The meeting will begin shortly

Please mute your microphone until called for questions.

Please disable your video unless you are speaking.

Please enter your name and title in the chat.

Please insert questions in chat or raise hand to speak.

This meeting is being recorded.

EAST FORK SAN JACINTO RIVER
WATERSHED PARTNERSHIP

EAST FORK SAN JACINTO RIVER WATERSHED PARTNERSHIP

July 12, 2023

EAST FORK SAN JACINTO RIVER
WATERSHED PARTNERSHIP

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MEETING OUTLINE

- Welcome and Introductions

- Project Background

- Bacteria Source Model Revisions

- Implementation Strategies

- Next Steps

- Discussion

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INTRODUCTION

WHO WE ARE

Texas Commission on Environmental Quality (TCEQ)

lead state environmental management agency

Houston-Galveston Area Council (H-GAC)
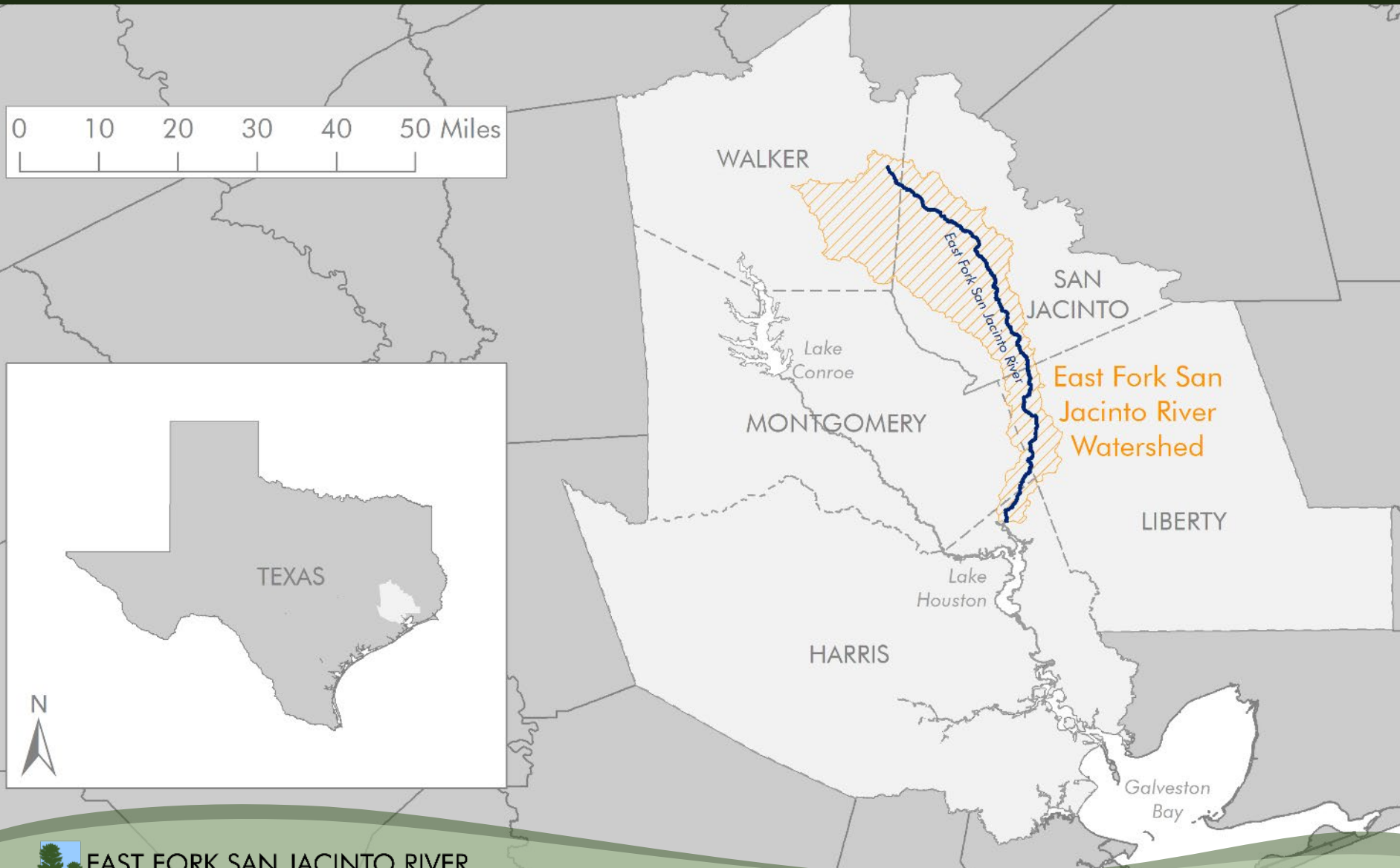
regional council of governments

Watershed Partnership

local stakeholders working with TCEQ and H-GAC to develop and implement a watershed protection plan for the East Fork San Jacinto River watershed

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PROJECT BACKGROUND

WHERE WE WORK

ASSESSING WATER QUALITY

- Statewide monitoring

- TCEQ produces integrated report of results every two years

- Waterways exceeding standards are **impaired**

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Surface water quality in the East Fork San Jacinto River Watershed is impaired due to high levels of fecal indicator bacteria.

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BACTERIA SOURCES

Human Waste
- Wastewater
- Septic/Aerobic Systems
- Illicit Sewage

Domestic Animal Waste
- Pets
- Livestock

Wildlife and Invasive Species Waste
- Deer and Other Wildlife
- Feral Hogs

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BACTERIA SOURCE MODEL REVISIONS

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BACTERIA MODELING SUMMARY

- Source pressures vary spatially
  - Highest potential loading in the Winters Bayou subwatershed influenced by agriculture, wildlife and invasive feral hogs
  - High loading also possible in lower East Fork subwatershed due to human related sources

- Source pressures will fluctuate over time due to changes in land use and land cover

- Total daily load will increase 40% by 2050 if no action is taken

- Stakeholder feedback used to refine these results

Potential Daily *E. coli* Loading: Total

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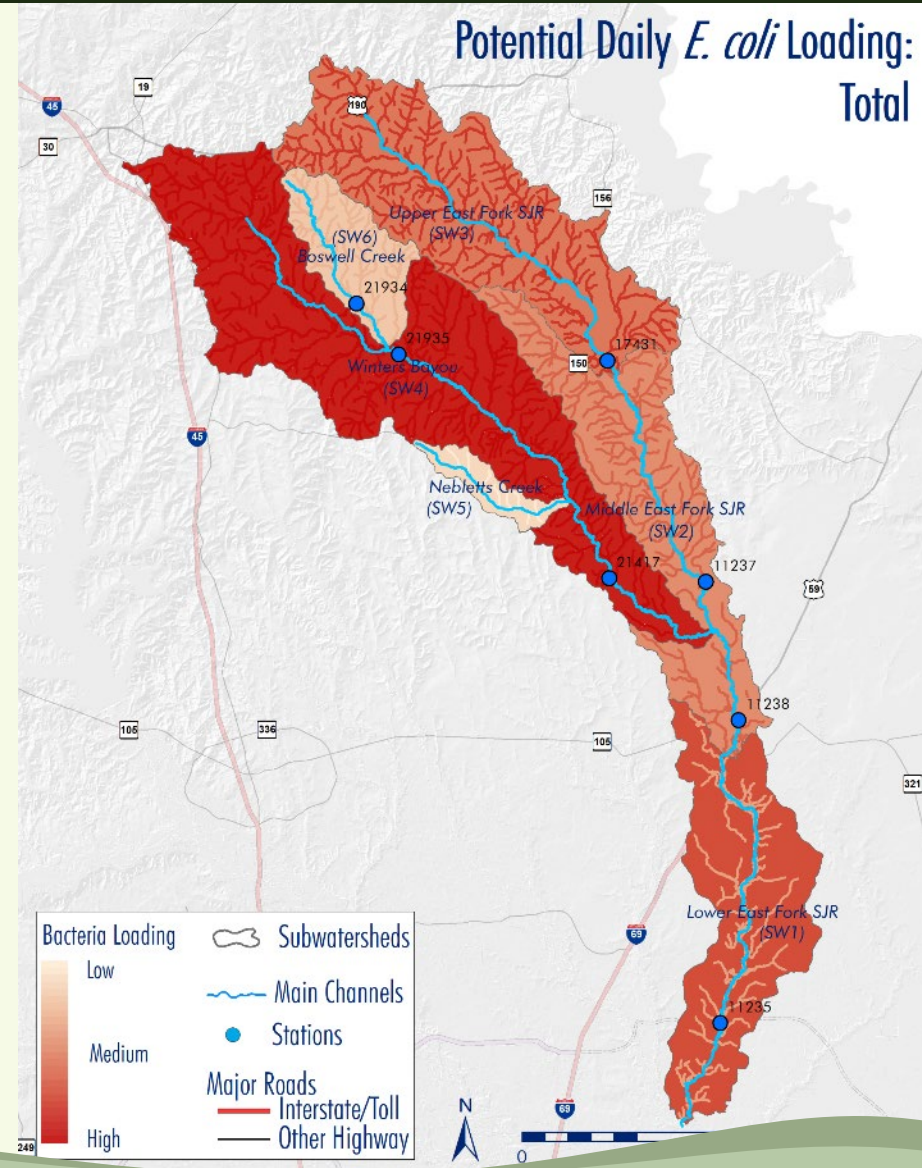
On-Site Sewage Facilities

First Draft Methods:

- Used permit data and assumption of unpermitted units based on occupied parcels outside service areas

- Estimated 10% failing

Revision Suggestions:

- Consider no failure rate for permitted systems and 20% rate for unpermitted systems

- Consider no failure rate for permitted systems and 50% rate for unpermitted systems

- Consider 20% failure rate for permitted systems and 50% rate for unpermitted systems

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LIVESTOCK

First Draft Methods:

- County agricultural census data and suitable land cover adjusted by watershed area ratio

- Includes cattle, horses, sheep and goats

- Used daily load value of 5.4×10^9 cfu/day based on Teague *et al.*, 2009

Revisions:

- Update daily load value to 1.1×10^{10} cfu/day based on broader literature review
    - Coffey *et al.*, 2010 (Agricultural Water Management)
    - Coffey *et al.*, 2013 (Human and Ecological Risk Assessment: An International Journal)
    - Iqbal and Hofstra, 2018 (Human and Ecological Risk Assessment: An International Journal)

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Feral Hogs

First Draft Methods:

- Used AgriLife population density literature values

- Density assumptions adjusted for land cover type

Revisions:

- Allocate 50% of lowest population density estimate to the riparian buffer in areas of medium to high development

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OTHER SOURCES

First Draft Methods:

- Accounts for potential wildlife impacts on the instream load
- As no population data are available for many wildlife species, method assumes additional 10% of total calculated load can be attributed to wildlife
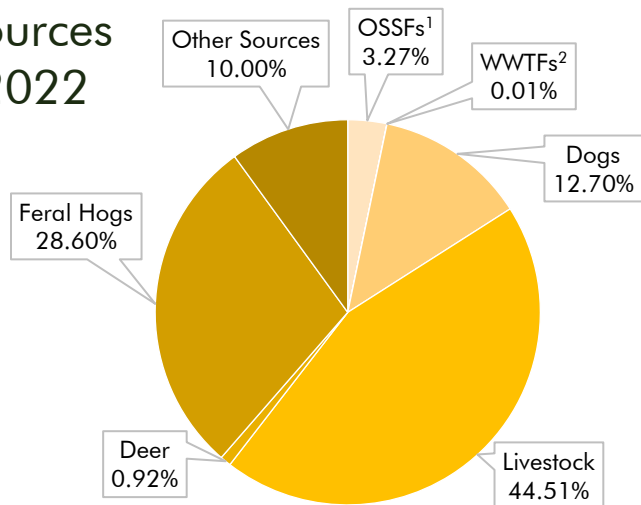
Revisions:

- Generalize language to "other sources" or "safety margin"
- Do not assume consistent percent contribution from wildlife in future projections

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FIRST DRAFT

Sources 2022

- Other Sources 10.00%
- OSSFs[1] 3.27%
- WWTFs[2] 0.01%
- Dogs 12.70%
- Feral Hogs 28.60%
- Deer 0.92%
- Livestock 44.51%

41,322 billion cfu/day

REVISED

Sources 2022

- Other Sources 10.00%
- OSSFs[1] 2.50%
- WWTFs[2] 0.00%
- Dogs 5.79%
- Feral Hogs 16.14%
- Deer 0.42%
- Livestock 65.14%

90,559 billion cfu/day

Adjustments made for:
- OSSFs[1] – assume no failure for permitted units and 20% failure for unpermitted units
- Livestock – use revised unit load
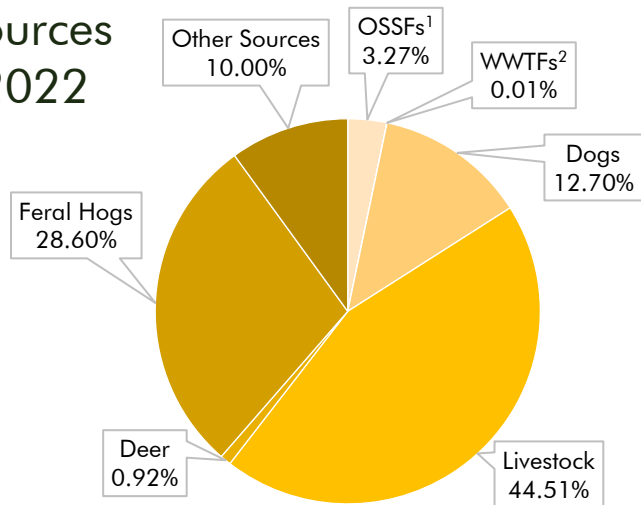- Feral hogs – account for population in riparian buffer

[1]OSSFs – On-Site Sewage Facilities
[2]WWTFs – Wastewater Treatment Facilities

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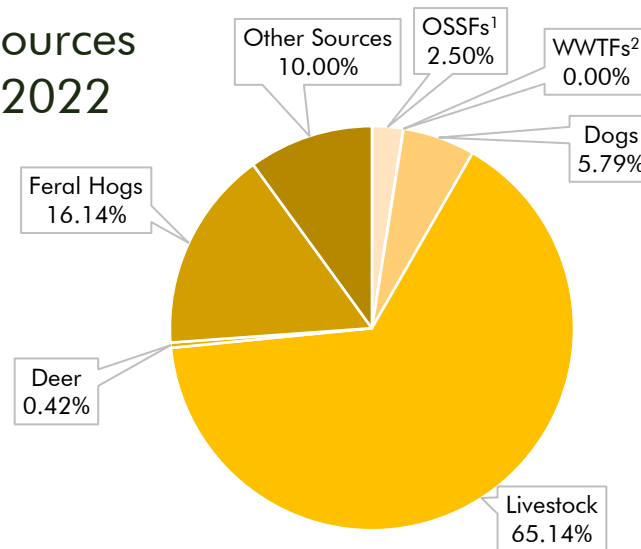
Updated Model Results, Example 2

FIRST DRAFT

Sources 2022
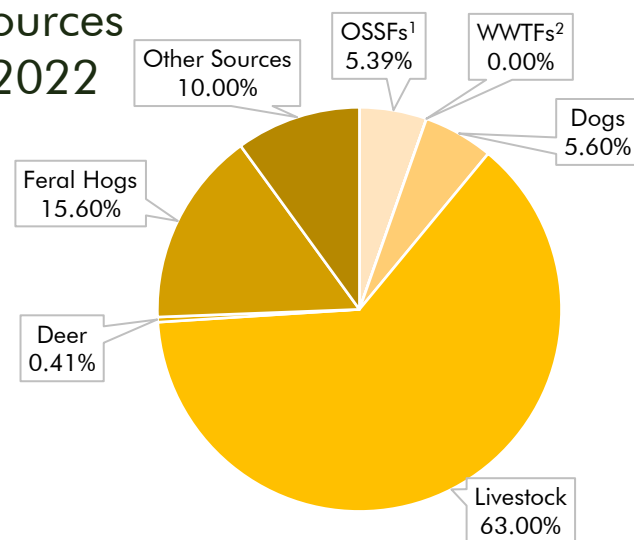
Pie chart data:
- Other Sources 10.00%
- OSSFs[1] 3.27%
- WWTFs[2] 0.01%
- Dogs 12.70%
- Livestock 44.51%
- Deer 0.92%
- Feral Hogs 28.60%

41,322 billion cfu/day

REVISED

Sources 2022

Pie chart data:
- Other Sources 10.00%
- OSSFs[1] 5.39%
- WWTFs[2] 0.00%
- Dogs 5.60%
- Livestock 63.00%
- Deer 0.41%
- Feral Hogs 15.60%

93,644 billion cfu/day

[1]OSSFs – On-Site Sewage Facilities
[2]WWTFs – Wastewater Treatment Facilities

Adjustments made for:
- OSSFs[1] – assume no failure for permitted units and 50% failure for unpermitted units
- Livestock – use revised unit load
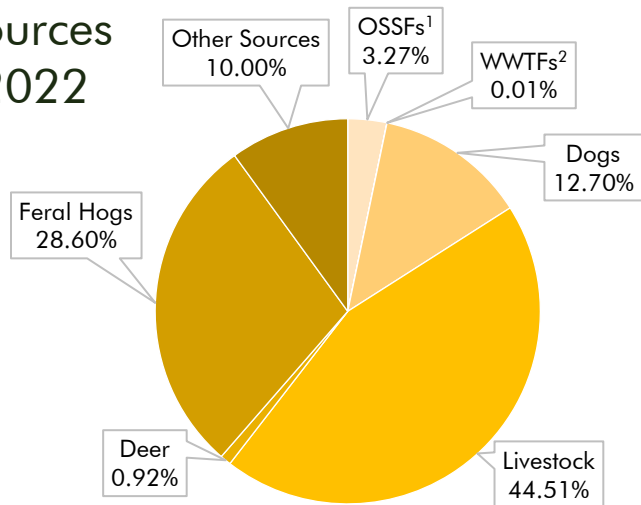- Feral hogs – account for population in riparian buffer

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Updated Model Results, Example 3

FIRST DRAFT

Sources 2022

- Other Sources 10.00%
- OSSFs[1] 3.27%
- WWTFs[2] 0.01%
- Dogs 12.70%
- Feral Hogs 28.60%
- Deer 0.92%
- Livestock 44.51%

41,322 billion cfu/day

REVISED

Sources 2022

- Other Sources 10.00%
- OSSFs[1] 6.32%
- WWTFs[2] 0.00%
- Dogs 5.54%
- Feral Hogs 15.43%
- Deer 0.40%
- Livestock 62.30%
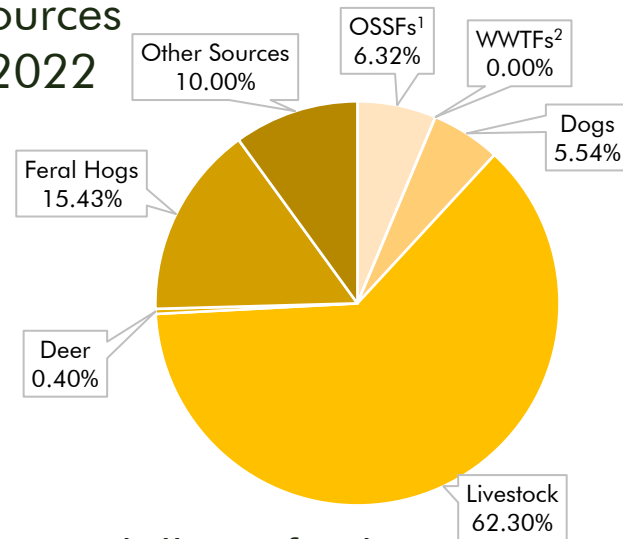
94,686 billion cfu/day

Adjustments made for:
- OSSFs[1] – assume 20% failure for permitted units and 50% failure for unpermitted units
- Livestock – use revised unit load
- Feral hogs – account for population in riparian buffer

[1]OSSFs – On-Site Sewage Facilities
[2]WWTFs – Wastewater Treatment Facilities

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IMPLEMENTATION STRATEGIES

IDENTIFYING SOLUTIONS

- Where coordination is possible, the WPP will describe solutions that **enhance, support** and **fill gaps** in existing efforts

- Descriptions of new proposals included in the WPP will identify:
  - Responsible parties
  - Resource needs
  - Timelines
  - Measures of success

- WPP development can attract funding/technical resources

EAST FORK SAN JACINTO RIVER
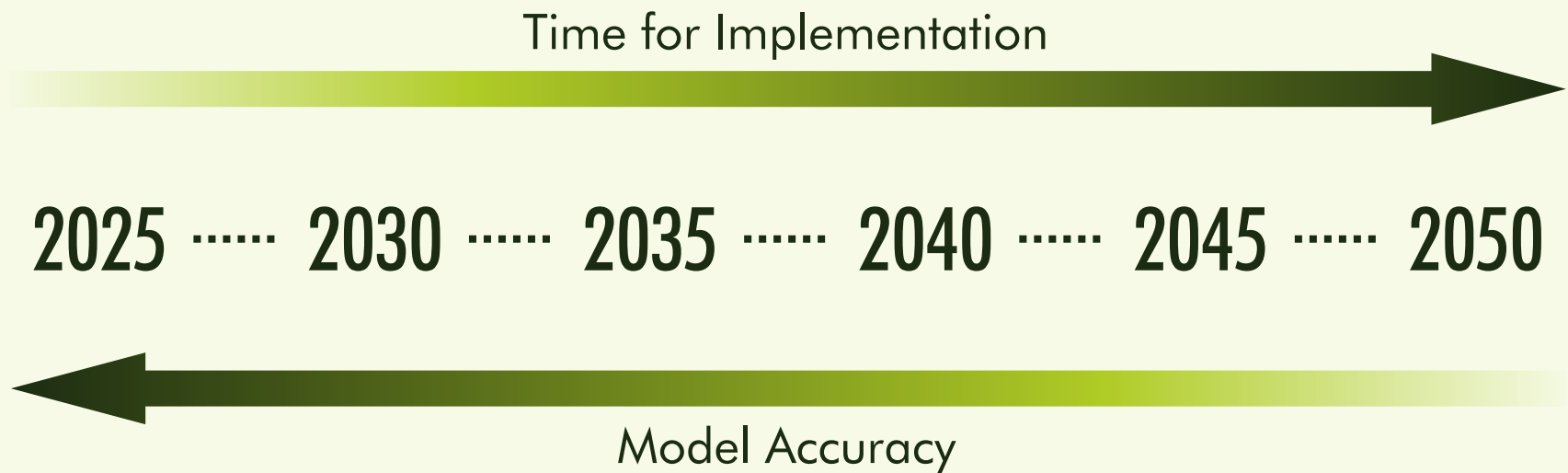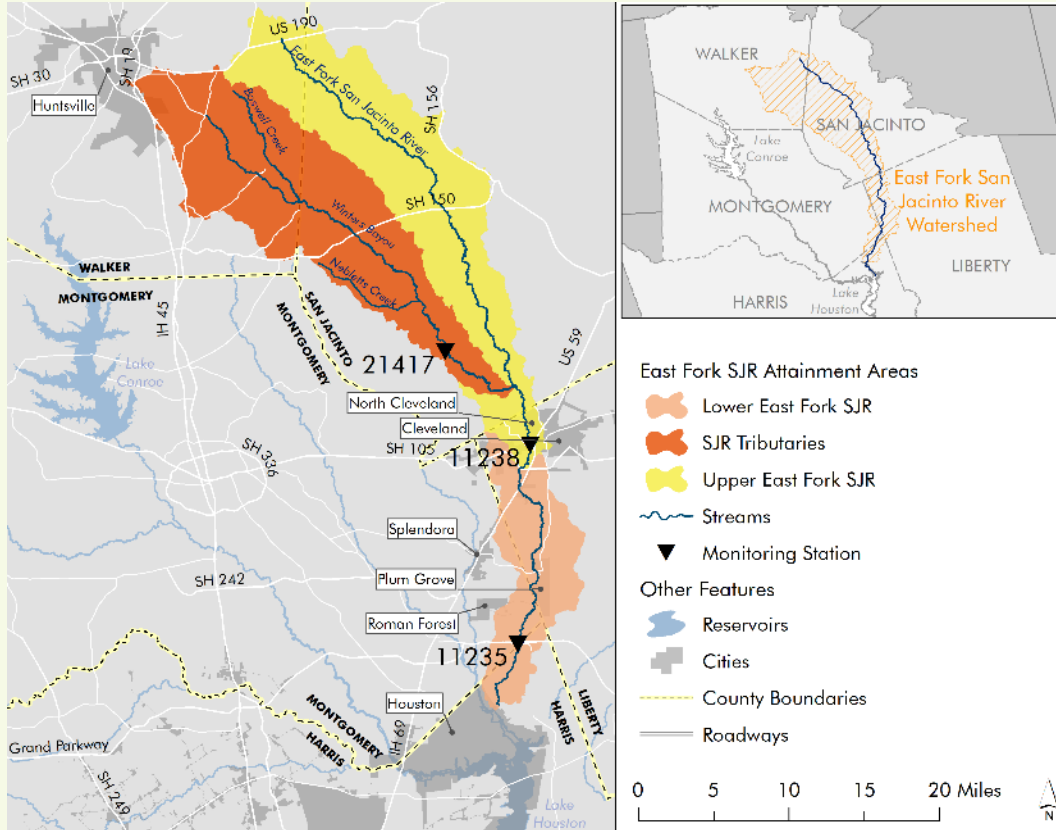WATERSHED PARTNERSHIP

Setting Goals

- Decide on target date for implementation goals

- Select focus areas based on modeling results and stakeholder recommendations

- Effort is not required to be proportional to model results

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SELECTING A TARGET DATE

Time for Implementation

2025 ······ 2030 ······ 2035 ······ 2040 ······ 2045 ······ 2050
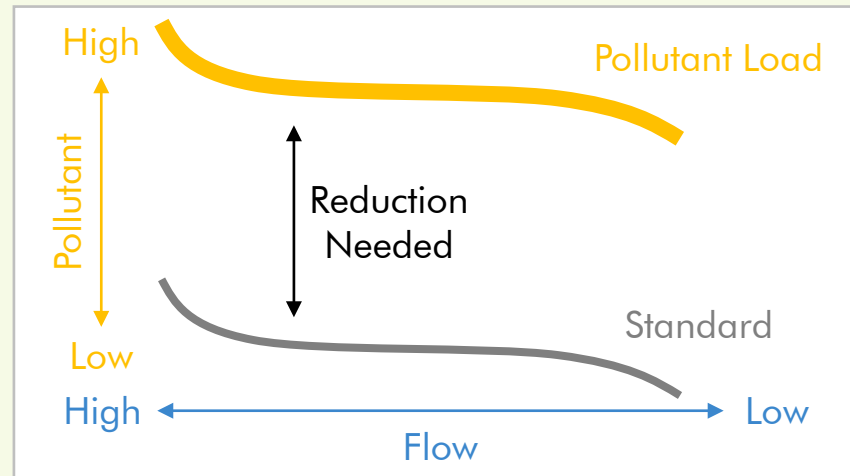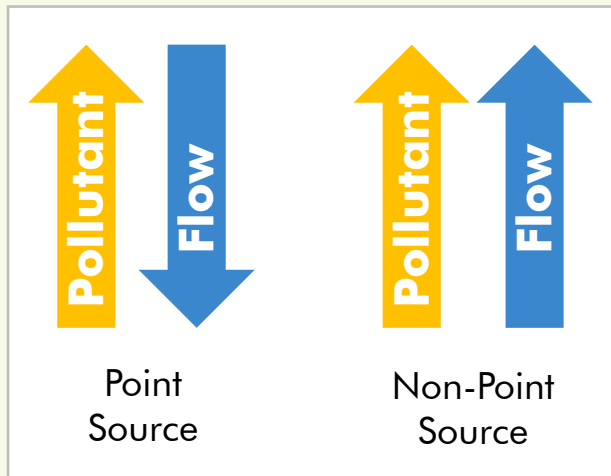
Model Accuracy

WHERE TO FOCUS

- Different pressures affect different parts of the watershed

- Implementation measures can be customized in different areas for more effective results

- H-GAC suggests focusing on three major attainment areas
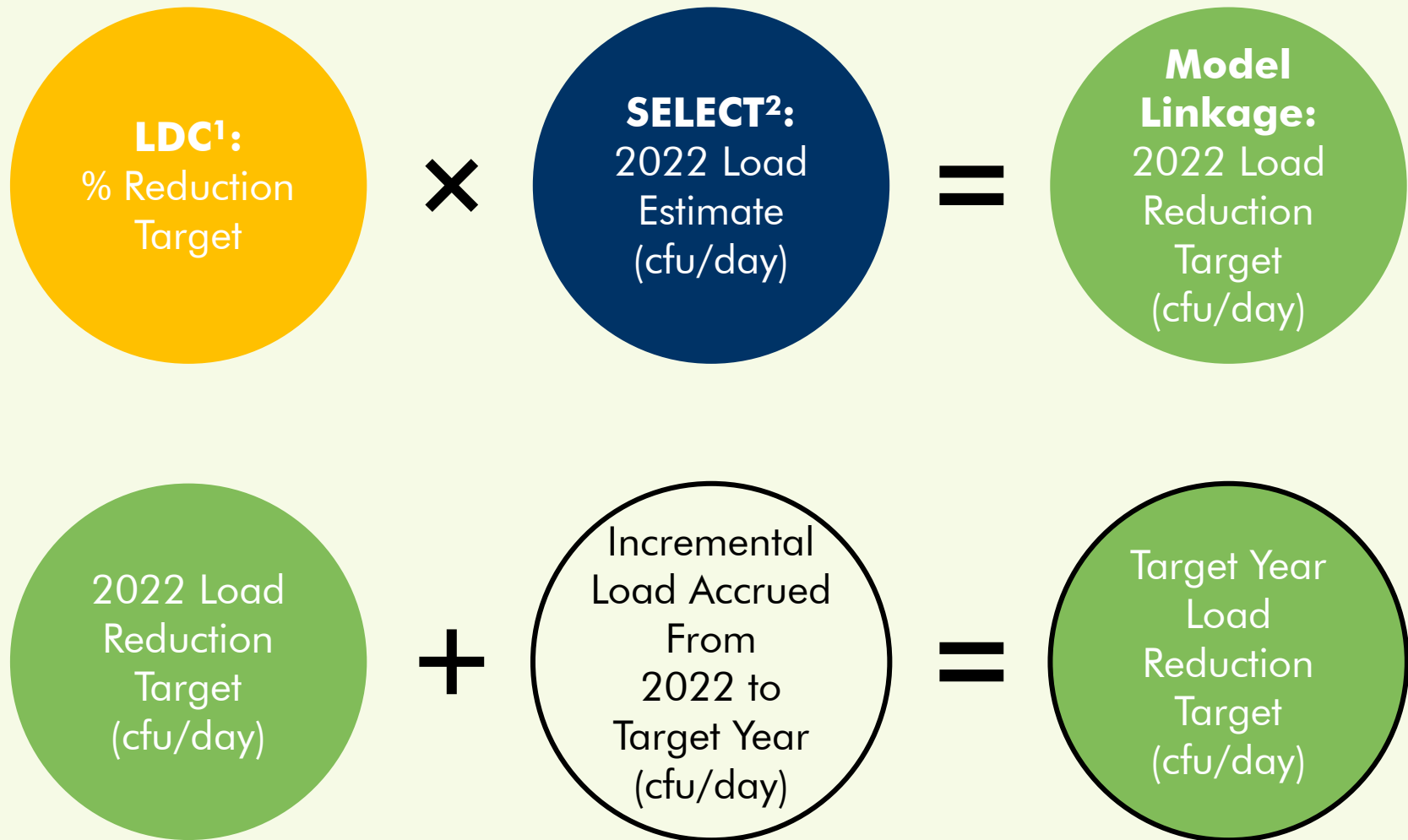
RELATIONSHIP TO STREAMFLOW

Point Source

Non-Point Source

High — Pollutant Load

Pollutant

Reduction Needed

Standard

Low

High — Flow — Low

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PERCENT REDUCTION BASED ON FLOW

Stream Flow Conditions	E. coli Load Reduction Estimate		
	Tributaries	Upper East Fork	Lower East Fork
High Flow	70%	86%	83%
Moist Conditions	25%	45%	56%
Mid-Range Conditions		4%	31%
Dry Conditions			1%
Low Flow			
Weighted Average	**36%**	**38%**	**35%**

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Reduction Target Calculations

LDC[1]: % Reduction Target

×

SELECT[2]: 2022 Load Estimate (cfu/day)

=

Model Linkage: 2022 Load Reduction Target (cfu/day)

2022 Load Reduction Target (cfu/day)

+

Incremental Load Accrued From 2022 to Target Year (cfu/day)

=

Target Year Load Reduction Target (cfu/day)

[1] Load Duration Curve
[2] Spatially Explicit Load Enrichment Calculation Tool

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ACHIEVING THE REDUCTION TARGET

Target Year Load Reduction Target (cfu/day)

- Reduce loads from each source proportional to respective contribution to the target year load;

- Reduce loads from each source subjectively; or

- Reduce loads from each source proportional to respective contribution to the 2022 load estimate

Representative Units

- During modeling process, load contributed by each unit varies with proximity to waterway

- When calculating number of units to address based on reduction targets, reduction target divided by maximum load per unit (assume buffer areas prioritized in implementation)
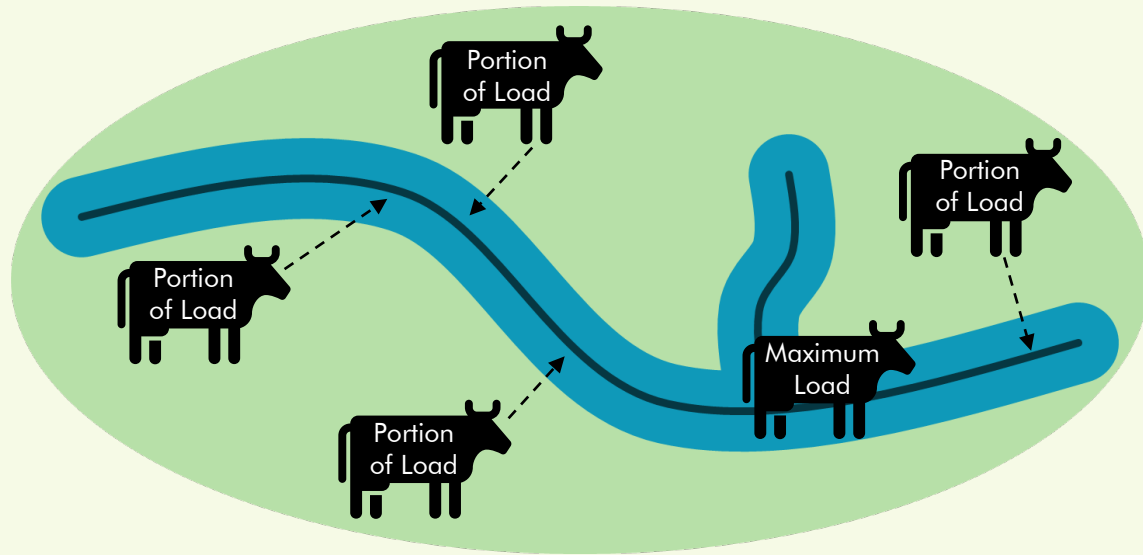
Unit Reductions, Example 1

Source	Unit Reduction Target by 2040		
	Tributaries	Upper East Fork	Lower East Fork
OSSFs[1]*	39	70	520
WWTFs[2]	<1	<1	<1
Dogs	115	270	1,832
Cattle	1,532	840	267
Horses	144	141	85
Sheep and Goats	175	96	30
Deer	457	413	202
Other Sources	NA	NA	NA
Feral Hogs	679	605	311

[1]OSSFs – On-Site Sewage Facilities   * Assume no failure for permitted units and 20% failure for unpermitted units
[2]WWTFs – Wastewater Treatment Facilities

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UNIT REDUCTIONS, EXAMPLE 2

Source	Unit Reduction Target by 2040		
	Tributaries	Upper East Fork	Lower East Fork
OSSFs[1]*	96	176	1,171
WWTFs[2]	<1	<1	<1
Dogs	115	271	1,942
Cattle	1,531	841	283
Horses	144	141	90
Sheep and Goats	175	96	32
Deer	457	414	215
Other Sources	NA	NA	NA
Feral Hogs	679	606	330

[1]OSSFs – On-Site Sewage Facilities   * Assume no failure for permitted units and 50% failure for unpermitted units
[2]WWTFs – Wastewater Treatment Facilities

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UNIT REDUCTIONS, EXAMPLE 3

Source	Unit Reduction Target by 2040		
	Tributaries	Upper East Fork	Lower East Fork
OSSFs[1]*	101	185	1,510
WWTFs[2]	<1	<1	<1
Dogs	115	271	2,001
Cattle	1,531	841	291
Horses	144	141	92
Sheep and Goats	175	96	33
Deer	457	414	221
Other Sources	NA	NA	NA
Feral Hogs	679	606	340

[1]OSSFs – On-Site Sewage Facilities   * Assume 20% failure for permitted units and 50% failure for unpermitted units
[2]WWTFs – Wastewater Treatment Facilities

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NEXT STEPS

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Timeline

You Are Here

Identify Water Quality Issues · Form Partnership · Discuss and Model · Identify Solutions · Submit WPP · Implement!

2022 ➞ 2024

SHORT TERM GOALS

- Next Partnership meeting in August to discuss specific strategies and milestones for implementation priorities

- One-on-one meetings with stakeholders

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How Can We Help?

- Tell us about your projects and organizations!

- Tell us how we can:
  - Amplify
  - Collaborate
  - Coordinate

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DISCUSSION & QUESTIONS

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rachel.windham@h-gac.com

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Houston, TX 77027

www.eastforkpartnership.com

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