Mid and Lower Cibolo Creek Watershed Meeting Overview

Clare Entwistle
Texas Water Resources Institute

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Topics for Today

- Review of previous meeting & Update on Formation of Steering Committee/Work Groups
- Example WPP
- Watershed Characterization
- Stormwater/Wastewater Update
- Next Steps & Open Discussion

Review of Previous Meeting

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Watershed Waterbodies

- Mid-Lower Cibolo Creek (~92 miles)
- Martinez Creek (~26 miles)
- Salatrillo Creek (~11 miles)
- Clifton Branch (~8 miles)

Summary of Water Quality Conditions

- Ongoing primary contact recreation impairment in Lower Cibolo & Clifton Branch due to *E. coli* bacteria
- Concern in Martinez Creek due to *E. coli* bacteria
- Dissolved Oxygen impairment in Clifton Branch, improving DO in Mid Cibolo Creek
- Nutrient concerns based on TCEQ screening levels in the Mid Cibolo, portion of Lower Cibolo, Martinez Creek, and Salatrillo Creek

What is a Watershed Protection Plan?

- Watershed Protection Plans (WPP) address complex water quality issues across multiple jurisdictions
- The goal is to improve, restore or maintain good water quality within a particular watershed
- WPPs are tools to better leverage the resources of local governments, state and federal agencies, and non governmental organizations
- WPPs are a voluntary, proactive approach to integrating activities and prioritizing BMP implementation

Major Tasks for Stakeholders

- Provide guidance and input on potential sources of bacteria and nutrients and estimated pollutant loads
- Set goals and objectives
- Guide identification of measures that could be implemented to address bacteria
- Identify outreach and education that is needed
- Oversee development of an implementation plan & schedule

Level of Participation

- Coordination/Steering Committee – A decision making body made up of stakeholders from diverse interest/backgrounds

  Meetings once a month between WG and Committee

- Stakeholder Group – The general body of individuals who participate in public meetings
- Workgroup – Groups made up of stakeholders of a similar interest/background

  Meetings once a month between WG and Committee Meetings

- Technical Advisory Group – Consisting of state and federal agencies with water quality responsibilities.

  1-2 Additional meetings; participate in WG and Committee Meetings

Steering Committee Representation

- Cibolo Creek Municipal Authority
- Landowners – Marion and Stockdale
- Guadalupe Farm Bureau
- City of Marion
- City of Schertz
- AgriLife Extension – Guadalupe and Wilson Counties
- Guadalupe County Commissioner
- San Antonio River Authority
- Local SWCDs

Ideas of areas that still need to be represented:

- City of La Vernia, Stockdale, Universal City
- County Commissioners – Wilson, Karnes, Bexar
- Randolph AFB
- GBRA
- Local GCDs
- City Urban Planning/Public Works Department
- Landowners/Homeowners/Citizens: Representing Karnes County, Bexar County

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Possible Work Groups

Suggested Work Groups:

- Urban (2)
- Agricultural (12)
- Wastewater (7)

Example Watershed Protection Plan

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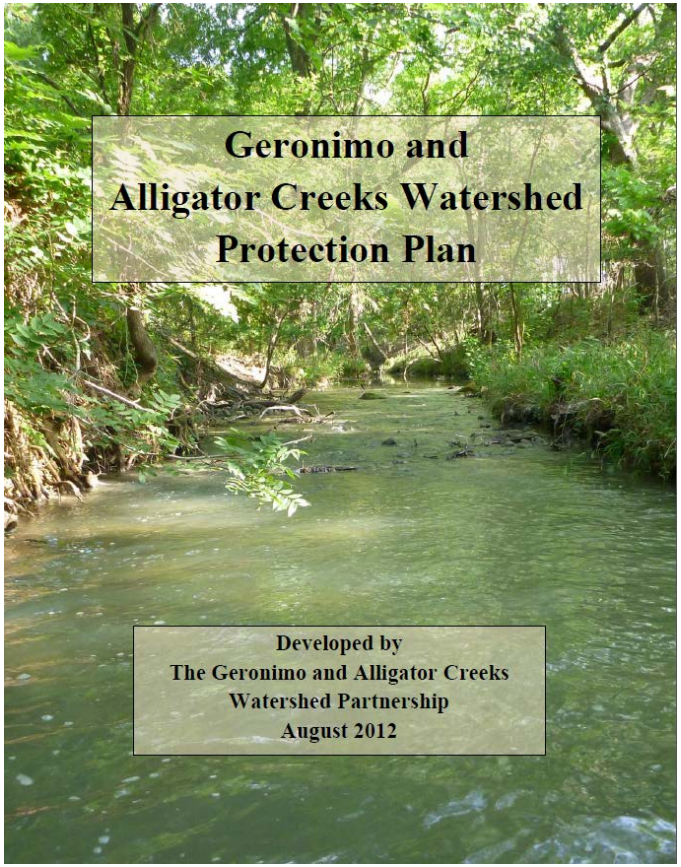
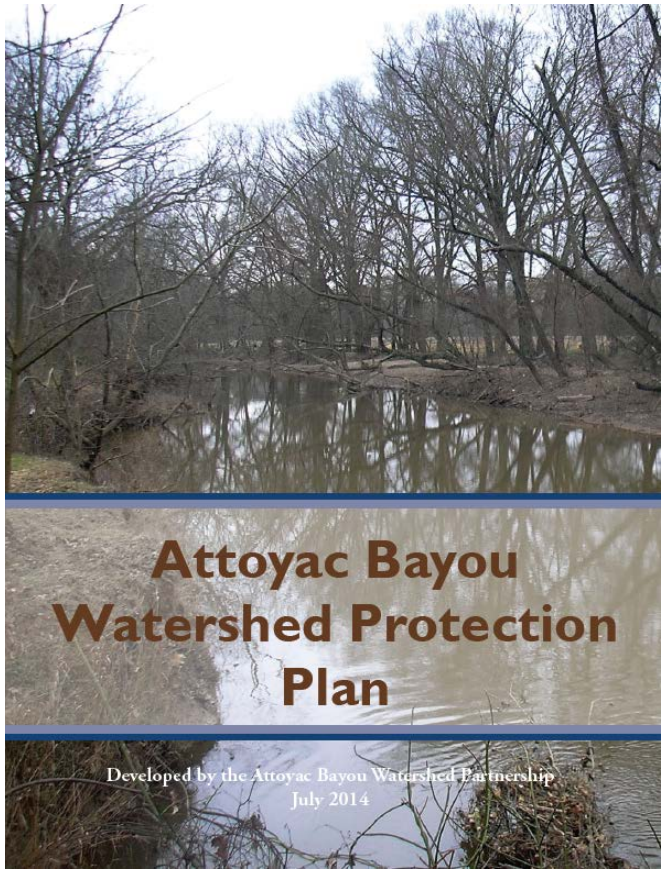
Key Elements of Watershed Plans

- Identification of Sources of Bacteria
- Estimated Loading Reductions Needed
- Description of Management Measures
- Education and Outreach Needed
- Schedule for Implementation
- Implementation Milestones
- Possible Sources of Financial Assistance and Estimated Costs
- Measures of Success (i.e. indicators to measure reductions)
- Monitoring plan to evaluate effectiveness

Example Watershed-Based Plans





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- Problem Statement/ Statement of Purpose:
  - Water quality monitoring has indicated the fecal indicator bacteria levels are often above the state's water quality standard for contact recreation and have elevated nitrate-nitrogen levels. In 2008, Geronimo Creek was listed on the state's 303(d) impaired water bodies list.
  - Identify stakeholders – any individual directly or indirectly affected by activities implemented to protect water quality.
  - It is a starting point to focus restoration efforts and enable financial and technical assistance to facilitate improvements in Geronimo and Alligator Creeks.

Document overview/ Executive Summary:

- Overview of watershed
- Development of Steering Committee and Workgroups to develop plan
  - Identified pollutant sources
  - Reductions in pollutants to meet standards
  - Identification of Management Measures
- Documented needed education and outreach
- Established how we will track progress through water quality monitoring and interim milestones
- Set a goal of improving and protecting water quality in Geronimo and Alligator Creeks.

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Chapter 1 – Watershed Management

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Chapter 1 – Watershed Management

- Watershed definition
- Watersheds and water quality
- Benefits of watershed approach
- Watershed-based planning
- Adaptive management

Definition of a Watershed

A watershed is the land area that drains to a common waterway such as a stream, lake, estuary, wetland or, ultimately, the ocean. All land surfaces on Earth are included in a watershed; some are very small while others encompass large portions of nations or continents. For example, many smaller watersheds, or sub-watersheds, combine to form the Attoyac Bayou watershed, which is actually a small part of the Neches River Basin.

A Watershed's Impacts on Water Quality

All activities, both human and natural, that occur within the boundaries of a watershed have the potential to influence water quality in the receiving water body. As a result, an effective management strategy that addresses water quality issues in a watershed's receiving water body must examine all human activities and natural processes within that watershed.

The Watershed Approach

The Watershed Approach is "a flexible framework for managing water resource quality and quantity within a specified drainage area or watershed. This approach includes engaging stakeholders to make management decisions supported by sound science and appropriate technology" (USEPA 2008). The Watershed Approach is based on the following principles:

- geographic focus based on hydrology rather than political boundaries;
- water quality objectives based on scientific data;
- coordinated priorities and integrated solutions; and,
- diverse, well-integrated partnerships.

A watershed's boundaries often cross municipal, county and state boundaries, because they are determined by the landscape. Using the Watershed Approach, all potential sources of pollution entering a waterway can be addressed through the process by all potential watershed stakeholders.

A stakeholder is anyone who lives, works or has an interest within the watershed or may be affected by decisions; stakeholders can include individuals, groups, organizations or agencies. Stakeholder involvement is critical for effectively employing a holistic approach to watershed management that adequately addresses all watershed concerns.

Watershed Protection Plan (WPP) Development Process

WPPs are locally driven mechanisms for voluntarily addressing complex water quality problems that cross multiple jurisdictions. WPPs are coordinated frameworks for implementing prioritized water quality protection and restoration strategies driven by environmental objectives. Through the development process, stakeholders are encouraged to holistically address all of the sources and causes of impairments and threats to both surface water and groundwater resources within a watershed. To help ensure that plans developed will effectively address water quality issues when implemented, the U.S. Environmental Protection Agency (USEPA) has established nine key elements that it deems critical for achieving water quality improvements. These elements are listed and defined in Appendix A.

WPPs serve as tools to better leverage the resources of local governments, state and federal agencies and non-governmental organizations. WPPs integrate activities and prioritize implementation projects based upon technical merit and benefits to the watershed, promote a unified approach to seeking funding for implementation and create a coordinated public communication and education program. Developed and implemented through diverse, well-integrated partnerships, a WPP assures the long-term health of the watershed with solutions that are socially acceptable, economically viable and achieve environmental goals for water resources. Adaptive management is used to modify the WPP based on an on-going, science-based process that involves monitoring and evaluating strategies and incorporates new knowledge into decision making.

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Chapter 2 – Watershed Characterization

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Overview

- Describes the current conditions of the watershed
- Developed through state and federal data resources and local stakeholder knowledge
- This information is used throughout the plan to identify pollution loadings, management measures, and prioritize critical areas.

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Chapter 2 – Watershed Characterization

- Watershed boundaries
- Topography
- Soils
- Climate
- Ecoregions
- Land Use / Land Cover
- Permitted Discharges
- Surface & Groundwater Resources
- Water quality

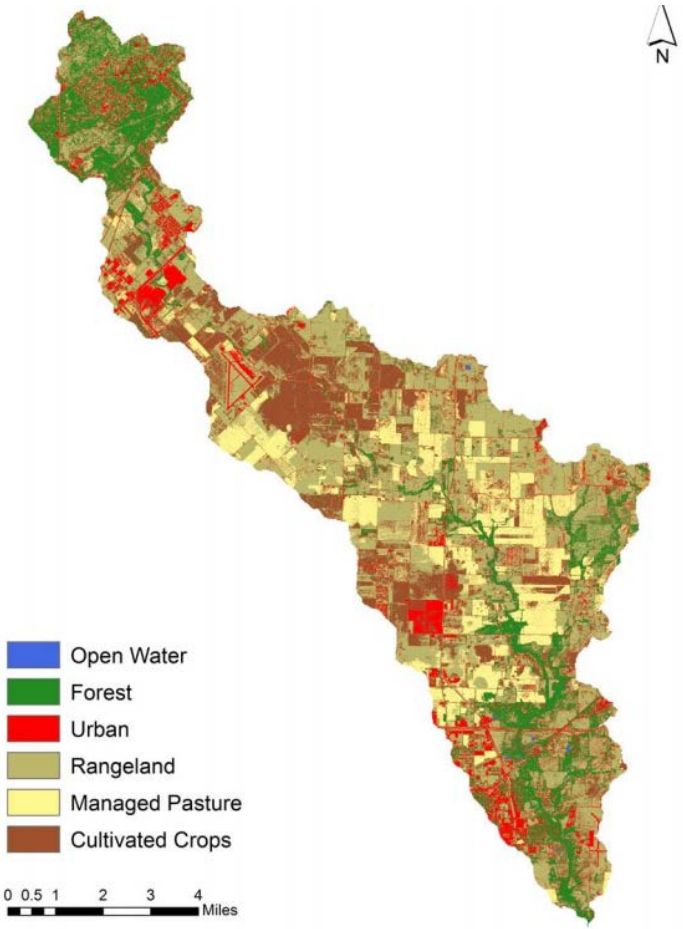

Figure 4.2. Geronimo and Alligator Creeks Watershed land use map.

Chapter 3 -
Pollutant Loads and Sources

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Introduction – Chapter 3

- Estimate of Needed Load Reductions
  - How much and when

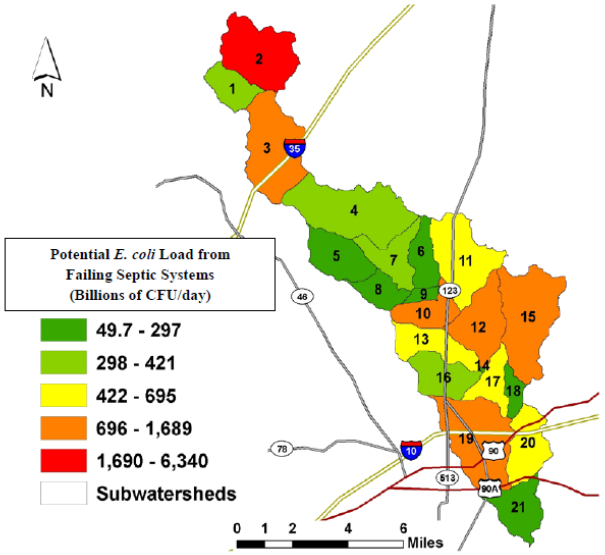
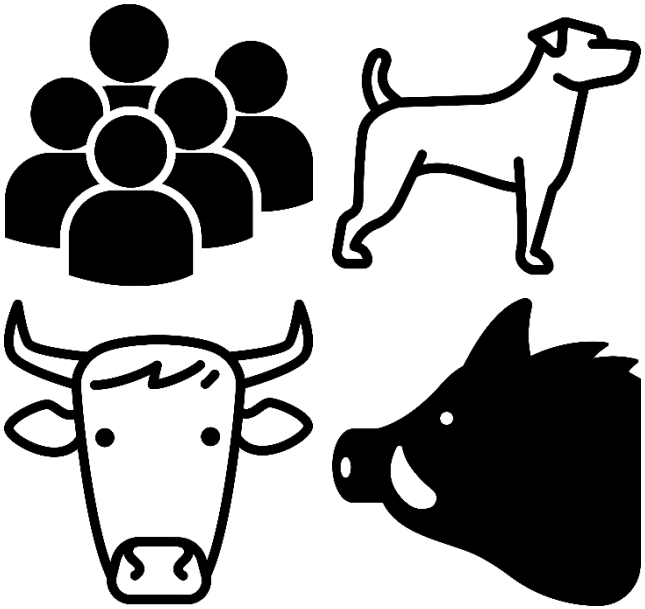


Figure 5.6. Average daily potential *E. coli* load from failing septic systems by subwatershed.

- Estimating Pollutant Source Loads
  - What and where



Images: Freepik from flaticon.com

Needed Load Reduction

Table 5.3 *E. coli* loads and reductions needed to meet the water quality goal at station 16398

Flow Condition	% of Time Flow Exceeds	Daily Loading (cfu/day)	Annual Loading (cfu/year)	% Reduc-tion Needed to Meet Goal	Needed Annual Load Reduction (cfu/year)
High Flows	0-10%	6.54E+12	2.39E+15	49%	1.57E+15
Moist Conditions	10-40%	2.57E+13	9.39E+15	*	*
Mid-range Conditions	40-60%	6.37E+12	2.33E+15	*	*
Dry Conditions	60-90%	5.07E+10	1.85E+13	*	*
Low Flows	90-100%	1.51E+10	5.52E+12	*	*

*Condition meets water quality goal and no reduction is needed

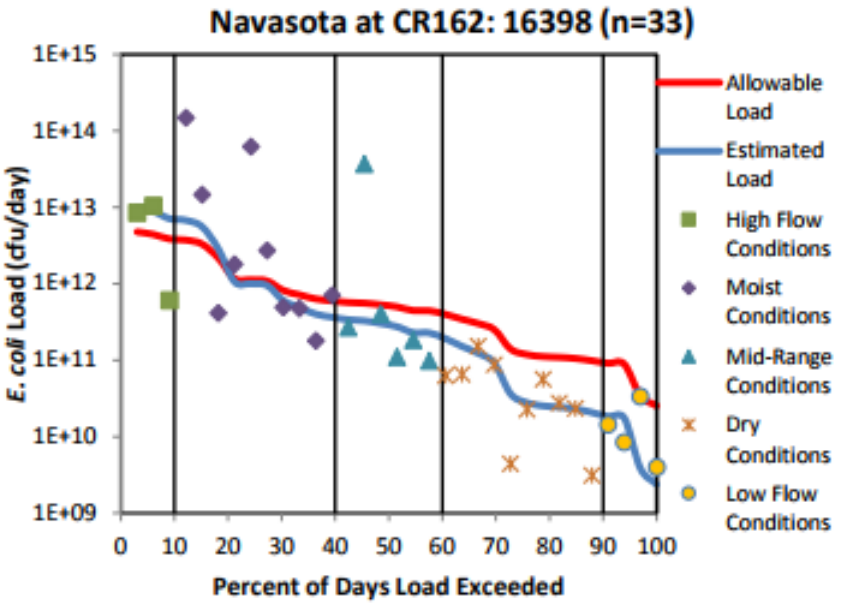
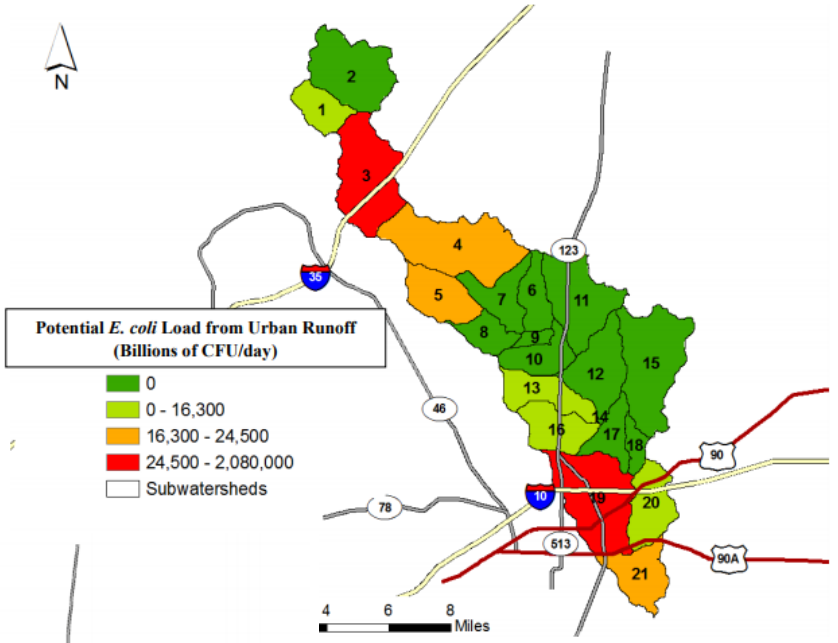


Figure 5.3 *E. coli* LDC at station 16398 for monitored flow regimes

Estimating Pollutant Source Loads

- Estimates maximum *potential* loading
- Does not account for deposition, fate, or transport processes
- Informs the types of management measures that would be effective and where in a watershed to focus those efforts



coli load from urban runoff by subwatershed.

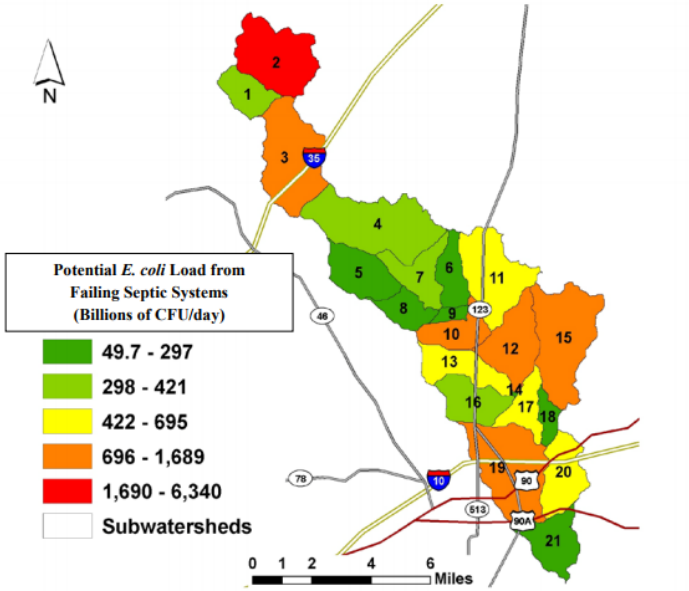


Figure 5.6. Average daily potential *E. coli* load from failing septic systems by subwatershed.

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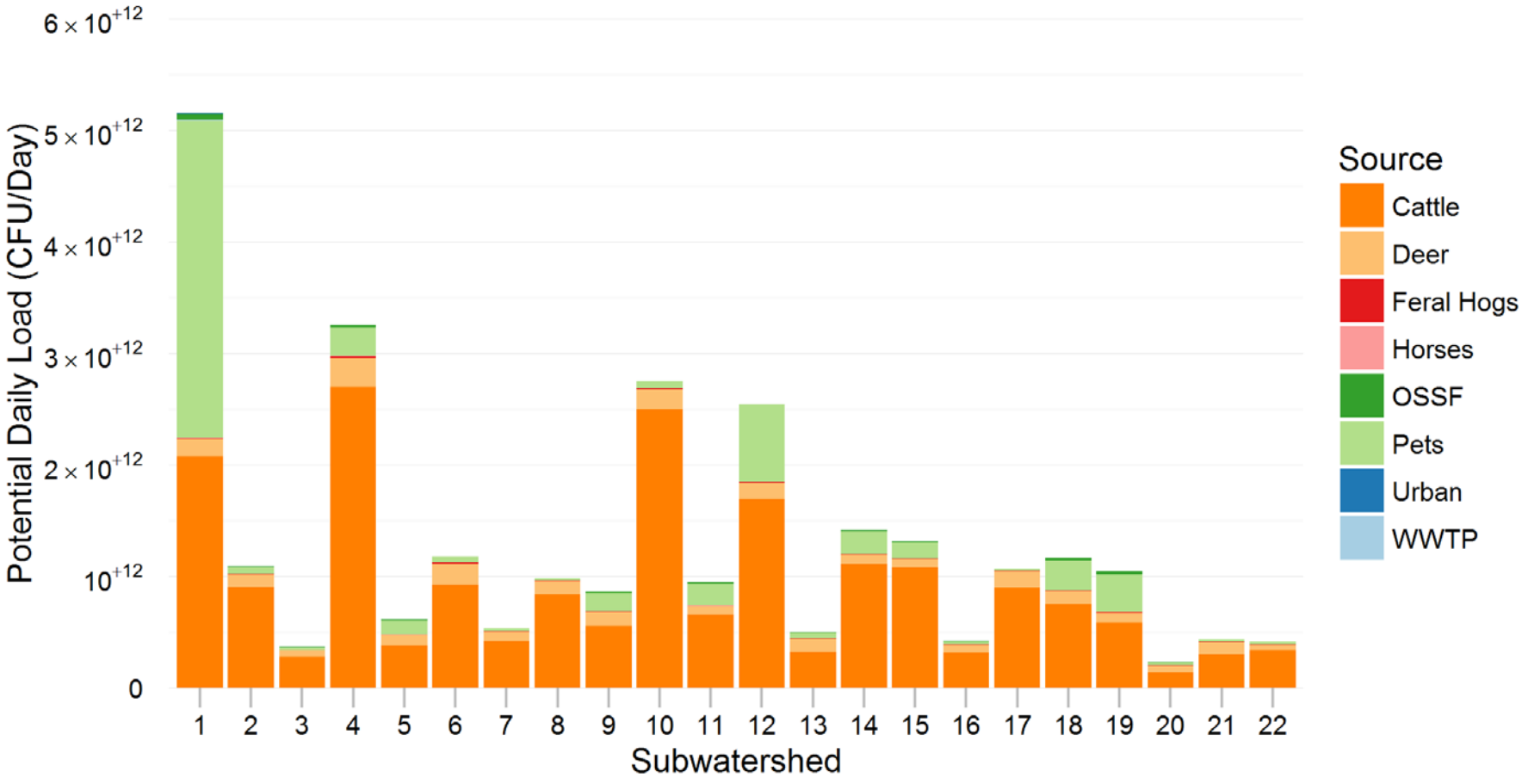
Estimating Pollutant Source Loads



Chapter 4 – WPP Management Measures

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Purpose of Management Measures

- Proposed primarily to address causes and sources of impairments in the watershed identified in earlier chapters
- All measures are voluntary
- Heavy focus on public outreach and education
- Also consist of:
  - Problem statement
  - Objective
  - Priority areas
  - Description
  - Load reduction
  - Potential funding sources

Table 8.1. Jurisdiction, implementation milestones, and estimated financial cost for management measures.

Management Measure	Jurisdiction	Unit Cost	Number Implemented Year			Total Cost
			1-3	4-6	7-10	
Urban Stormwater Management Measures						
Pet Waste Collection Stations	City of New Braunfels	$620/station $85 annual/station	6	3	3	$14,325
Pet Waste Collection Stations	City of Seguin	$620/station $85 annual/station	5	2	2	$10,935
Initiate Spay/Neuter Program	City of New Braunfels	$35,000	1	---	---	$35,000

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Management Measures

- Agricultural
  - Develop conservation plans
- Wildlife and Non-Domestic Animals
  - Remove feral hogs
- On-site Sewage Facility
  - Replace failing systems
- Illegal Dumping
  - Reduce illegal dumping
- Urban
  - Stormwater planning and management
  - Structural measures
  - Pet waste programs
- Wastewater Treatment Facility
  - Wastewater reuse
- Sanitary Sewer Overflow
  - Infrastructure maintenance and replacement

Education and Outreach

- The Watershed Coordinator
- Public Meetings
- Future Stakeholder Engagement
- Education Program
  - Feral Hog Management Workshops
  - Lone Star Healthy Streams
  - OSSF Operation and Maintenance
  - Texas Well Owner Network
  - Riparian Education
  - Wildlife Management
- Public Meetings
- Newsletters and News Releases

Chapter 5 – Sources for Watershed Protection Plan Implementation

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Chapter 5

TECHNICAL ASSISTANCE

Successful implementation of the Geronimo and Alligator Creeks Watershed Protection Plan relies on active engagement of local stakeholders, but also will require support and assistance from a variety of other sources. The technical expertise, equipment, and manpower required for many management measures are beyond the capacity of the local stakeholders alone. As a result, direct support from one or a combination of several entities will be essential to achieve water quality goals in the watershed. Focused and continued implementation of key restoration measures will require the creation of multiple full-time equivalent positions in the watershed to coordinate and provide technical assistance to stakeholders.

Management Measure	Technical Assistance
MM- 1:- Develop- and- implement- conservation- plans- in- priority- areas- of- the- watershed	TSSWCB,-Texas-AgriLife,-NRCS,-and-TPWD
MM- 2:- Explore- Feasibility- of- Altering- Tax- Exemption- Requirements- for- Small- Acreage- Landowners	Texas- Comptroller- of- Public- Accounts- office- to- ensure- that- all- requirements- of-the-tax-code-have-been-met
MM- 3:- Promote- the- Management- of- and- Control-Feral-Hog-Populations	Texas-A&M-AgriLife-Extension-Service-¶ Texas-Wildlife-Services
MM- 4:- Promote- the- Reduction- of- Illicit- Dumping- and- Proper- Disposal- of- Animal- Carcasses	Texas-A&M-AgriLife-County-Extension-Agents¶ TCEQ-Region-14¶ TCEQ-Small-Business-and-Local-Government-Assistance-Program
MM- 5:- Identify- OSSFs,- Prioritize- Problem- Areas,- and- Systematically- Work- to- Bring- Failing-Systems-into-Compliance	TCEQ-Region-14-¶ TCEQ-Small-Business-and-Local-Government-Assistance-Program
MM- 6:- Promote- the- Improved- Quality- of- and- Management- of-Urban-Stormwater	TCEQ-Region-14
MM- 7:- Coordinate- Efforts- to- Reduce- Unauthorized-Discharges	TCEQ-Region-14
MM- 8:- *Reduce- WWTF- Contributions- by- Meeting-Half-of-the-Permitted-Bacteria-Limit*	TCEQ,-TEEX
MM-9:- *Monitoring-of-WWTF-Effluent-to-Ensure-Permit-Compliance*	TCEQ-permit-compliance-assistance¶ TEEX—WWTF-operation-and-maintenance¶ TRWA—sample-collection-and-handling¶ Private-Engineering-firms—general-civil-engineering-services
MM-10:- *Improve-and-Upgrade-WWTFs*	TCEQ-permit-compliance-assistance¶ TEEX—WWTF-operation-and-maintenance¶ TRWA¶ Private-Engineering-firms—general-civil-engineering-services

Management Measure	Financial Assistance Program
MM- 1:- Develop- and- implement- conservation- plans- in- priority- areas- of- the- watershed	Agricultural-Conservation-Easement-Program-(ACEP)¶ Agricultural-Food-Research-Initiative-Competitive-Fellowship-Grants-Program¶ Coastal-Wetlands-Conservation-Grants¶ Coastal-Zone-Management-Administration-(CZMA)-Awards¶ Conservation-Innovation-Grants¶ Conservation-Stewardship-Program-(CSP)¶ Environmental-Education-Grants¶ Environmental-Quality-Incentives-Program-(EQIP)¶ Farm-Business-Management-and-Benchmarking-(FBMB)-Program¶ Federal-and-State-CWA-§319(h)-Grants-(USEPA/TCEQ/TSSWCB)¶ Integrated-Programs¶ National-Integrated-Water-Quality-Program-(NIWQP)¶ Regional-Conservation-Partnership-Program-(RCPP)¶ Sustainable-Agriculture-Research-&-Education-(SARE)¶ Targeted-Watershed-Grants-Program
MM-2:- Explore- Feasibility- of- Altering- Tax- Exemption- Requirements- for- Small- Acreage- Landowners	State-CWA-§319(h)-Grants-(TCEQ/TSSWCB)
MM- 3:- Promote- the- Management- of- and- Control-Feral-Hog-Populations	State-CWA-§319(h)-Grants-(TSSWCB)-or-other-available-opportunities.Texas-Department-of-Agriculture-(TDA)¶ Texas-Wildlife-Services
MM- 4:- Promote- the- Reduction- of- Illicit- Dumping- and- Proper- Disposal- of- Animal- Carcasses	State-CWA-§319(h)-Grants-(TCEQ/TSSWCB)¶ USDA-Rural-Utilities-Service-Water-and-Waste-Disposal-Loans-and-Grants
MM-5:- Identify- OSSFs,- Prioritize- Problem- Areas,- and- Systematically- Work- to- Bring- Failing-Systems-into-Compliance	Coastal-Impact-Assistance-Program-(CIAP)¶ Coastal-Management-Program-(CMP)-and-National-Coastal-Zone-Management-Program-(CZM)¶ State-CWA-§319(h)-grants-(TCEQ)
MM-6:- Promote- the- Improved- Quality- of- and- Management- of-Urban-Stormwater	Clean-Water-State-Revolving-Fund-(CWSRF)¶ Environmental-Education-Grants¶ State-CWA-§319(h)-Grants-(TCEQ)¶ Urban-Water-Small-Grants
MM- 7:- Coordinate- Efforts- to- Reduce- Unauthorized-Discharges	Clean-Water-State-Revolving-Fund-(CWSRF)¶ Economically-Distressed-Areas-Program-(EDAP)¶ Water-and-Waste-Disposal-Loans-and-Grants
MM- 8:- *Reduce- WWTF- Contributions- by- Meeting- Half- of- the- Permitted- Bacteria- Limit*	Clean-Water-State-Revolving-Fund-(CWSRF)¶ Economically-Distressed-Areas-Program-(EDAP)¶ Water-and-Waste-Disposal-Loans-and-Grants
MM- 9:- *Monitoring- of- WWTF- Effluent- to- Ensure-Permit-Compliance*	Clean-Water-State-Revolving-Fund-(CWSRF)¶ Economically-Distressed-Areas-Program-(EDAP)¶ Water-and-Waste-Disposal-Loans-and-Grants
MM-10:- *Improve-and-Upgrade-WWTFs*	Clean-Water-State-Revolving-Fund-(CWSRF)¶ Economically-Distressed-Areas-Program-(EDAP)¶ Existing-local-funding-for-wastewater-improvements¶ Water-and-Waste-Disposal-Loans-and-Grants

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Chapter 6 – Measures of Success

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Water Quality Targets

- Monitoring and Water Quality Targets
  - Interim Measurable Milestones
- Adaptive Management

Measures of Success Continued

- Additional Data Collection Needs
  - Additional monitoring data at index site from quarterly to monthly

- Data Review
  - Evaluate collected data
  - Participate in annual Clean Rivers Program meeting
  - Discuss adaptive management

Questions?

Clare Entwistle
Texas Water Resources Institute
210-277-0292 ext 110
clare.entwistle@ag.tamu.edu

Patty Carvajal
San Antonio River Authority
pmcarvajal@sara-tx.org

Michael Schramm
Texas Water Resources Institute
979-458-9191
michael.schramm@ag.tamu.edu

Lucas Gregory, PhD
Texas Water Resources Institute
lfgregory@ag.tamu.edu

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