

Lampasas River Watershed Partnership

Wastewater Infrastructure Work Group

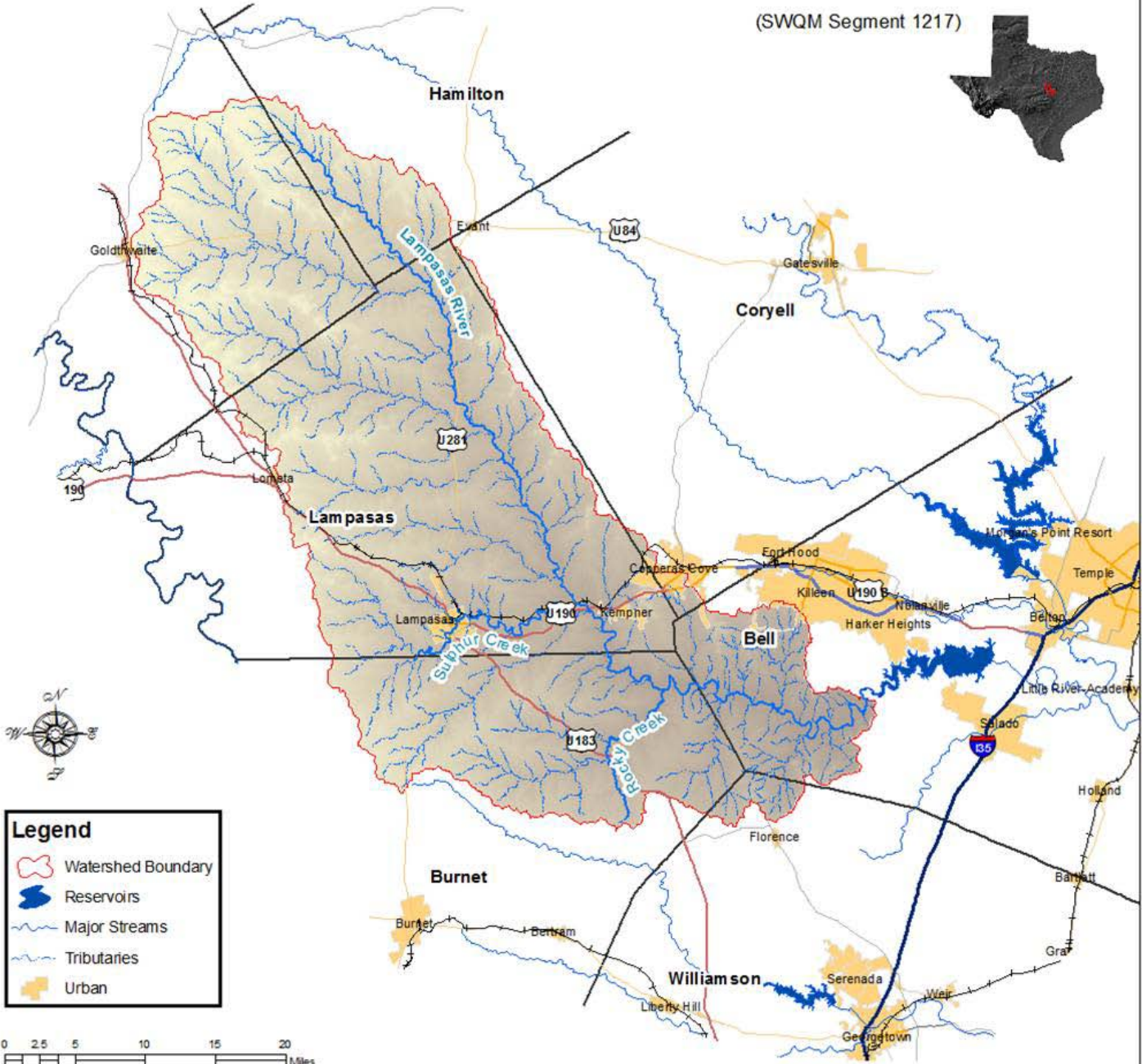
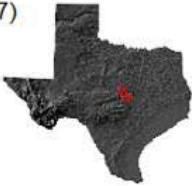
Lisa Prcin
Watershed Coordinator
Texas AgriLife Research at
Blackland Research & Extension Center

Wastewater Infrastructure Work Group

- ▶ Discuss specific causes and sources of nonpoint source pollution stemming from wastewater sources
- ▶ Wastewater sources include on-site sewage facilities (OSSFs or septic systems) and wastewater treatment facilities (WWTFs)
- ▶ Identify and recommend strategies to the Steering Committee to reduce and abate pollution from these sources
- ▶ Possible topics:
 - Regionalization of wastewater treatment
 - Conversion of OSSFs to a centralized WWTF
 - Repair/replacement of OSSFs

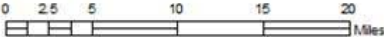
LAMPASAS RIVER WATERSHED

(SWQM Segment 1217)



Legend

- Watershed Boundary
- Reservoirs
- Major Streams
- Tributaries
- Urban



Stakeholder Concerns

- ▶ What concerns do you have about the watershed?

Land Use/Land Cover Analysis

County and Watershed Acreage

County	Total (acres)	Watershed in County (acres)
Bell	695,340	72,457
Burnet	652,364	171,906
Coryell	675,943	7,043
Hamilton	534,838	46,620
Lampasas	456,673	351,326
Mills	479,613	139,185
Williamson	727,138	9,838
Total	4,221,908	798,375

County and Watershed Percentages

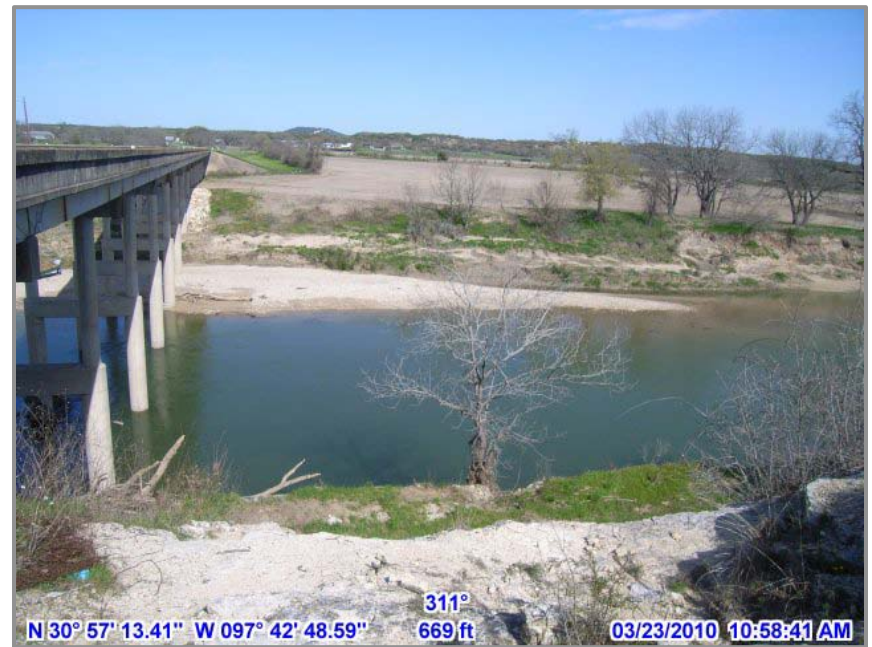
County	Percent of County in Watershed	Percent of Watershed in County
Bell	10%	9%
Burnet	26%	22%
Coryell	1%	1%
Hamilton	9%	6%
Lampasas	77%	44%
Mills	29%	17%
Williamson	1%	1%

Methods Used

- ▶ **National Agriculture Imagery Program (NAIP) Digital Ortho Imagery:**
 - NAIP Ortho photos are collected and compiled each year by the United States Department of Agriculture (USDA) Farm Service Agency (FSA) during a portion of the agricultural growing season at a one or two meter resolution (2008).
- ▶ **National Land Cover Dataset:**
 - The NLCD was developed using a decision–tree classification approach for multi–temporal Landsat imagery and several ancillary datasets. The category of urban land was extracted from the dataset using the ArcGIS Spatial Analyst extension to compare and compliment the NAIP classification (2001).
- ▶ **Crop Data Layer:**
 - The CDL was used in the classification process to gather in depth cropland points in the watershed. A CDL is a small unit of land that has a permanent, contiguous boundary, with a common land use and owner, and a common producer in agricultural land associated with USDA farm programs. CDL boundaries are delineated from relatively permanent features such as fence lines, roads, and/or waterways (FSA)(2008).
- ▶ **Ground Truth Data:**
 - Samples for each LU/LC class within the study were gathered using Trimble GeoXH 2005 and RICOH Caplio 500SE 1.38 Rev 2 units, as well as digital sampling of high–resolution aerial photography. The primary focus of the field collection process was to collect ground control points across the entire area, particularly in classes which were difficult to distinguish.

Land Use Definitions

- ▶ Water: All areas of open water, generally with less than 25% cover of vegetation or soil



Land Use Definitions continued

- ▶ Urban: Includes areas with a mixture of some constructed materials and lawn grasses. These areas most commonly include residential and commercial developments



Land Use Definitions continued

- ▶ Forest: Areas dominated by trees generally greater than 15 feet tall, greater than 50% of total vegetation cover and areas adjacent to streams, creeks and/or rivers



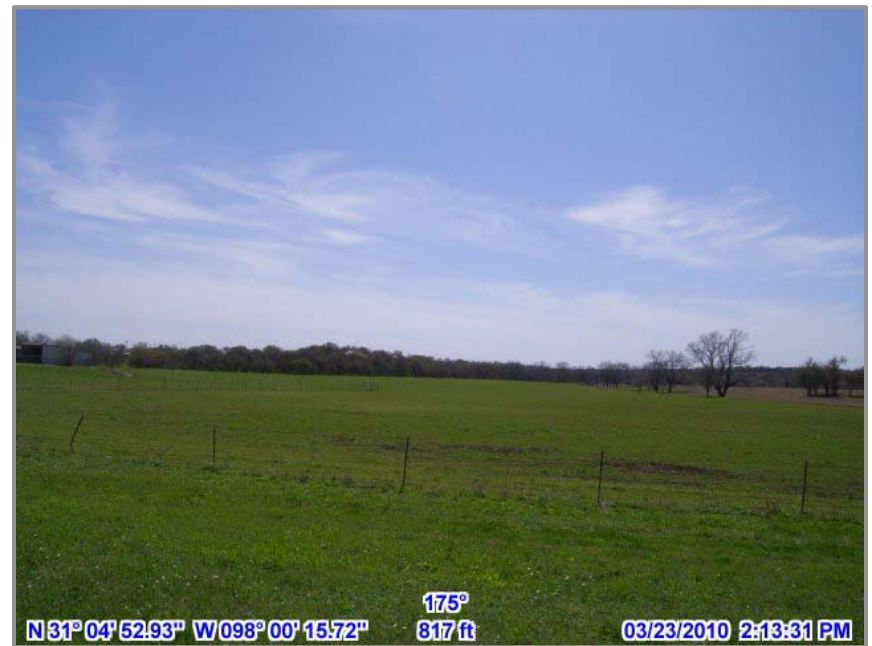
Land Use Definitions continued

- ▶ Pasture:
Transitional area
between
unmanaged
rangeland and
managed pasture



Land Use Definitions continued

- ▶ Managed Pasture:
Areas of grasses, legumes, or grass-legume mixtures planted for livestock grazing or the production of seed or hay crops



Land Use Class Definitions continued

- ▶ Rangeland: Areas of unmanaged shrubs, grasses, or shrub-grass mixtures



Land Use Class Definitions continued

- ▶ Barren:
(Rock/Sand/Clay) –
Barren areas of
bedrock, desert
pavement, scarps,
slides, strip mines,
gravel pits,
construction sites and
other accumulations of
earthen material –
vegetation accounts for
less than 15% of total
cover and includes
transitional areas



Land Use Class Definitions continued

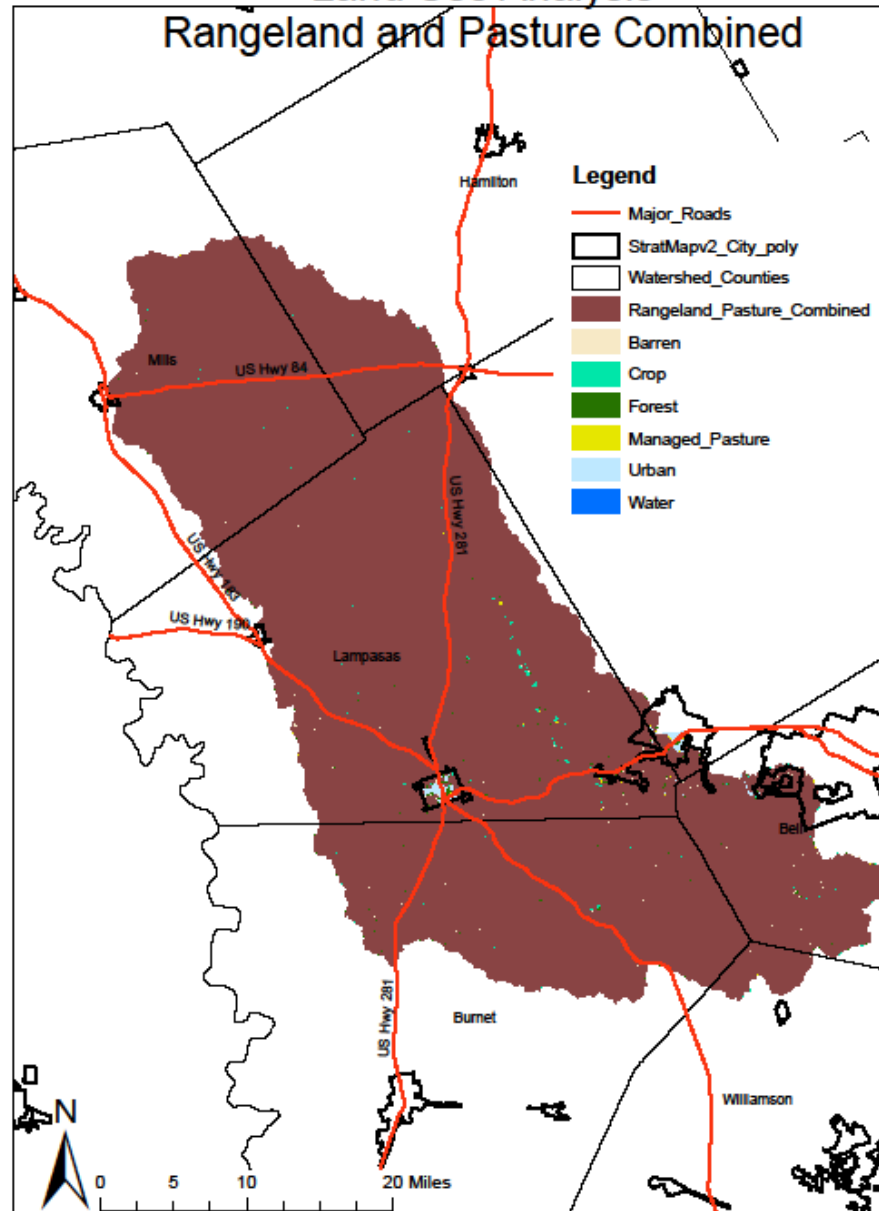
- ▶ Crops: Areas used for the production of annual crops, such as corn, soybeans, vegetables and cotton and also perennial crops such as orchards – also includes all land being actively tilled



Lampasas River Watershed

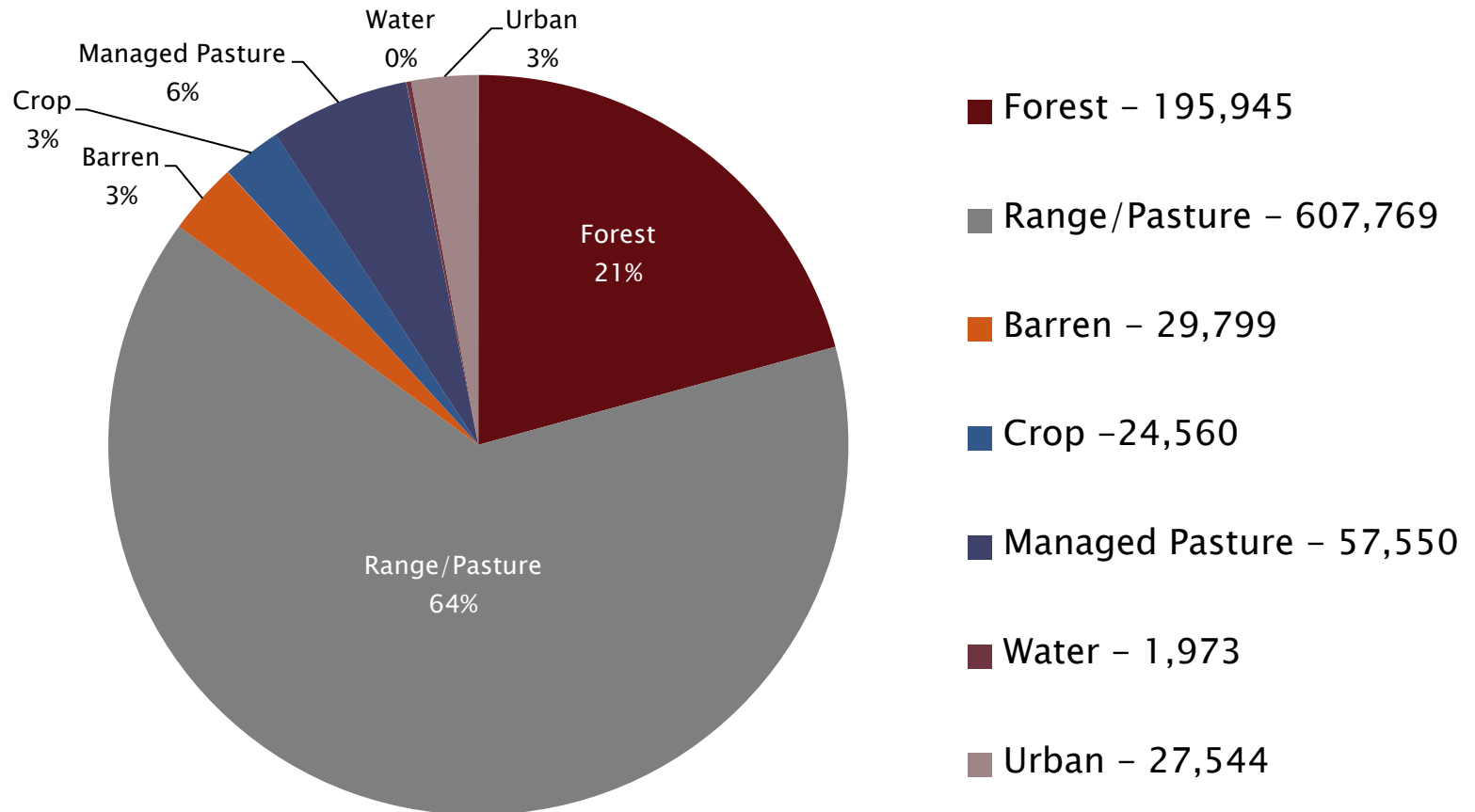
Land Use Analysis

Rangeland and Pasture Combined

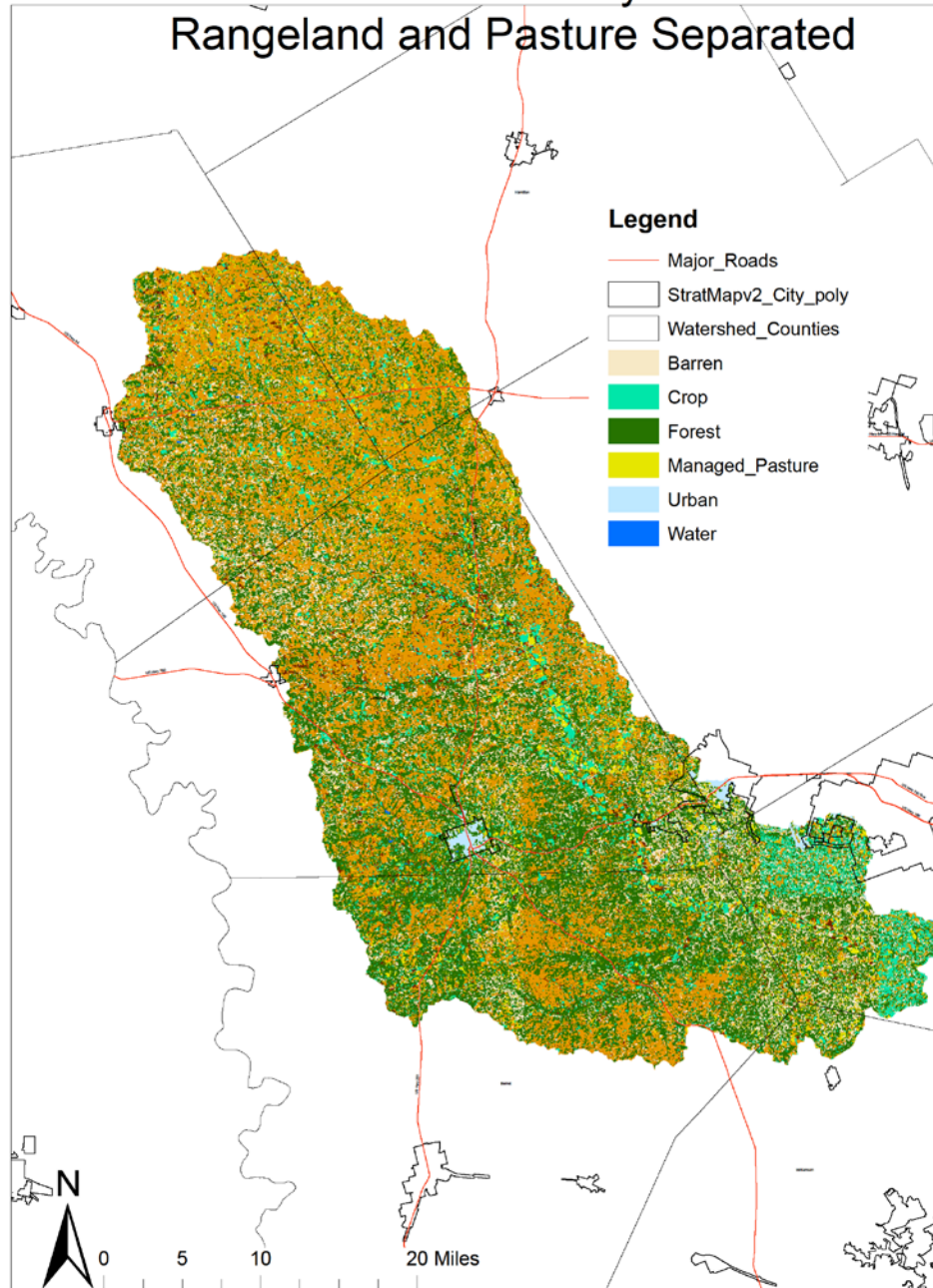


Watershed Land Use/Land Cover

Rangeland and Pasture Combined

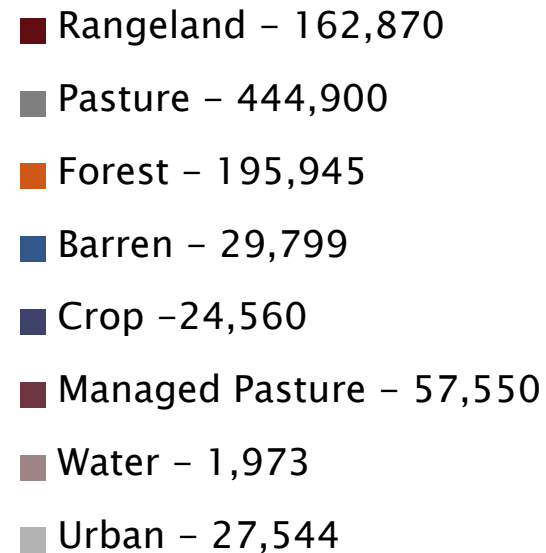
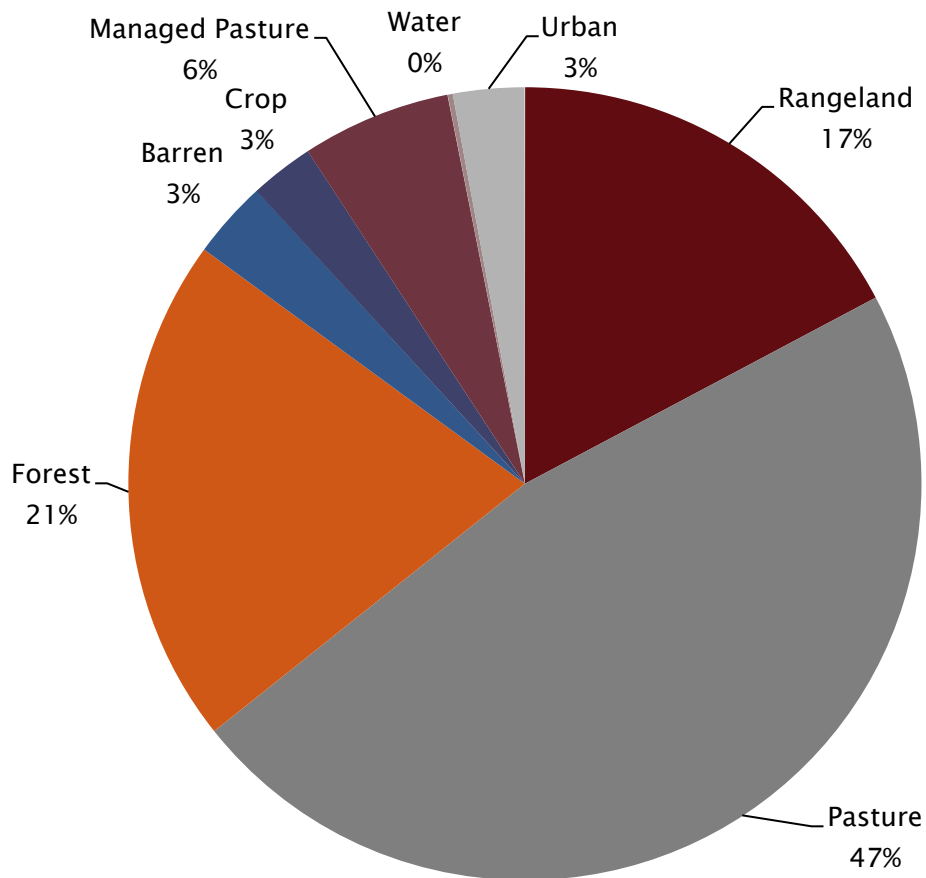


Lampasas River Watershed Land Use Analysis Rangeland and Pasture Separated



Watershed Land Use/Land Cover

Rangeland and Pasture Separated



Watershed Land Use/Land Cover

- ▶ Accuracy based on ground-truthing
 - Rangeland and Pasture Combined = 87%
 - Rangeland and Pasture Separated = 71%
 - Difficult to distinguish between rangeland and pasture digitally

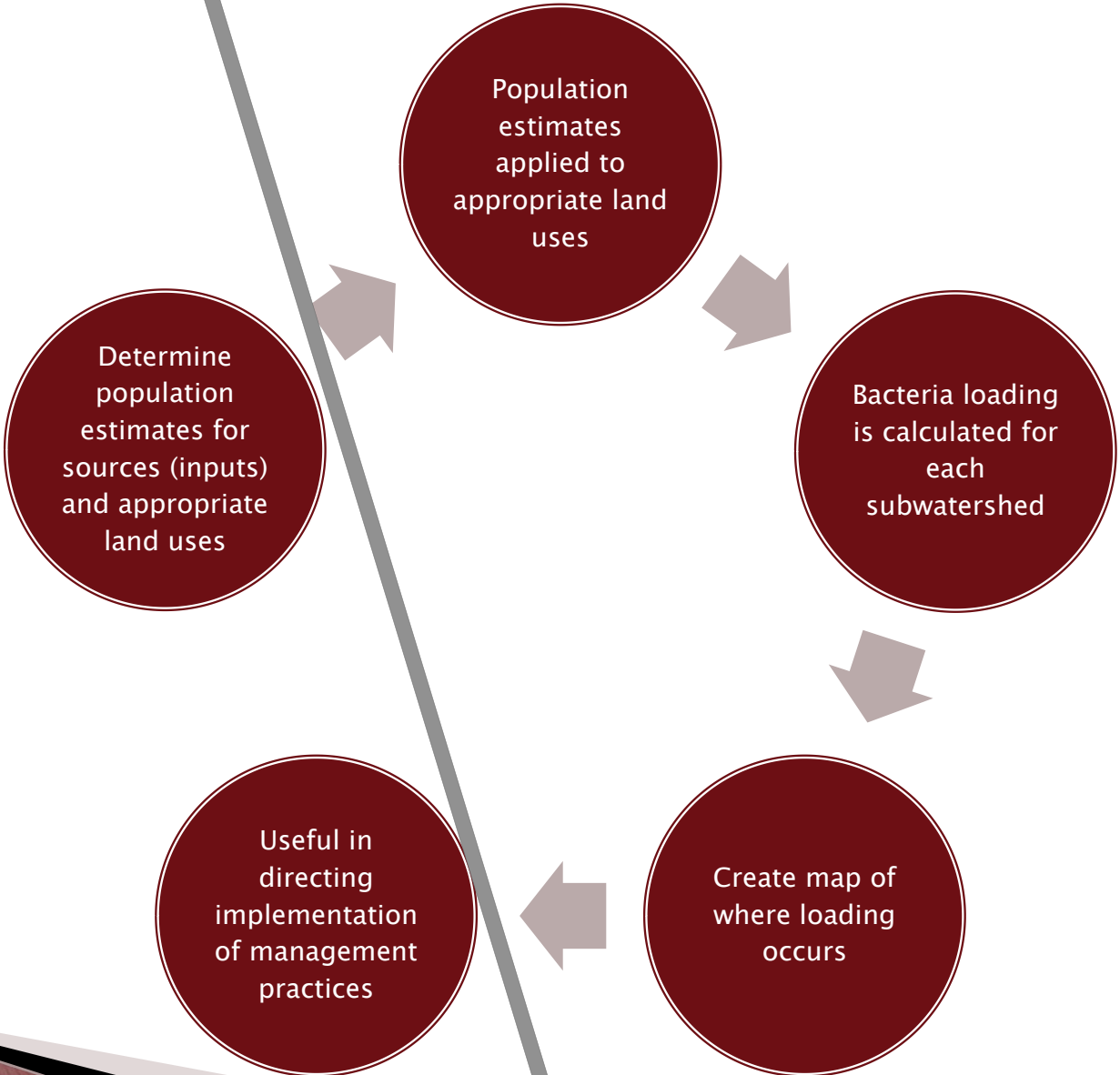
Sources and Distribution of Nonpoint Source Pollutants

SELECT Model

- ▶ Stakeholders estimate populations that may contribute to bacteria loading (Inputs)
- ▶ Land use lets us locate those sources in the correct areas of the watershed
- ▶ SELECT uses estimated populations and land use to estimate loadings from sources
- ▶ WPP is developed with a more clear understanding of sources and loading estimates

Work Group Functions

SELECT Functions



SELECT Inputs

- ▶ **Agricultural Issues Work Group**
 - Livestock – cattle, horses, sheep and goats
 - Cropland fertilizer application
- ▶ **Habitat and Wildlife Work Group**
 - Whitetail deer
 - Feral hogs
- ▶ **Urban/ Suburban Issues Work Group**
 - Pet populations
 - Urban stormwater runoff
- ▶ **Wastewater Infrastructure Work Group**
 - Septic systems
 - WWTP data

Pollutant Sources

- ▶ Onsite sewage facilities
- ▶ Wastewater treatment facilities
- ▶ High density growth areas
- ▶ Infrastructure/ Sanitary sewer overflows
- ▶ Illegal dumping

Pollutant Sources with Data

- ▶ OSSF (septic tanks)
- ▶ Wastewater Treatment Facilities
- ▶ Other pollutant data sources???

Population Estimates – Septics

- ▶ How do we estimate the number of septics in the watershed?
- ▶ Are there surveys that tell us where and how many systems there are and if they are functioning properly?
- ▶ Yes... number of households from census or extracting households that are not on sewer service

Wastewater Treatment Plants

- ▶ Two WWTFs within watershed
 - City of Lampasas – CH2M Hill
 - Discharges into Sulfur Creek
 - Permitted for 1.5 mgd
 - City of Copperas Cove – South WWTF
 - Discharges into Clear Creek
 - Permitted for 2.5 mgd

Data Needed

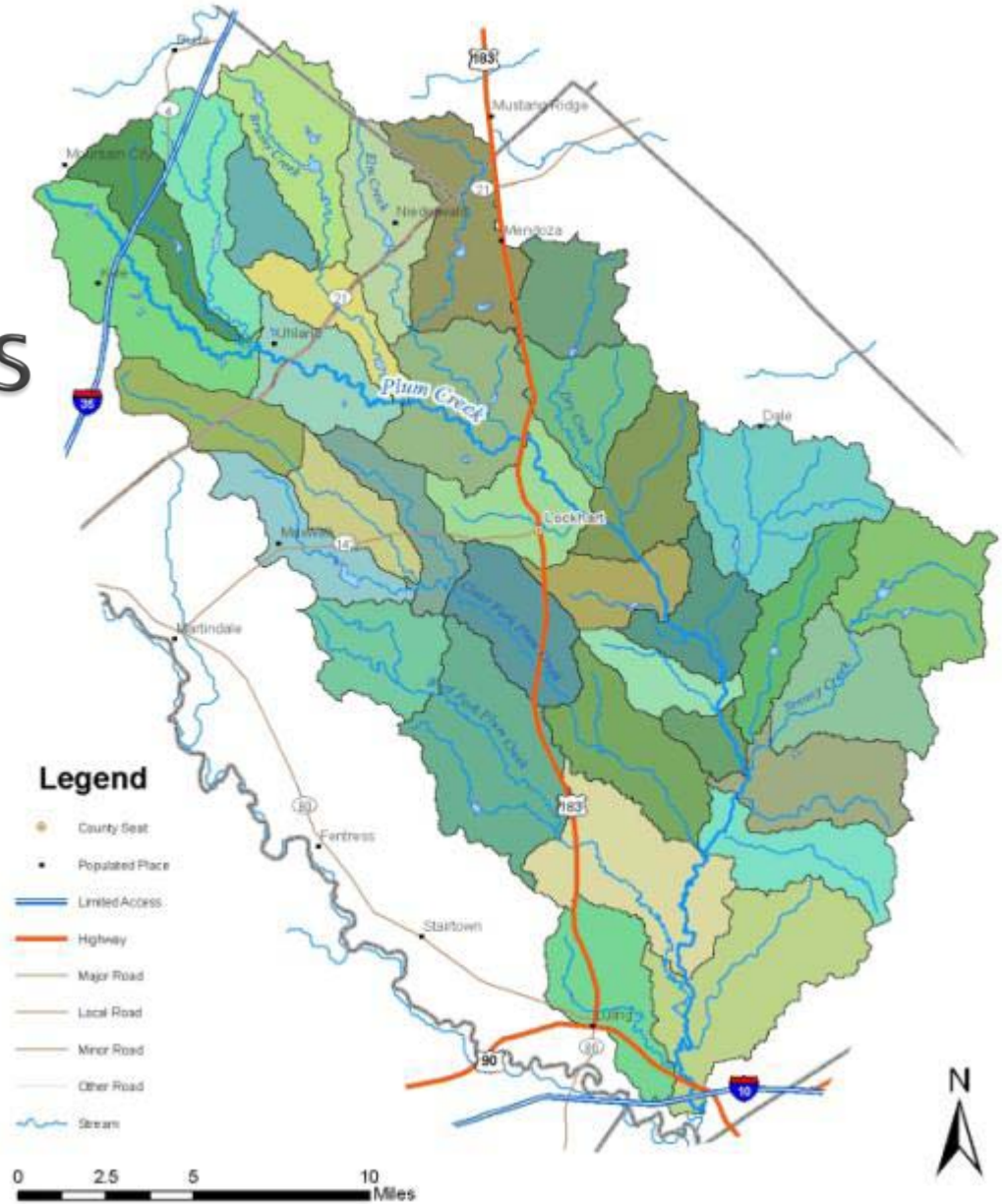
- ▶ Maps of water and sewer lines
- ▶ Water quality data
 - Bacteria
 - Nutrients
- ▶ OSSF permits and violations
- ▶ Population projections
- ▶ Water and wastewater planning
- ▶ City limit and ETJ boundaries

Next Steps

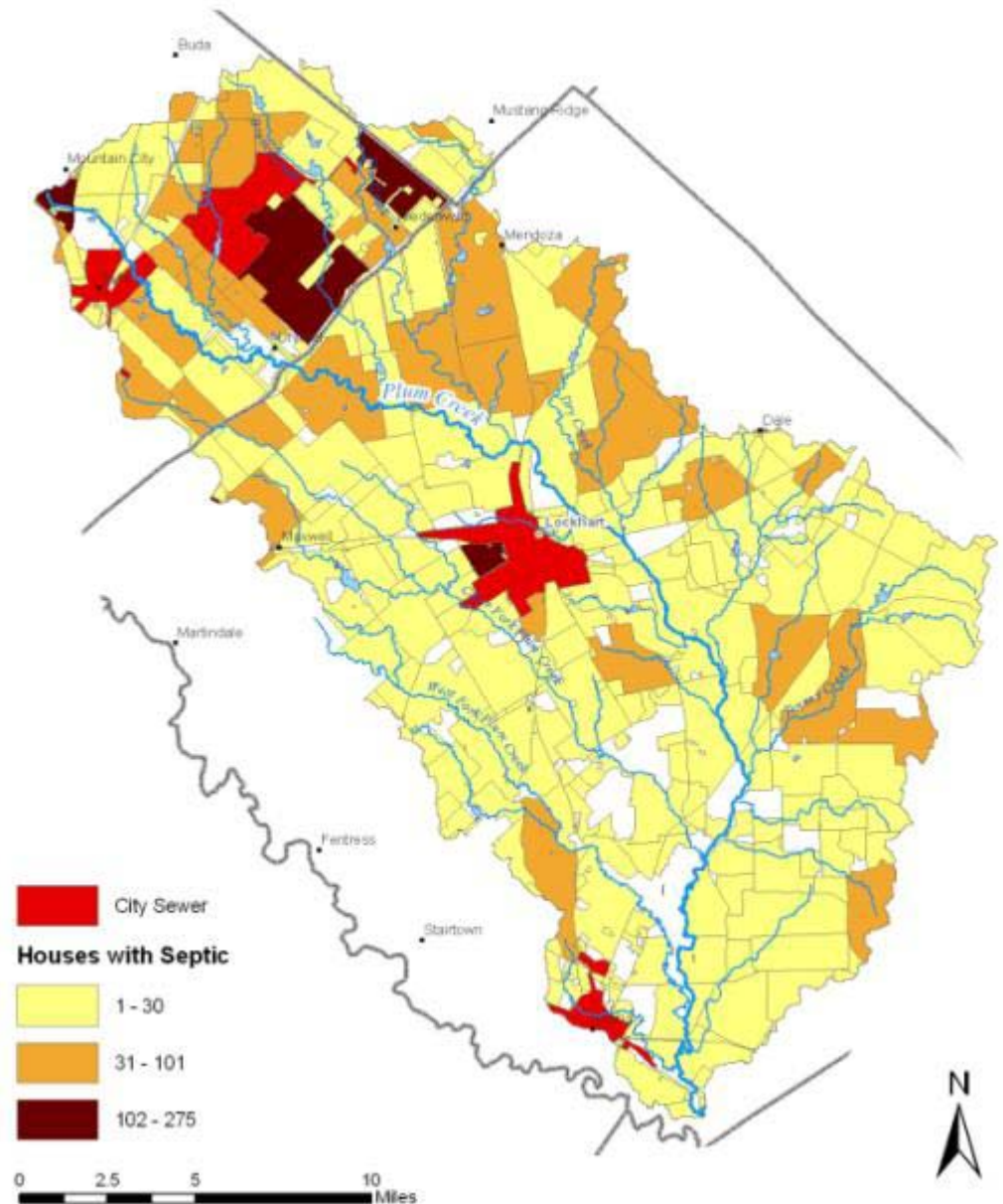


Plum Creek Watershed

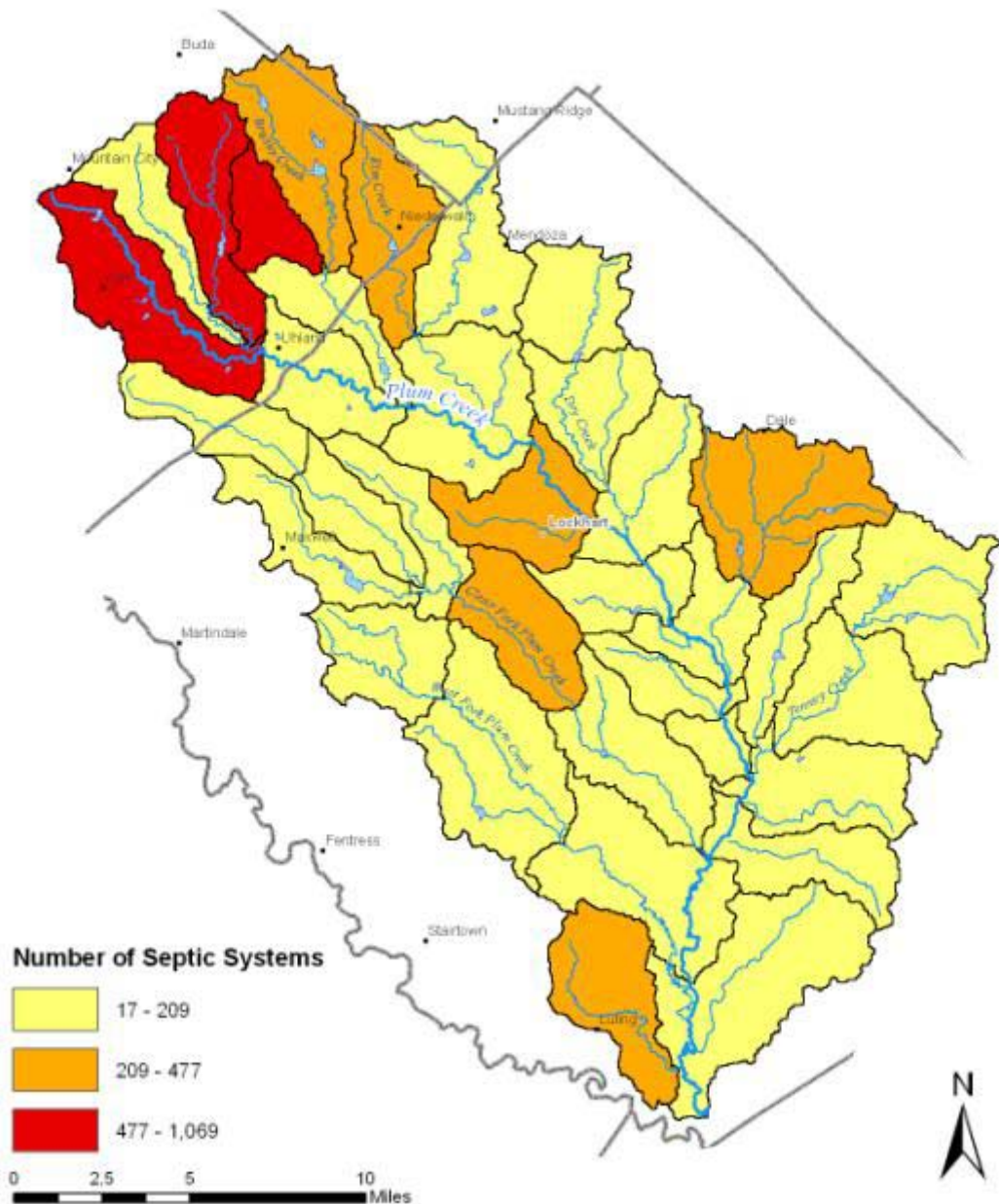
Subwatersheds



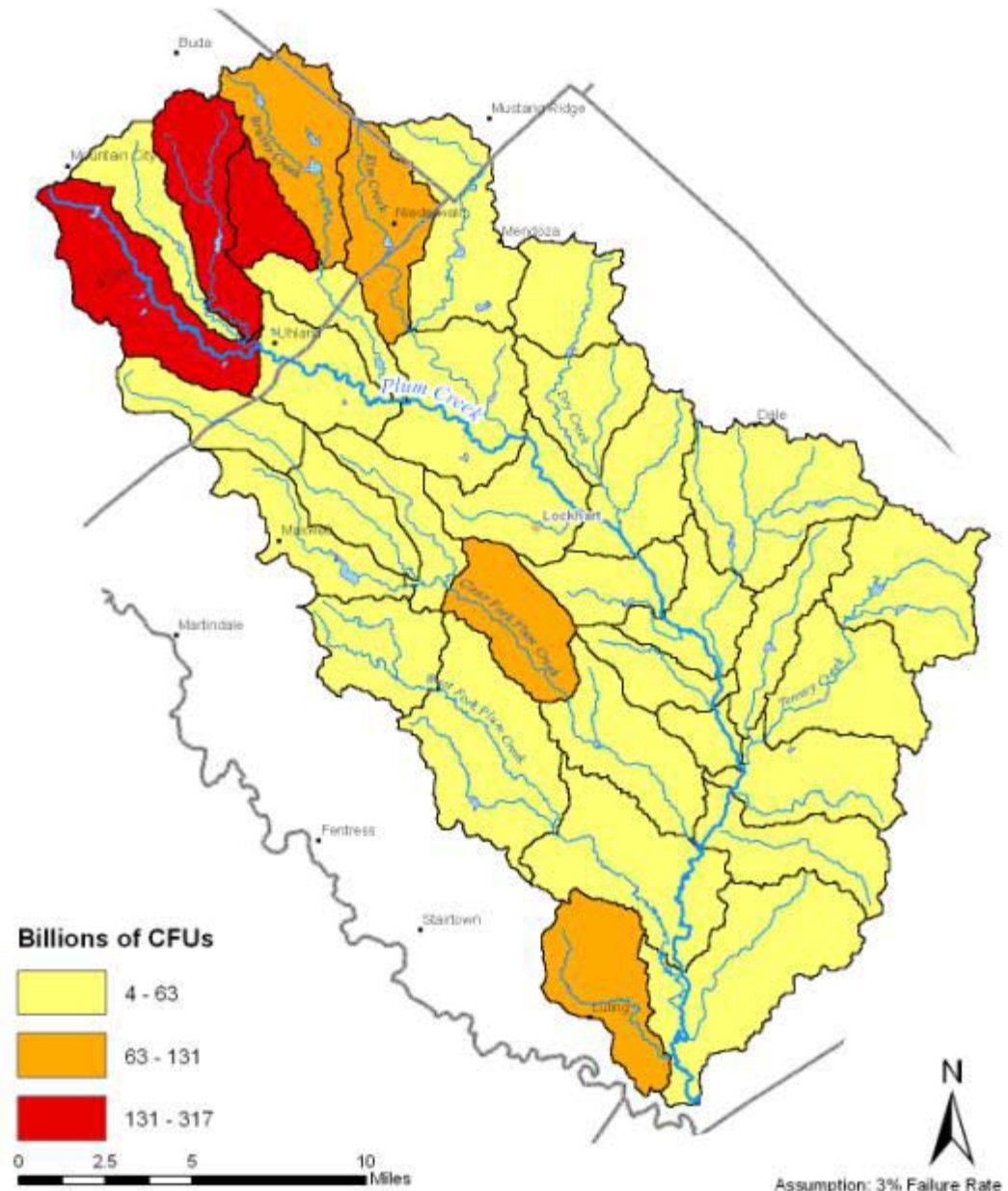
Distribute
septics to
households
based on
census
data and
sewer data



Density
determined by
sum of septics
in each
subwatershed



Loading determined from density



Other Work Groups

- ▶ **Habitat and Wildlife Work Group**
Monday, April 12th, 6 p.m. to 9 p.m.
Lampasas County Farm Bureau
1793 US Hwy 281
Lampasas, TX 76550
- ▶ **Waste Water Infrastructure Work Group**
Monday, April 19th, 2 p.m. to 5 p.m.
Lampasas City Hall – Council Chambers
405 South Main Street
Lampasas, TX 76550
- ▶ **Agriculture Issues Work Group**
Monday, April 19th, 6 p.m. to 9 p.m.
Lampasas County Farm Bureau
1793 US Hwy 281
Lampasas, TX 76550
- ▶ **Outreach and Education Work Group**
Tuesday, April 20th, 6 p.m. to 9 p.m.
Lampasas City Hall – Council Chambers
405 South Main Street
Lampasas, TX 76550
- ▶ **Urban/Suburban Issues Work Group**
Wednesday, April 21st, 2 p.m. to 5 p.m.
City of Killeen – Solid Waste Building
2003 Little Nolan Road
Killeen, TX 76542

These meetings are open to anyone interested, don't worry about whether you signed up or not. Please pass this info along to anyone else that might have interest or expertise to share.

May

- ▶ Does this date, time and location work for the group?
- ▶ If so, next meeting either Wednesday, May 12 or Monday, May 17
- ▶ Rainwater harvesting clinic:
 - Harker Heights Activity Center, Harker Heights
 - April 21–22
 - \$150 pre-reg
 - \$175 onsite reg
- ▶ My new phone number:
 - (254) 774–6008