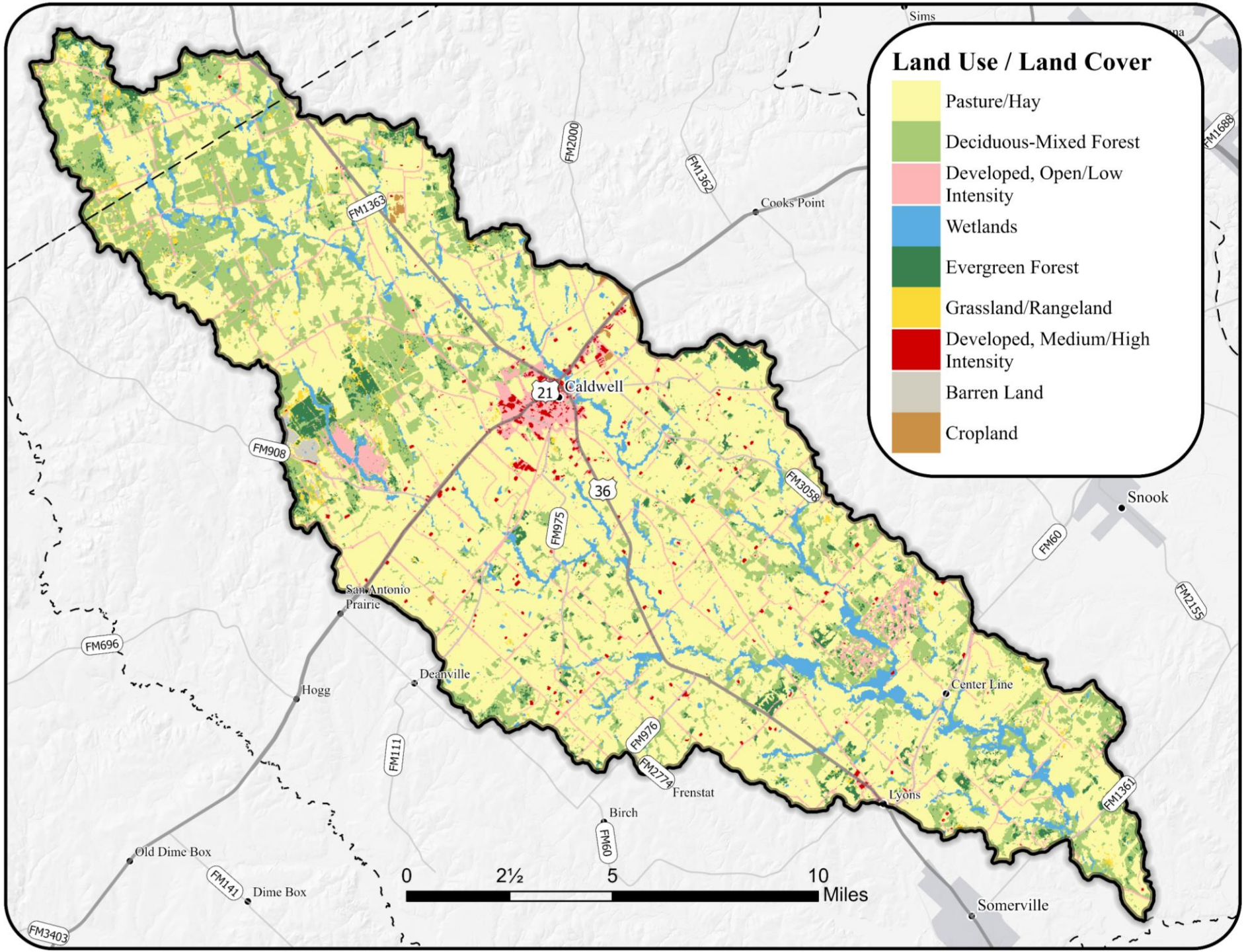

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Potential Sources of Pollution

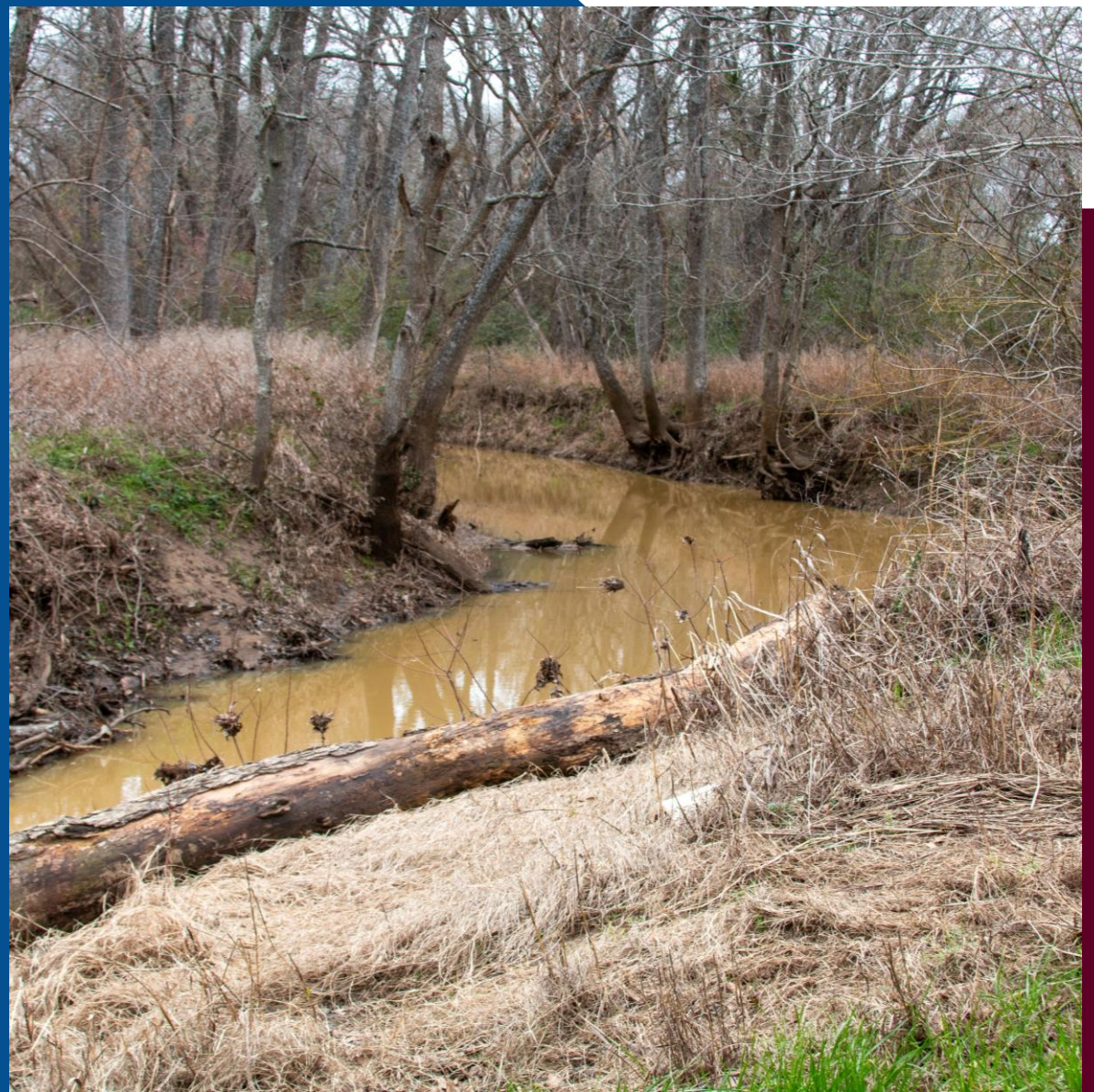
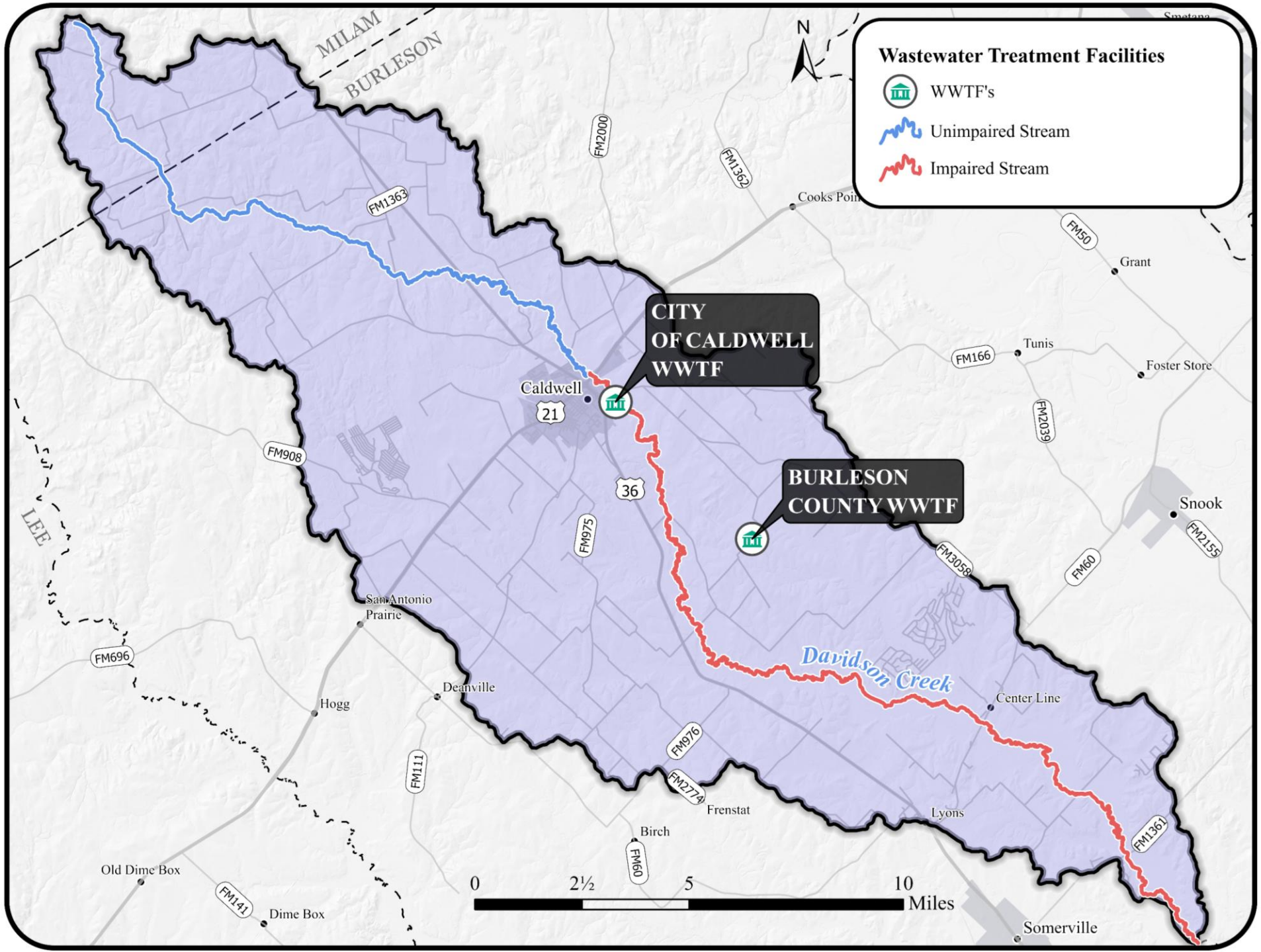


Photo by Cameron Castilaw
Feb 14th, 2024

Point Sources

- Wastewater treatment facilities (WWTF)
- Construction sites
- Concrete production
- Sanitary sewage overflows

Wastewater Treatment Facilities



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Facilities	Flow (MGD*)		*E. coli* (cfu/100 mL)		Number of Violations
	Facility Permitted Flow	Actual 3yr Average Facility Flow in 2025	Daily Average	Single Grab	Jan 2022 – Jun 205
City of Caldwell WWTF WQ0010813 -001)	0.711	0.39778	126	399	– 2 daily average *E. coli* – 1 daily average Ammonia
Burelson unty WWTF WQ0015306 -001)	0.075	NA	126	399	Permit has expired and not currently in the process for renewal

Permitted Stormwater

- 8 active construction permits
- 1 active concrete production permit
- 1 sanitary sewer overflow incidents in the past 5 years

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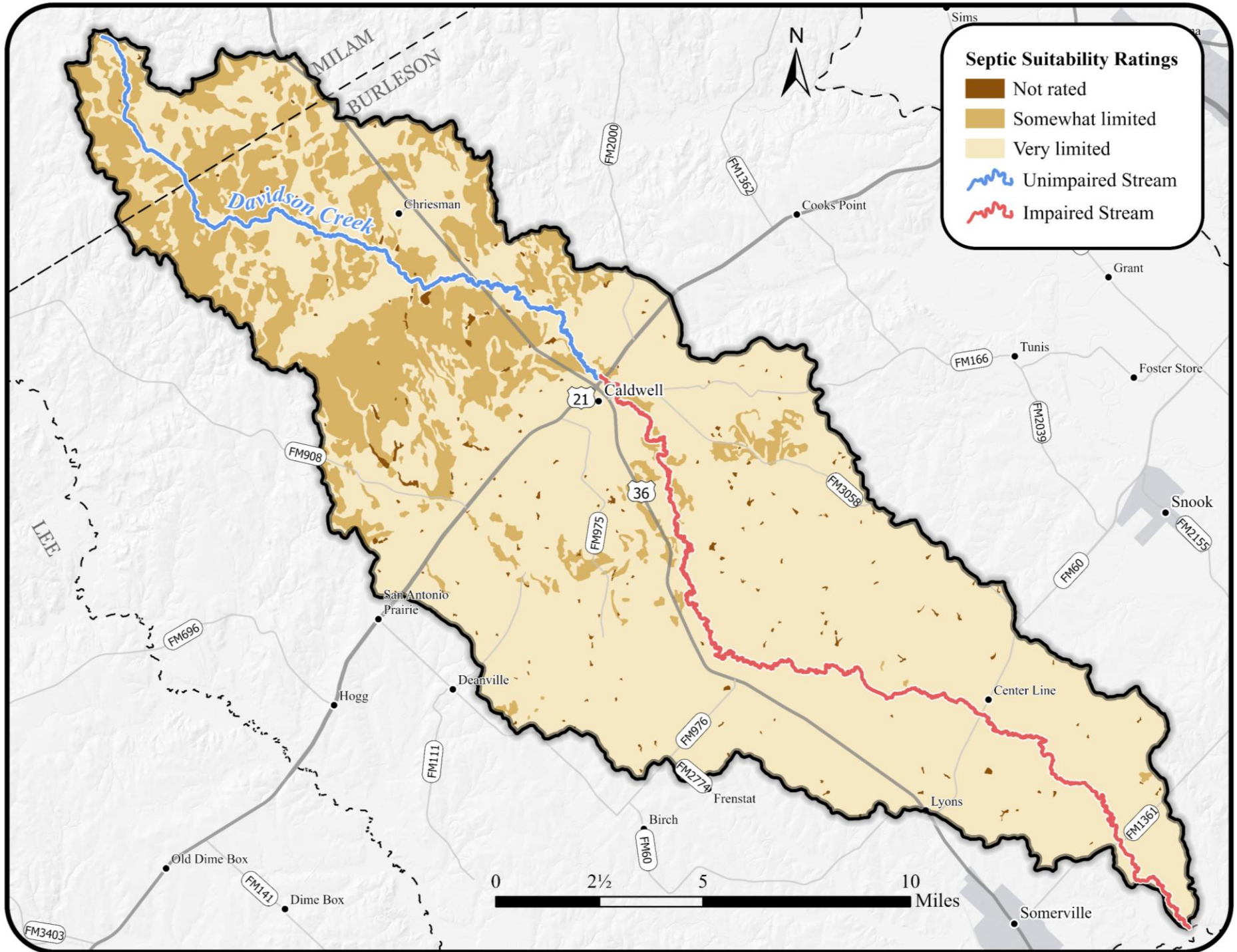
Nonpoint Sources

- On-site sewage facilities (OSSF)
- Livestock (cattle, horses, goats, sheep, poultry)
- Deer and Feral Hogs
- Domestic Dogs

Septic Suitability



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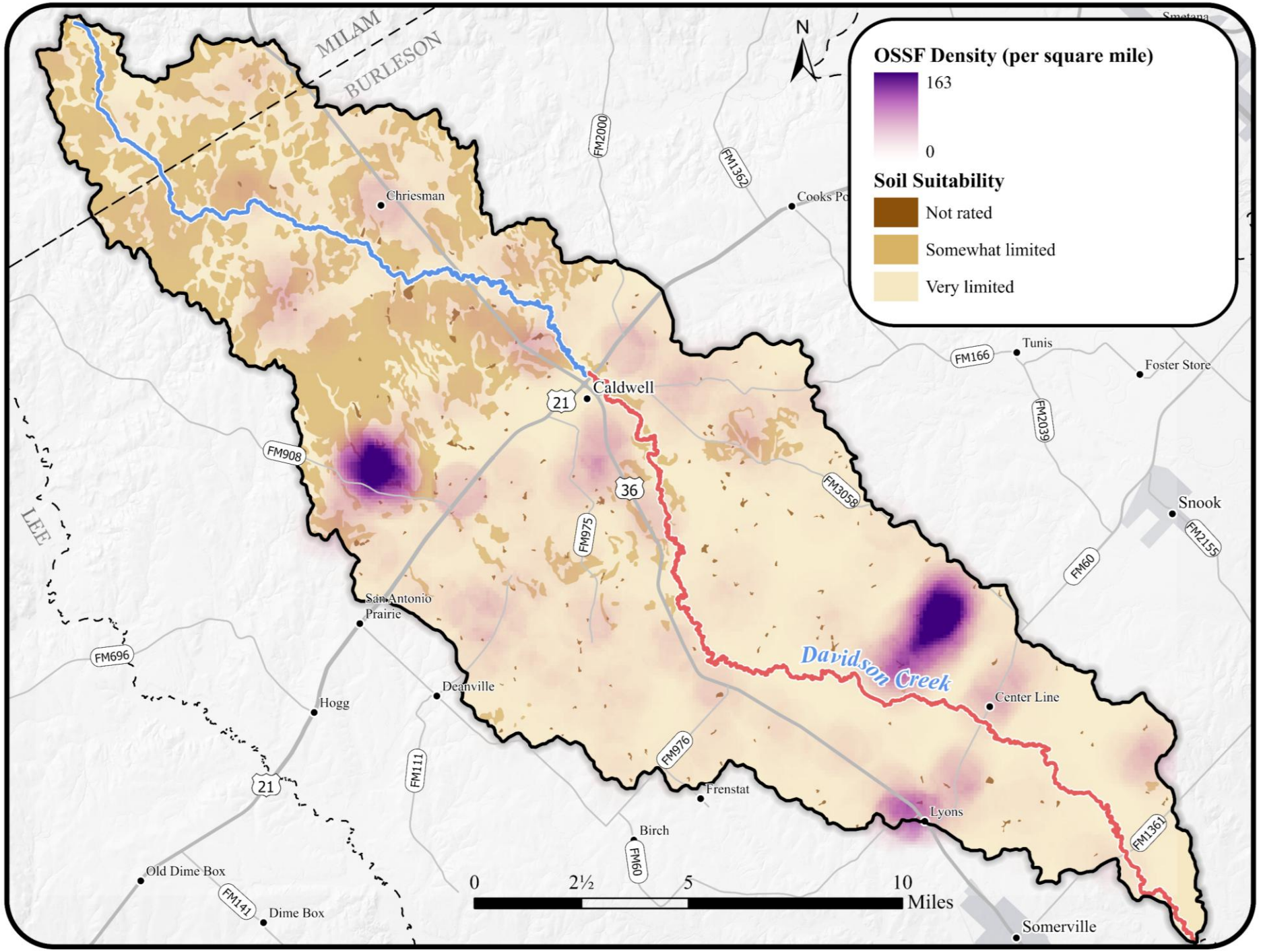
On-site Sewage Facilities



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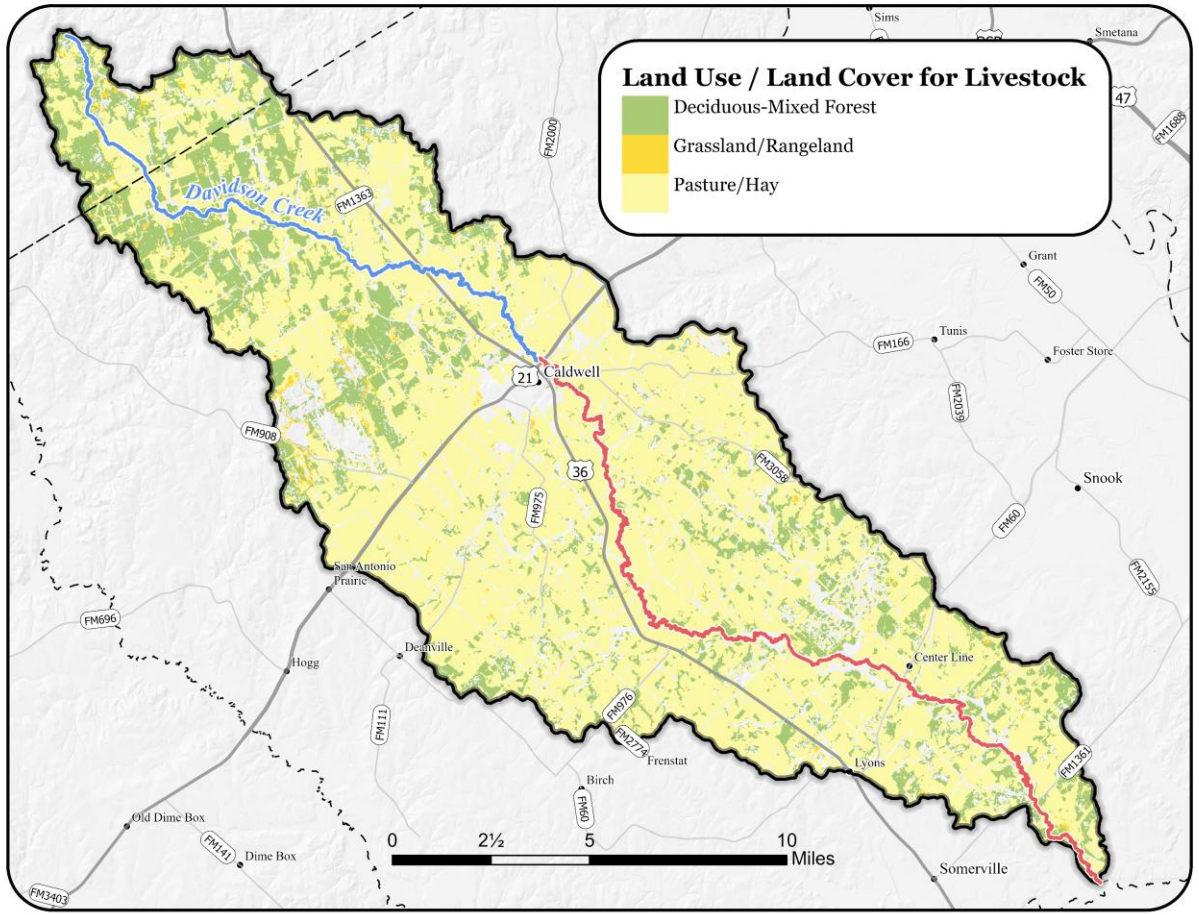
Cattle Population in Watershed – Method 1

Estimated based USDA NASS county-level data

- Total Cattle – **22,421**
- Downscaled to watershed level

$$\frac{grazeable\ land\ in\ watershed}{grazeable\ land\ in\ county} \times \#\ of\ cattle\ in\ county$$

- Grazeable land
  - Hay/pasture (improved pasture)
  - Grassland/Rangeland, Deciduous-Mixed Forest (unimproved pasture)



Cattle Population in Watershed – Method 2

Estimate based on USDA Natural Resources Conservation Service recommend stocking rates

- Total Cattle – **32,512**
  - 10 ac/head for unimproved pasture
  - 3 ac/head for improved pasture

	Grassland/ Herbaceous	Hay/ Pasture	Deciduous – Mixed Forest
Watershed (acres)	89,245	1,659	25,981

Method 3 – stakeholder recommended stocking rates?

Livestock

2022 U.S Department of Agriculture (USDA) National Agricultural Statistics Service (NASS)

County	Total County Grazeable Land (ac)	Total Watershed Grazeable Land (ac)
Burleson	**322,928**	**108,897**
Milam	**502,057**	**7,987**

Livestock	Counties	
	Burleson	**Milam**
Cattle	61,788	99,601
Hogs/Pigs	469	669
Sheep/Lambs	1,093	2,498
Goats	1,152	3,644
Horse	301	1,634
Poultry - Layers	233,196	173,622
Poultry - Broilers	4,701,830	5,350,433

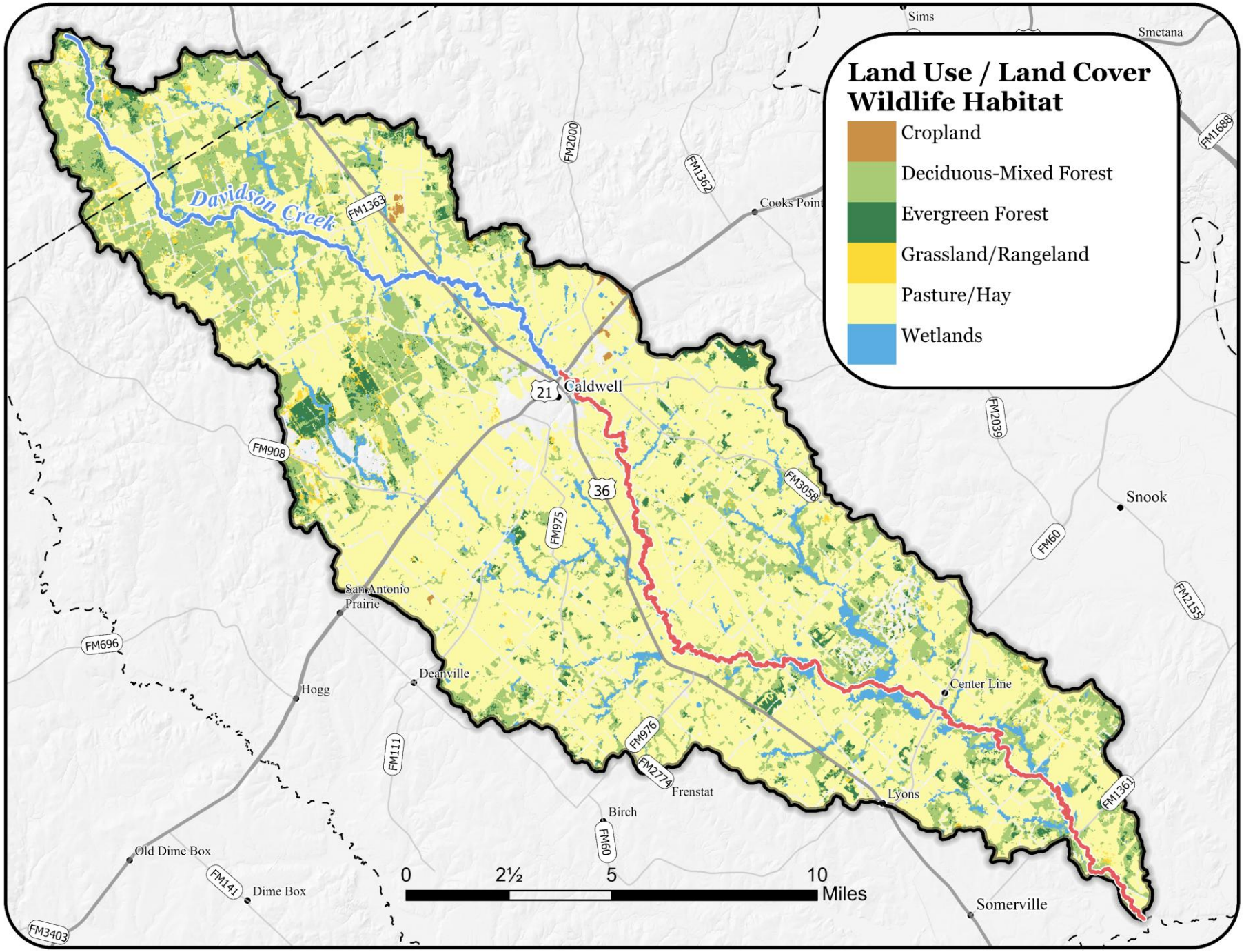
Other Livestock Populations

Estimated based on 2022 USDA NASS county-level data

- Downscaled to subwatershed level

Livestock in Watershed	Hogs/Pigs	Sheep/Lambs	Goats	Horse	Layers	Broilers
Milam County	11	40	58	26	2,762	85,119
Burleson County	158	369	389	102	78,638	1,585,547
Total Watershed	**169**	**408**	**447**	**128**	**81,400**	**1,670,667**

Land Use and Land Cover for Wildlife



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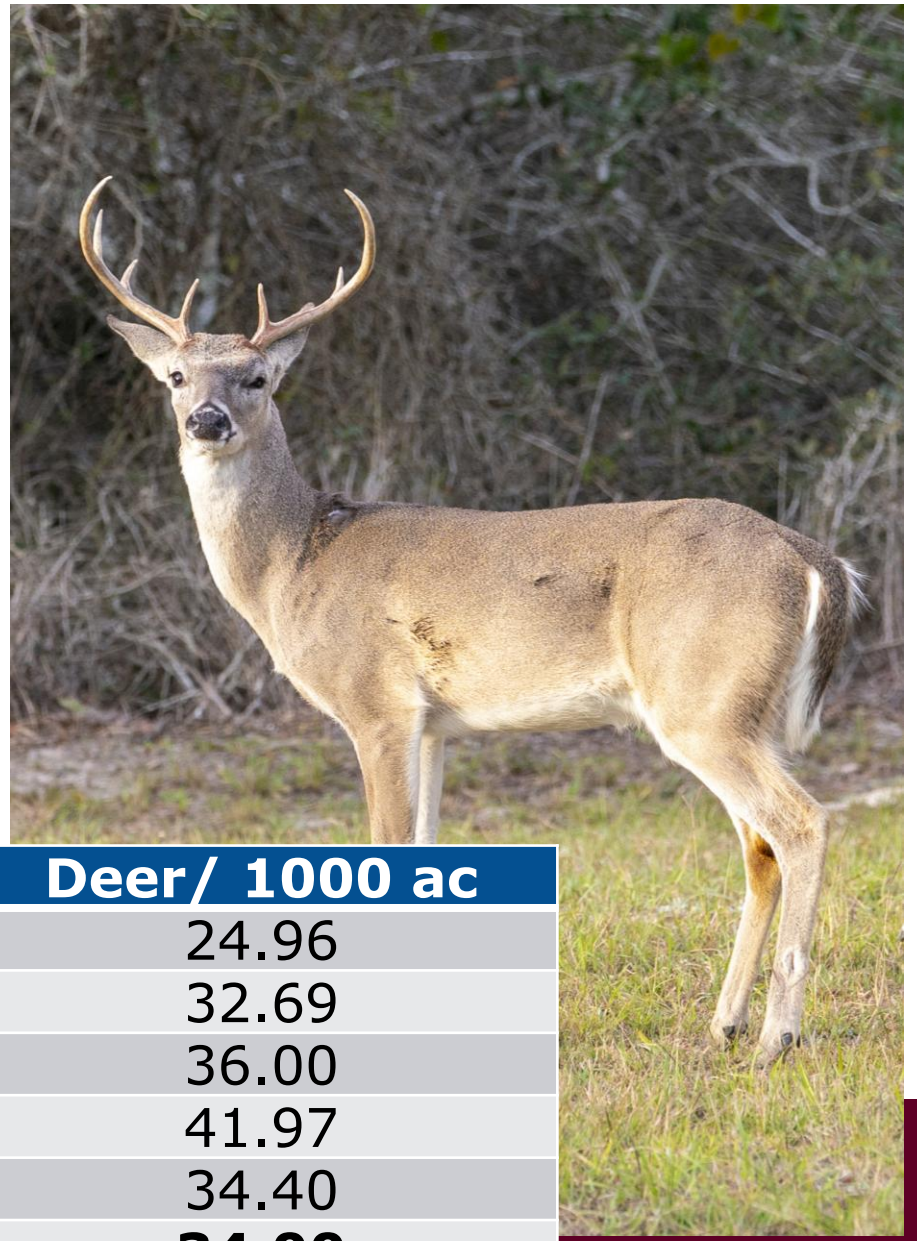
Wildlife – Deer in Watershed

Estimated based on Texas Parks and Wildlife Department survey

- Total Deer – **4,352**
- Between 2015 and 2022
  - Croplands
  - Deciduous-Mixed Forest
  - Evergreen Forest
  - Pasture/Hay
  - Grassland/Rangeland
  - Wetlands



19 South	Deer/ 1000 ac
2022	24.96
2020	32.69
2018	36.00
2016	41.97
2015	34.40
Average	**34.00**

Feral Hogs in Watershed – Method 1

Estimated based on "Feral Hog Population Growth, Density and Harvest in Texas"

- Total Feral Hogs Estimated – **3,281**
  - Based on 39 ac of suitable habitat per hog
  - Excluding barren and developed land
- 1.8 ~ 3.4 million (average 2.6 million) statewide

Feral Hogs in Watershed – Method 2

Estimated based on "Education Program for Improved Water Quality in Copano Bay Task Two Report"

- Total Feral Hogs – **3,999**
- Based on 32 ac/hog
  - Excluding barren and developed lands
- Total Feral Hogs – **3,843**
- Based on 33.3 ac/hog
  - Excluding barren and developed lands

Method 3 – stakeholder recommended density?

Population

Year	Burleson	Milam
2020	10,118	359
2030	10,886	380
2040	11,373	395
2050	11,862	415
2060	12,248	431
2070	12,565	447

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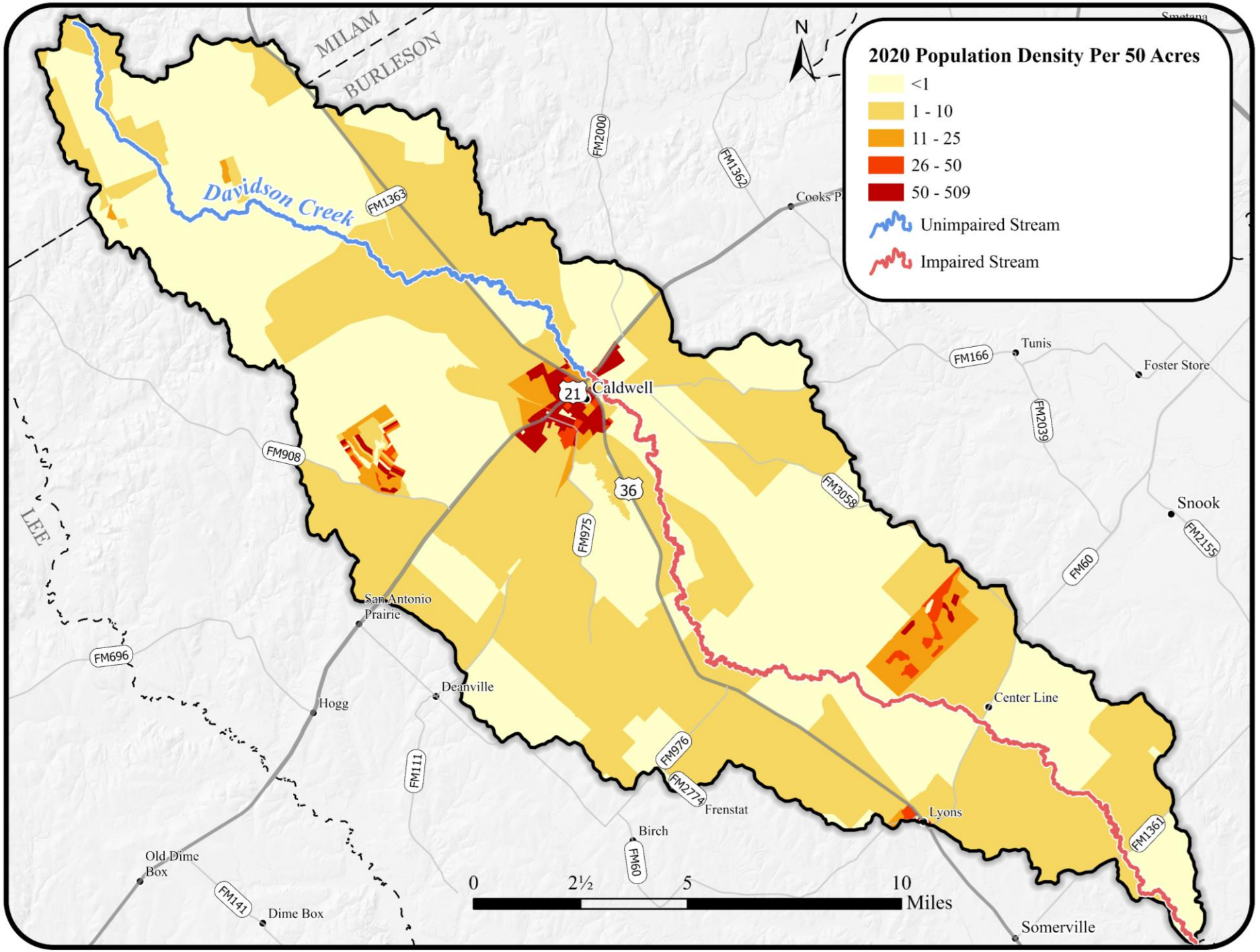


Dogs in Watershed

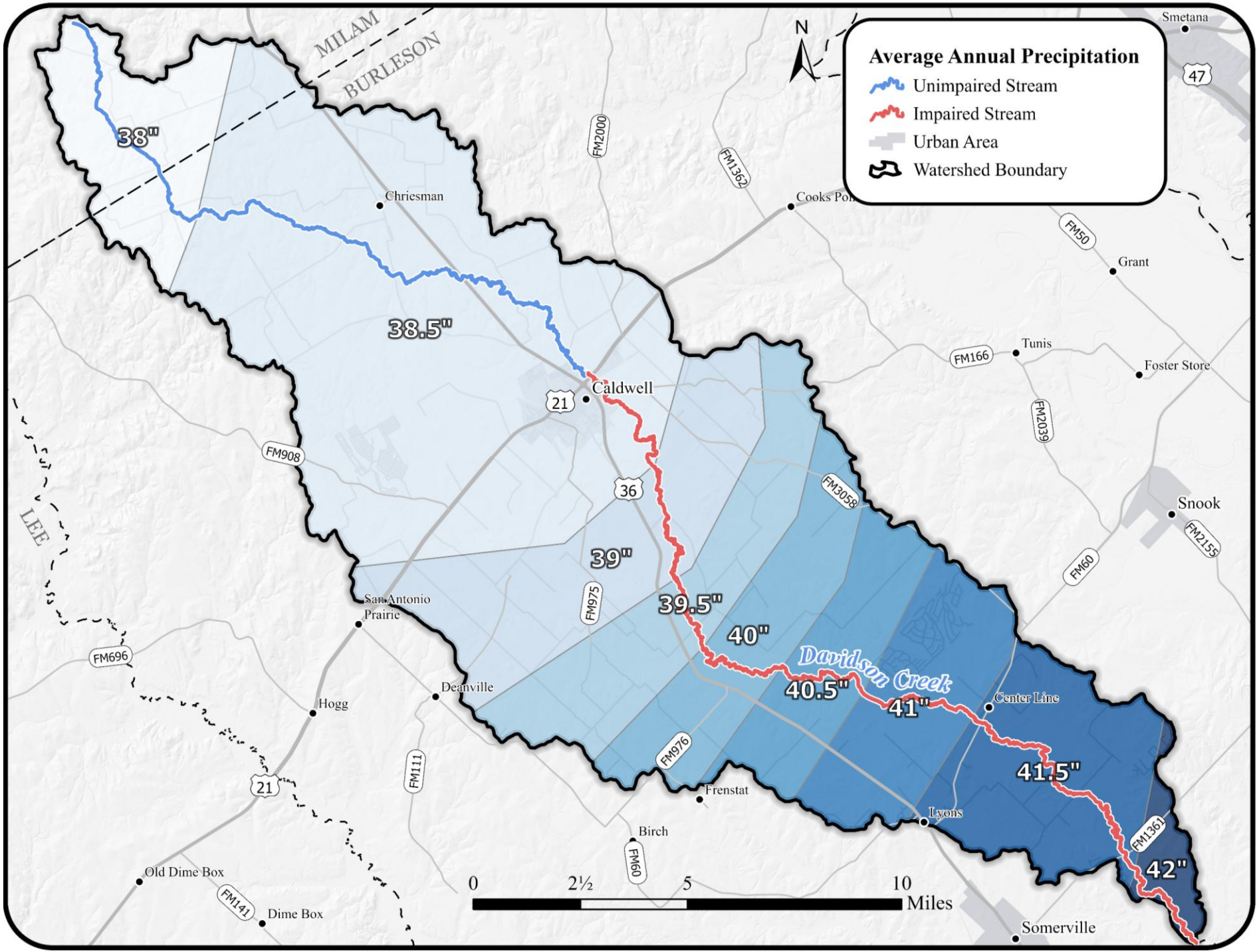
- Total Dogs – **3,485**
- Estimated based on 2024 American Veterinary Medical Association survey
  - About 45.5% of US households own dogs
  - Of those, the average number of dogs is 1.5

	Households	Dogs
Watershed	5,106	3,485

Alternative method – stakeholder recommended # of dogs/house?

Watershed Characterization

Precipitation



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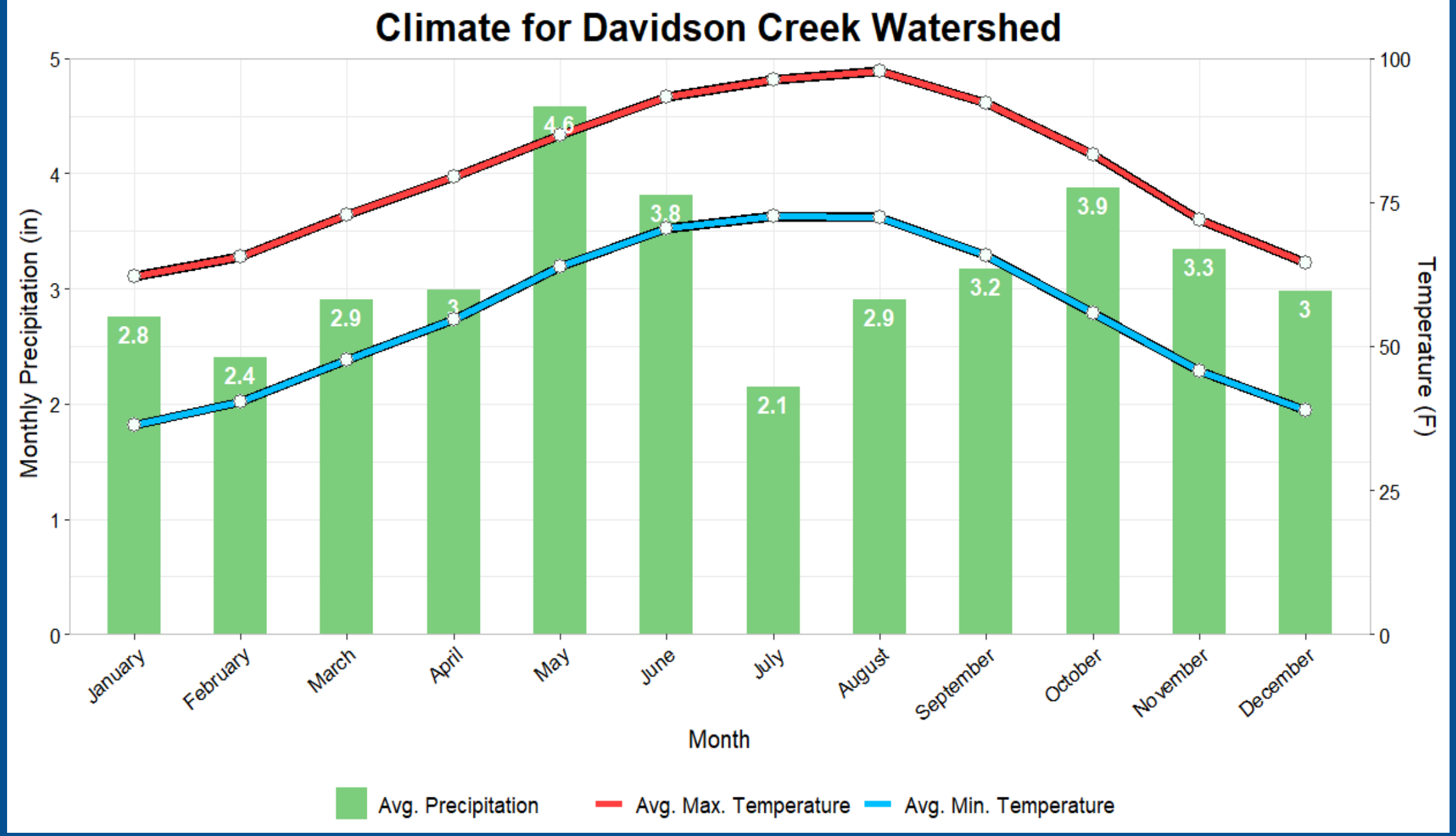

Data retrieved from Somerville Dam, Weather Station: TX USC00418446

Soil Group	Description
A	**High water infiltration rates** when fully wet. Low runoff potential.
B	**Moderate infiltration rate** when fully wet. Moderate runoff potential.
C	**Slow infiltration rate** when fully wet. High runoff potential.
D	**Very slow infiltration rate** when fully wet. Very high runoff potential

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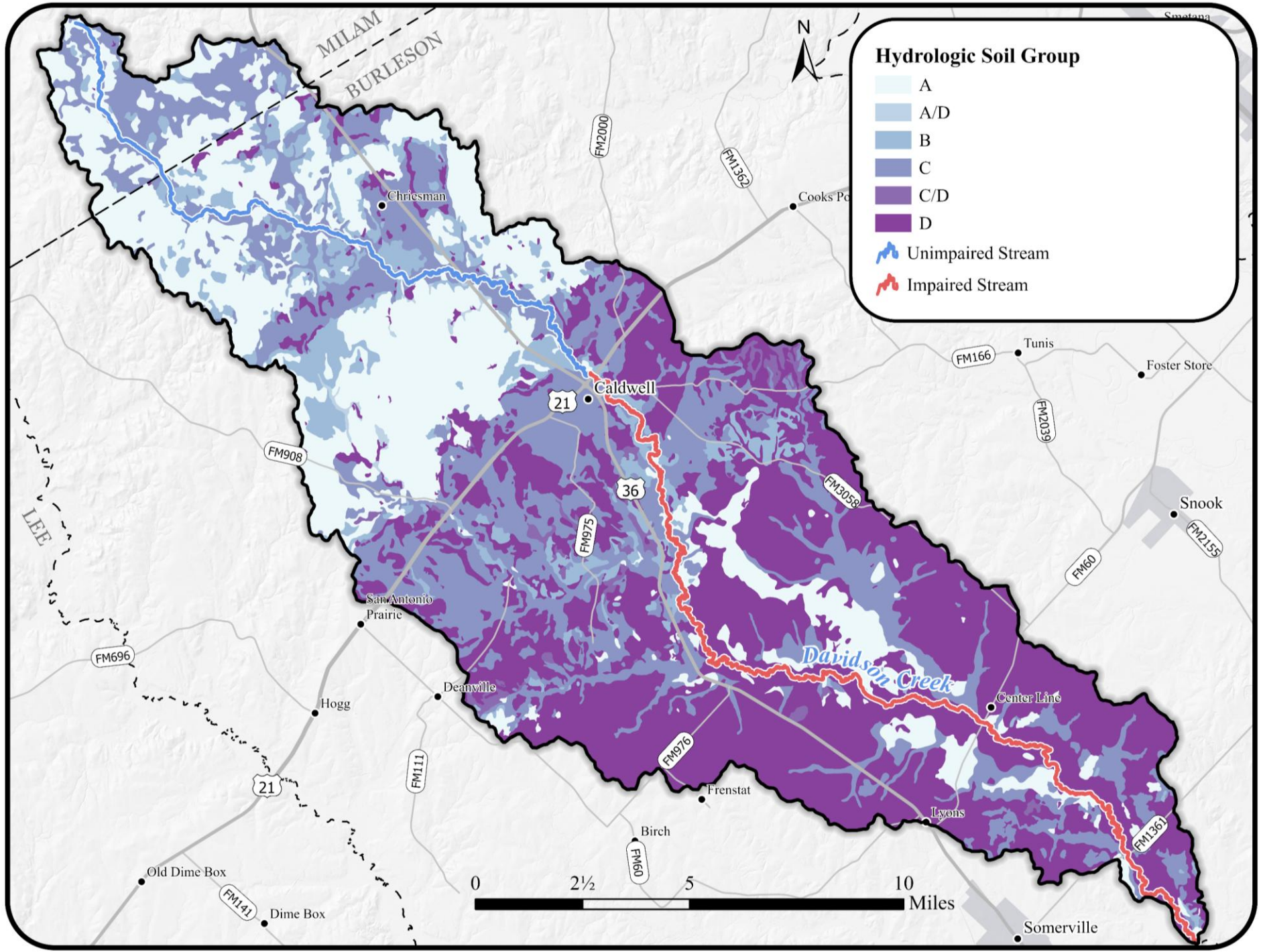
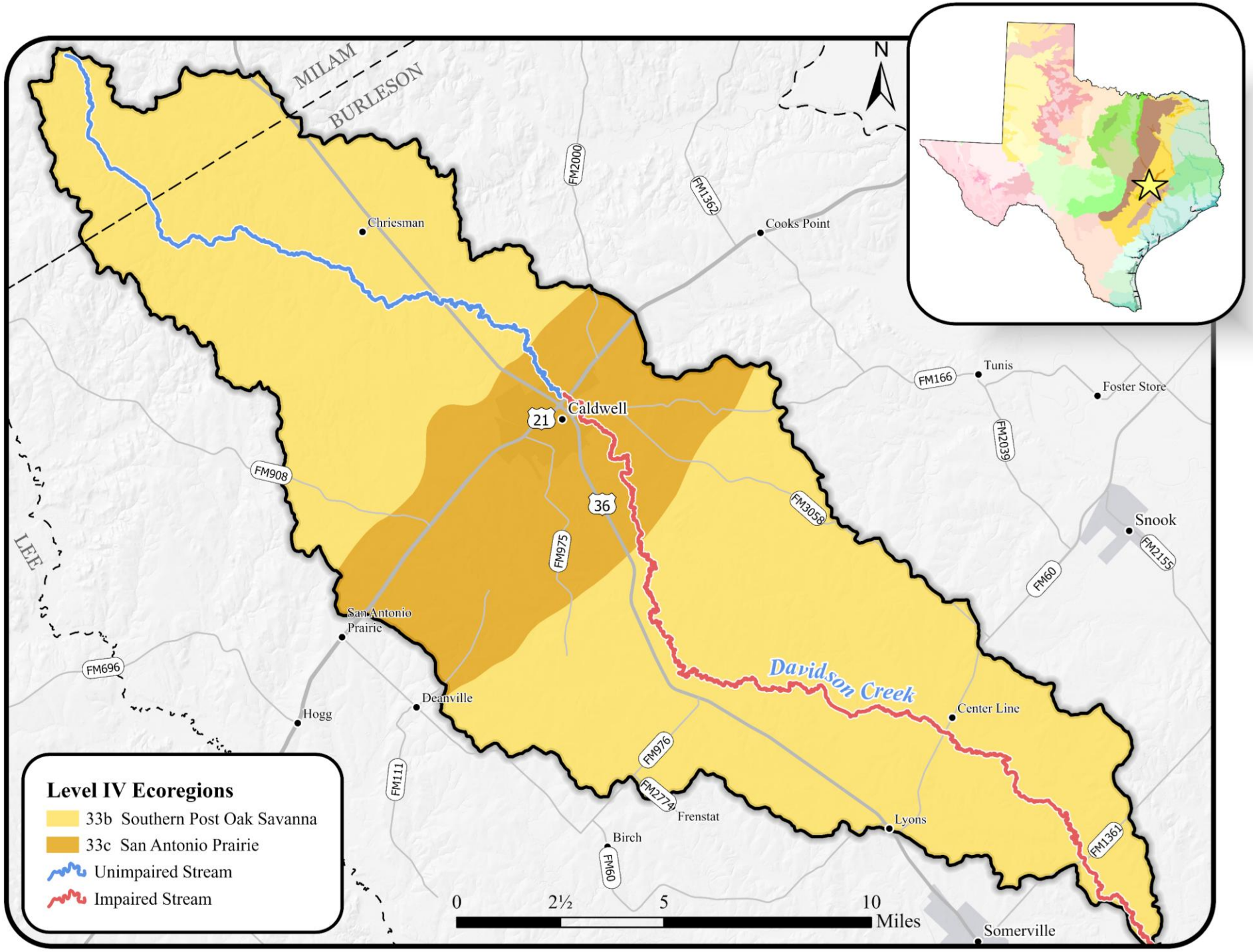


Level IV Ecoregions



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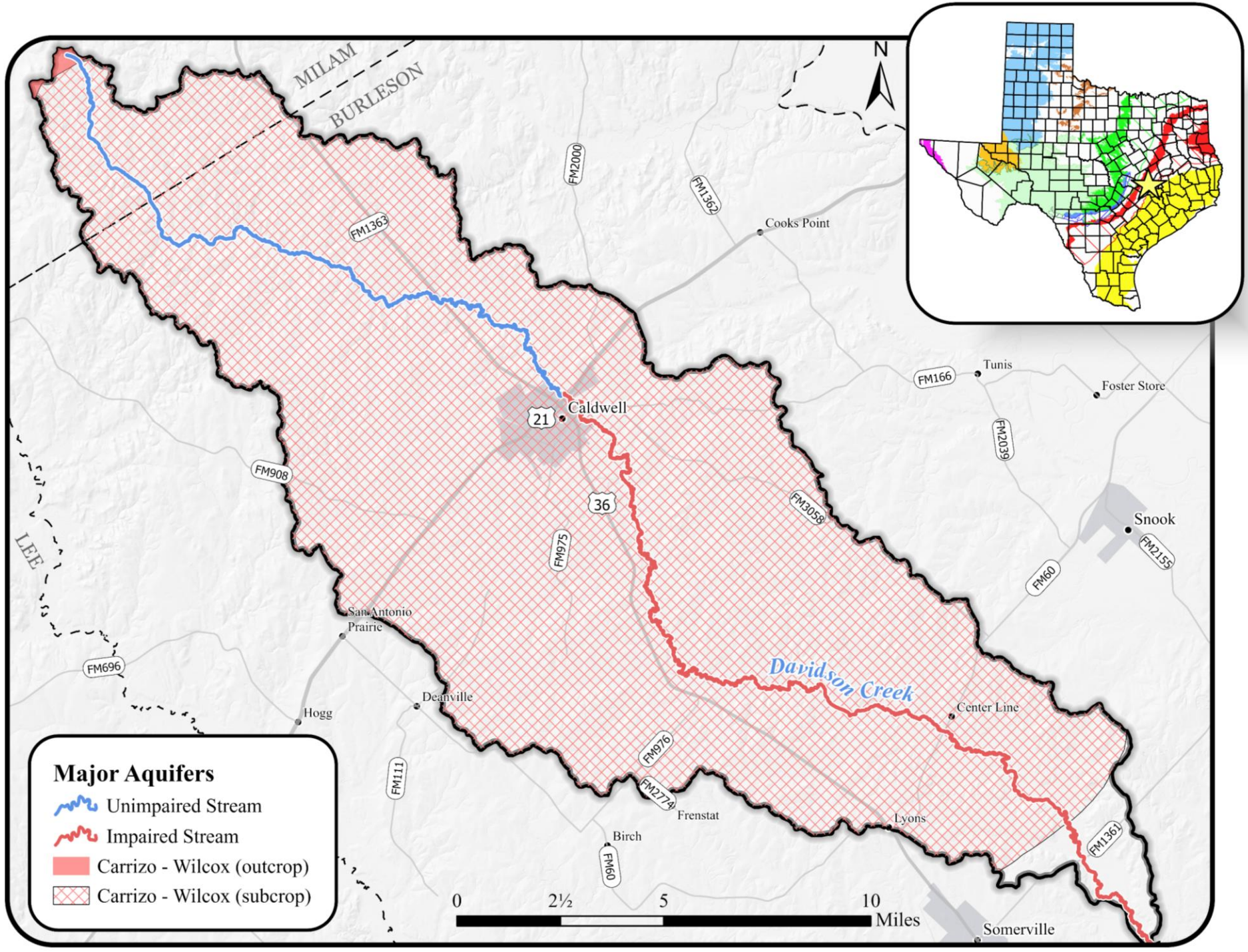
Major Aquifers



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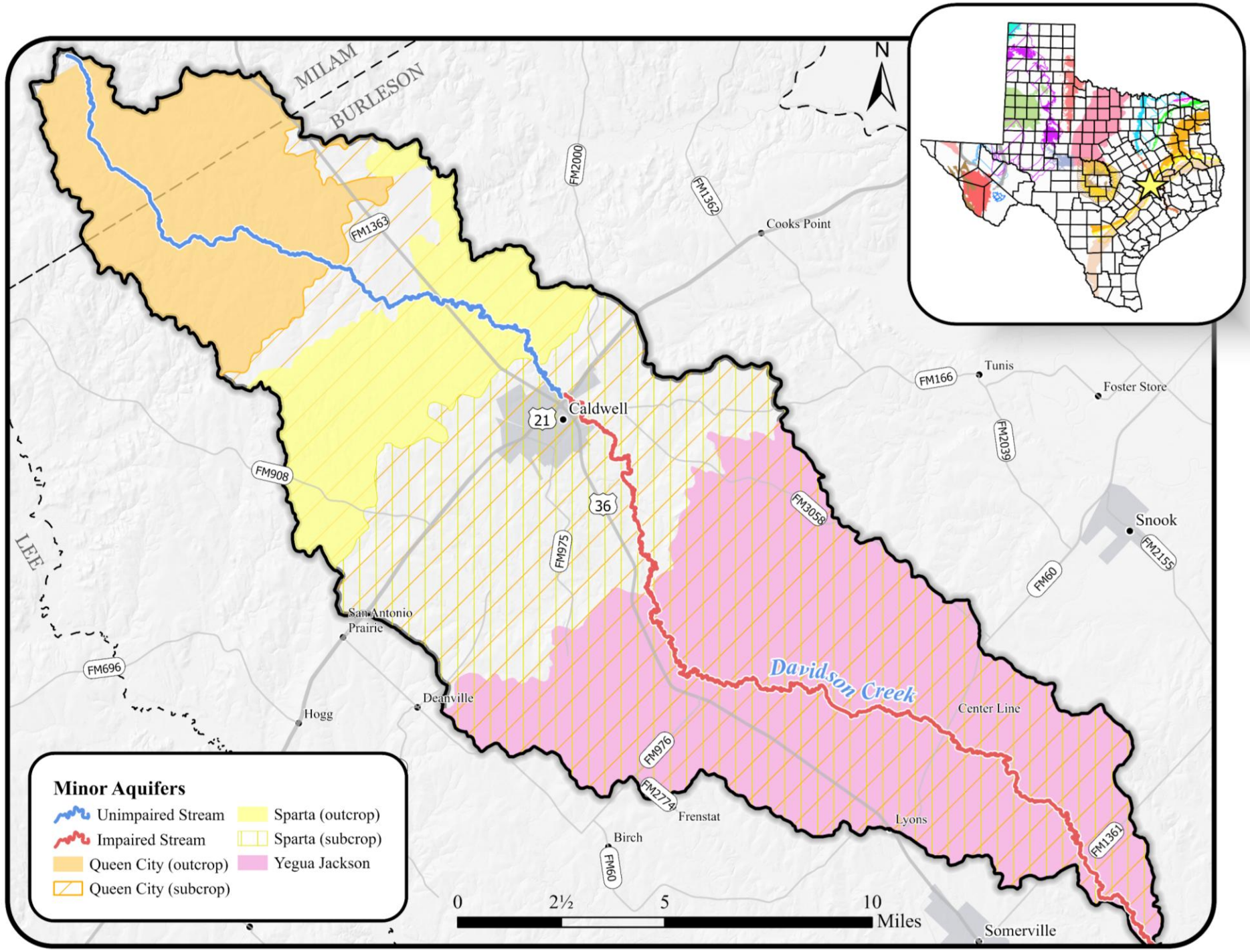
Minor Aquifers



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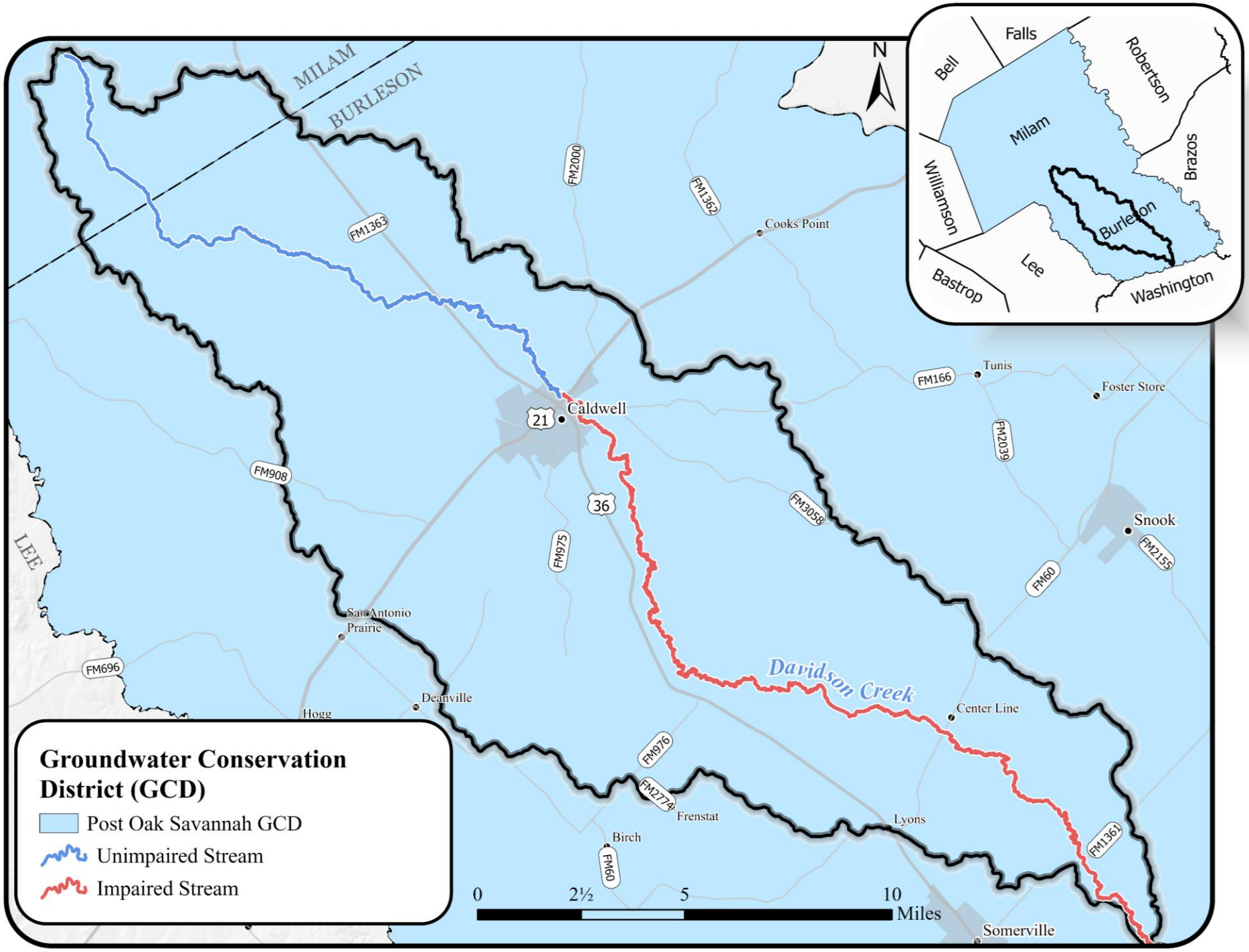
Groundwater District



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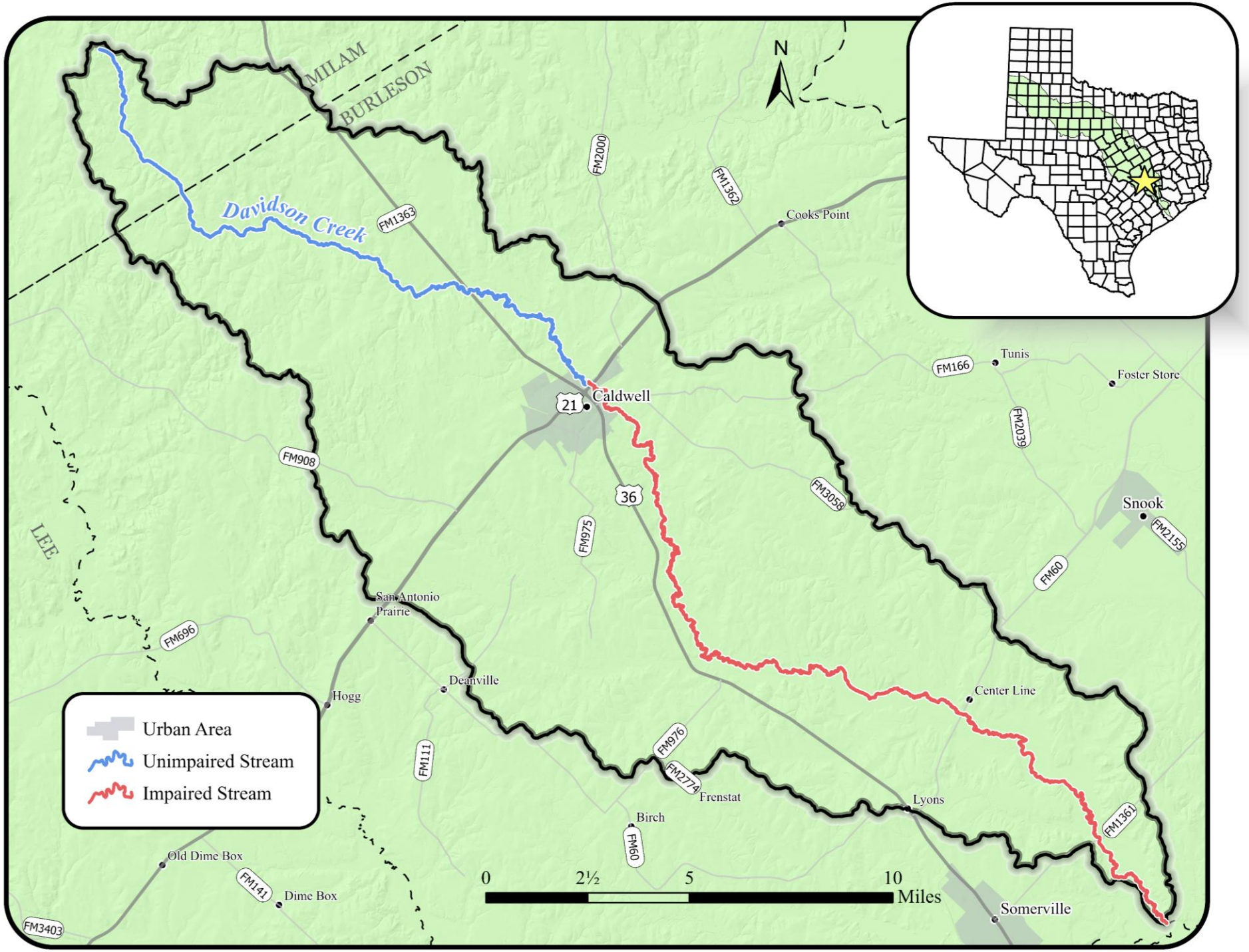
River Authority



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Additional Meetings and Overall Timeline

- Next Stakeholder Meeting
- Send out and post online meeting reminders and recap of previous meeting
- Continued monitoring for Davidson Creek will begin soon

Questions?

https://davidson.twri.tamu.edu/

Contact: Amanda Tague
TWRI Research Specialist I
amanda.tague@ag.tamu.edu
979-314-8049

Contact: John Grange
Burleson County Extension Agent
john.grange@ag.tamu.edu
979-567-2308