

Lampasas River Watershed Partnership

Habitat and Wildlife
Work Group
April 12, 2010

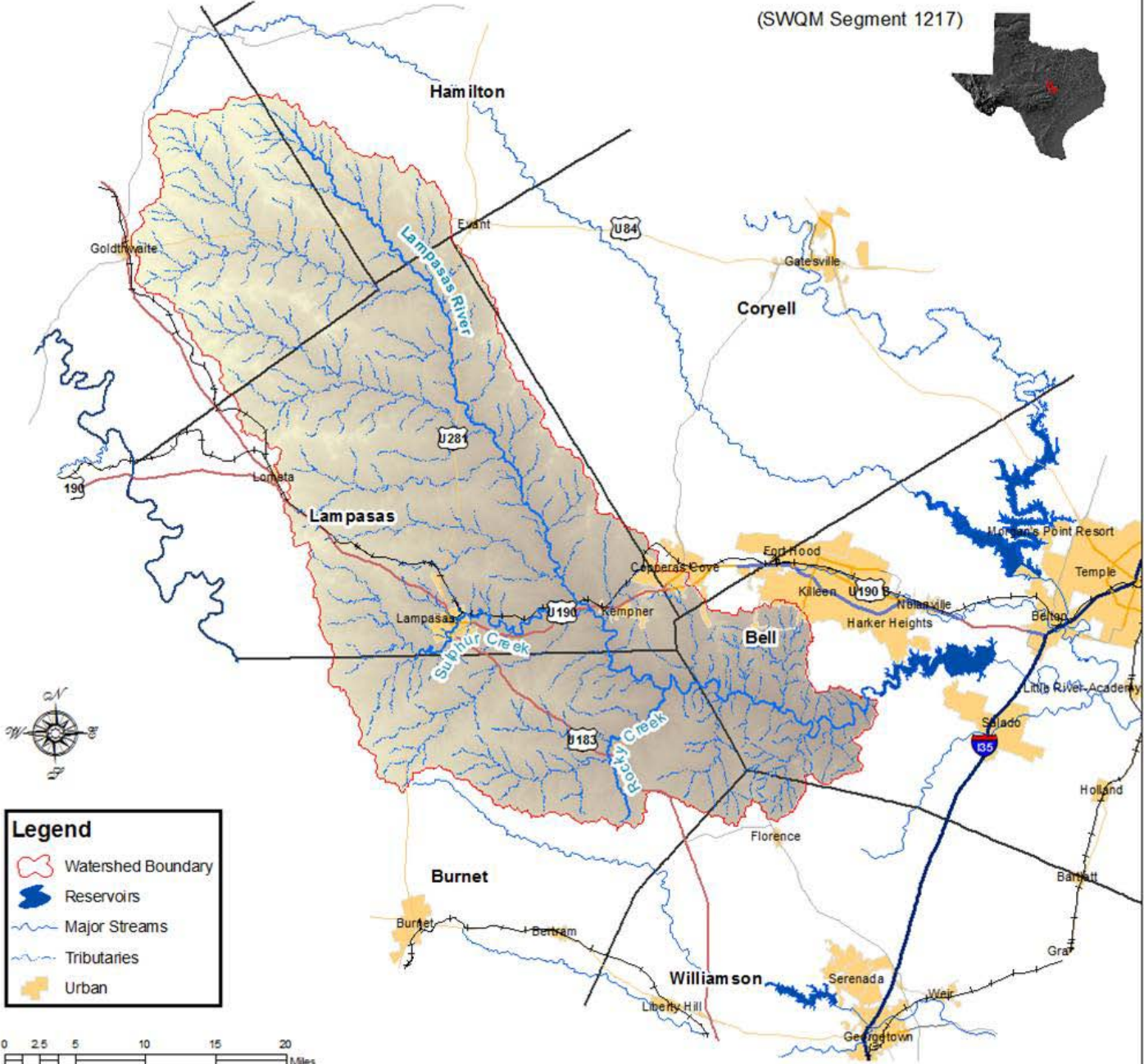
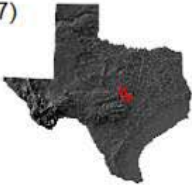
Lisa Prcin
Watershed Coordinator
Texas AgriLife Research at
Blackland Research & Extension Center

Habitat & Wildlife Work Group

- ▶ Purpose is to discuss specific causes and sources of nonpoint source pollution stemming from wildlife and feral hogs (an invasive species)
- ▶ Estimate populations of possible sources
- ▶ Identify and recommend strategies to the Steering Committee to reduce and abate pollution from these sources

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

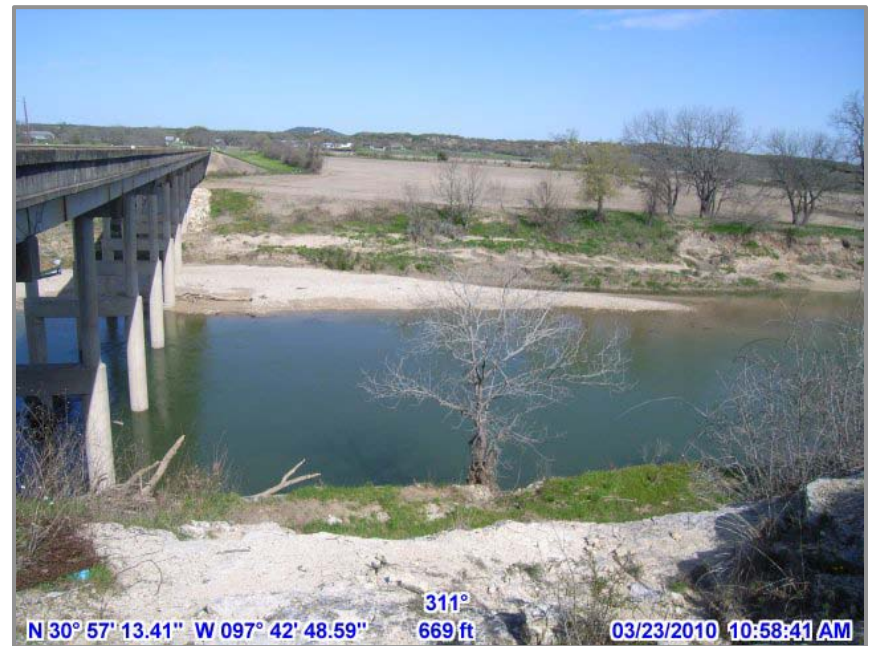
County	Percent of County in Watershed	Percent of Watershed in County
Bell	10%	9%
Burnet	26%	22%
Coryell	1%	1%
Hamilton	9%	6%
Lampasas	77%	44%
Mills	29%	17%
Williamson	1%	1%

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.
- ▶ **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.
- ▶ **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).
- ▶ **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



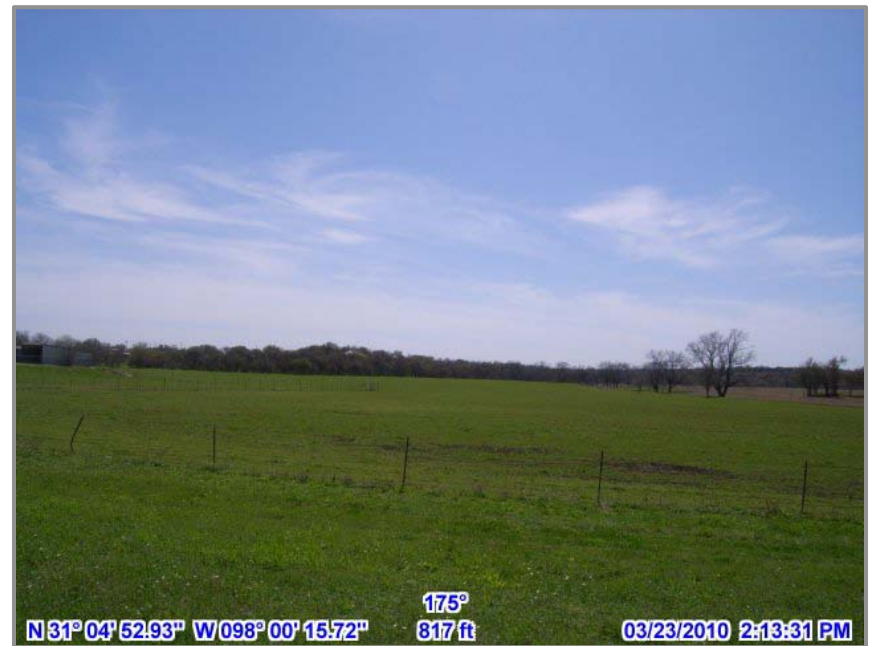
Land Use Definitions continued

- ▶ 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

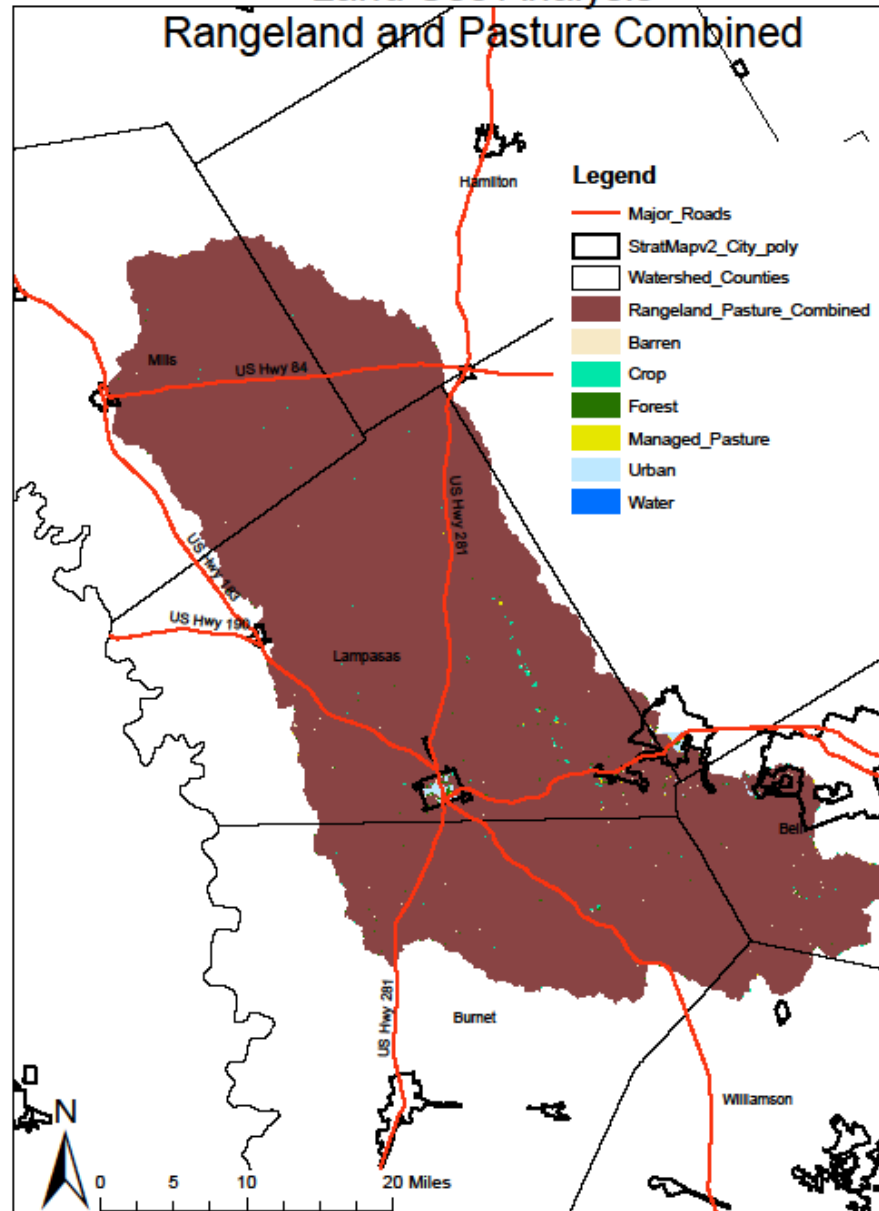
- ▶ Crops: Areas used for the production of annual crops, such as corn, soybeans, vegetables and cotton and also perennial crops such as orchards – also includes all land being actively tilled



Lampasas River Watershed

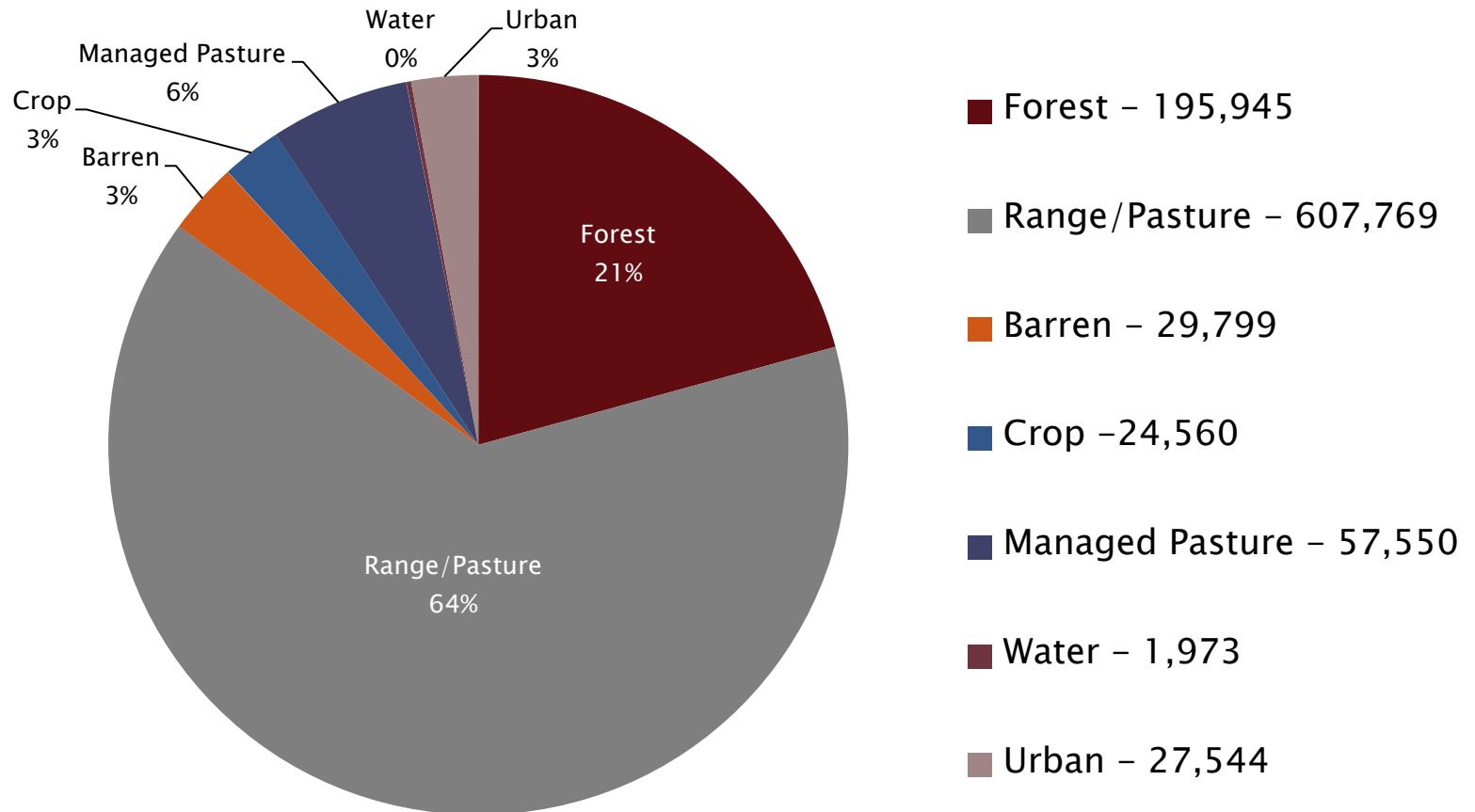
Land Use Analysis

Rangeland and Pasture Combined

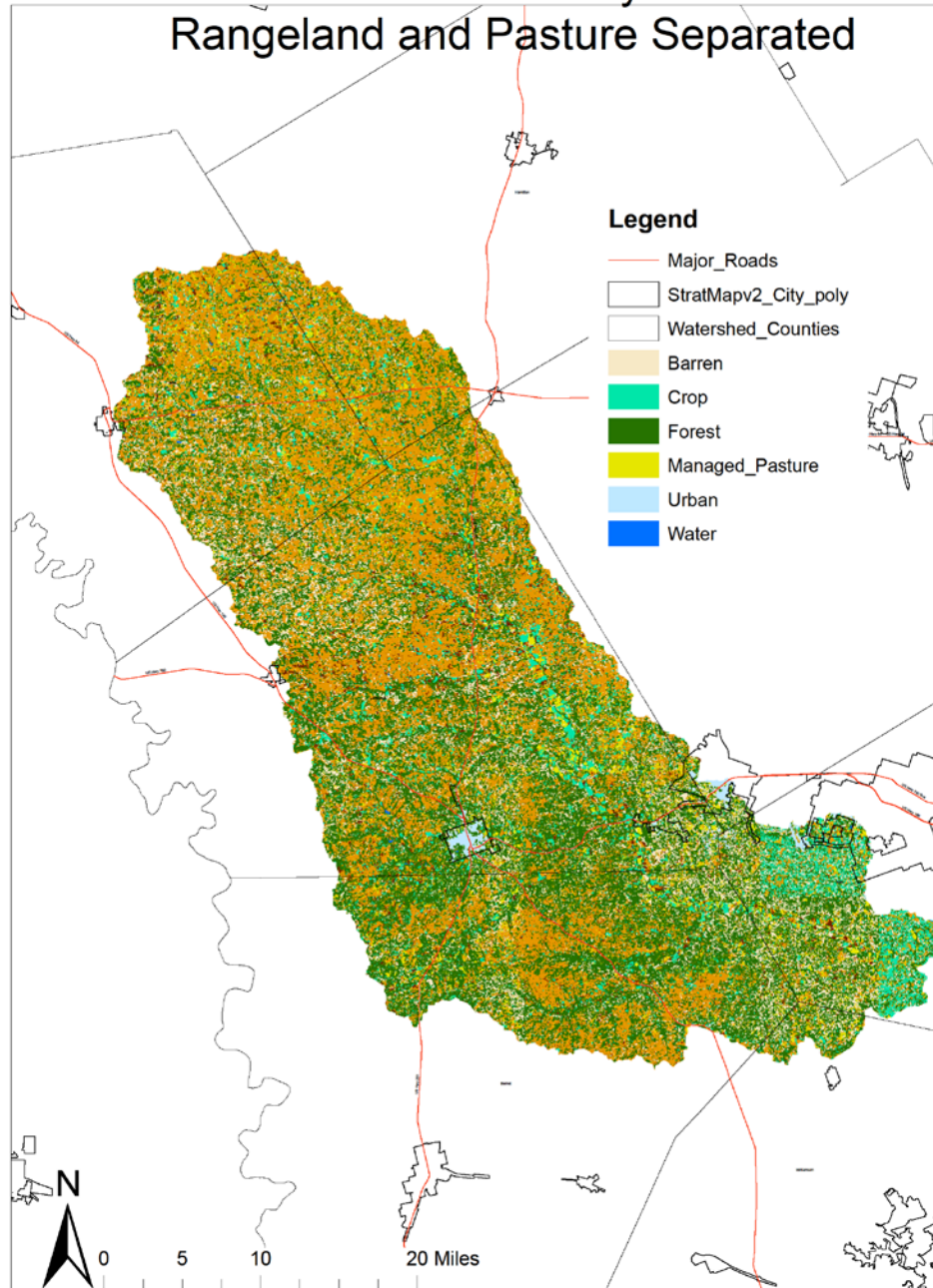


Watershed Land Use/Land Cover

Rangeland and Pasture Combined

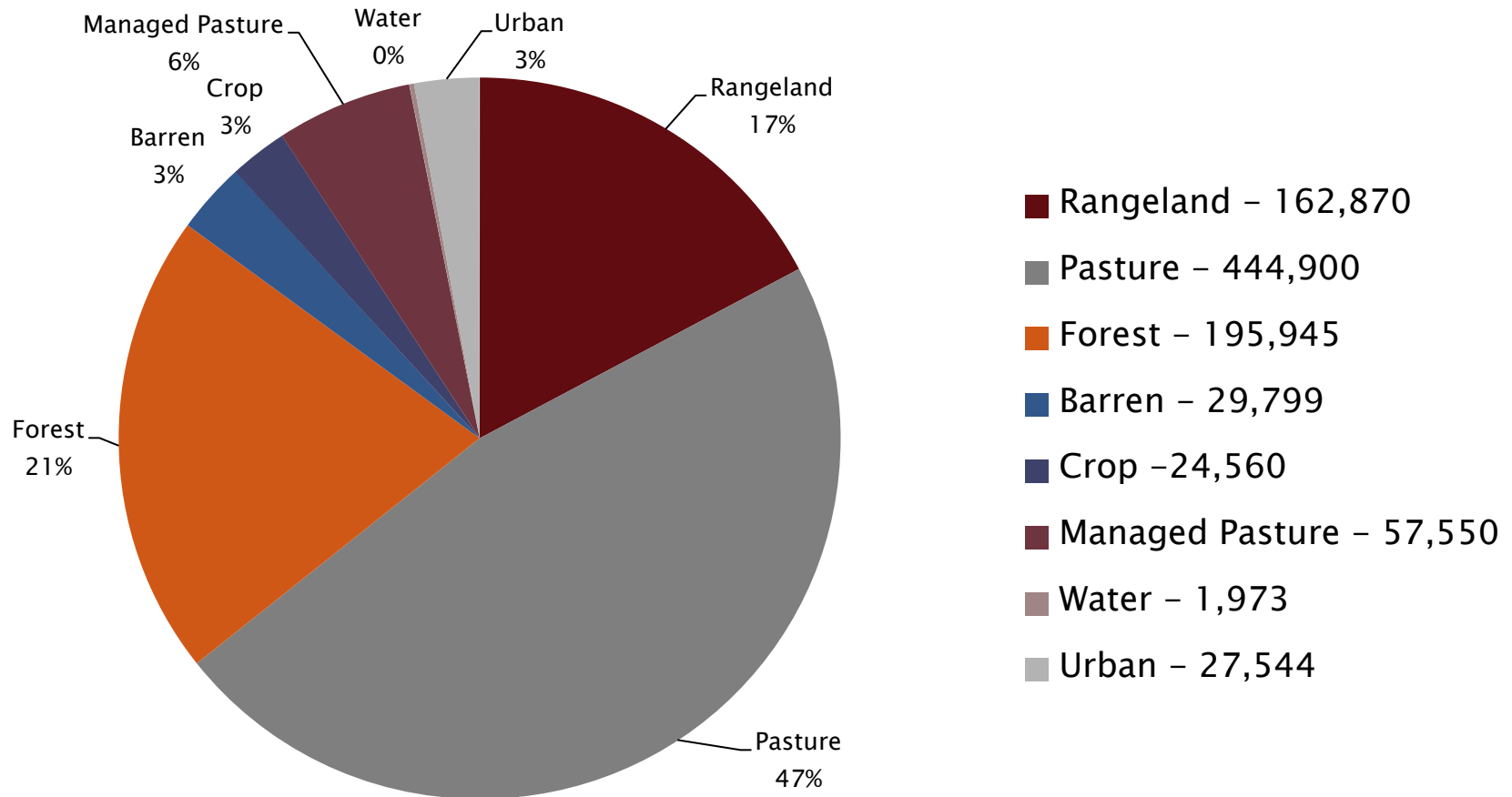


Lampasas River Watershed Land Use Analysis Rangeland and Pasture Separated



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
- ▶ Which method do you prefer?

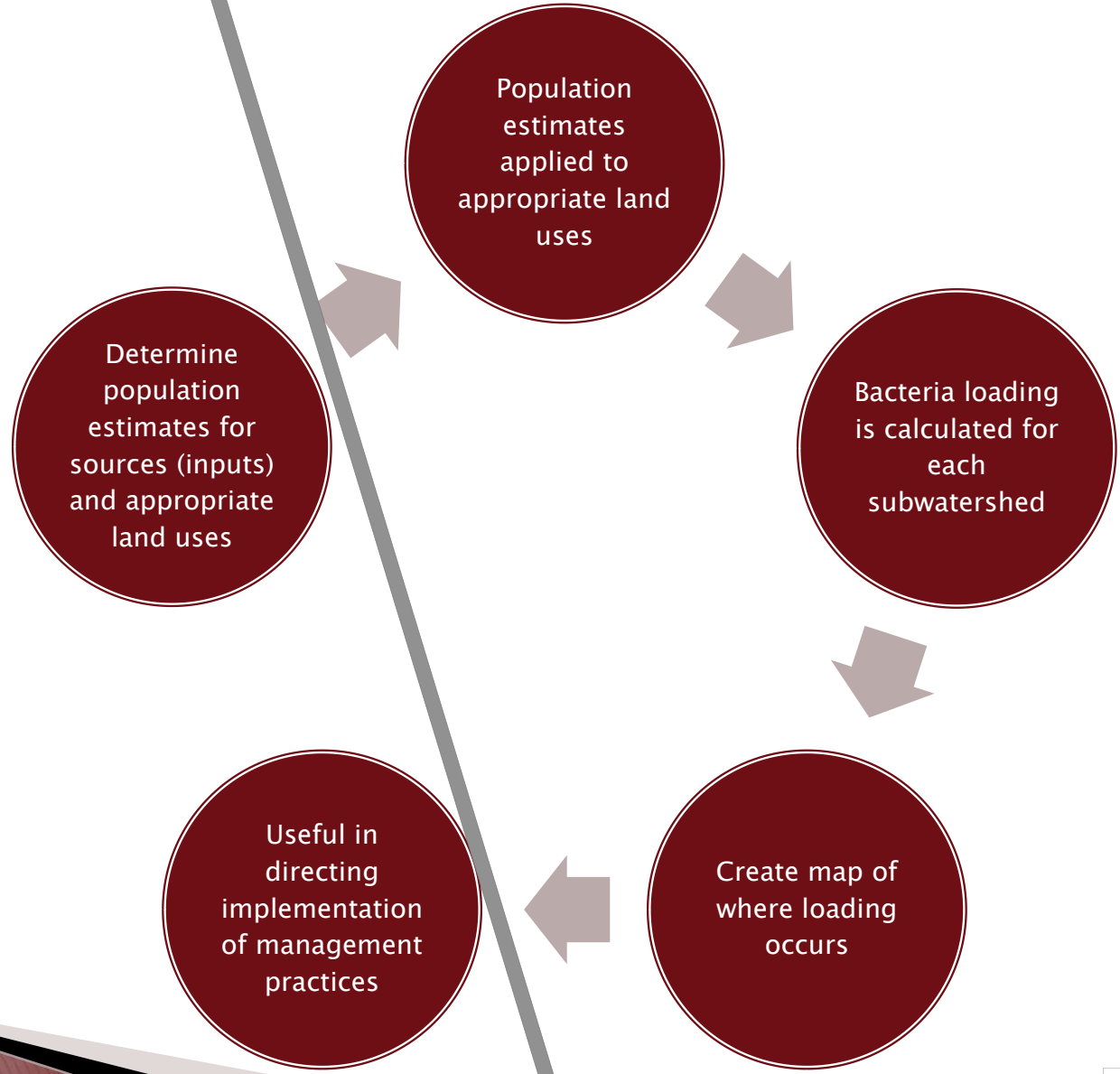
Sources and Distribution of Nonpoint Source Pollutants

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

Sources of Bacteria and/or Nutrients

- ▶ Feral hogs
- ▶ Deer
- ▶ Coyotes
- ▶ Raccoons
- ▶ Skunks
- ▶ Birds
- ▶ Migratory waterfowl
- ▶ Illegal dumping
- ▶ Solid waste disposal by hunters

Sources of Bacteria and/or Nutrients with Data

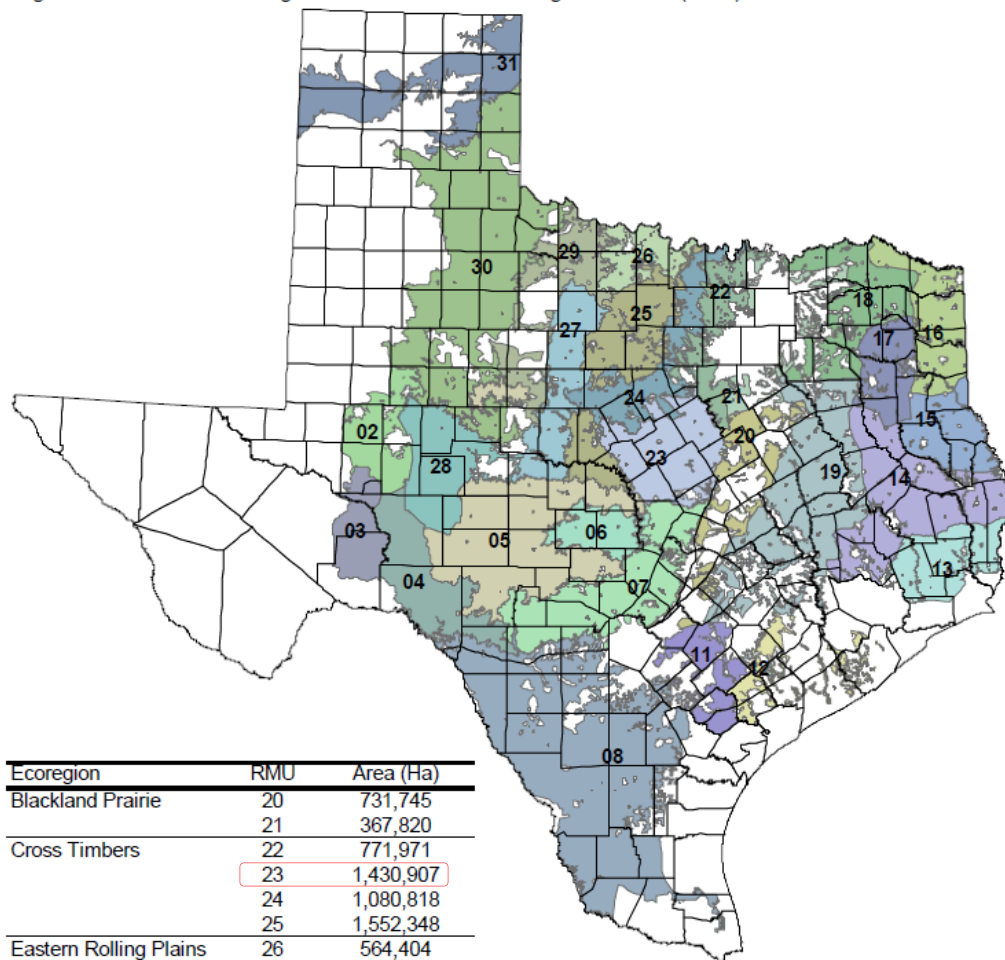
- ▶ Feral hogs
- ▶ Whitetail deer
- ▶ Other pollutant data sources???

Whitetail Deer Population Estimates

- ▶ Two options for estimates:
 - Estimate provided by TPWD deer census (Lockwood 2008)
 - Deer population program is designed to detect population changes within a Resource Management Unit (RMU)
 - Estimates provided by two Wildlife Management Associations (WMA) within watershed
 - Simms Creek WMA
 - Portions of Lampasas and Mills Counties
 - Southwest Hamilton WMA
 - Portions of Lampasas and Hamilton Counties

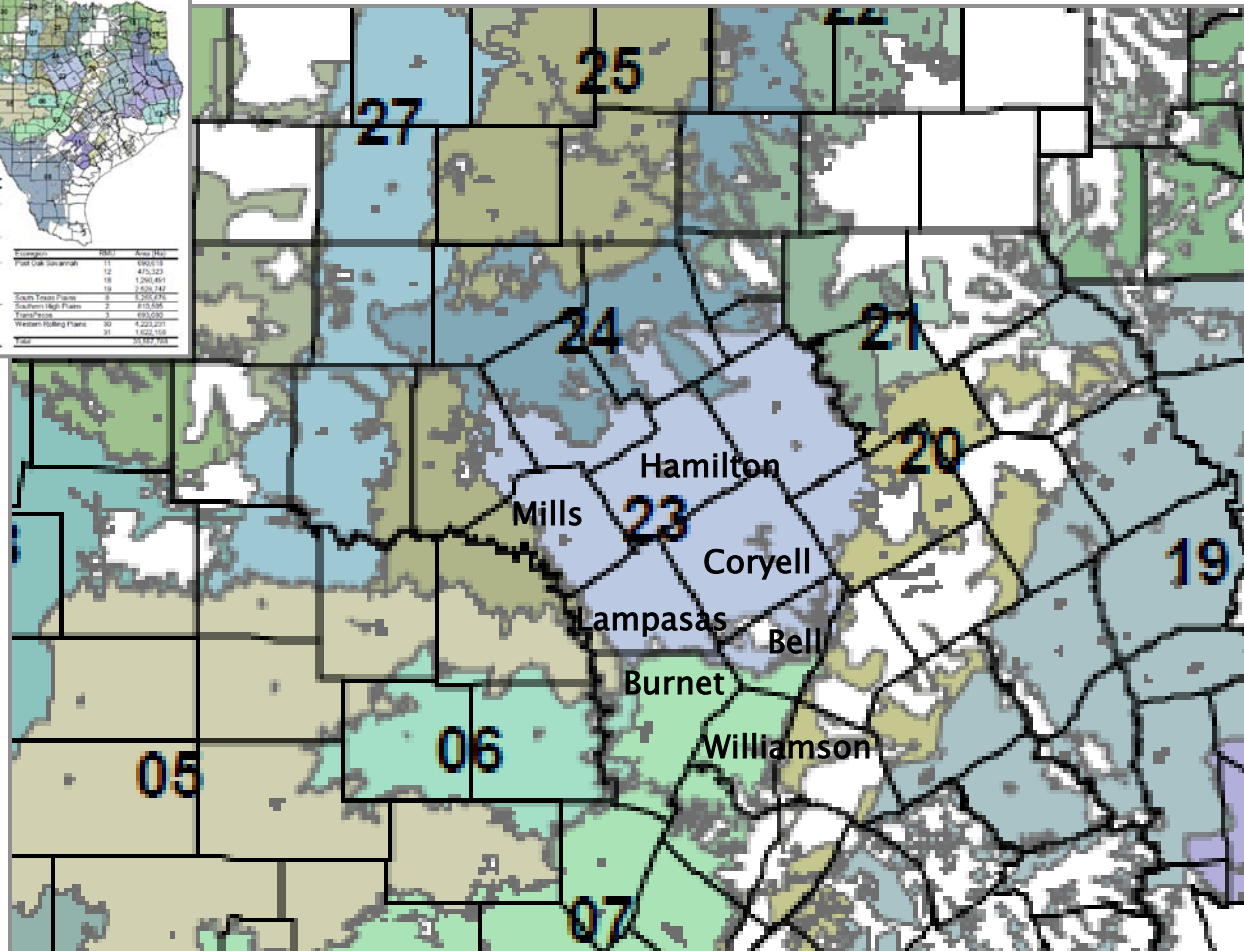
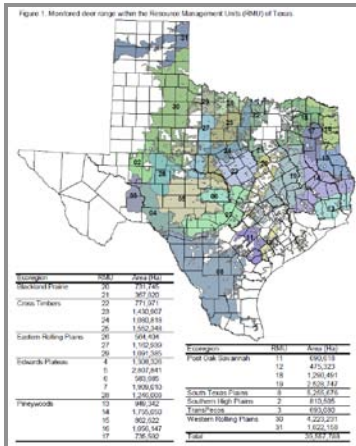
Figure 1. Monitored deer range within the Resource Management Units (RMU) of Texas.

Monitored Deer Range Within the Resource Management Units of Texas (Lockwood, 2008)



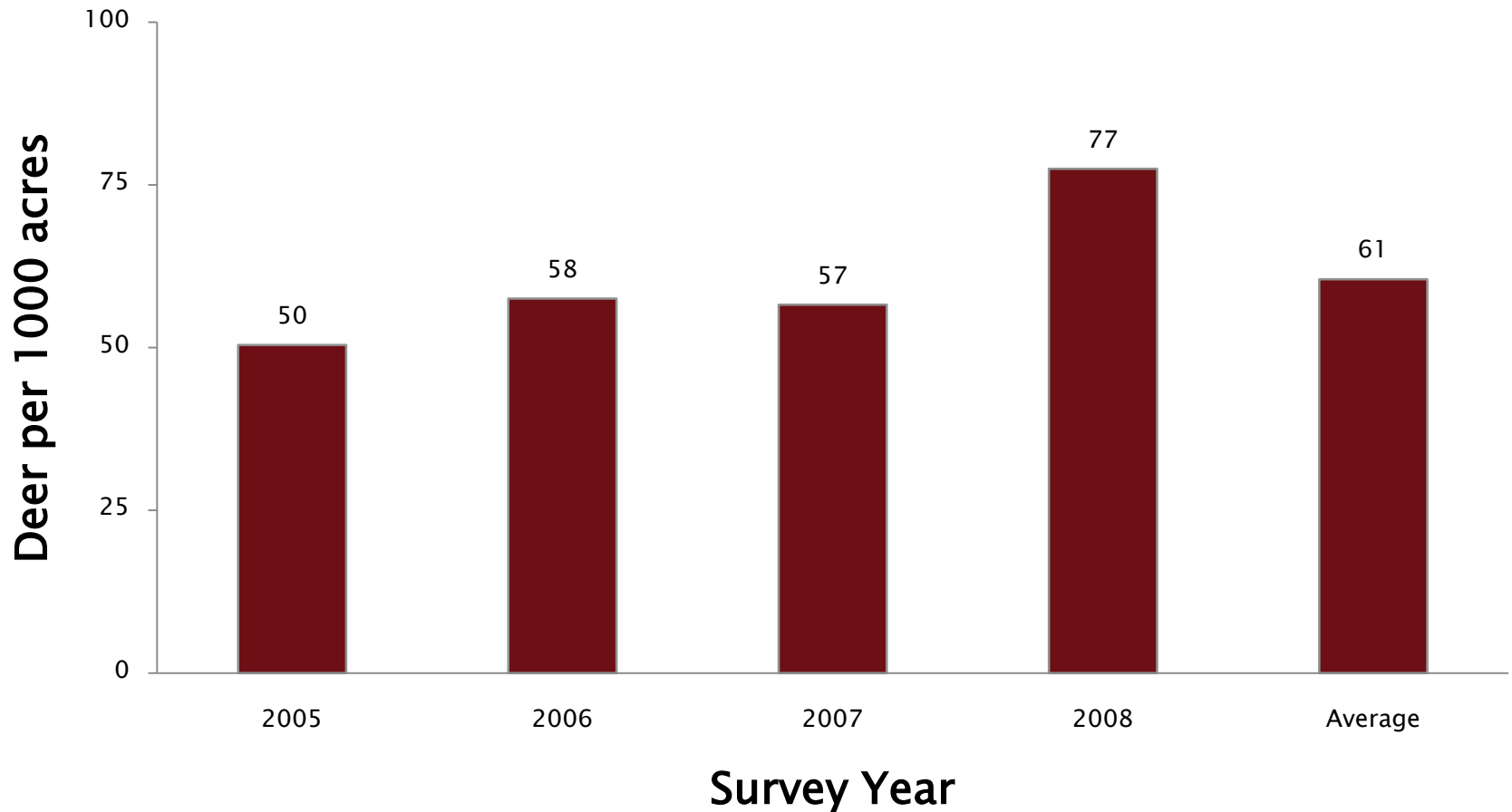
Ecoregion	RMU	Area (Ha)
Blackland Prairie	20	731,745
	21	367,820
Cross Timbers	22	771,971
	23	1,430,907
	24	1,080,818
	25	1,552,348
Eastern Rolling Plains	26	564,404
	27	1,162,939
	29	1,091,385
Edwards Plateau	4	1,308,326
	5	2,807,841
	6	583,685
	7	1,909,010
Pineywoods	28	1,246,008
	13	949,342
	14	1,755,050
	15	862,622
	16	1,056,147
	17	735,592

Ecoregion	RMU	Area (Ha)
Post Oak Savannah	11	690,618
	12	475,323
	18	1,290,491
	19	2,528,747
South Texas Plains	8	5,255,676
Southern High Plains	2	810,505
TransPecos	3	693,080
Western Rolling Plains	30	4,223,231
	31	1,622,158
Total		39,557,788



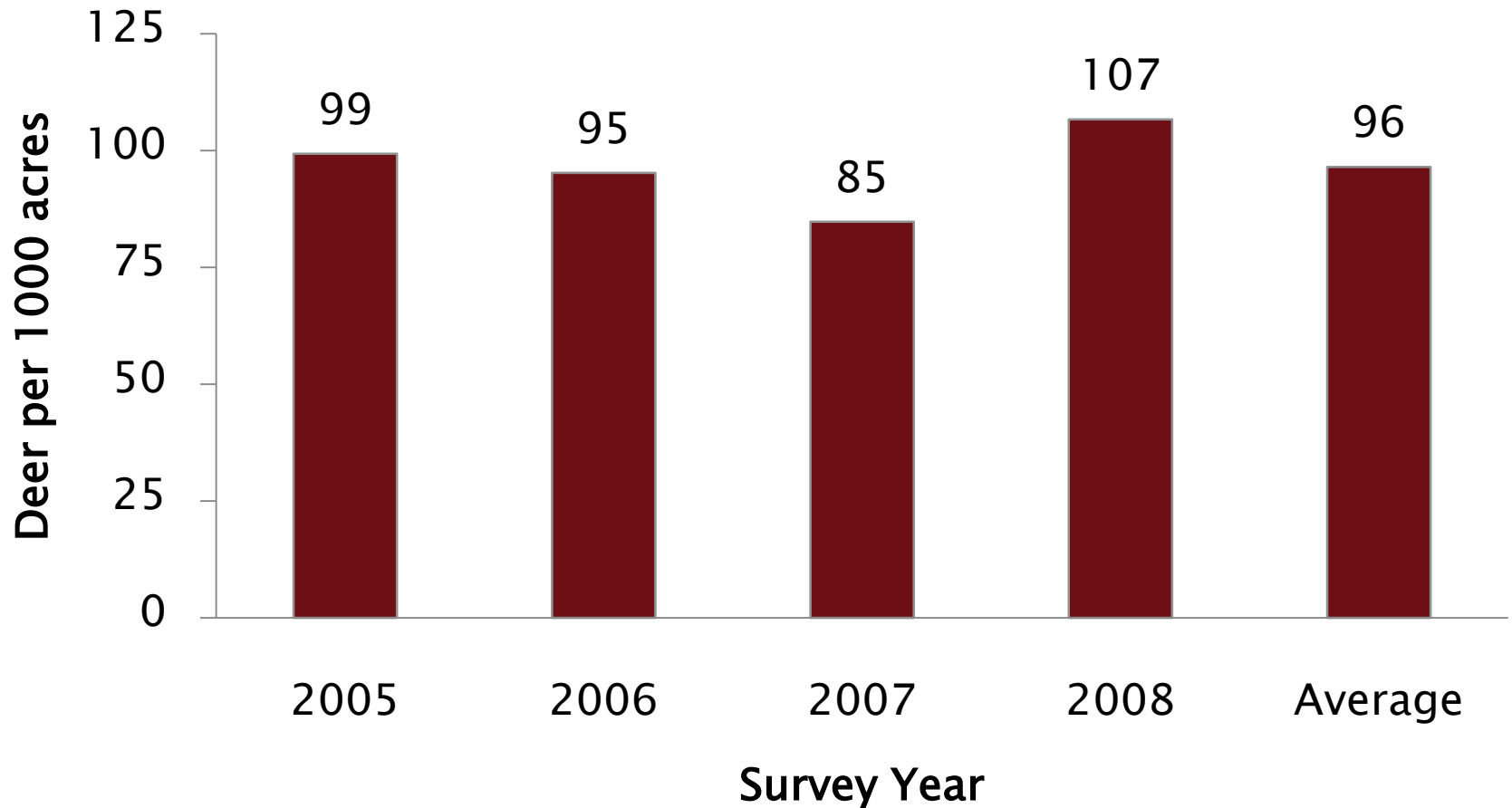
Estimated Whitetail Deer Population

RMU 23 – 3,535,834 acres



Total RMU average deer population is 213,936

Estimated Whitetail Deer Population RMU 7 - 4,717,248 acres



Total RMU average deer population is 455,167

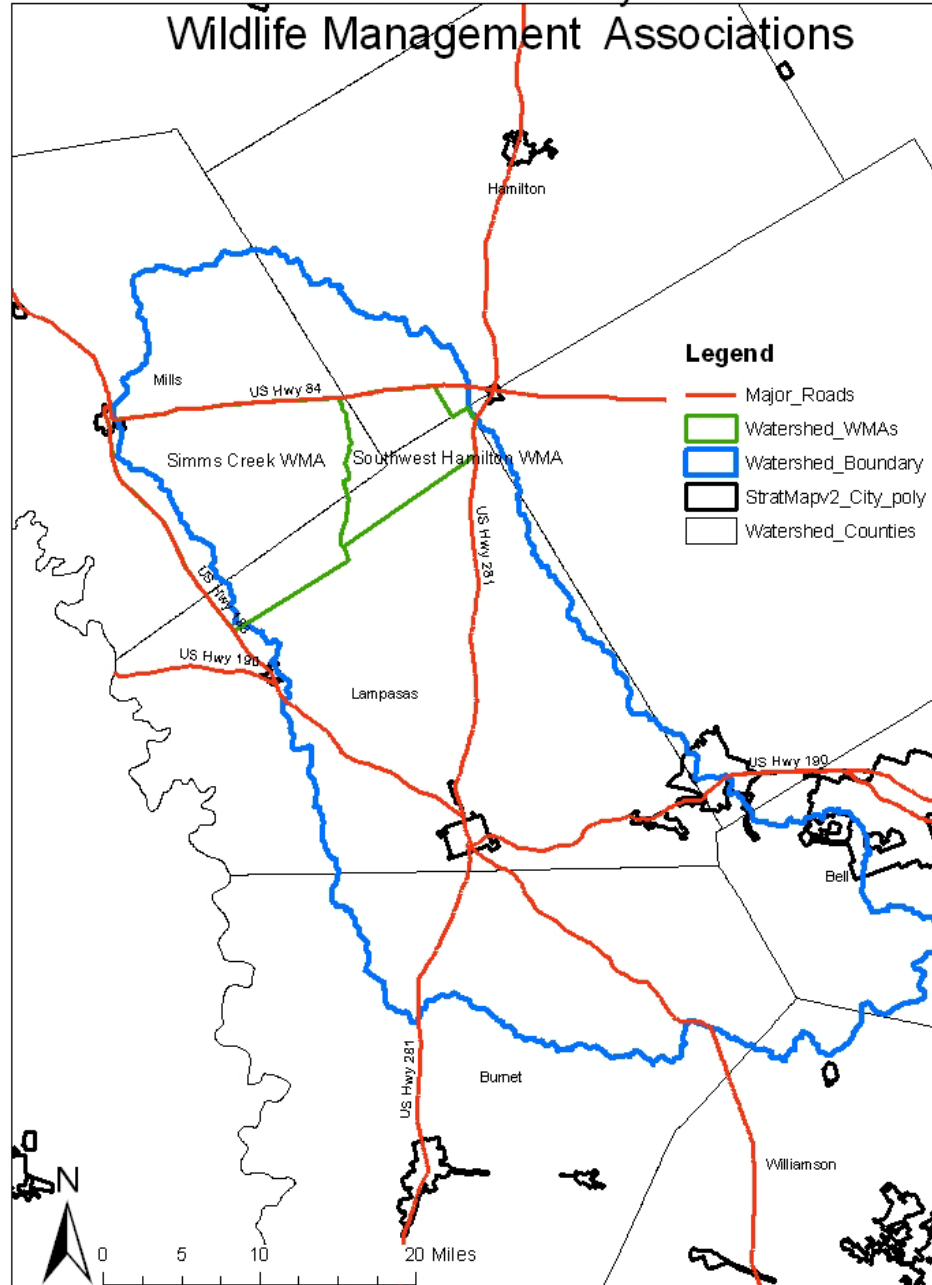
Estimated Whitetail Population

TPWD (Lockwood 2008)

- ▶ Distribute population across appropriate land uses
 - Forest ~ 100% of population
 - $0.061 \text{ deer/acre} * 607,769 \text{ acres} = \underline{11,856 \text{ deer}}$
 - Pasture ~ 50% of population
 - $0.061 \text{ deer/acre} * 0.50 * 444,900 \text{ acres} = \underline{13,459 \text{ deer}}$
 - Rangeland ~ 50% of population
 - $0.061 \text{ deer/acre} * 0.50 * 162,870 \text{ acres} = \underline{4,927 \text{ deer}}$
- ▶ Total acreage = 803,715
- ▶ Watershed Total = 30,242 deer
- ▶ Does this seem reasonable?

Lampasas River Watershed Land Use Analysis

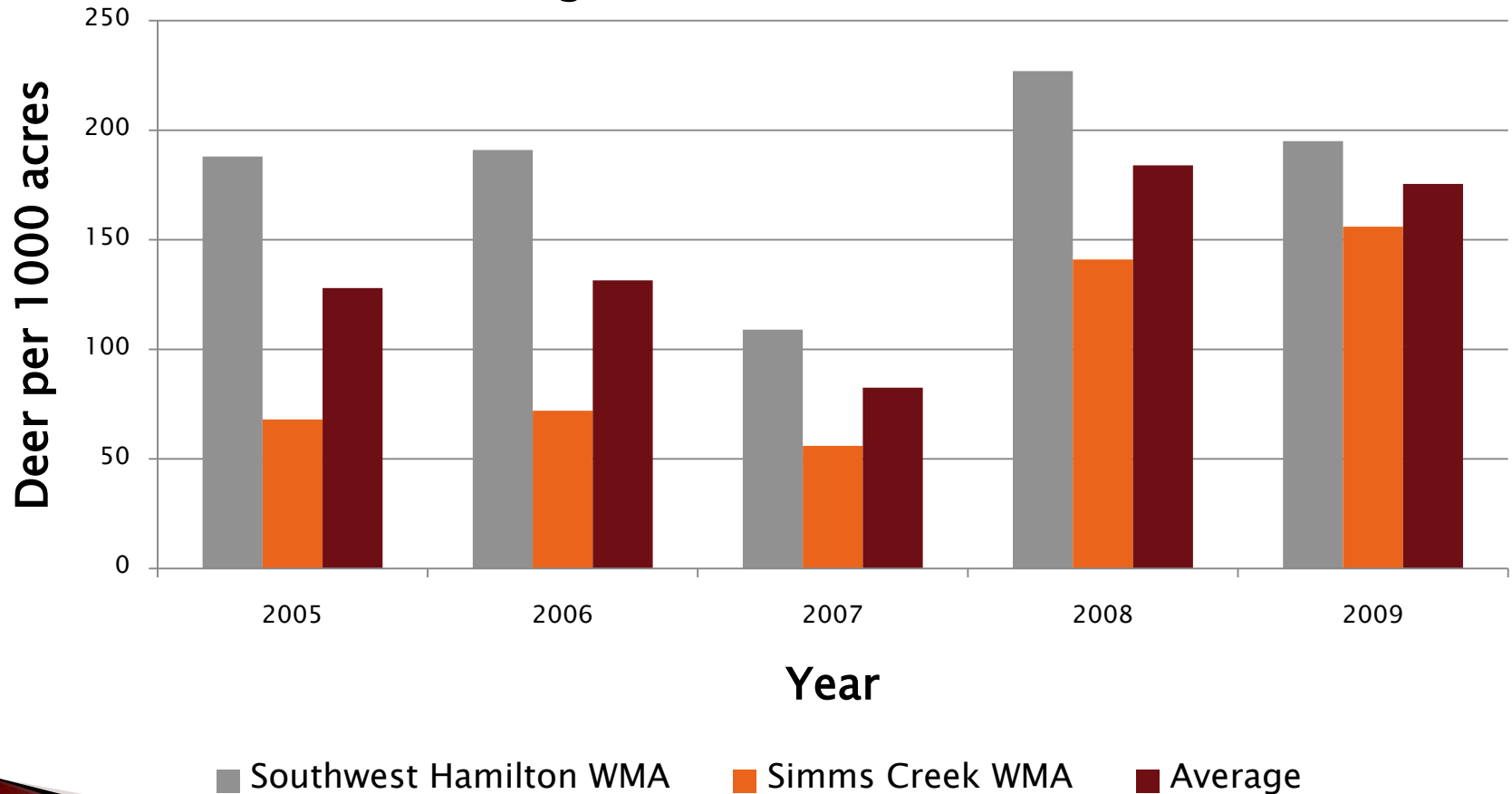
Wildlife Management Associations



Estimated Whitetail Population

WMA Survey Estimates

Overall Average = 143 deer/1000 acres



Estimated Whitetail Population

WMA Estimates

- ▶ Distribute population across appropriate land uses
 - Forest ~ 100% of population
 - $0.14 \text{ deer/acre} * 607,769 \text{ acres} = \underline{27,491 \text{ deer}}$
 - Pasture ~ 50% of population
 - $0.14 \text{ deer/acre} * 0.50 * 444,900 \text{ acres} = \underline{31,210 \text{ deer}}$
 - Rangeland ~ 50% of population
 - $0.14 \text{ deer/acre} * 0.50 * 162,870 \text{ acres} = \underline{11,425 \text{ deer}}$
- ▶ Total acreage = 803,715
- ▶ Watershed Total = 70,126 deer
- ▶ Does this seem reasonable?

Whitetail Deer Population Estimates

- ▶ WMA estimate is more than twice the TPWD census estimates
 - TPWD = 61 deer/1000 acres = 30,242 deer
 - WMAs = 143 deer/1000 acres = 70,126 deer
- ▶ Which estimate seems more appropriate, or maybe something in the middle?

Feral Hog Estimates

- ▶ Feral hogs are an introduced, exotic species
- ▶ Abundance and distribution in Texas have been increasing
- ▶ Texas Wildlife Services estimates 2 million +/- feral hogs in state
- ▶ Actual population data is limited within the state
- ▶ Study by Hellgren, 1997 suggests population ranges from 8–16 hogs/mi²
 - Median = 12 hogs/mi² or 19 hogs/1000 acres

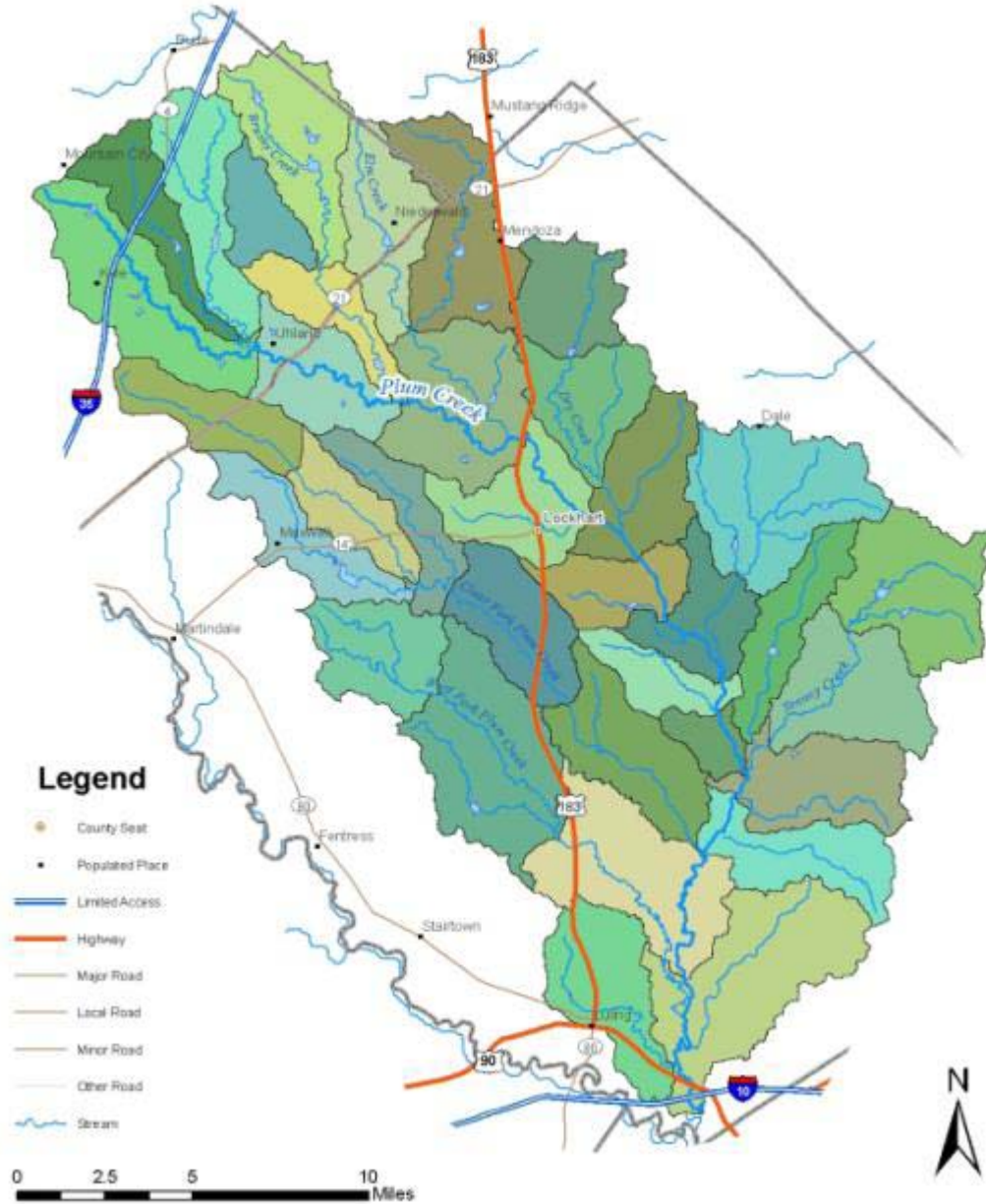
Feral Hog Estimates

- ▶ Distribute across appropriate land uses (all except water and urban)
 - Forest
 - $0.019 \text{ hogs/acre} * 607,769 \text{ acres} = 3,723 \text{ hogs}$
 - Pasture
 - $0.019 \text{ hogs/acre} * 444,900 \text{ acres} = 8,453 \text{ hogs}$
 - Rangeland
 - $0.019 \text{ hogs/acre} * 162,870 \text{ acres} = 3,095 \text{ hogs}$
 - Barren
 - $0.019 \text{ hogs/acre} * 29,799 \text{ acres} = 566 \text{ hogs}$
 - Crop
 - $0.019 \text{ hogs/acre} * 24,560 \text{ acres} = 467 \text{ hogs}$
 - Managed Pasture
 - $0.019 \text{ hogs/acre} * 57,550 \text{ acres} = 1,093 \text{ hogs}$
- ▶ Total Acreage = 915,624
- ▶ **Watershed Total = 15,271 hogs**
- ▶ Does this seem reasonable?

Next Steps



Plum Creek Watershed



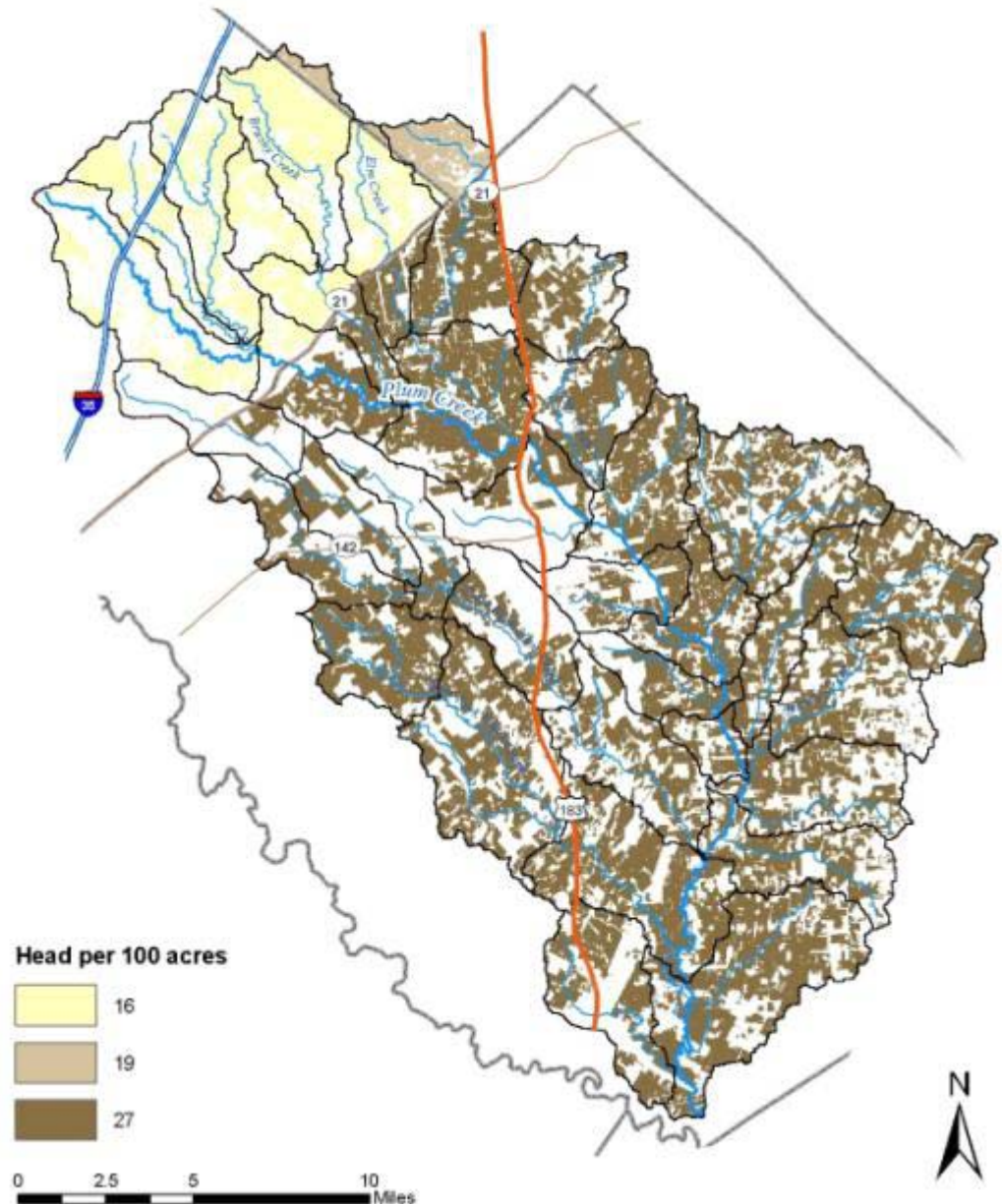
Plum Creek Texas Ag Statistics

Cattle Numbers:

- Caldwell – 44,000
- Hays – 24,000
- Watershed – 30,866
- Livestock can be uniformly distributed to the supporting land areas
- The numbers then can be summed for each sub-watershed

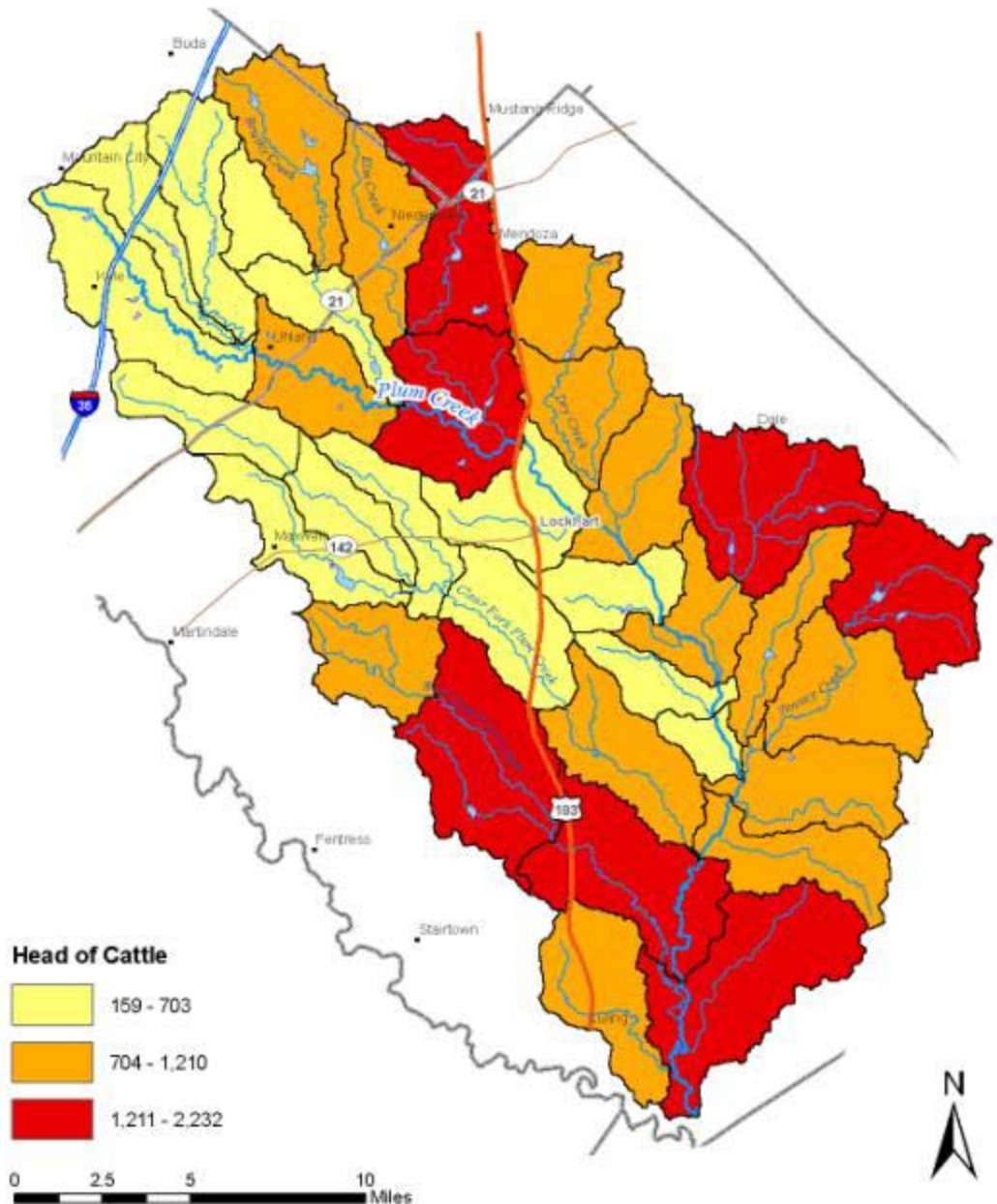
Cattle Distribution

Distribute
cattle to
appropriate
land use



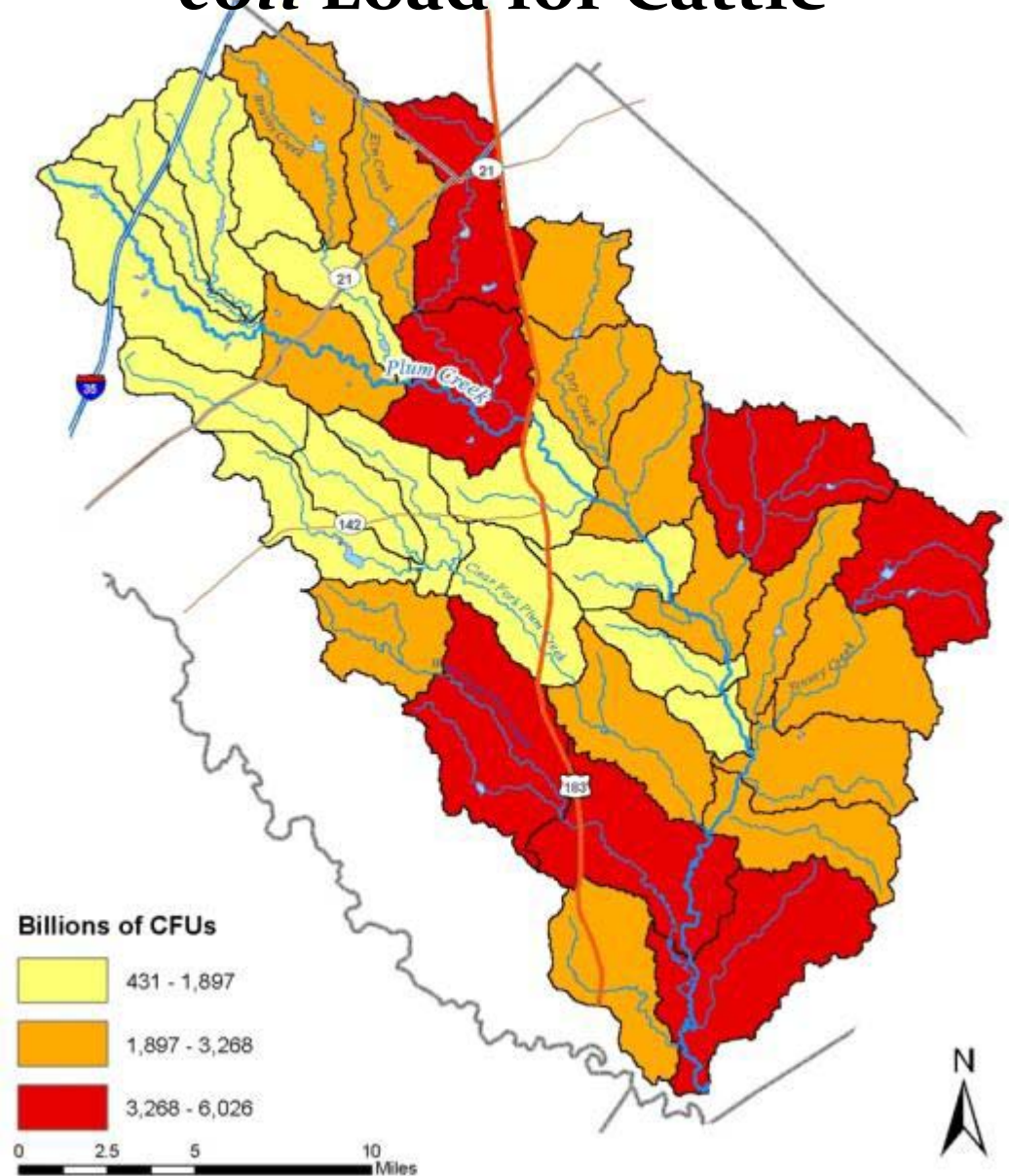
Cattle Density

Density is determined by adding the cattle populations within each subwatershed



Average Daily Potential *E. coli* Load for Cattle

Loading is determined by density in each subwatershed



May

- ▶ Does this date, time and location work for the group?
- ▶ If so, next meeting is Monday, May 10, 2010
- ▶ Lampasas County Farm Bureau 6 – 9 p.m.
- ▶ Rainwater harvesting clinic:
 - Harker Heights Activity Center, Harker Heights
 - April 21–22
 - \$150 pre-reg
 - \$175 onsite reg
- ▶ New phone number:
 - (254) 774–6008

Other Work Groups

- ▶ **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.