Attoyac Bayou WPP Development Update

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Texas Water Resources Institute

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Project Partners

- Angelina & Neches River Authority
- Castilaw Environmental Services, LLC
- Stephen F. Austin State University
- Texas A&M AgriLife Research
- Texas Water Resources Institute

Texas Water Resources Institute
make every drop count

Soil Water TSSWCB
Texas State Soil and Water Conservation Board

SFA

Texas A&M AgriLife Research | Extension

Castilaw Environmental Services, LLC

ANRA
Angelina & Neches River Authority

United States Environmental Protection Agency

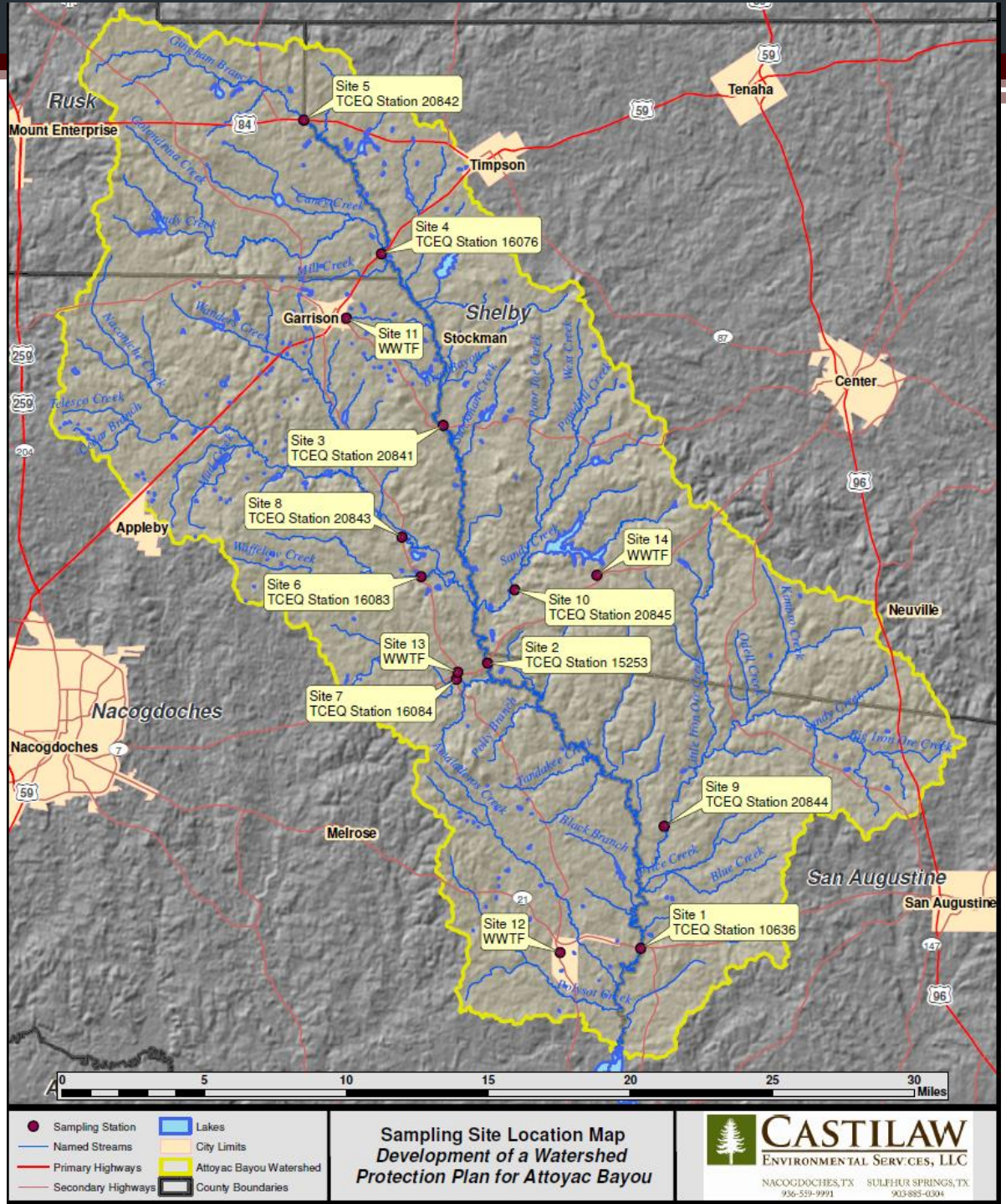
Attoyac Bayou Watershed Partnership Mission

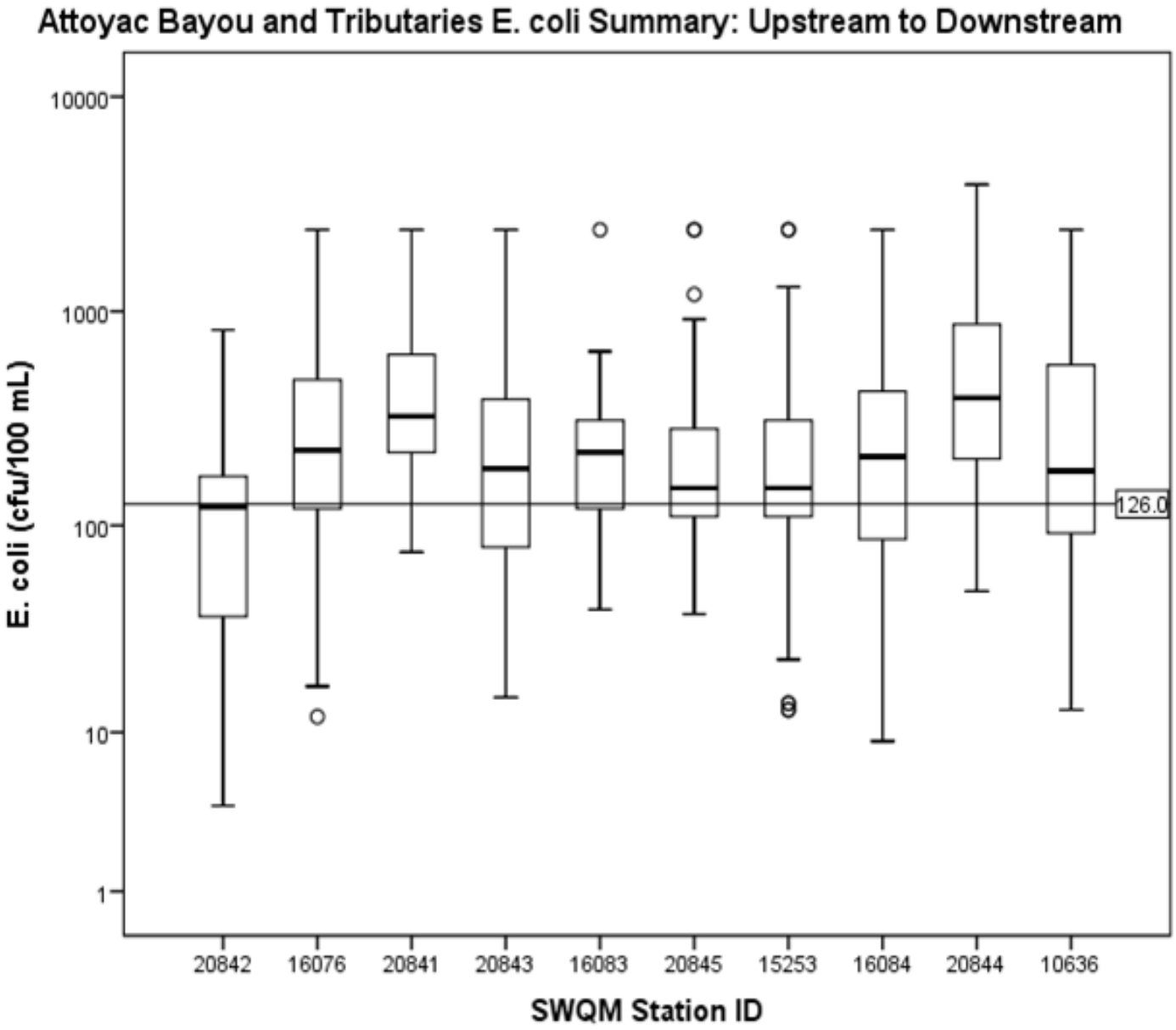
- To promote long-term conservation and stewardship of the Attoyac Bayou watershed in a manner that improves and sustains instream water quality, protects its ecologically diverse natural resources and maintains the economic viability of the watershed while simultaneously supporting the needs of watershed stakeholders

Attoyac Bayou Approach

- To collect additional data in the Attoyac Bayou Watershed to better characterize the hydrology and *E. coli* levels present, assess the current uses of the water body

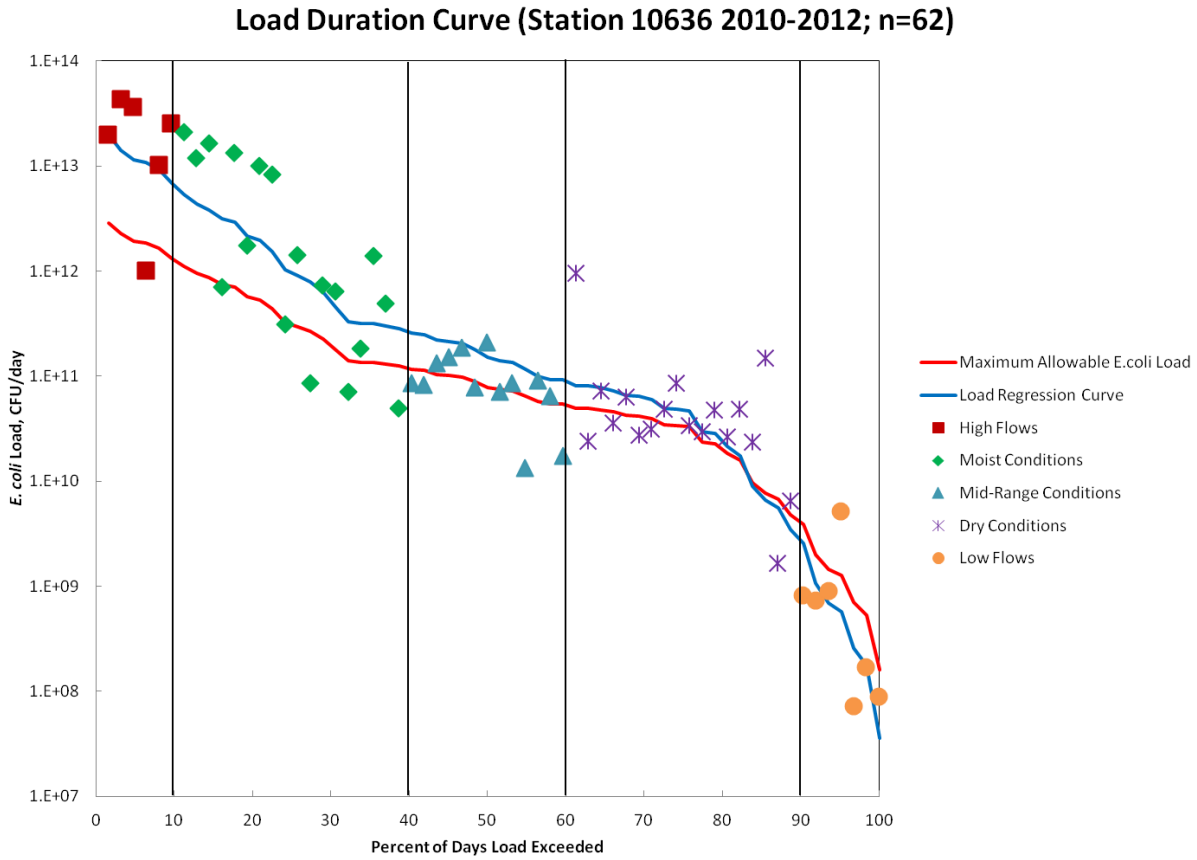
- Work to provide a local watershed partnership needed information to develop a plan to reduce in stream *E. coli* levels


Site 5
TCEQ Station 20842
Site 4
TCEQ Station 16076
Site 11
WWTF
Site 3
TCEQ Station 20841
Site 8
TCEQ Station 20843
Site 6
TCEQ Station 16083
Site 13
WWTF
Site 7
TCEQ Station 16084
Site 14
WWTF
Site 10
TCEQ Station 20845
Site 2
TCEQ Station 15253
Site 9
TCEQ Station 20844
Site 12
WWTF
Site 1
TCEQ Station 10636
Rusk
Mount Enterprise
Timpson
Tenaha
Garrison
Shelby
Stockman
Center
Appleby
Nacogdoches
Nacogdoches
Melrose
Neuville
San Augustine
San Augustine
0 5 10 15 20 25 30
Miles
Sampling Station
Named Streams
Primary Highways
Secondary Highways
Lakes
City Limits
Attoyac Bayou Watershed
County Boundaries
Sampling Site Location Map
Development of a Watershed
Protection Plan for Attoyac Bayou
CASTILAW
ENVIRONMENTAL SERVICES, LLC
NACOGDOCHES, TX 936-559-9991
SULPHUR SPRINGS, TX 903-885-0304

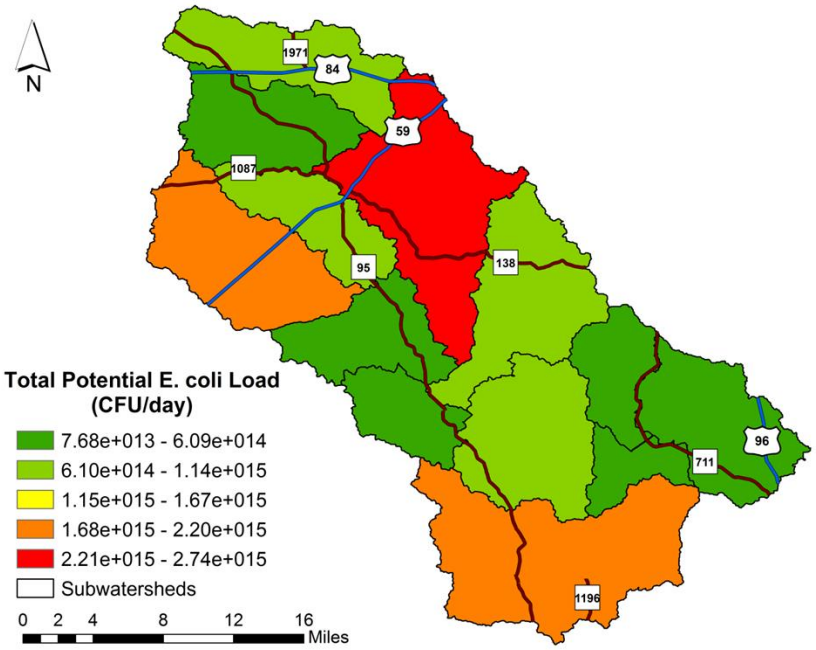

Attoyac Bayou and Tributaries E. coli Summary: Upstream to Downstream
E. coli (cfu/100 mL)
10000
1000
100
10
1
126.0
20842
16076
20841
20843
16083
20845
15253
16084
20844
10636
SWQM Station ID

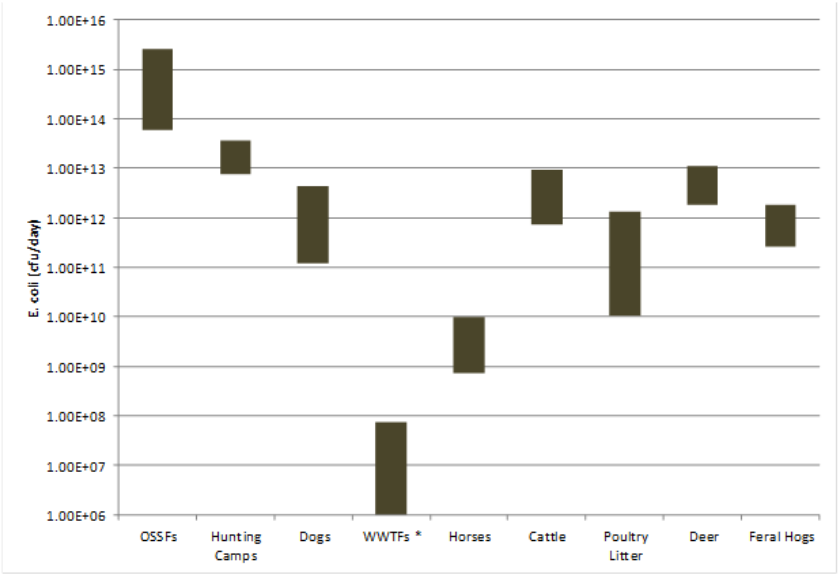
Attoyac at SH 21 (10636)

Flow Condition	% Exceedence	Percent Reduction	Daily Loading Reduction Needed (cfu/day)	Daily Loading (cfu/day)
High Flows	0-10	83	1.00E+13	1.20E+13
Moist Conditions	10-40	68	1.26E+12	1.70E+12
Mid-Range Flows	40-60	48	8.24E+10	1.65E+11
Dry Conditions	60-90	18	1.34E+10	4.25E+10
Low Flows	90-100	N/A	N/A	7.68E+08



Aggregate Output





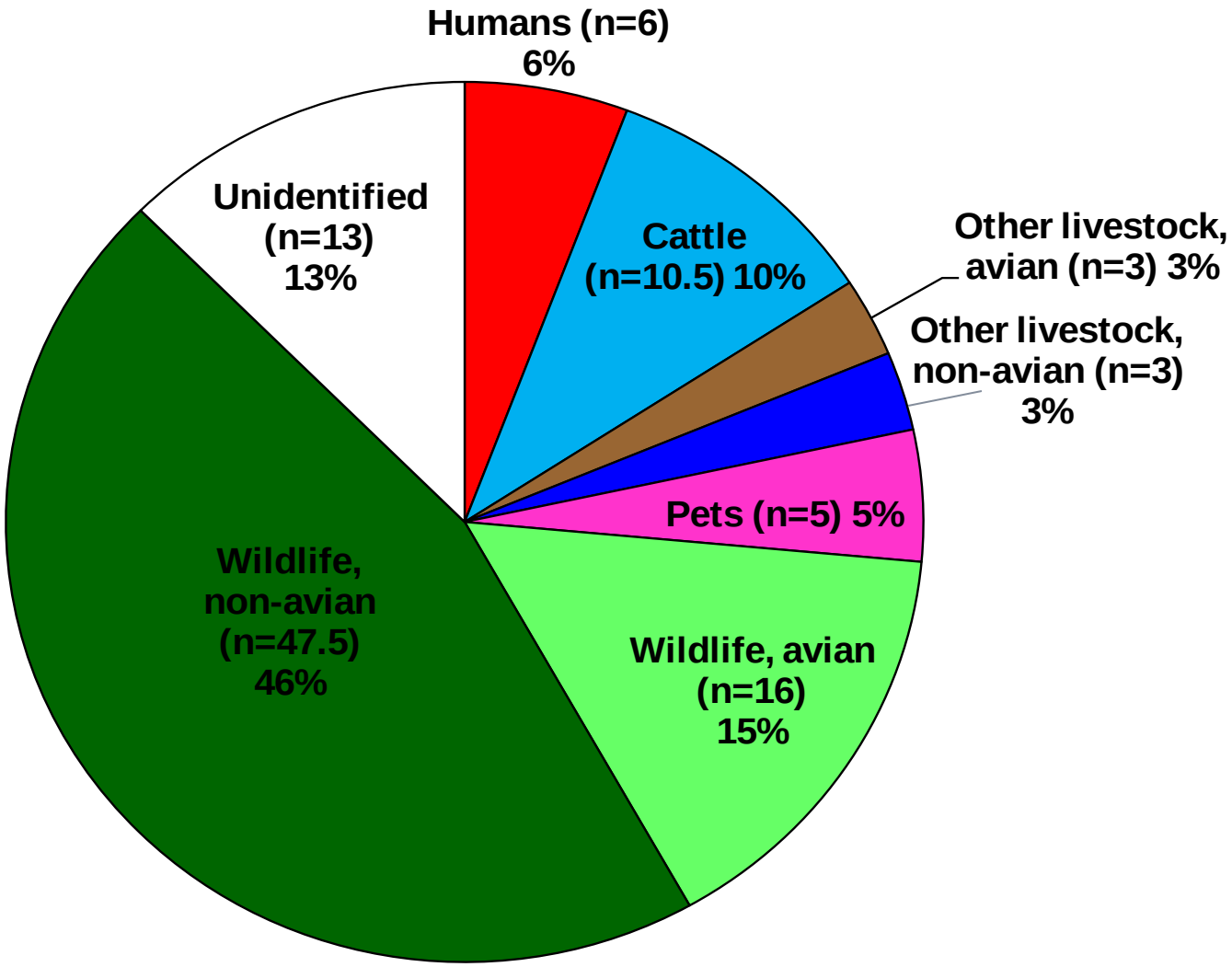
Daily Potential *E. coli* Load Ranges per Source

Potential *E. coli* Sources	**Daily Potential *E. coli* Load (CFU/day)**
Cattle	7.37×10^{11} - 9.57×10^{12}
Horses	7.44×10^{8} - 9.72×10^{9}
Deer	1.88×10^{12} - 1.08×10^{13}
Feral Hogs	2.59×10^{11} - 1.86×10^{12}
Poultry Litter	1.06×10^{10} - 1.31×10^{12}
OSSFs	6.00×10^{13} - 2.48×10^{15}
Dogs	1.23×10^{11} - 4.38×10^{12}
WWTFs	0 - 7.57×10^{7}
Hunting Camps	7.69×10^{12} - 3.59×10^{13}

RUAA Findings

- No recreation directly observed during field work
- Evidence of secondary recreation observed at ten 10 of the 43 survey sites
- Obstructions to recreation were common
  - Steep banks, thick brush, private property, woody debris, snakes, alligators
- Surveys indicate very limited primary contact recreation on private property

E. coli BST Results
Base + Storm Samples (7-Way Split)



Key Findings and Basis for WPP

- *E. coli* levels generally elevated and from a variety of sources
- No obvious source of *E. coli* identified = no obvious solution
- Recommend reasonable voluntary management

WPP Components

Chapter 1 – Watershed Management

- Defines general watershed management approach
- Watershed's relation to water quality
- WPP development process
- Highlights importance of private property rights

Chapter 2 – Regional History

- Early human influence
- European exploration
- Early Texas
- Rise of Industry
  - Railroads
  - Agriculture
  - Forestry
  - Oil and Gas

WPP Components

Chapter 3 – Watershed Characteristics

- Watershed boundaries
- Soils, topography, LULC
- Climate
- Water Resources
- Population

Chapter 4 – Current Conditions

- Demographics
- Agricultural production
- Forestry

WPP Components

Chapter 5 – Water Quality Assessment

- Defines waterbodies and uses
- Monitoring stations and sampling regime
- Index sites and sub-watersheds
- Water quality standards and historic water quality

Chapter 6 – Potential Sources of Pollution

- OSSFs
- Pets
- Livestock
- Poultry
- WWTFs
- Oil & Gas
- Wildlife and Feral Animals
- Illegal Dumping

WPP Components

Chapter 7 – Pollutant Source Assessment

- Monitoring data & results
- Load duration curves
- Bacterial source tracking
- Recreational Use Attainability Analysis
- Stakeholder Inputs
- Reconciliation of Results

Chapter 8 – Watershed Goals

- Meet designated standards
- Establish appropriate recreation standard
- Improve local water quality awareness
- Encourage voluntary practice adoption

WPP Components

Chapter 9 – Voluntary Management Strategies

- Reduce livestock impacts on riparian areas through WQMPs
- Remove feral hogs and limit access to food
- OSSF ID, inspection, repair or replacement
- OSSF education and outreach

Chapter 10 – Financial Assistance

- Federal Sources
  - Farm Bill programs
  - CWA (319) grants
- State Sources
  - Water Quality Management Plans
  - Supplemental Environmental Projects
- Other Sources

WPP Components

Chapter 11 – Education & Outreach

- Role of watershed coordinator
- Describe initial efforts
- Plan future efforts
  - Field days
  - Educational workshops
  - Meetings/newsletters
  - Volunteer monitoring
  - Roadway signage

Chapter 12 – Measuring Success

- Established incremental water quality targets
- Define additional data collection needs
- Process for data reviews
- Interim measurable milestones

WPP Components

Chapter 13 – Plan Implementation

- Lists each measure along with responsible party, implementation goals, and projected costs
- Discusses technical assistance needs and sources
- Continued monitoring and coordination

Appendices

- WPP key elements
- Landuse/landcover map development approach
- Describes in detail how management measure loading reductions were derived

EPA Plan Review and Acceptance

Review:

- Plan will go to EPA for review early next week
- 30 to 60 day review time

Acceptance:

- Opens the doors to implement practices in WPP with 319 grant funds
- When accepted, will be one of 5 accepted plans in Texas

Funding

- Grant from the Texas State Soil and Water Conservation Board from their Clean Water Act, Section 319 Program supported by U.S. Environmental Protection Agency

Attoyac Bayou WATERSHED PARTNERSHIP

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Texas A&M System