Cotton Bayou Watershed Implementation Plan Development

Public Meeting
June 17, 2024

Houston-Galveston Area Council

Meeting Outline

- **Introductions**
- *Project Overview & Updates*
- *Implementation Plan Development*
- *Next Steps*
- *Discussion*

Introductions

Texas Commission on Environmental Quality (TCEQ)

lead state environmental management agency

Houston-Galveston Area Council (H-GAC)

regional council of governments

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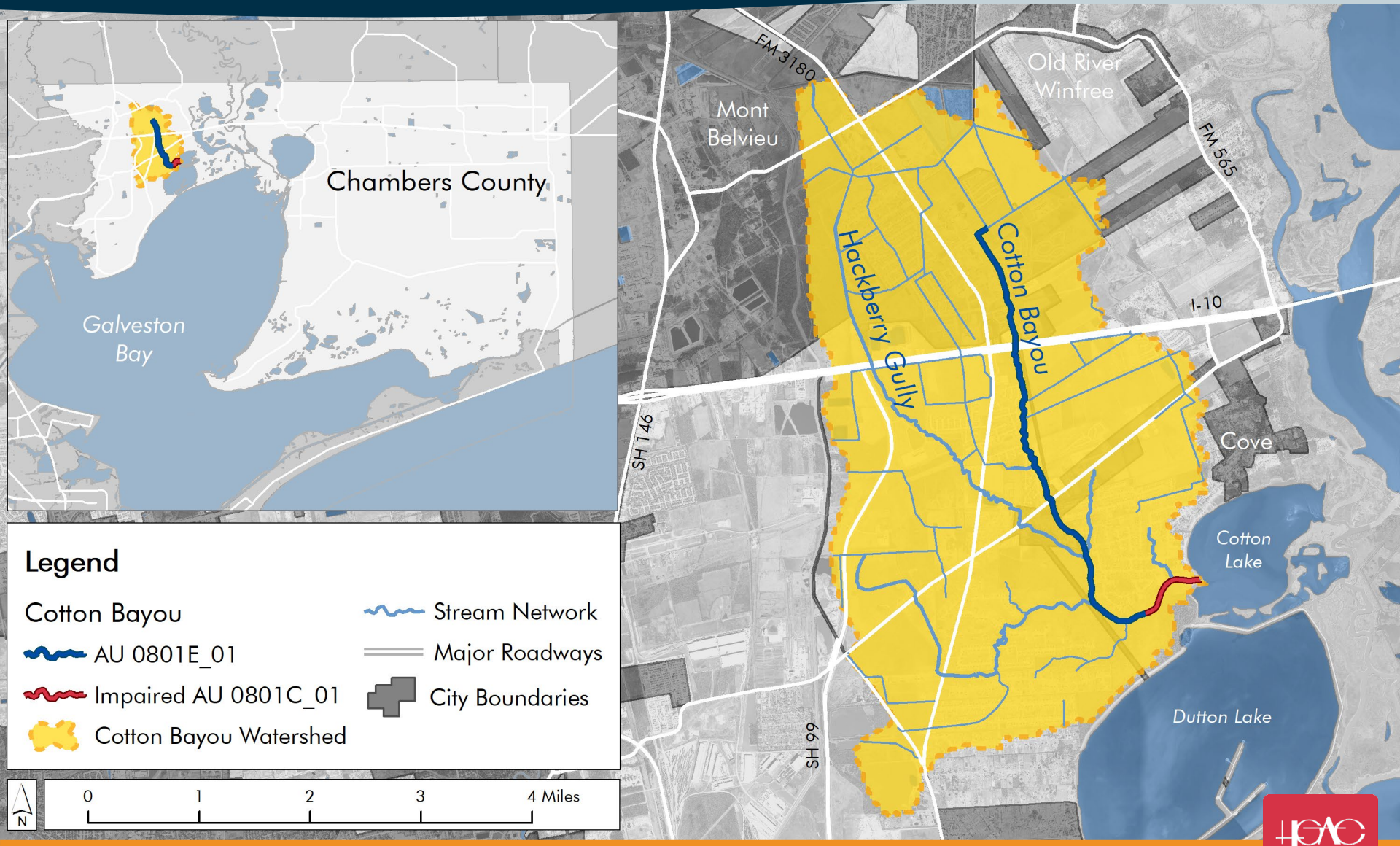
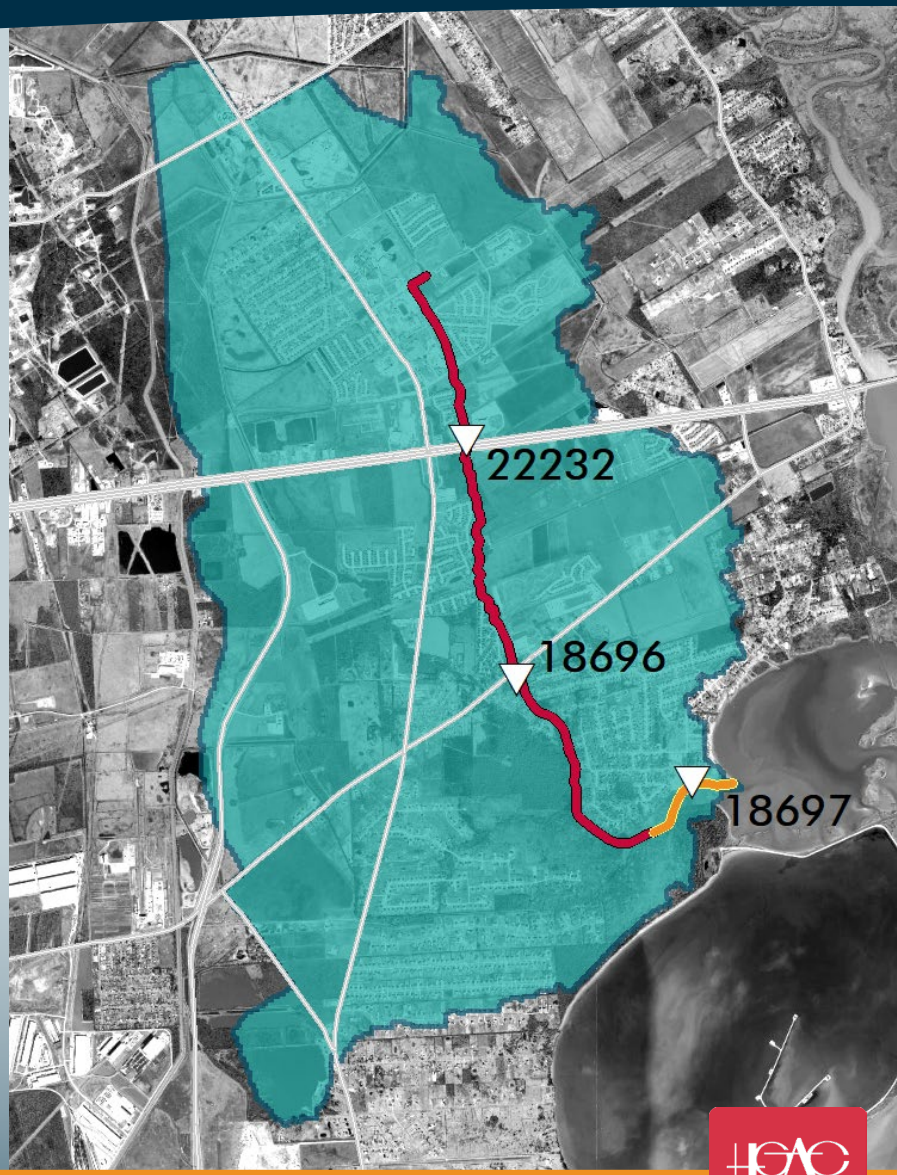
Watershed Area



Water Quality

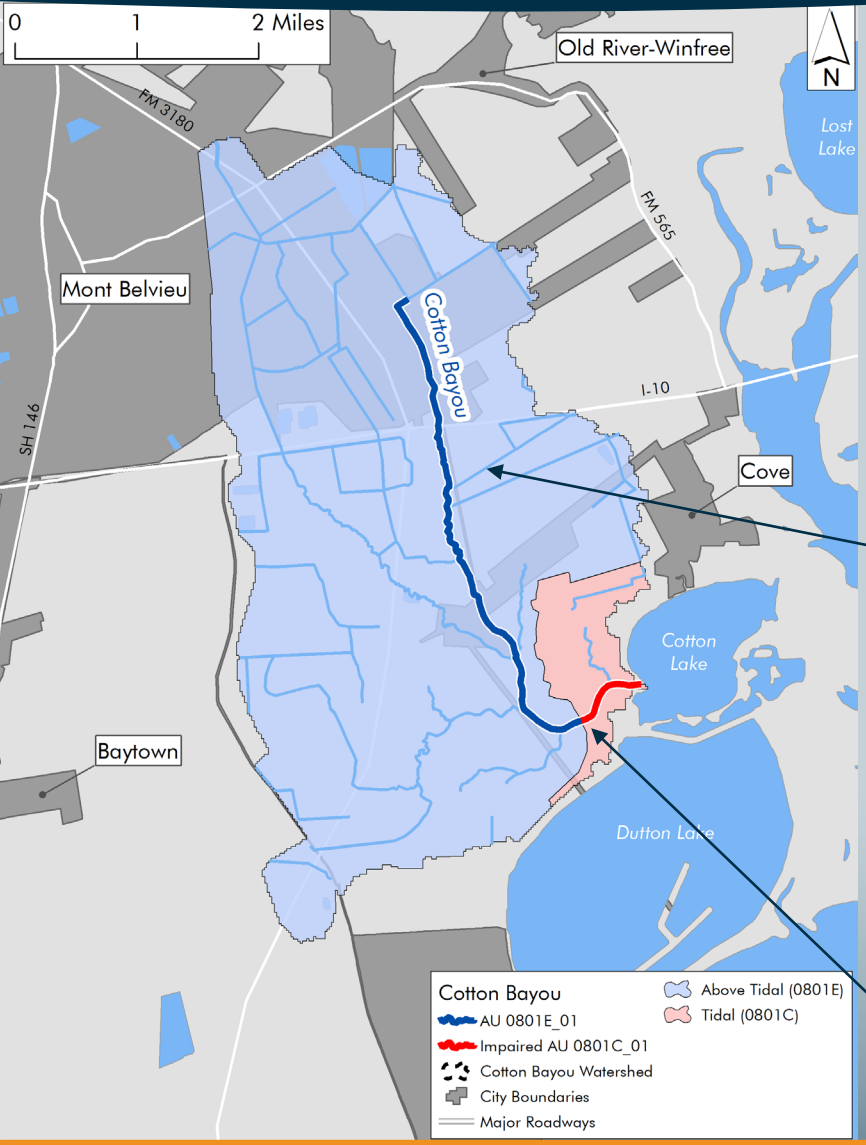
- Contact recreation use **impaired** due to high levels of fecal indicator bacteria (Enterococci) in surface water
- Other water quality **concerns** include low dissolved oxygen and high concentrations of nutrients
- Three monitoring sites including new station (22232) at I-10

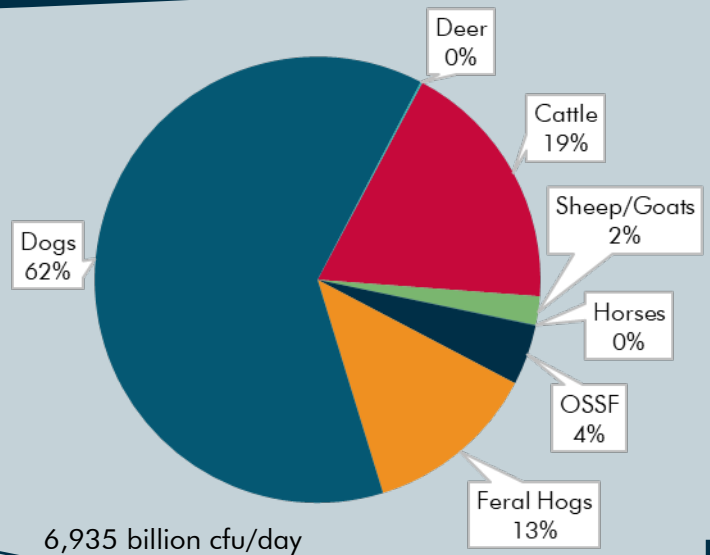


Bacteria Sources

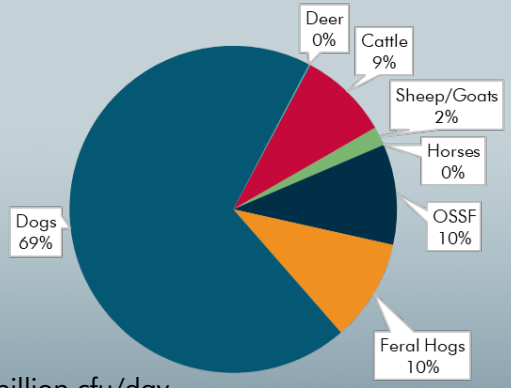
- **Human Waste**
  - Wastewater
  - Septic/Aerobic Systems
  - Illicit Sewage
- **Domestic Animal Waste**
  - Pets
  - Livestock
- **Wildlife/Feral Hog Waste**
  - Deer and Other Wildlife
  - Feral Hogs

Estimated Bacteria Loads





6,935 billion cfu/day
(93% watershed load)



485 billion cfu/day
(7% watershed load)

98.80%
Reduction
Needed

Estimated Reductions by Source

Watershed	OSSF Load Reduction	Cattle Load Reduction	Sheep and Goat Load Reduction	Horse Load Reduction	Deer Load Reduction	Feral Hog Load Reduction	Dog Load Reduction	Total Load Reduction
Cotton Bayou Above Tidal	300.57	1,261.75	142.27	2.28	8.00	861.72	4,275.50	6,852.09
Cotton Bayou Tidal	47.65	42.68	8.89	0.00	0.53	48.36	330.98	479.09
Total Watershed	**348.22**	**1,304.43**	**151.16**	**2.28**	**8.53**	**910.08**	**4,606.48**	**7,331.18**

* All loads are expressed in billion cfu/day

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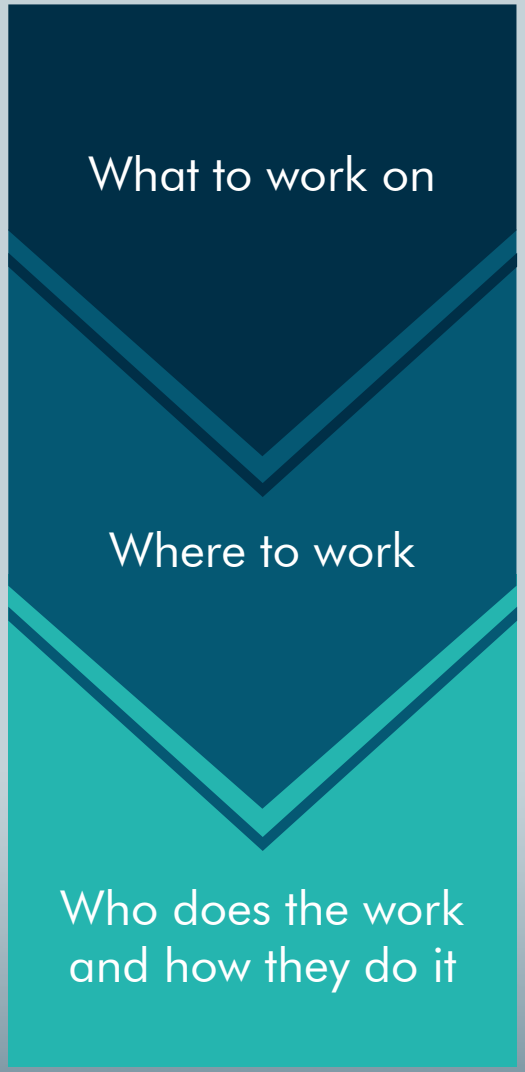
Strategies

- Actionable items to address bacteria reduction for a specific management measure
- Identify priority areas to implement actions supporting the management measure
- List parties responsible for each action and their obligations



Milestones and Schedule

- Measurable goals to reflect progress of strategies
- Implementation schedule details which milestones should be accomplished in the next five years and at what point

Adaptive Management

- Stakeholders periodically assess plan measures for efficiency and effectiveness
- Metrics:
  - Milestones
  - Schedule
  - Water quality data

Management Measures

Strategy Ranking

Reduce stormwater sources such as pet wastes and illegal dumping

Promote safe OSSF use and maintenance

Support land management initiatives

Promote feral hog management

Maintain and improve WWTF and collection system function

Stormwater and Runoff

WHAT

Goal: Reduce stormwater sources of fecal wastes, including pet waste and illegal dumping

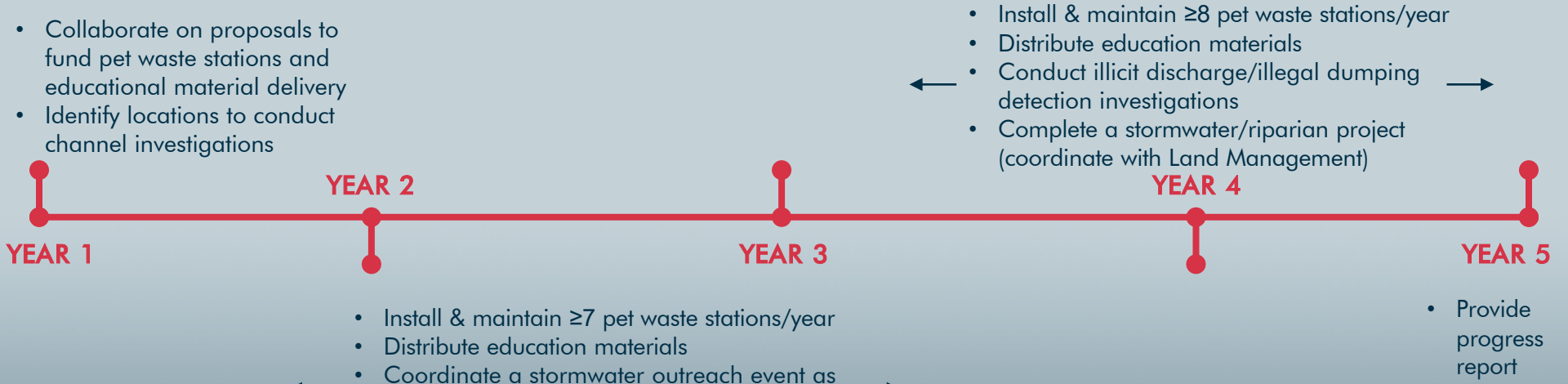
Potential Strategies:
- Educate/engage on appropriate pet waste disposal
- Install and maintain waste bag dispensers and collection stations
- Support control of feral animal population
- Identify and reduce illegal dump sites
- Develop stormwater/riparian demonstration project

WHERE

Priority Areas:
- Developed areas
- Watershed-wide (education)

WHO

Responsible Parties:
- Watershed coordinator
- Local governments
- H-GAC
- Texas A&M AgriLife Extension
- Texas Parks and Wildlife Department



On-Site Sewage Facilities

WHAT

Goal: Reduce fecal waste from failing on-site sewage facilities (OSSFs)

Potential Strategies:
- Educate/engage on appropriate OSSF maintenance
- Support home inspector and homeowner workshops
- Identify resources to repair or replace failing OSSFs
- Where possible, connect to centralized wastewater systems

WHERE

Priority Areas:
- Watershed areas south of I-10

WHO

Responsible Parties:
- Watershed Coordinator
- Authorized Agents
- H-GAC
- Real estate agents
- Texas A&M AgriLife Extension
- Texas General Land Office
- USDA Rural Utilities Service

Land Management

WHAT

Goal: Reduce bacteria loading from livestock and support nutrient reduction initiatives

Potential Strategies:

- Implement best management practices to reduce livestock exposure to waterway
- Support voluntary adoption of water quality management plans (WQMPs) and conservation management plans (CMPs)
- Manage/protect riparian corridors
- Support agricultural and riparian workshops
- Develop stormwater/riparian demonstration project

WHERE

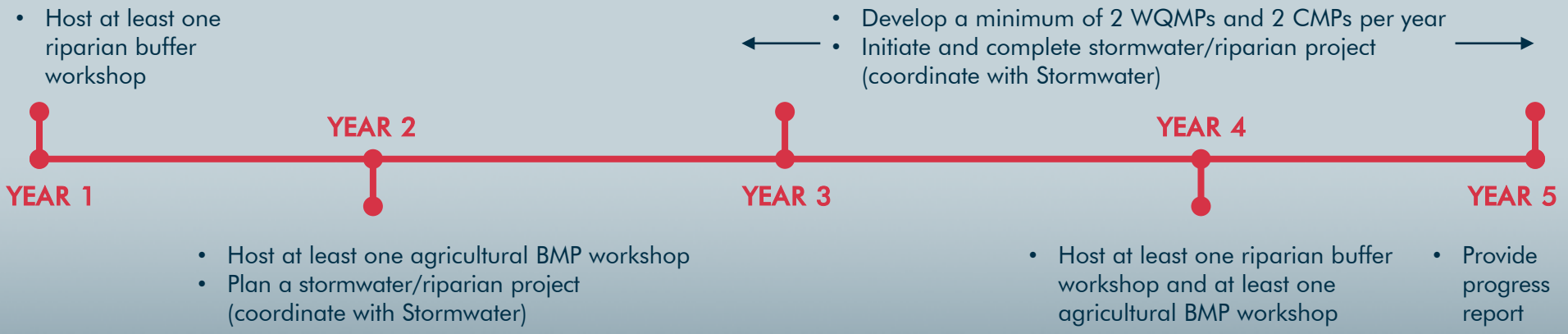
Priority Areas:

- Watershed areas with rural land cover

WHO

Responsible Parties:

- Watershed coordinator
- Landowners and producers
- Texas State Soil and Water Conservation Board
- Natural Resources Conservation Service
- Soil and Water Conservation District
- Texas A&M AgriLife Extension
- Texas Parks and Wildlife Department



Invasive Species

WHAT

Goal: Reduce fecal deposition by feral animal populations, specifically feral hogs

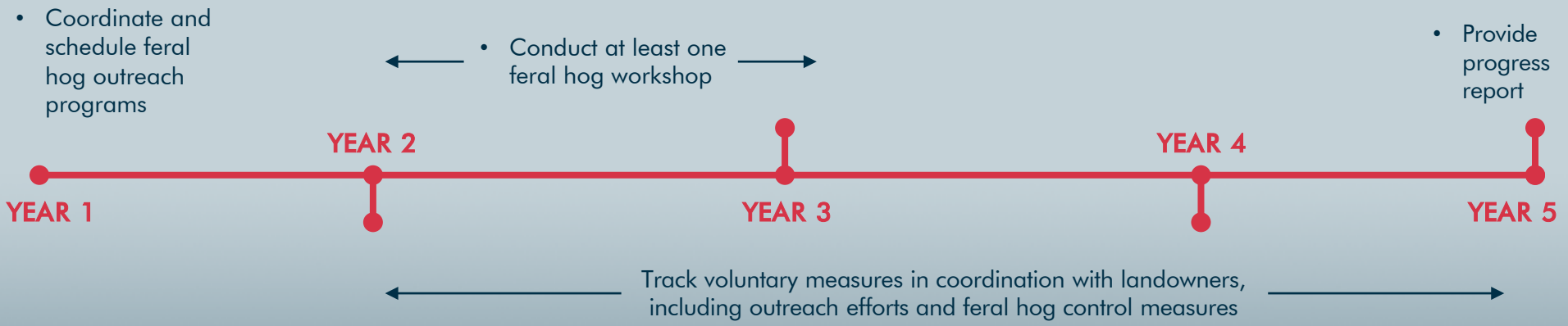
Potential Strategies:
- Manage feral hog population
- Educate/engage on best practices to discourage feral hog utilization of fringe areas

WHERE

Priority Areas:
- Areas of natural land cover (for direct management)
- Watershed-wide (education)

WHO

Responsible Parties:
- Watershed coordinator
- Texas A&M AgriLife Extension



Wastewater Treatment

WHAT

Goal: Develop and implement strategies that reduce fecal waste from wastewater treatment facilities (WWTFs) and sanitary sewer collection systems in priority areas

Potential Strategies:
- Educate/engage on WWTF and collection system maintenance
- Support operator workshops and training programs
- Develop and conduct a fats, oils, grease, and wipes (FOG) prevention campaign

WHERE

Priority Areas:
- Watershed-wide

WHO

Responsible Parties:
- Watershed Coordinator
- Local Governments
- TCEQ
- H-GAC
- Texas A&M Engineering Extension
- USDA Rural Utilities Service
- Water Professional Associations

YEAR 1
- Develop target permittee list

YEAR 2
- Conduct a technical assistance workshop on technology, rules and regulation changes, operation and maintenance, reuse, and program assistance

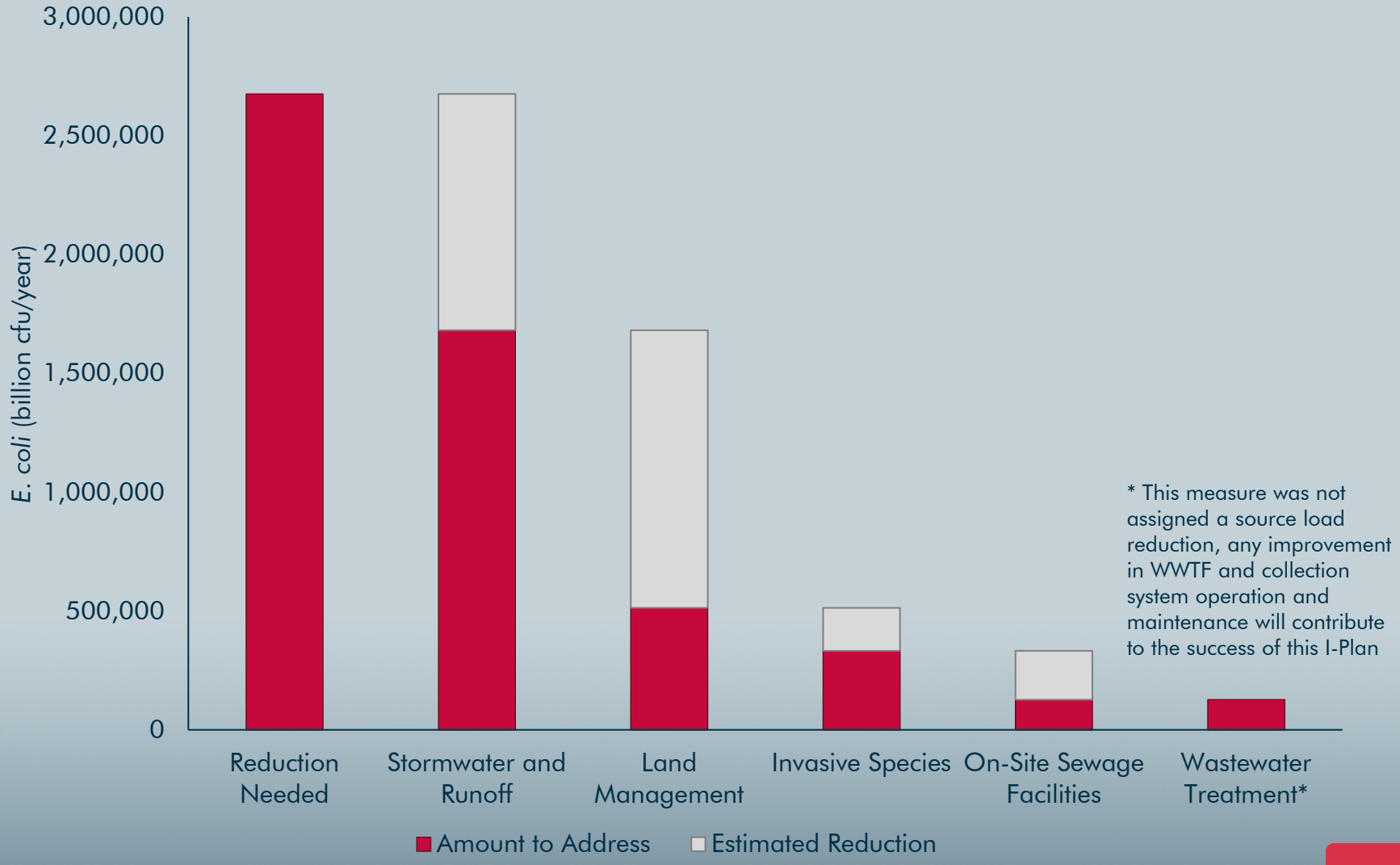
YEAR 3
- Conduct one home and business owner general outreach workshop

YEAR 4
- Conduct a technical assistance workshop on technology, rules and regulation changes, operation and maintenance, reuse, and program assistance

YEAR 5
- Provide progress report

Develop and implement a FOG blockage prevention campaign

Potential Load Reduction



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Project Timeline

Next Steps

- Implementation Plan in review with TCEQ
- Amendment to the TMDL to include Cotton Bayou Above Tidal
- New H-GAC Project Manager, Cornell Evans, Jr.

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Discussion and Questions

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Visit our project website at:

www.h-gac.com/watershed-based-plans/cotton-bayou-tmdl

This project is funded by the Texas Commission on Environmental Quality and facilitated locally by the Houston-Galveston Area Council.

Supplementary Slides

TMDL Calculations

- The TMDL is a calculation of the criterion load at the 95th percentile of flows

- The TMDL includes allocations for regulated and unregulated sources of pollution, future growth, and a 5% margin of safety by calculating the following components:

$$TMDL = MOS + WLA_{wwtf} + WLA_{sw} + LA$$

Margin of Safety (MOS)
5% of the allowable load at 95th percentile of flows

Wasteload Allocation for WWTFs (WLA_{wwtf})
regulated wastewater treatment facility load; includes allocation for future growth

Wasteload Allocation for Stormwater (WLA_{sw})
regulated stormwater load

Load Allocation:
unregulated source load

Cotton Bayou TMDL

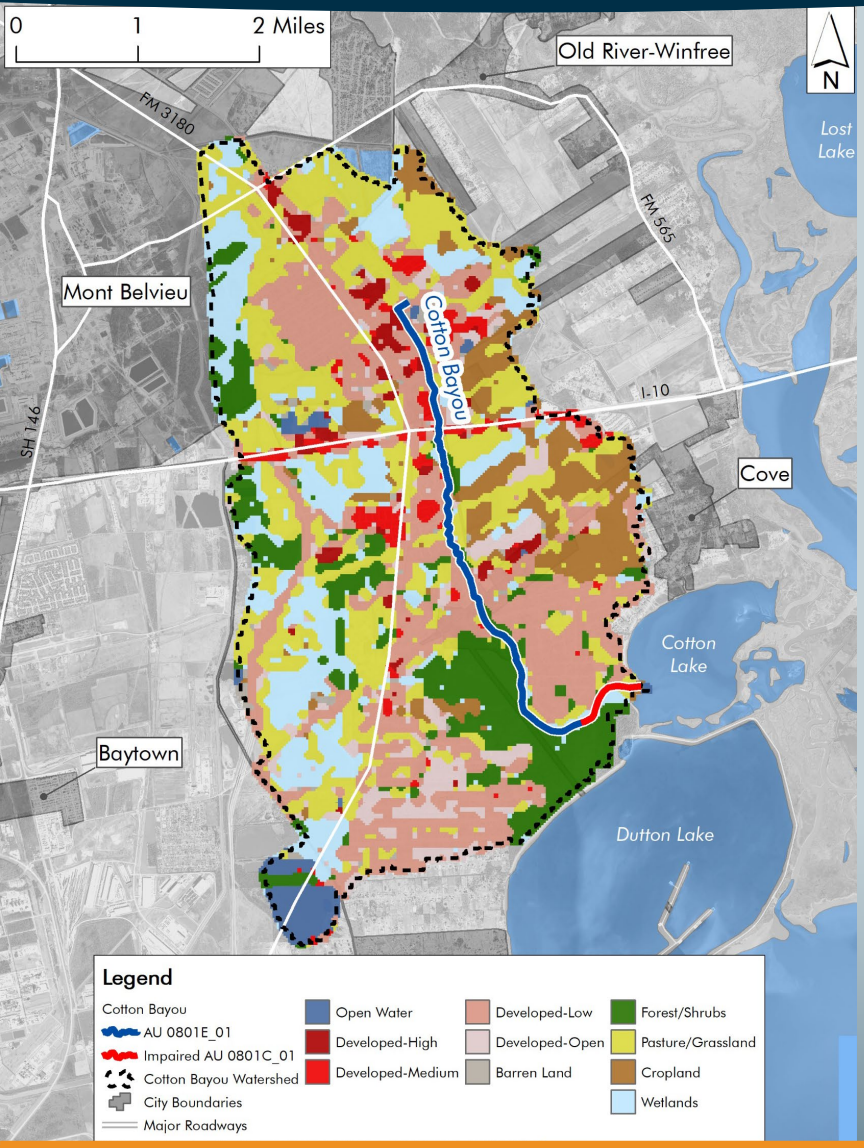
Assessment Unit	TMDL (Total Allowable Load)	MOS (Margin of Safety)	WLA_{wwtf} (includes future growth) (Wastewater Allocation)	WLA_{sw} (Stormwater Allocation)	LA (Other Sources)
0801C_01	89.17	4.46	15.25	24.39	45.07

* Units for all values = billion cfu/day of Enterococci *

Estimating Bacteria Loads

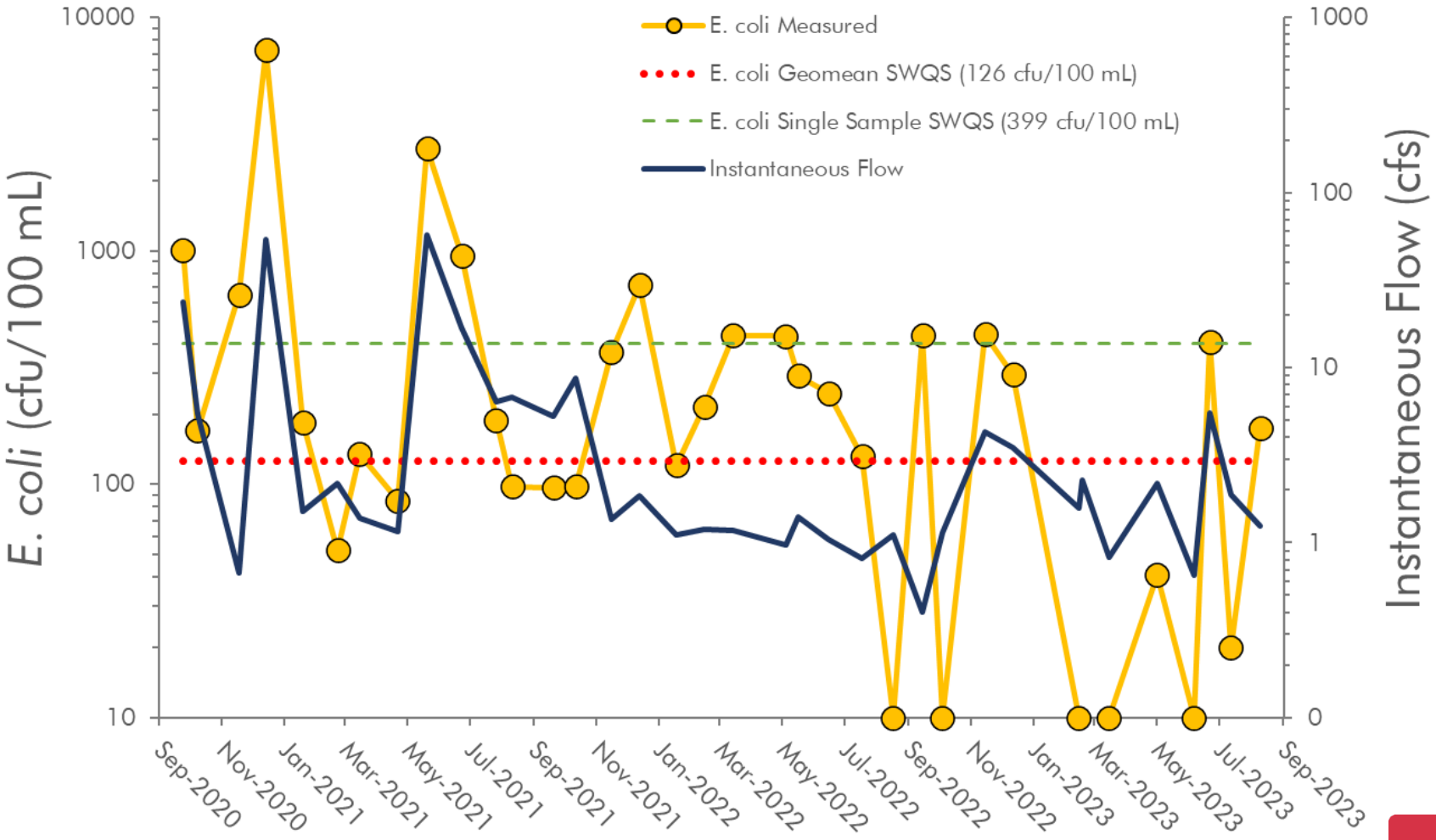
- Most current sources used (2018 or newer)
- No fate and transport considered
- No ground truthing
- No adjustments made for proximity to waterway
- No wildlife estimates beyond deer and invasive feral hogs

Land Cover

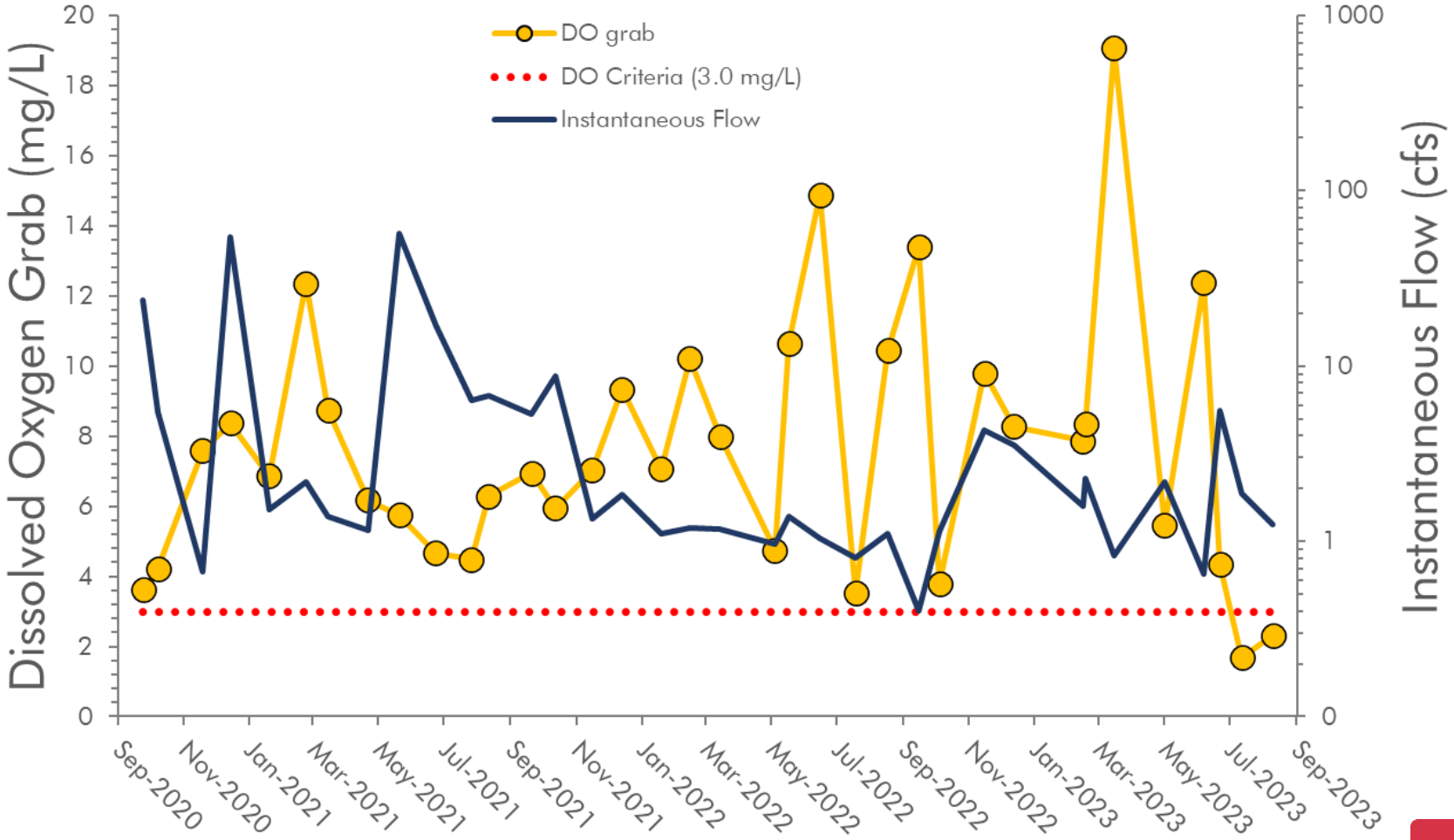


- Based on 2018 imagery
- 10 classes
- Estimated livestock, deer, and feral hogs based on appropriate land cover

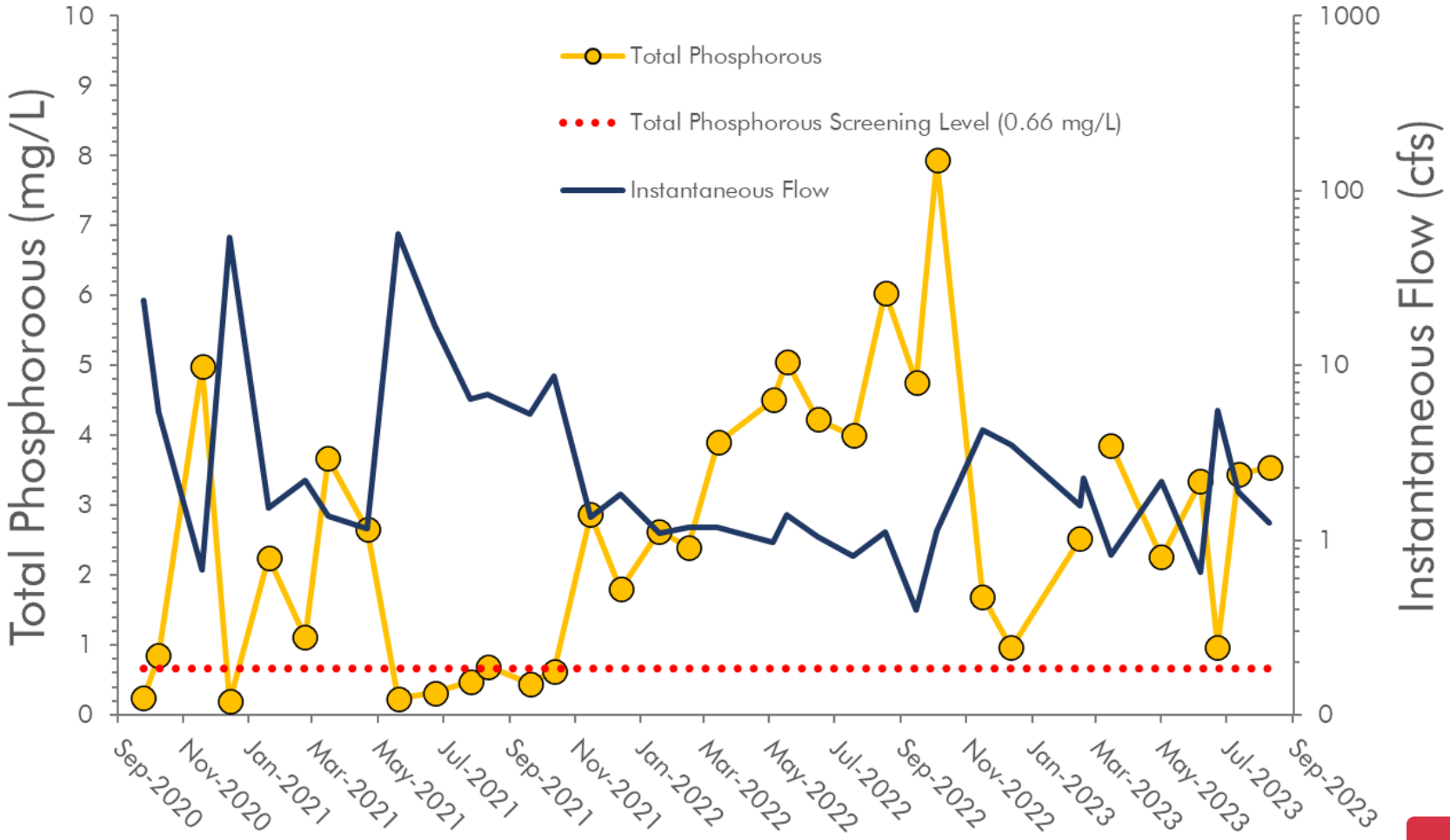
Bacteria at 22232



Dissolved Oxygen at 22232



Total Phosphorous at 22232



Nitrate at 22232