The Mill Creek Partnership: January meeting recap

Galen Roberts

Texas A&M AgriLife Extension Service

Mill Creek
February 23, 2015

Recap from January meeting

- Affirmed Steering Committee Membership.
- Discussed Ground Rules for Partnership.
- Reviewed sections 1-2 of the Mill Creek WPP.
- Discussed future meeting dates and times.

Mill Creek Steering Committee

- The Mill Creek Steering Committee is the decision making body for the Partnership.
- The goal of the Steering Committee is to affirm the consensus of the Partnership and facilitate the development and implementation of a Watershed Protection Plan (WPP) for Mill Creek.

Affiliation	Name
Austin County	Robert 'Bobby' Rinn
Austin County Env.	David Ottmer
Washington County	Luther Hueske
Washington County Env.	Mark Marzahn
City of Bellville	Arlie Kendrick/Shawn Jackson
City of Burton	Peggy Felder
City of Industry	Charlie Tallerine
Austin County SWCD	Kenneth Blezinger
Washington County SWCD	Ronnie Shulte/Ray Thaler
Mill Creek Drainage District/Realty	J. Frank Monk
Landowner/Ag Producer	Doug Albrecht
Landowner/Ag Producer	Robert Luedeker
Landowner/Ag Producer	George Dillingham
Landowner/Ag Producer	Doug Marek
Local Resident	James Elam
Local Resident	Ben Mayberry
Local Resident	Greg Plate
Business/Industry/Realty	Ric Flores
Wildlife/Educator	Dr. Bill Eikenhorst/William Amelang

Partnership Ground Rules

Ground Rules for the Mill Creek Watershed Partnership are intended to address:

- Role of Steering Committee
- Time frame for project
- Size and function of Steering Committee
- Replacements, additions, alternates, and proxies
- Decision making process

Draft Section 1

Watershed Management:

- Watersheds and water quality
- Benefits of a watershed approach
- Watershed protection planning

Draft Section 2

Watershed Characteristics:

- Water Resources
- Water Quality
- Geography
- Climate
- Soils
- Land use
- Ecology
- History

Draft Section 3

The Mill Creek Partnership:

- Partnership formation
- Public meetings
- Partnership structure
- Ground rules
- Technical advisory group

Discussion & Questions

- Partnership and Steering Committee.
- Ground Rules.
- Draft sections 1-3.

Outline of the Mill Creek Watershed Protection Plan

Galen Roberts

Texas A&M AgriLife Extension Service

Mill Creek
January 26, 2015

4 Steps of Watershed Planning

1. Establish a "Partnership"
2. Prepare a Watershed Protection Plan
   - Characterize the watershed
   - Establish goals and strategies
   - Develop an implementation strategy
3. Implement the Watershed Plan
4. Measure Progress and Make Adjustments

All of which rely heavily on local stakeholder input and participation

Major Tasks

- Gather and analyze data
- Identify pollutant sources
- Estimate pollutant loads
- Set goals and objectives
- Identify BMPs to reduce pollution
- Identify outreach and education needs
- Develop an implementation schedule

Mill Creek WPP Outline

1. Watershed Management
2. Overview of the Watershed
3. The Mill Creek Partnership

January

4. Methods of Analysis
5. Pollutant Source Assessment

February

6. Management Measures
7. Measures of Success
8. Project Implementation

March-May

How Much Pollutant Load Reduction is Needed?

Galen Roberts

Texas A&M AgriLife Extension Service

Mill Creek
January 26, 2015

Margin of Safety

1. The contact recreation standard for bacteria is 126 cfu/100mL.
2. Typically a 10% margin of safety is applied which would make our target 113 cfu/100mL.

Determining Pollutant Reduction

- Simple Math Approach:
  - Mill Creek bacteria geomean is 192 cfu/100mL and our goal is 113 cfu/100mL.
  - A 41% reduction is needed to meet our target.
- Load Duration Curve (LDC)
  - Visual representation of pollutant loadings under different flow conditions.
  - Uses regression analysis to determine how much pollutant reduction is needed to meet WQ standards.

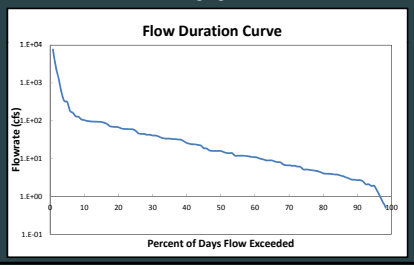
LDC Analysis

1. Use stream gage data to plot stream discharge (*Flow Duration Curve*); then
2. Multiply by water quality data concentration to create a Load Duration Curve

Stream discharge (cfs) ✖ Bacteria Concentration (cfu/mL) = Bacteria Load (cfu/day)

LDC Analysis

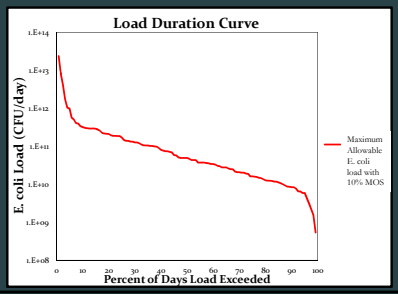
- Flow Duration Curve: used to determine high, medium, and low flow regimes.
  - Utilizes USGS stream gage data at SH-36/Mill Creek



LDC Analysis

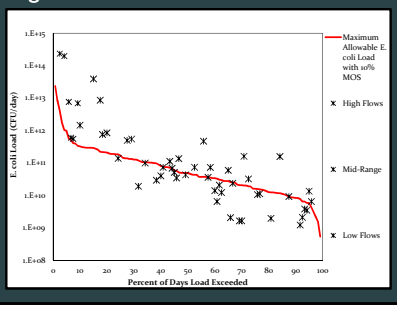
- Determine maximum allowable load at each flow.

Flow ✖ 113 cfu/100mL = Max Allowable Load



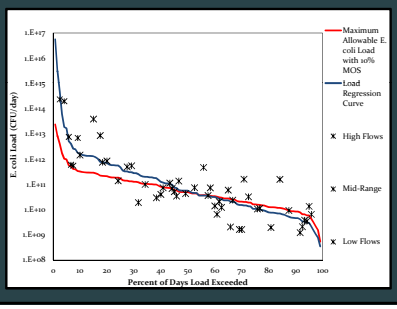
LDC Analysis

- Multiply flow data by WQ data to plot bacteria loading.



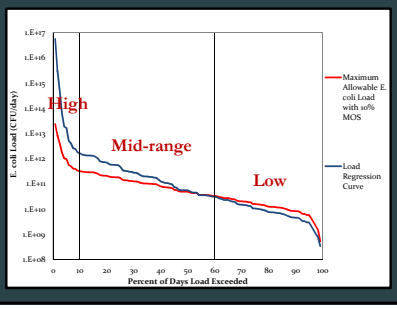
LDC Analysis

- Use regression analysis to plot best fit line for bacteria loads.



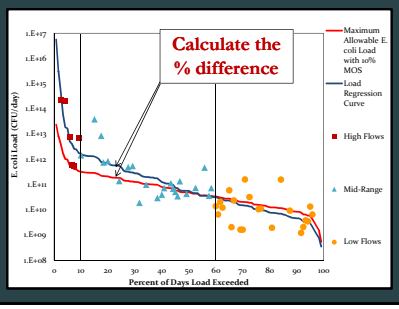
LDC Analysis

- Determine High, Mid-range, and Low Flow regimes.



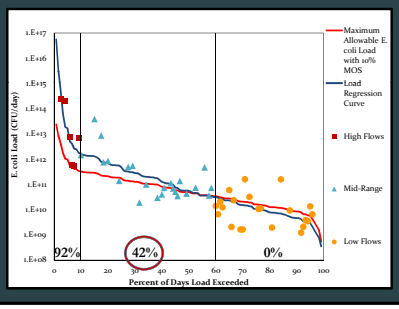
LDC Analysis

- Calculate the average percent reduction needed for each flow regime.



LDC Results

- A 42% reduction at Mid-range flows is needed.



Discussion of LDC Analysis & Results

- Analytical assumptions:
  - 10% margin of safety is applied to LDC analysis.
  - Contact recreation peaks during mid-range flows.
- Interpretation of results:
  - 42% reduction is needed at mid-range flows.
  - Nonpoint sources are the primary cause of impairment.

Pollutant Source Assessment

Galen Roberts

Texas A&M AgriLife Extension Service

Mill Creek
January 26, 2015

Pollutant Source Assessment

- Identify potential sources of pollution.
- Estimate number and distribution of pollutant sources.
- Determine potential impact of pollutant sources on in-stream water quality.

Pollutant Source Identification

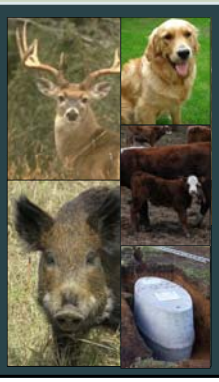
Potential Sources	Bacteria	Nutrients	Other
Humans & domestic			
Septic Systems	X	X	X
Dogs	X	X	
Livestock			
Cattle	X	X	
Horses	X	X	
Goats	X	X	
Sheep	X	X	
Domestic Hogs	X	X	
Wildlife & nondomestic			
Deer	X	X	
Feral Hogs	X	X	
Cropland		X	X
Industrial	X	X	X

Pollutant Source Identification

- Stakeholder input.
- Existing datasets:
  - National Agricultural Statistics Service (NASS) data
  - National Pollutant Discharge Elimination System (NPDES) permit data
  - Texas Parks and Wildlife Department (TPWD) wildlife survey data
  - National Agricultural Imagery Program (NAIP) land use data

Pollutant Source Identification

- Human and domestic animals:
  - Septic Systems
  - Domestic Dogs
- Livestock:
  - Cattle
  - Horses
  - Sheep and Goats
  - Domestic Hogs
- Wildlife and nondomestic animals:
  - Deer
  - Feral Hogs



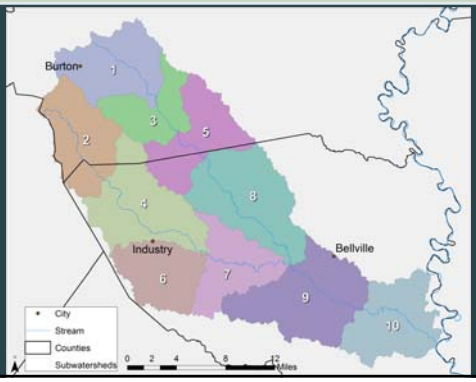
Pollutant Source Assessment

- Spatially Explicit Load Enrichment Calculation Tool (SELECT)
  - Estimates the likely distribution of potential pollutant sources across the watershed.
  - Estimates potential pollutant load from each subwatershed.

SELECT Inputs

- SELECT Inputs:
  - Subwatershed boundaries
  - Land use data
  - Soils data
  - Topography
  - Human population
  - Wildlife population
  - Livestock population

SELECT Inputs: Subwatershed Delineation



SELECT Inputs: Land Use Classification

- 2012 National Ag. Imagery Program; 1m resolution.
- 2013-2014 Landsat-8 data; 15 meter resolution.

SELECT: Land Use Classification

- Land Use Categories:
  - Open Water — Water
  - Evergreen Forest
  - Deciduous Forest
  - Mixed Forest
  - Near Riparian Forest — Forest
  - Shrub/Scrub
  - Grassland/Herbaceous — Rangeland
  - Pasture/Hay — Managed Pasture
  - Cultivated Crops — Cropland
  - High/Med./Low Urban
  - Barren Land — Urban

SELECT Inputs

Soils data:

- SSURGO Database (NRCS)

Topography:

- Digital Elevation Map (USGS)

Hydrography:

- Stream Network (USGS)

SELECT Analysis

1. **Divides the entire watershed into 30m grid cells.**
2. **Uses soil data, land use, topography to determine physical, chemical, and biological characteristics for each cell.**
3. **Accounts for spatial distribution of each cell (*i.e. distance from stream*).**
4. **Groups cells by subwatershed.**
5. **Calculates potential load from each subwatershed based on population inputs.**

SELECT Analysis

Wildlife, Livestock, Human Population and Distribution:

- Existing datasets (TPWD Surveys, NRCS Ag Census, 2010 Population Census).
- Stakeholder input.

Key discussion points for each category:

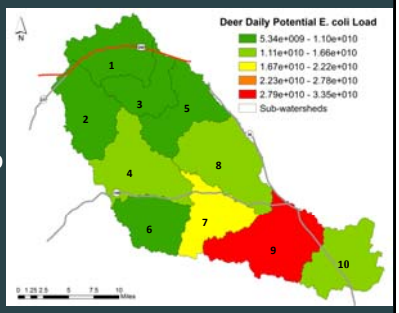
- Total population.
- Density or stocking rate.
- Distribution.

Wildlife & Nondomestic Populations

- Species:
  - Deer
  - Feral Hogs

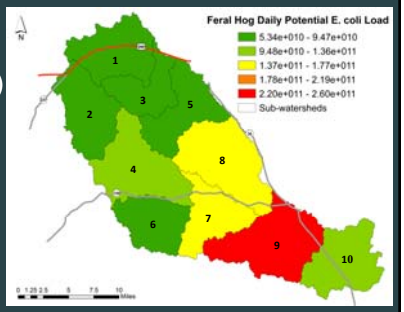
Wildlife & Nondomestic Populations

- Deer:
  - 69.7 ac./deer
  - Distributed to Forestland
  - However, TPWD data received after initial analysis shows a higher population



Wildlife & Nondomestic Populations

- Feral Hogs:
  - 25 ac./hog (26 hogs/mile)
  - Distributed along riparian corridors (100 ft.)

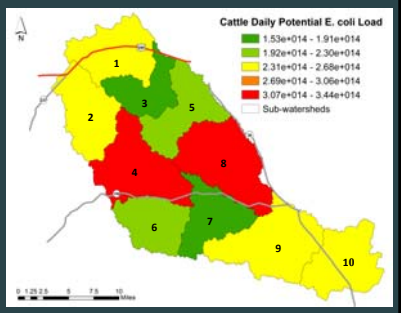


Livestock Populations

- Classes of livestock:
  - Cattle
  - Horses
  - Goats
  - Sheep
  - Domestic Hogs

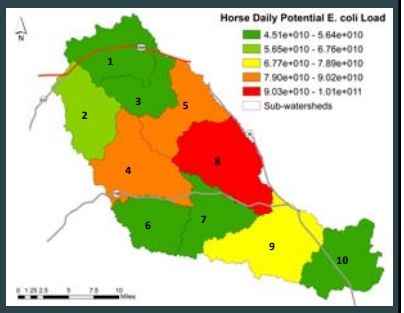
Livestock Populations

- Cattle:
  - NASS data
  - 38,299 cattle
  - Distributed to Rangelands & Managed Pasture
  - 5.2 ac./cow



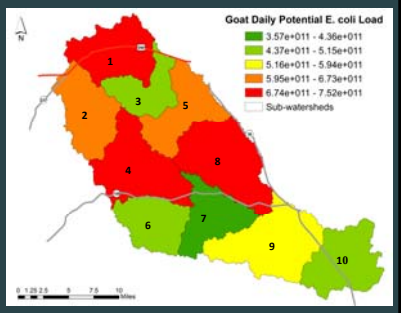
Livestock Populations

- Horses:
  - NASS data
  - 2,251 horses
  - Distributed to Managed Pasture



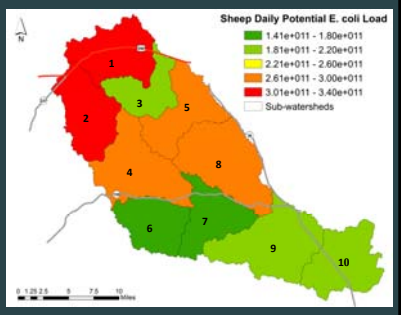
Livestock Populations

- Goats:
  - NASS data
  - 762 goats
  - Distributed to Rangeland & Managed Pasture



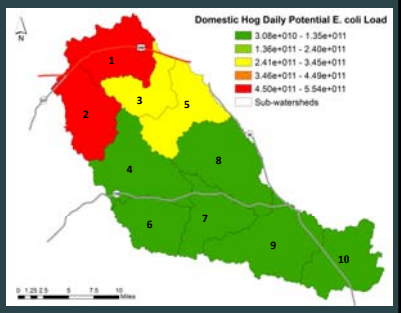
Livestock Populations

- Sheep:
  - NASS data
  - 322 Sheep
  - Distributed to Rangeland & Managed Pasture



Livestock Populations

- Domestic Hogs:
  - NASS data
  - 291 Hogs
  - Distributed to Managed Pasture

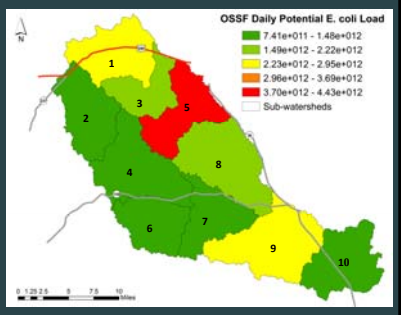


Human & Pet Populations

- Humans & Pets:
  - Septic Systems
  - Domestic Dogs

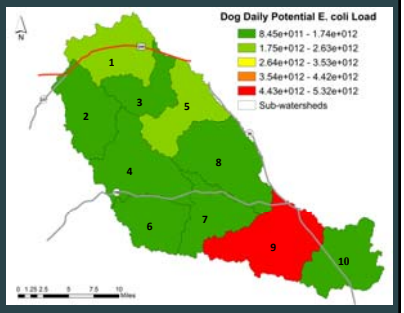
Human & Pet Populations

- Septic Systems:
  - Washington County: US Census Data (2,517)
  - Austin County: H-GAC data (981); US Census data (3,614)



Human & Pet Populations

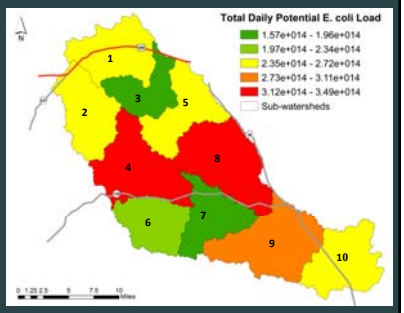
- Dogs:
  - 0.8 Dogs per Household
  - US Census shows 7,289 households
  - 5,831 dogs in watershed



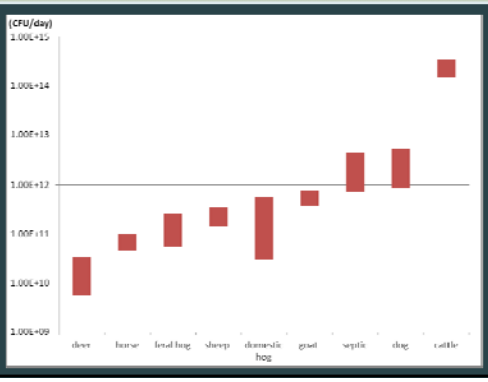
SELECT Analysis

ALL Sources:

- Livestock
- Humans
- Dogs
- Wildlife



Relative Ranges



Discussion & Questions

Spatially Explicit Load Enrichment Calculation Tool (SELECT):

- Datasets
- Inputs
- Analysis
- Results

Next Steps in the Planning Process

Galen Roberts

Texas A&M AgriLife Extension Service

Mill Creek
January 26, 2015

Meeting Dates and Times

- Partnership meetings are slated for the last Monday of each month @ 6pm.
- Will be held here, at the Bleiblerville VFD.
- Next meetings:

March 30

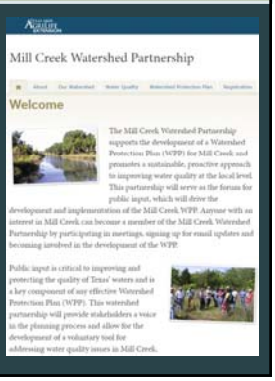
April 27

March 30 Meeting

- Review and approve LDCs and reduction target (*Section 4*)
- Review and approve final SELECT analysis (*Section 5*)
- Begin to discuss management measures (*Section 6*)
  - Be thinking of what is needed/wanted.
  - Look to the Geronimo WPP for examples of BMPs.
  - Send me ideas as you have them.

Website: http://millcreek.tamu.edu

- Clearinghouse for all information related to the Partnership
  - **Meeting info**
  - **Email list signup**
  - **Event registration**
- Maps, data, publications and useful links will all be available on the website
  - **http://millcreek.tamu.edu**



Contact Info

Galen Roberts

Texas A&M AgriLife Extension: College Station

groberts@ag.tamu.edu

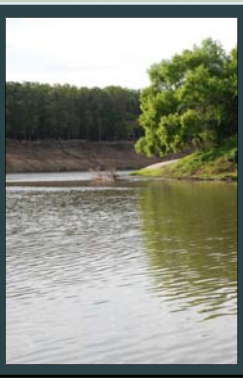
979-862-8070

Ward Ling

Texas A&M AgriLife Extension: College Station

wling@ag.tamu.edu

979-845-6980



SAVE THE DATE

Mill Creek Partnership Meeting

March 30, 2015: 6pm

Here at the Bleiblerville VFD