Petronila & San Fernando Creeks WPP:
Ag/Habitat Workgroup

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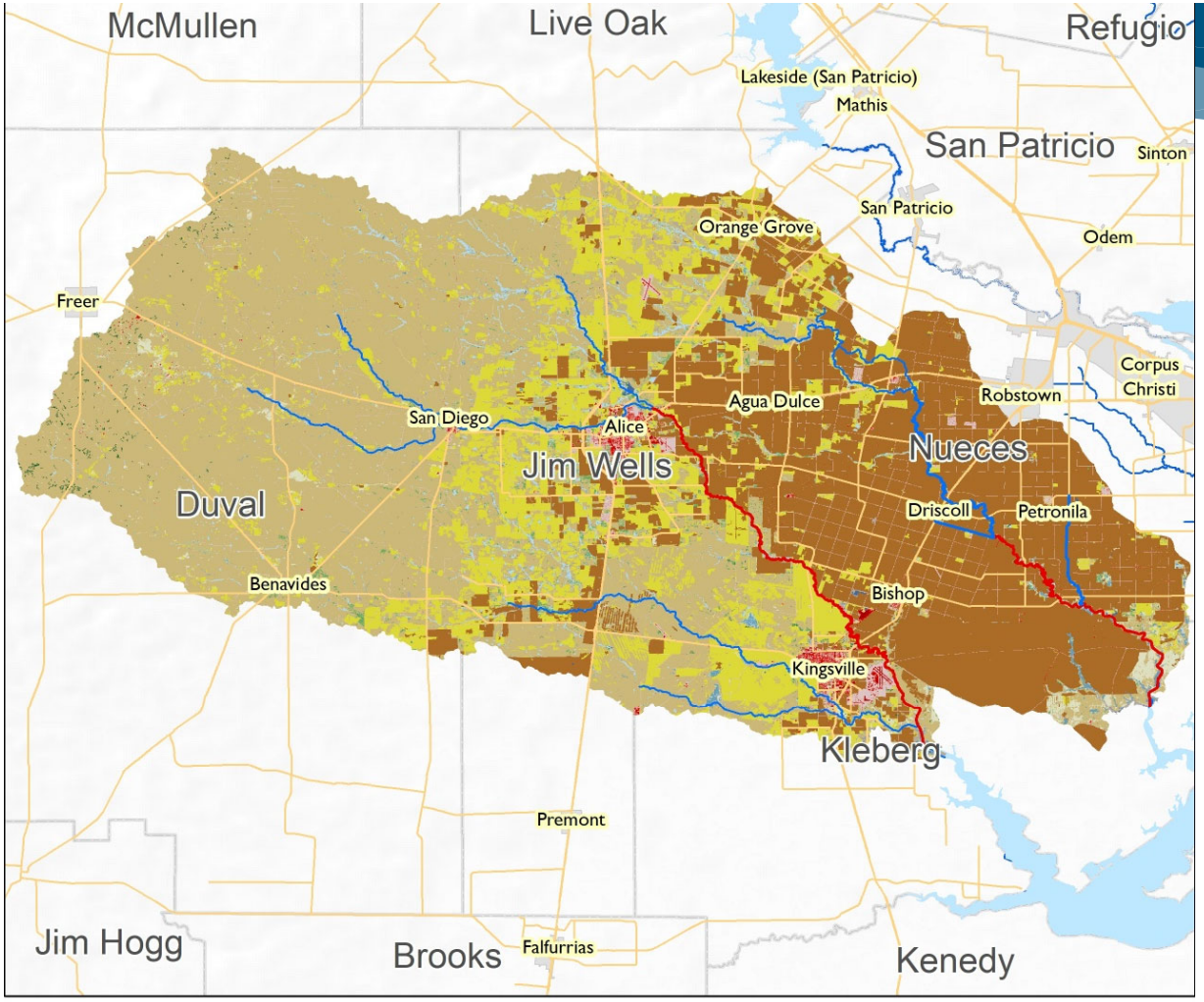
Meeting Outline

- Review and discuss Livestock/Wildlife populations estimates in the watershed
- Present SELECT model outputs
  - Aids in prioritizing areas for management recommendations
- Discussion on potential management measures

Land Use and Land Cover



Land Cover / Land Use

- Open Water
- Developed, Open Space
- Developed, Low Intensity
- Developed, Medium Intensity
- Developed, High Intensity
- Barren Land (Rock/Sand/Clay)
- Deciduous Forest
- Evergreen Forest
- Mixed Forest
- Shrub/Scrub
- Grassland/Herbacious
- Pasture/Hay
- Cultivated Crops
- Woody Wetlands
- Emergent Herbacious Wetlands

Petronila & San Fernando Creek

Sources:
Land Use - NLCD
Stream Segments - TCEQ
Counties, Cities, Roads - TNRIS

0 3.75 7.5 15 22.5 30 Miles

N

- Hay/Pasture: 15.6%
- Shrub/Scrub: 45.1%
- Developed Land: 4.1%
- Cropland: 29.7%
- Forest: 1.4%
- Herbaceous: 1.2%
- Wetlands: 2.4%
- Barren Land: 0.3 %
- Open Water 0.1%

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SELECT Model

- Estimates potential bacteria loading based on populations, land cover and soils
- Uses acres/animal for livestock and wildlife assessment
  - Livestock – 2017 NASS
  - Deer – TPWD density surveys (used average of most recent 5 yrs.)
    - Duval and most of Jim Wells Co – 61.7 ac/deer
    - Kleberg, Nueces and part of Jim Wells Co – 26.1 ac/deer
    - Adjusted for cropland occurrence: 10% of TPWD estimates
  - Feral Hogs – NRI high density – 39.4 ac/hog
- Manual adjustments made in SELECT to ensure that modeled animal numbers were close to those discussed in Work Group meeting

Cattle

- 2017 NASS Data
  - Duval – 5,297
  - Jim Wells – 22,022
  - Kleberg – 6,257
  - Nueces – 4,659
- Total – 38,235

- Adjusted Head Used in SELECT
  - Petronila – 8,670
  - San Fernando – 29,544
- Total – 38,214

  - Created a % Land Cover Based Stocking Rate based on FSA County Recommendations for each Sub-Watershed
  - Verified that modeled # of head matched closely to 2017 NASS Data

Other Livestock

- 2017 NASS Data
- Adjusted SELECT Density Estimate

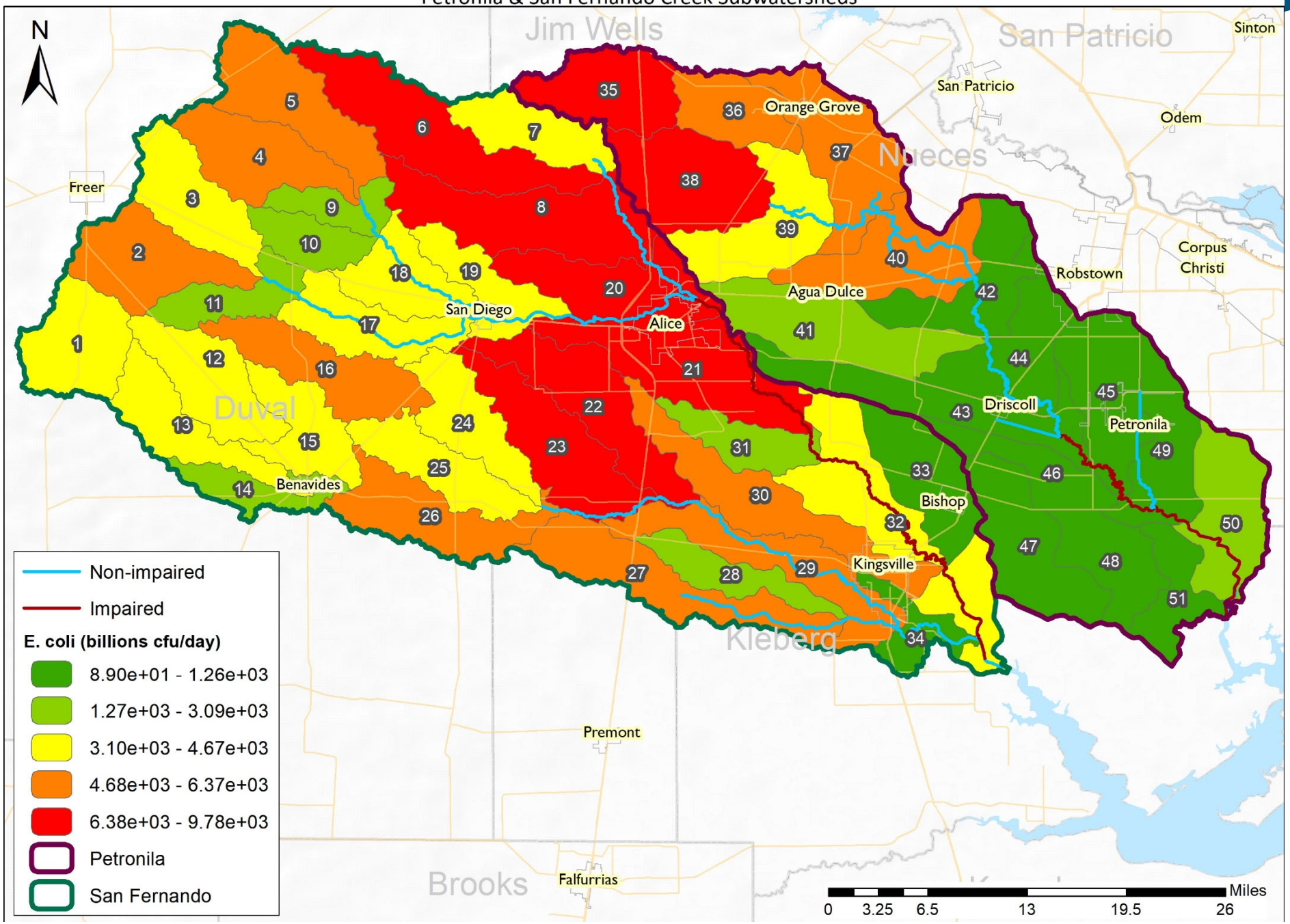
County	Horse	Goat	Sheep
Duval	94	222	149
Jim Wells	695	1,660	340
Kleberg	145	290	104
Nueces	361	270	170
Total	1,201	2,442	763
Petronila	437	733	231
San Fernando	711	1,734	526
Total	1,148	2,467	757

SELECT Modeling Approach

- Cattle: Density estimate applied to hay/pasture, grassland, shrub/scrub
- Horses and Sheep: Density estimates applied to hay/pasture and grassland only
- Goats: Density estimate applied to grassland and shrub/scrub
- Combine results into a Potential Livestock Load Estimate

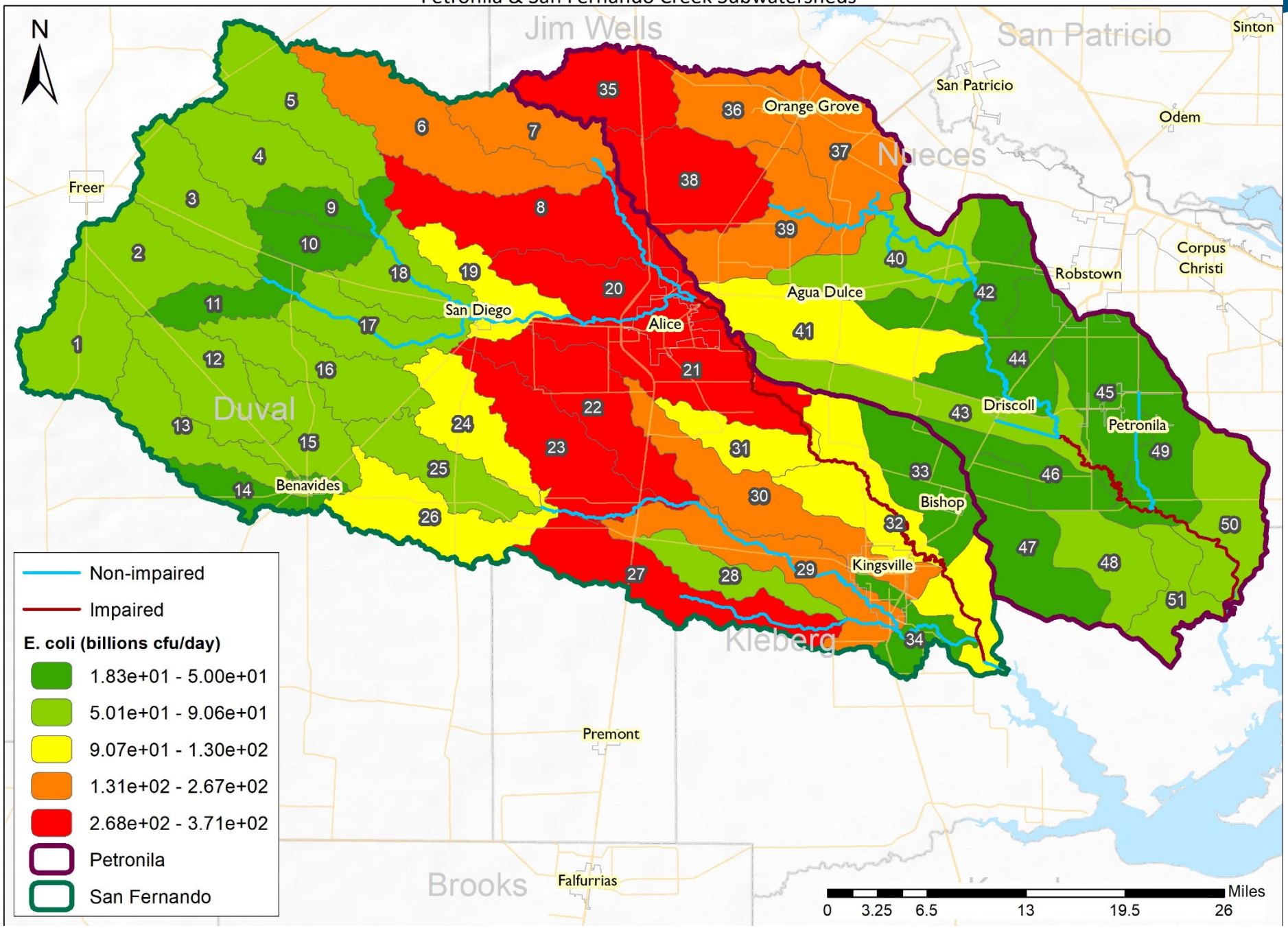
Potential E. coli Loading from Cattle

Petronila & San Fernando Creek Subwatersheds



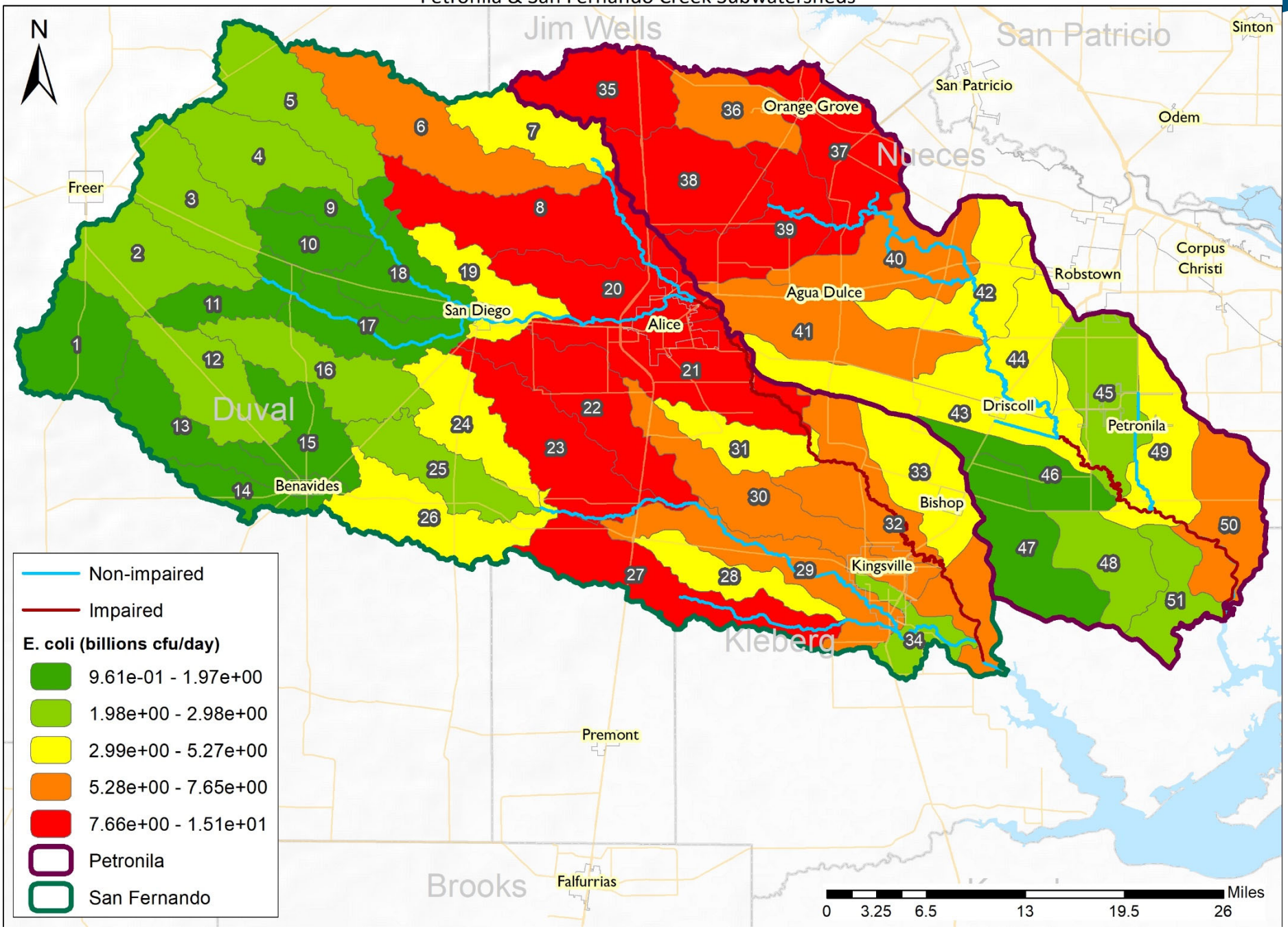
Potential E. coli Loading from Goats

Petronila & San Fernando Creek Subwatersheds



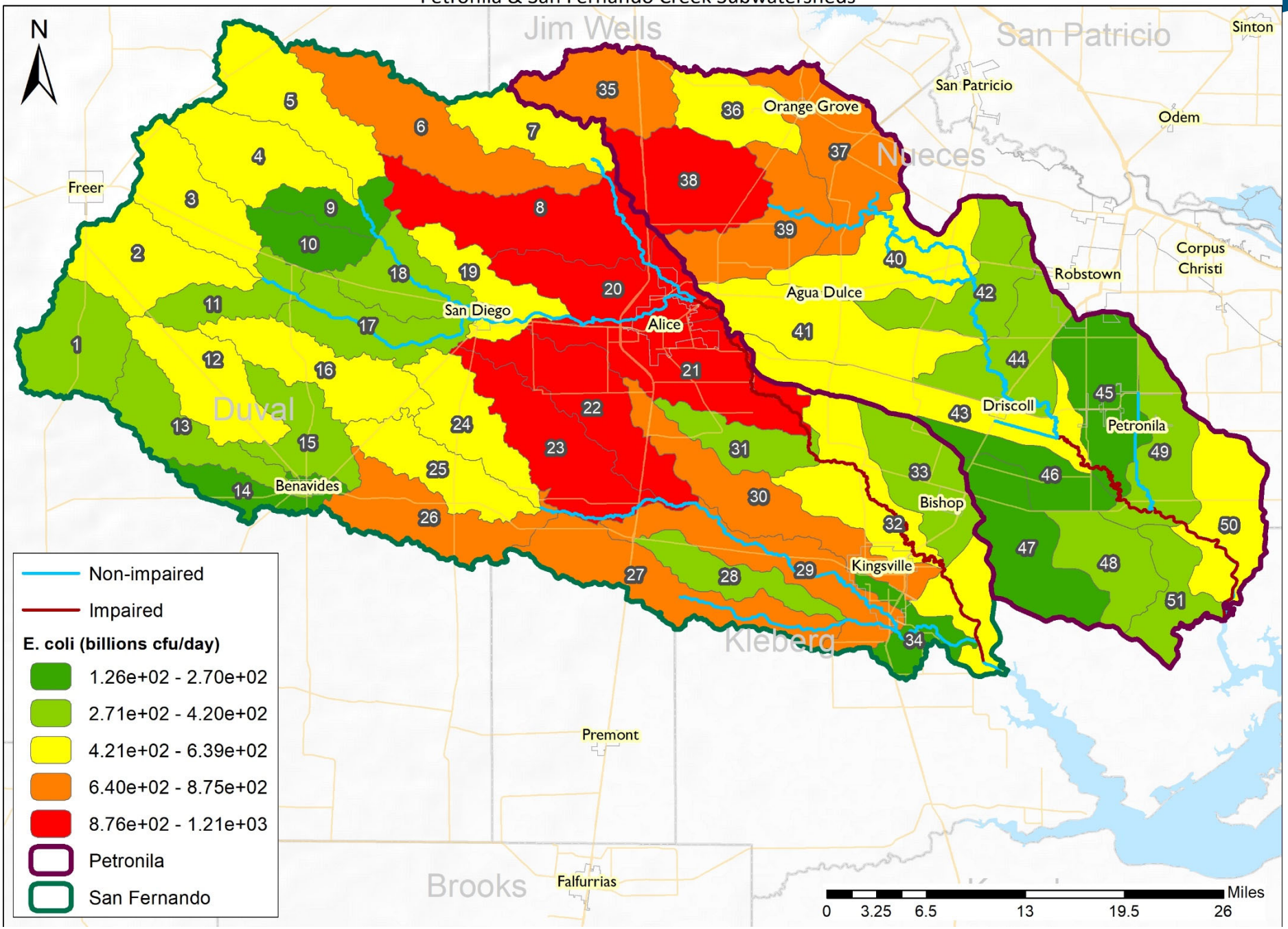
Potential E. coli Loading from Horses

Petronila & San Fernando Creek Subwatersheds



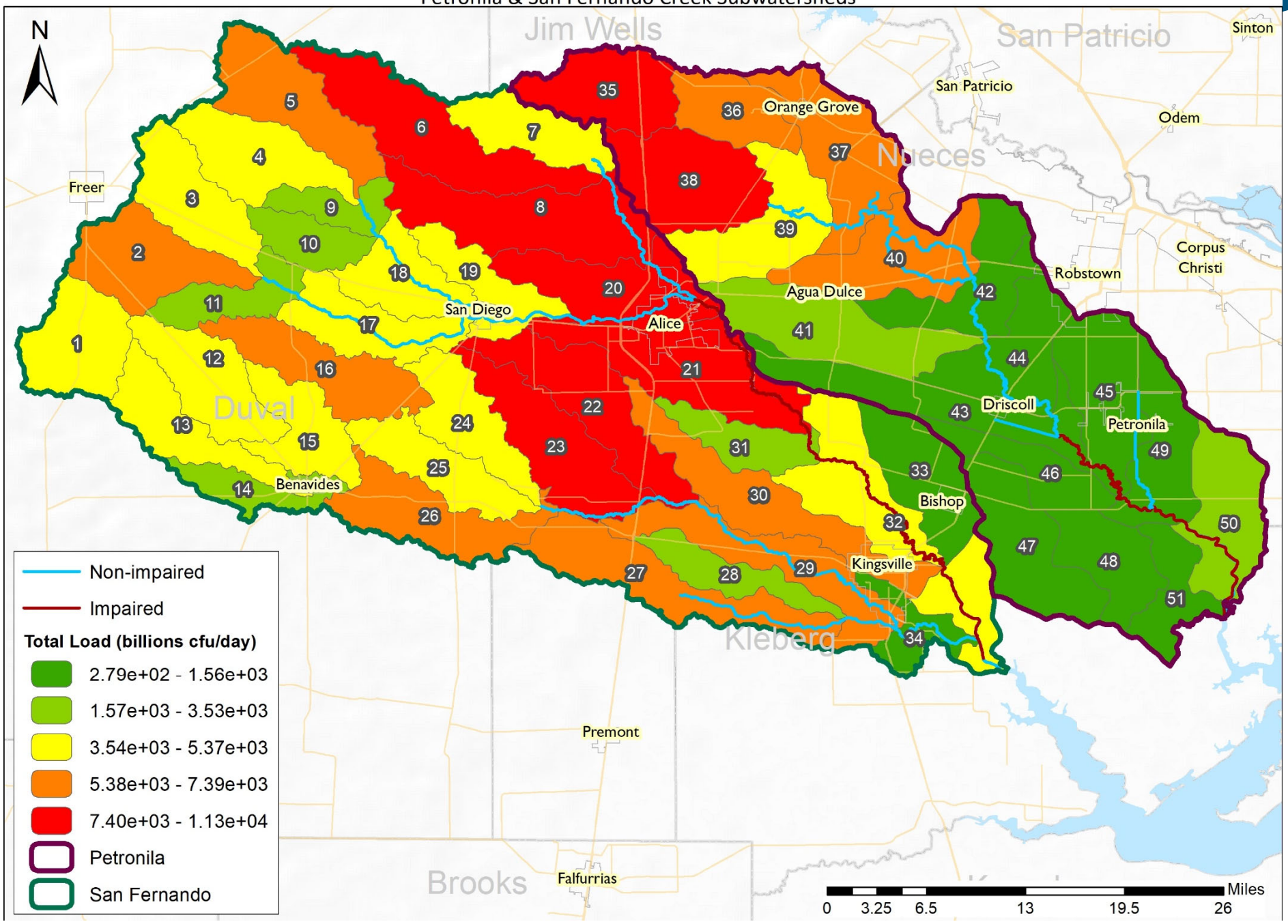
Potential E. coli Loading from Sheep

Petronila & San Fernando Creek Subwatersheds



Total Potential Livestock E. coli Load

Petronila & San Fernando Creek Subwatersheds



Deer

- Deer – RMU density estimates survey density; used average of most recent 5 years
  - 61.7 ac/deer for Duval and most of Jim Wells Co.
  - 26.1 ac/deer for Kleberg, Nueces and part of Jim Wells Co.
  - Applied to all land covers but barren, developed, open water
  - Applied 10% deer density to cropland to reflect decreased use in crop dominated areas with little cover

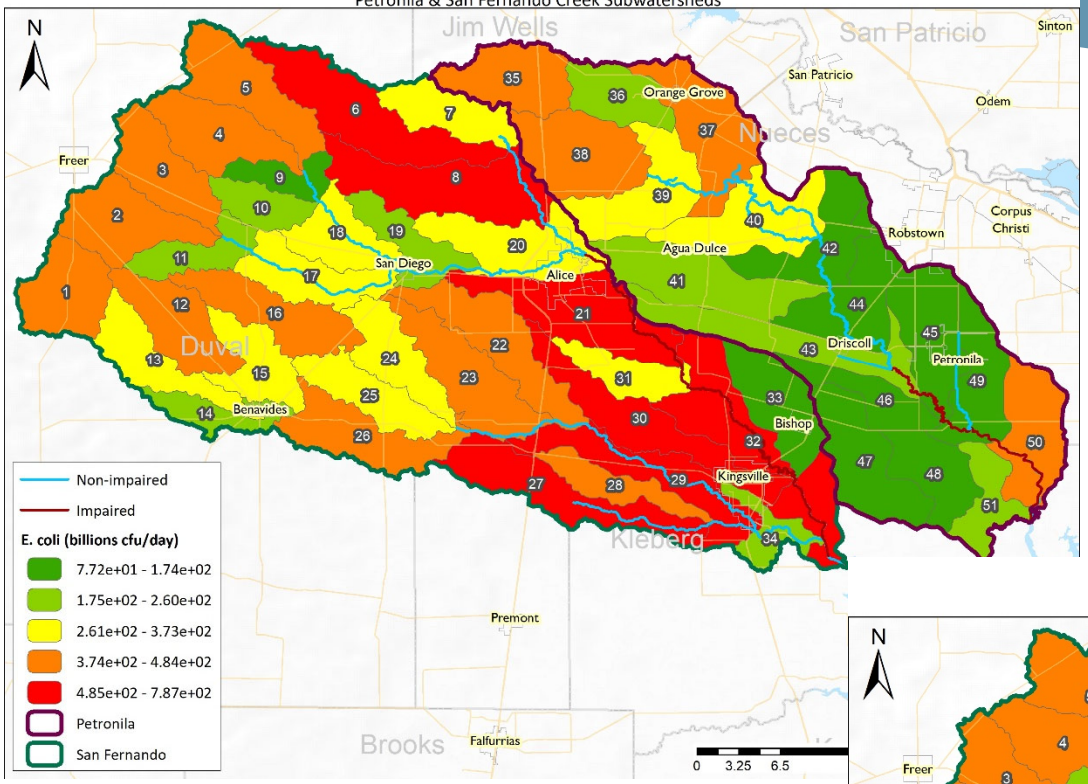
Feral Hogs

- Feral Hogs – Texas A&M Natural Resources Institute Method
  - 39.4 ac/hog applied to all land cover but barren, developed, open water
  - Applied 10% density for cropland

County	Wildlife in Watershed	
	Feral Hogs	Deer
Petronila	3,933	4,071
San Fernando	17,826	13,522
Total	**23,759**	**17,593**

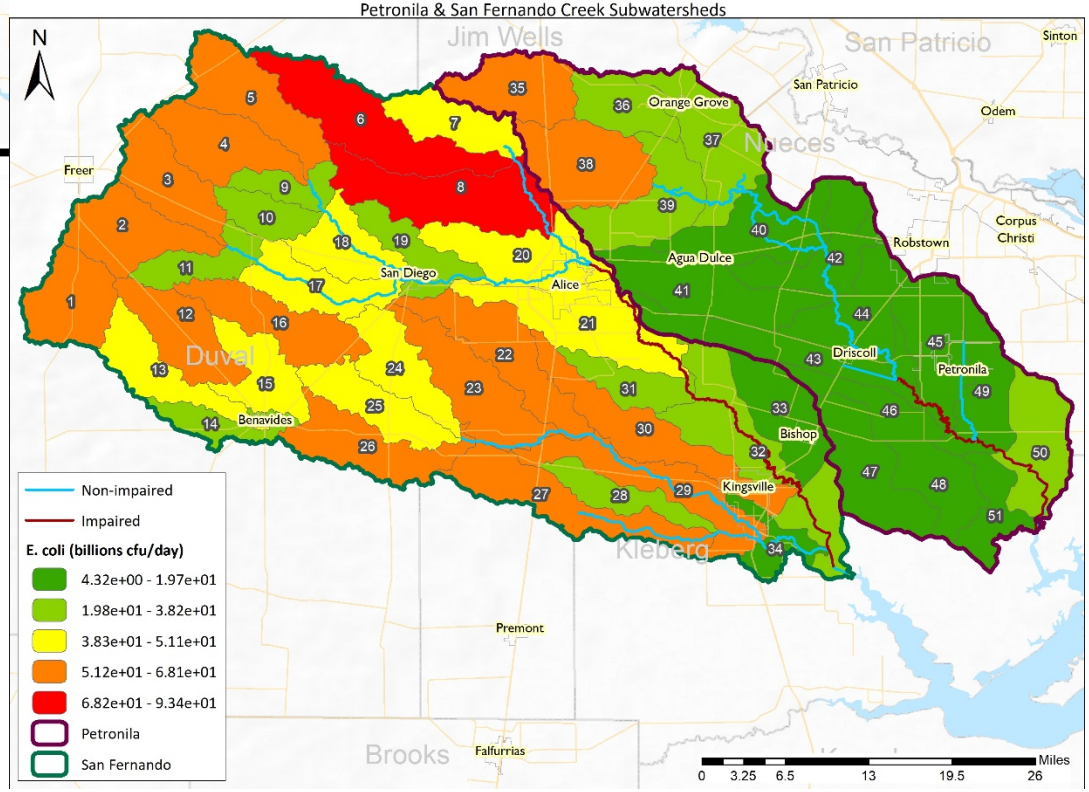
Potential E. coli Loading from Deer

Petronila & San Fernando Creek Subwatersheds



Potential E. coli Loading from Feral Hogs

Petronila & San Fernando Creek Subwatersheds



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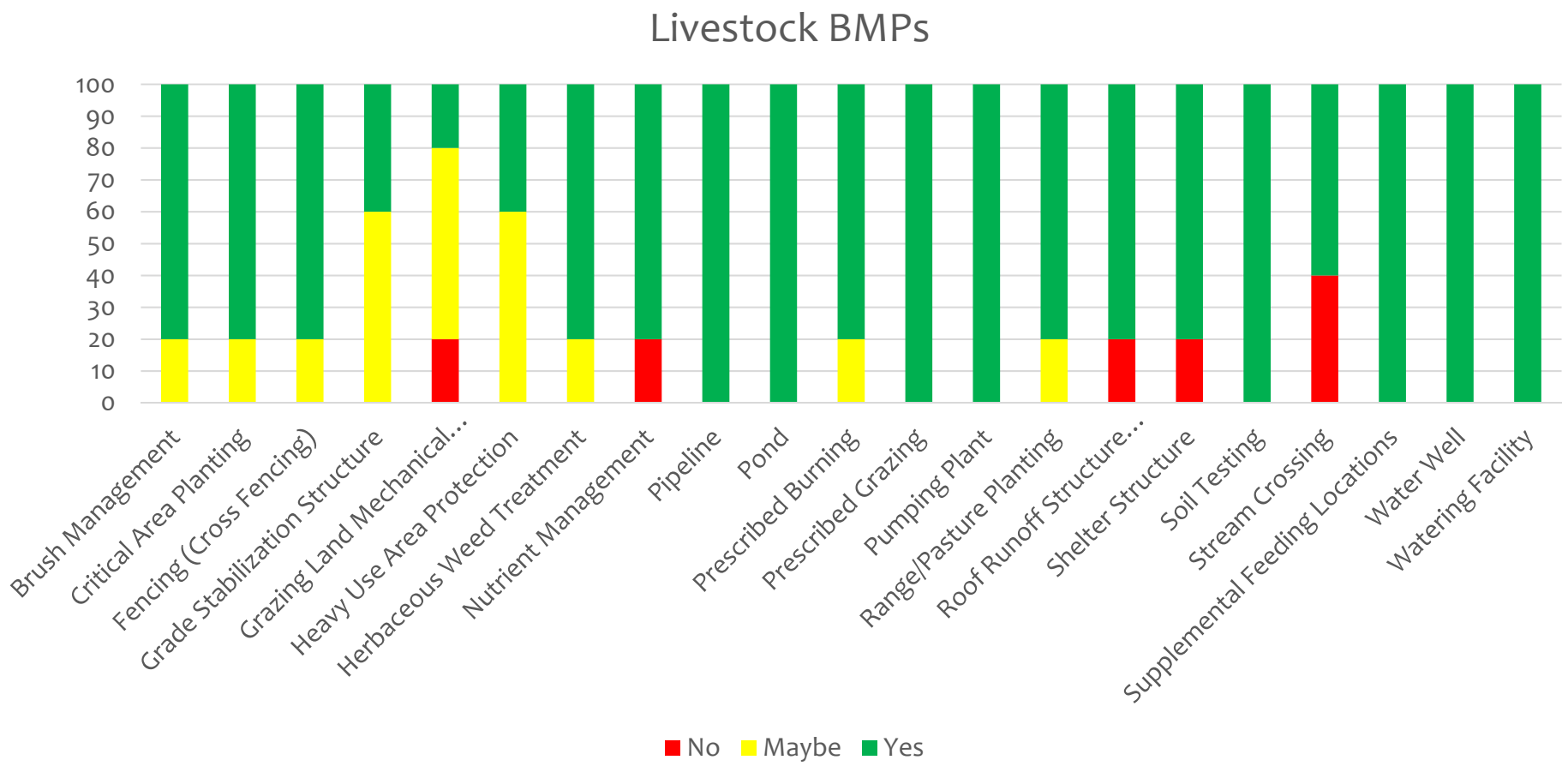
BMP Survey Results



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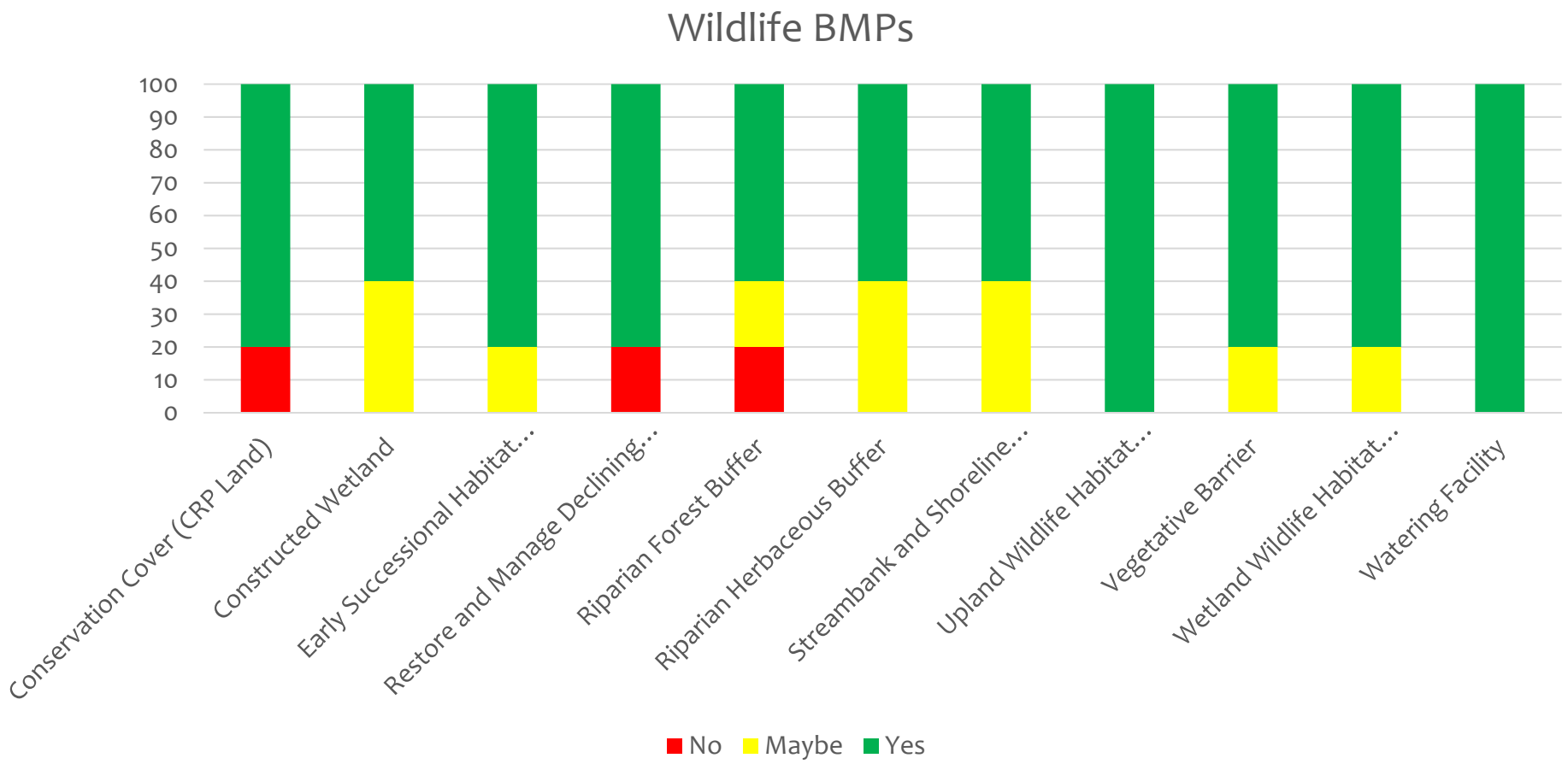

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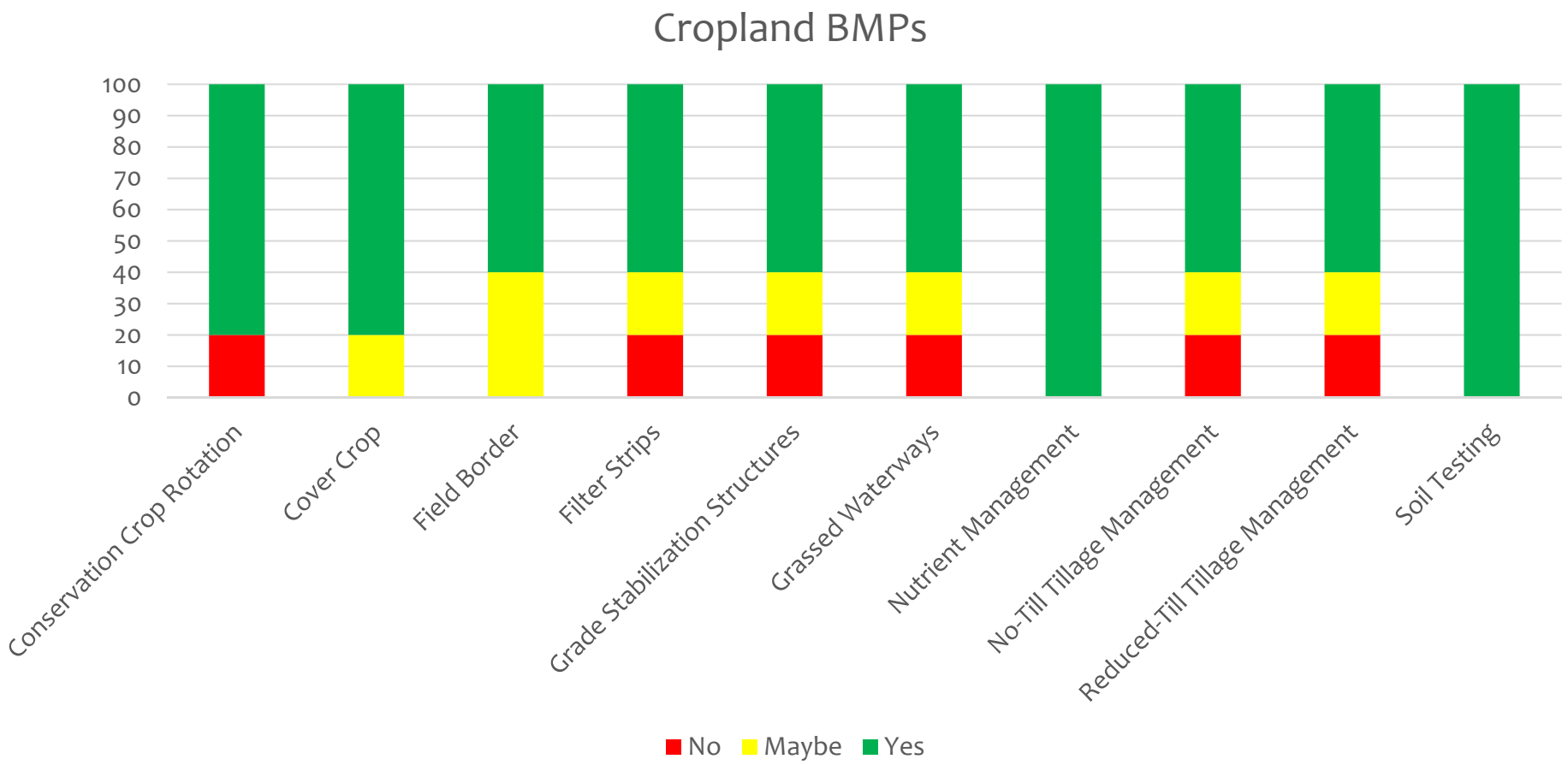

Mgmt Example

Source: Cattle and Other Livestock			
Problem: Direct and indirect fecal bacteria loading due to livestock in streams, riparian degradation and overgrazing			
Objectives: • Work with landowners to develop property-specific CPs and WQMPs that improve grazing practices and water quality. • Provide technical and financial support to producers. • Reduce fecal loadings attributed to livestock.			
Location: Priority subwatersheds identified below			
Critical Areas: All properties with riparian habitat throughout the watershed and all properties in subwatersheds 6, 8, 9, 10, 11, 12, 13 and 14			
Goal: Develop and implement CPs and WQMPs that minimize time spent by livestock in riparian areas and better utilize available grazing resource across the property.			
Description: CPs and WQMPs will be developed with producers to implement BMPs that reduce water quality impacts from overgrazing, time spent by livestock in and near streams and runoff from grazed lands. Practices will be identified and developed in consultation with NRCS, TSSWCB and local SWCDs as appropriate. Education programs and workshops will support and promote the adoption of these practices.			
Implementation Strategy			
Participation	**Recommendations**	**Period**	**Capital Costs**
TSSWCB, SWCDs	Develop funding to hire WQMP technician	2019–2029	Estimated $75,000 per year
Producers, NRCS, TSSWCB, SWCDs	Develop, implement and provide financial assistance for 40 livestock CPs and WQMPs over 10 years	2019–2029	$600,000 (est. $15,000 per plan)
AgriLife Extension, TWRI	Deliver education and outreach programs and workshops to landowners	2019, 2023, 2027	N/A
Estimated Load Reduction			
Prescribed management will reduce loadings associated with livestock by reducing runoff from pastures and rangeland as well as reducing direct deposition by livestock. Implementation of 40 WQMPs and CPs is estimated to reduce annual loads from livestock by 2.21×10^{14} cfu *E. coli* per year in the Mid and Lower Cibolo Creek watershed. Up to 983 pounds of nitrogen and 511 pounds of phosphorus per plan per year reduction is feasible.			
Effectiveness:	High: Decreasing the time that livestock spend in riparian areas and reducing runoff through effectively managing vegetative cover will directly reduce NPS contributions of bacteria and other pollutants to creeks.		
Certainty	Moderate: Landowners acknowledge the importance of good land stewardship practices and management plan objectives; however, financial incentives are often needed to promote the WQMP and CP implementation.		
Commitment	Moderate: Landowners are willing to implement stewardship practices shown to improve productivity; however, costs are often prohibitive and financial incentives are needed to increase implementation rates.		
Needs	High: Financial costs are a major barrier to promote implementation. Education and outreach are needed to demonstrate benefits of plan development and implementation to producers.		

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WQMPs in the Petronila & San Fernando Creeks Watershed

- Petronila Creek Watershed
  - 93 WQMPs on 18,907 acres total
    - 13,176 crop, 4,111 pasture, 1,380 range, 239 other
- San Fernando Creek Watershed
  - 43 WQMPs on 10,112 acres total
    - 3,807 crop, 1,943 pasture, 3,969 range, 392 other

NRCS Practices in Petronila Creek Watershed 2016-2021

Practices Implemented (# plans – total units)

- Brush management (56 - 2,532 ac)
- Critical area planting (1 – 2 ac)
- Fencing (25 - 41,020 ft)
- Heavy use area protection (6 – 1,122 sq ft)
- Herbaceous weed treatment (1 – 55 ac)
- Land forming (1 – 78 ac)
- Livestock pipeline (16 - 15,054 ft)
- Pasture/hay planting (20 - 1,225 ac)
- Prescribed grazing (9 – 2,062 ac)
- Pumping plant (5 plants)
- Rangeland planting (6 – 89 ac)
- Reduced/No Till residue mgmt. (820 - 174,497 ac)
- Water well (6 wells)
- Watering facility (6 facilities)

Number of Individual Practices Implemented

- 1,010

Total Acres of Practice Implementation

- 120,278

Some parcels have complimentary practices implemented

NRCS Practices in San Fernando Creek Watershed 2016-2021

Practices Implemented (# plans – total units)

- Brush management (161 – 6,087 ac)
- Conservation Cover (1 – 3.3 ac)
- Conservation Crop Rotation (1 – 996 ac)
- Critical area planting (1 – 2 ac)
- Fencing (34 – 129,754 ft)
- Field Border (4 – 24 ac)
- Heavy use area protection (11 – 3,463 sq ft)
- Herbaceous weed treatment (10 – 94 ac)
- Land forming (1 – 78 ac)
- Leave Standing Grain Crop (15 - 1,155 ac)
- Livestock pipeline (22 – 31,307 ft)
- Pasture/hay planting (111 – 4,017 ac)
- Prescribed grazing (12 – 842 ac)
- Pumping plant (54 plants)
- Range planting (7 – 67 ac)
- Reduced/No Till residue mgmt. (50 – 33,114 ac)
- Water well (55 wells)
- Watering facility (28 facilities)

Number of Individual Practices Implemented

- 890

Acres in Conservation Plans

- 36,958

Livestock, pastures, and rangeland

Potential Management Measures	Description
Implement agricultural BMPs that address water quality	BMP describe ways to manage land or activities to reduce or prevent impacts on surface water. BMPs available to livestock producers that improve water quality help manage vegetation in upland areas away from streams or protect sensitive riparian areas. Common BMPs include fencing, prescribed grazing, alternative water sources, forage planting, nutrient management, heavy use are protection, etc.
Develop and implement Texas State Soil and Water Conservation Board certified WQMP Program and NRCS conservation plans	NRCS offers a variety of program to develop and implement conservation plans (CPs) across entire operating units or for specific practices. Water quality management plans (WQMPs) are site-specific plans developed through and approved by SWCDs for agricultural or silvicultural lands that ensure water quality improvements through planning, implementation, and maintenance of each practice.
Conversion from agricultural tax valuation to wildlife management tax valuation	Wildlife Management Valuation of a property allows a landowner to maintain and care for the land and wildlife with an ag-type exemption, without all the requirements of an agricultural tax exemption. Eligible land must currently be under agricultural valuation, perform certain wildlife management activities, and have a wildlife management plan. This valuation may be appealing to landowners wishing to maintain lower livestock stocking rates.
Education Programs	Agencies provide a number of seminars and short courses for landowners implementing plans and best practices. This management measure will promote and target delivery of these education programs to the watershed. Example programs: Lone Star Healthy Streams and Texas Stream and Riparian Ecosystem Workshop

Wildlife, feral hogs, whitetail deer

Potential Management Measures	Description
Implement Feral Hog Management Program	SARA program in coordination with Wildlife Services and AgriLife Extension to hold workshops and outreach on feral hog control, hire technicians for training and trapping, and gate loaner program for landowners to build traps.
Education Programs	Programs include AgriLife Feral Hog workshops, outreach and education by SARA and partner agencies. Includes website, YouTube videos, and technical manuals for landowners.
Develop and implement wildlife management plans	Wildlife management plans describe historic and current land use practices, establishes land owner goals and objectives for the property, and describes the activities and practices to benefit wildlife and habitat. These plans are designed by landowners with possible assistance from TPWD, AgriLife Extension, or NRCS biologists. These plans can contain elements of grazing management, range enhancement, habitat protection, invasive/feral species control, etc. depending on the goals of the landowner.

Questions?

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