Big Elm Creek June 2019 Stakeholder Meeting

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Texas Water Resources Institute

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Introductions

⊙ Name
⊙ Entity/Group – (agency, landowner, citizen, business owner, etc.)

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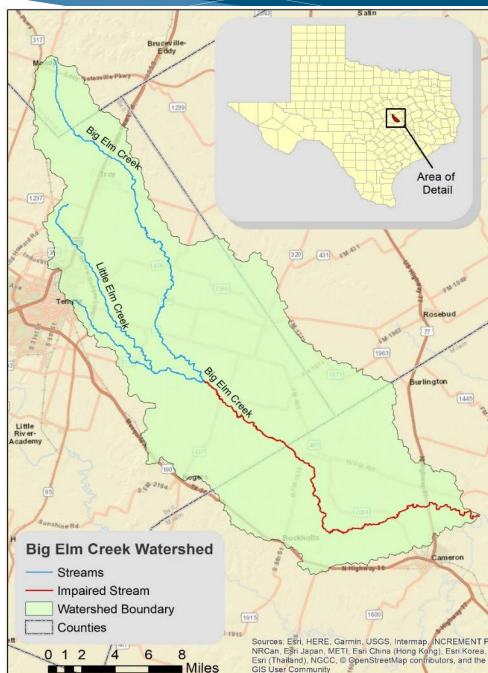*make every drop count*

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Agenda

⊙ Previous Meeting Recap
  ◉ Load Duration Curves
  ◉ Bacterial Loads/Sources
  ◉ Animal numbers
⊙ Management Measures
⊙ Discussion

Big Elm Creek Watershed
— Streams
— Impaired Stream
  Watershed Boundary
  Counties

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Review:
Bacterial Loads

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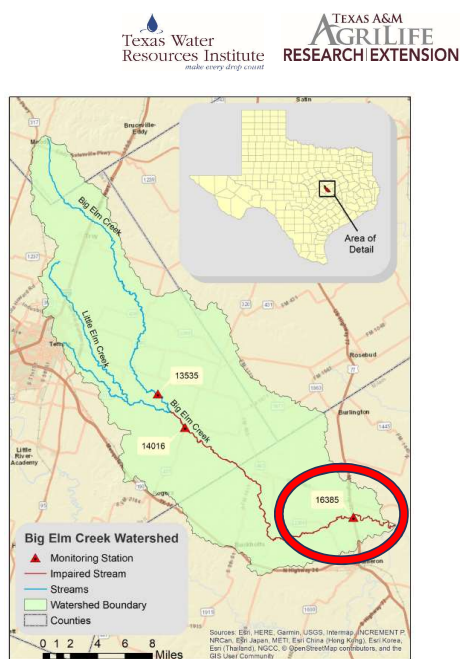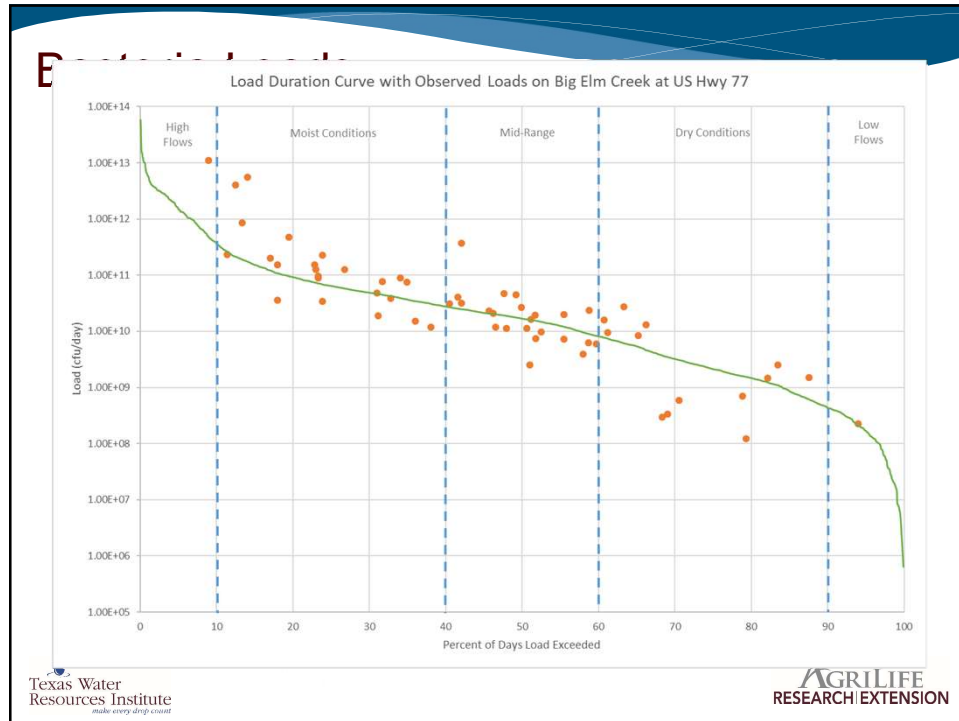
Load Duration Curve

◉ Visualizes streamflows and pollutant loads

◉ Helps assess under what conditions pollutant loads exceed water quality standards

◉ Can use to estimate the pollutant capacity of a stream and the reductions needed

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TCEQ SWQM Station

◉ Only 1 active station in the watershed with long-term *E. coli* data (Station #16385, on US 77)

Big Elm Creek Watershed
- ▲ Monitoring Station
- — Impaired Stream
- — Streams
- Watershed Boundary
- Counties

0 1 2 4 6 8 Miles

Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, © OpenStreetMap contributors, and the GIS User Community

Bacteria Loads

Load Duration Curve with Observed Loads on Big Elm Creek at US Hwy 77

Bacteria Loads

	High Flow Conditions	Moist Flow Conditions	Mid-Range Flow Conditions	Dry Flow Conditions	Low Flow Conditions
Days per year	36.5	109.5	73.0	109.5	36.5
Median Flow (cubic feet per second)	339.06	13.93	3.75	0.42	0.03
Existing Geomean Concentration (MPN/100 mL)	144.00	332.97	118.90	332.62	136.00
Allowable Daily Load (Billion MPN)	1045.2	42.94	11.6	1.3	0.11
Allowable Annual Load (Billion MPN)	381,497.82	15,671.53	4219.25	472.78	38.73
Existing Daily Load (Billion MPN)	1,194.51	113.46	10.91	3.42	0.12
Existing Annual Load (Billion MPN)	435,997.61	41,414.00	3,981.42	1,247.94	41.98
Annual Load Reduction Needed	54,499.79	24,742.46	N/A	775.15	3.25
Percent Reduction Needed	12.50%	62.16%	-5.97%	62.11%	7.74%

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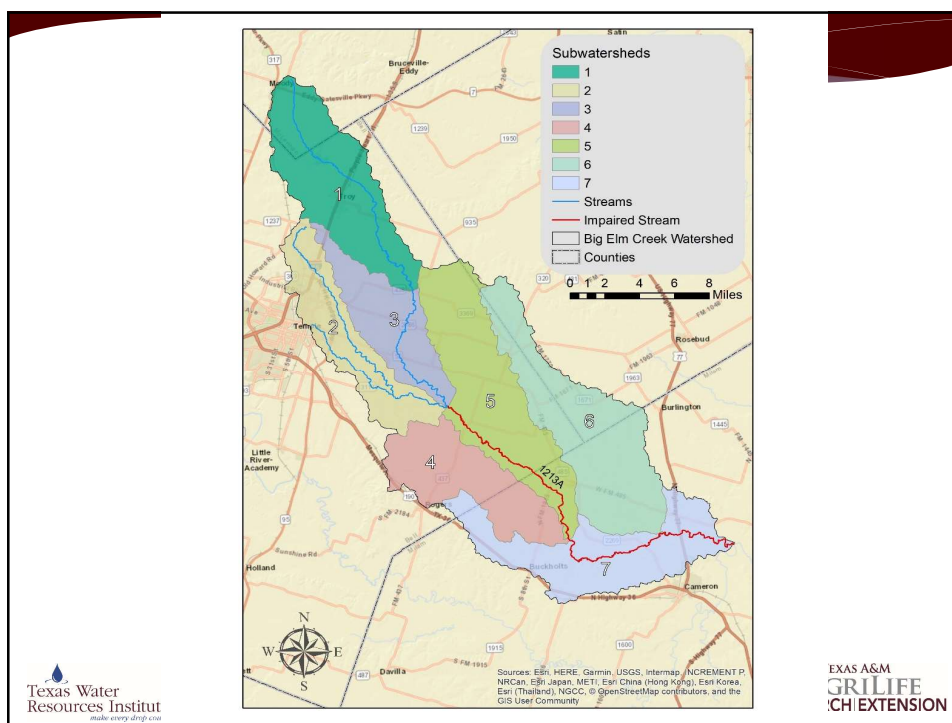*make every drop count*

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Needed Load Reduction

	High Flow Conditions	Moist Flow Conditions	Mid-Range Flow Conditions	Dry Flow Conditions	Low Flow Conditions
Possible Sources	Overland flow, Sanitary Sewer Overflows, Resuspension				
	Failing or non-existent OSSFs				
			Direct deposition from wildlife, feral hogs, livestock, pets. Illegal dumping		
Total Annual Load (Billion MPN)	482,682.94				
Total Annual Load Reduction	401,900.11				
Total Percent Reduction (Billion MPN)	83.26				

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Big Elm Creek Watershed Potential Source Estimates

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April 16, 2019

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Cattle Estimates

*11,849
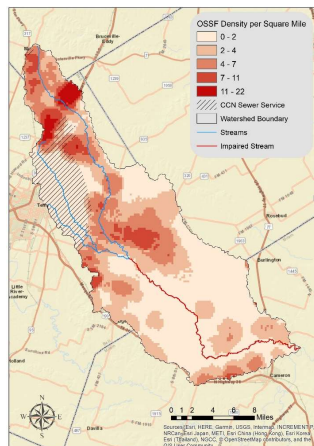**6 ac/hd Improved pasture**
10 ac/hd rangeland

- Substantial difference between NASS and stocking rate estimation methods
- NASS based on county-wide data. Weighted by graze-able acres per watershed
- Do we want to use the NASS estimate or stocking rate estimate?
- If we use stocking rate estimate, is the 1 head/10 acres appropriate for unimproved range?
- What about 1 head/3 acres for pastures?
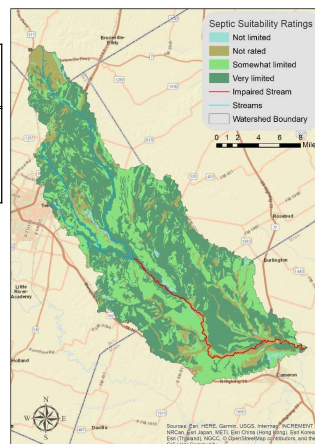- Are these realistic stocking rates locally?

	NASS	Stocking Est
Cattle*	7,333	16,322
Horses	942	N/A
Goats	2,990	?
Sheep	168	?
Poultry	2,655	N/A

OSSF Estimates

Estimated OSSFs	Estimated Failure rate
2,439	8%

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Estimated Household Pets

Watershed	Estimated Number of Households	AVMA Estimated Dogs per Household	AVMA Estimated Cats per Household	Estimated Dog Population	Estimated Cat Population
Big Elm	8,407	0.584	0.638	4,910	5,364

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Estimated Wildlife

	Total	AU Conversion	AUs
Feral Hogs*	5,695	0.125	712
Deer	7,103	0.112	795

*8,246 ***1,031**

Numbers developed for Deer from a density of 38.4 deer/1,000 acres provided by Texas Parks and Wildlife.
Numbers developed for Feral Hogs from a density of 33.3 acres per hog (Wagner and Moench, 2009).

*23ac

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Possible Management Measures to Address Impairments

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ER1 Ed Rhodes, 6/12/2019

Some Management Measures Used In Other Watersheds

◉ Source: Septic Systems/OSSFs
  ◉ Repair/replace failing systems
  ◉ Decommission and connect to centralized system
  ◉ Develop voluntary inspection program
  ◉ Education and outreach
◉ Source: Wildlife
  ◉ Voluntary hog removal
  ◉ Fencing deer feeders
  ◉ Bounty programs
  ◉ Education and outreach

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Some Management Measures Used In Other Watersheds

◉ Source: Pets
  ◉ Install and maintain pet waste stations
  ◉ Education and outreach
◉ Source: Agriculture
  ◉ Develop and implement WQMPs & Conservation Plans
  ◉ Soil testing campaigns
  ◉ Education and outreach

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Source: On-Site Sewage Facilities

1. **Management Measure**
   - ◉ Repair and replace failing OSSF systems
2. **Responsible Parties:**
   - ◉ Extension, county staff/DR, homeowners, contractors
3. **Effectiveness:**
   - ◉ Results in direct load reductions - high
4. **Feasibility:**
   - ◉ Needed financial resources (~$8,000-$10,000 per system)
     - ◉ USDA Individual Water & Wastewater Grants (https://www.rd.usda.gov/programs-services/individual-water-wastewater-grants)
   - ◉ Technical resources (County staff time, Extension, USDA, service providers)

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Source: On-Site Sewage Facilities

1. **Management Measure**
   - ◉ Decommission and connect to centralized system
2. **Responsible Parties:**
   - ◉ Extension, county staff/DR, homeowners, cities/communities
3. **Effectiveness:**
   - ◉ Results in direct load reductions - high
4. **Feasibility:**
   - ◉ Needed financial resources ($$$)
   - ◉ Technical resources (county staff time, Extension, service providers, TCEQ)

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Source: On-Site Sewage Facilities

1. **Management Measure**
   - ◎ Develop voluntary inspection program
2. **Responsible Parties:**
   - ◎ Extension, county staff/DR, homeowners, cities/communities
3. **Effectiveness:**
   - ◎ Indirect load reductions, depends on participation - moderate
4. **Feasibility:**
   - ◎ Needed financial resources (relatively inexpensive)
   - ◎ Technical resources (Extension, service providers)
   - ◎ Might include incentives to promote proper maintenance

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Source: Wildlife

1. **Management Measure:**
   - ◎ Voluntary hog removal
2. **Responsible Parties:**
   - ◎ Extension, TSSWCB, SWCDs, USDA-APHIS, landowners, lessees
3. **Effectiveness:**
   - ◎ Results in direct load reductions, difficult to track - moderate to high
4. **Feasibility:**
   - ◎ Needed financial resources (minimal at the individual property level)
   - ◎ Technical resources (generally available from agencies)

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Source: Wildlife

1. **Management Measure:**
   - ◉ Fencing deer feeders
2. **(Potential) Responsible Parties:**
   - ◉ Extension, TSSWCB, SWCDs, NRCS, landowners, lessees
3. **Effectiveness:**
   - ◉ Reduces free food for hogs – low to moderate across the watershed, possibly high at the property level
4. **Feasibility:**
   - ◉ Needed financial resources (~ $200+ per feeder)
   - ◉ Technical resources (Generally available)

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Source: Wildlife

1. **Management Measure:**
   - ◉ Feral hog bounties
2. **(Potential) Responsible Parties:**
   - ◉ Counties, Extension, TDA
3. **Effectiveness:**
   - ◉ Direct reductions, depends on participation – moderate to high
4. **Feasibility:**
   - ◉ Needed financial resources (sources uncertain)
   - ◉ Technical resources

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Source: Pets

1. **Management Measure:**
   - Install and maintain pet waste stations in parks and/or subdivisions
2. **(Potential) Responsible Parties:**
   - Extension, local communities/HOAs
3. **Effectiveness:**
   - Depends on individual participation - uncertain
4. **Feasibility:**
   - Needed financial resources (~ $500-700 per station)
   - Technical resources
   - Feasible locations?

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Source: Agriculture

1. **Management Measure:**
   - Develop and implement WQMPs & Conservation Plans
2. **Responsible Parties:**
   - TSSWCB, SWCDs, NRCS, Landowners, Lessees
3. **Effectiveness:**
   - Results in direct load reductions, depends on participation - high
4. **Feasibility:**
   - Needed Financial Resources (funding for technician, availability of cost-share programs to implement)
   - Technical Resources (Local availability?)

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Source: Agriculture

1. **Management Measure:**
    - ◉ Soil testing campaigns
2. **(Potential) Responsible Parties:**
    - ◉ Extension, TSSWCB, SWCDs, NRCS, landowners, lessees
3. **Effectiveness:**
    - ◉ Depends on participation – uncertain
4. **Feasibility:**
    - ◉ Needed financial resources (uncertain who would fund this)
    - ◉ Technical resources (local availability?)

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Other Management Measures

- ⊙ Additional thoughts and ideas?

- ⊙ Suggestions from Previous Meeting
    - ◉ Additional monitoring upstream
        - ◉ Clean Rivers Program
        - ◉ 3
    - ◉ Tax Exemption education
    - ◉ Small landowner education
    - ◉ Improve/upgrade WWTP

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