

Upper Trinity River Basin Coordinating Committee Meeting

Tuesday, August 26, 2025

Joy Douglas, E&D Planner

Welcome and Introductions

- The meeting agenda, presentation and handouts are located: [NCTCOG - Upper Trinity River Basin Coordinating Committee](#)



Chat

Please use the chat function to add your name and organization for attendance



Mic

Please mute your line

- Please introduce yourself in the chat



UTRB-CC Overview

UTRB-CC Overview

- Purpose: gather stakeholders to share information, successes, challenges, and updates on projects that impact water quality and bacteria
- Schedule: meets twice a year, features a member or topic presentation and project update/roundtable session
- ***The UTRBCC is supported by the NCTCOG TMDL Program***

Special Presentation: *Flood Control Prioritization Mapping and Green Stormwater Infrastructure Modeling*

Dr. Fouad Jaber, Texas A&M AgriLife



A-Rain Garden



B-Bioretention



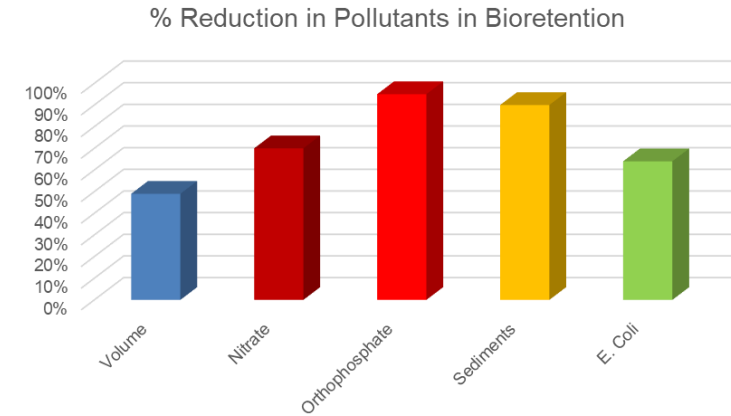
c- Permeable Pavement &
Street Planters

Green Stormwater Infrastructure

- Green Stormwater Infrastructure (GSI) is an engineered system of capturing, managing, and treating stormwater runoff at the source before it reaches waterways such as streams, rivers and lakes
- GSI includes practices such as Rain gardens, bioretention areas, permeable pavement, constructed wetlands and rainwater harvesting

Green Stormwater Infrastructure

- Our program have designed, constructed and monitored GSI for more than 17 years.



Green roof (Fort Worth Botanic Garden)



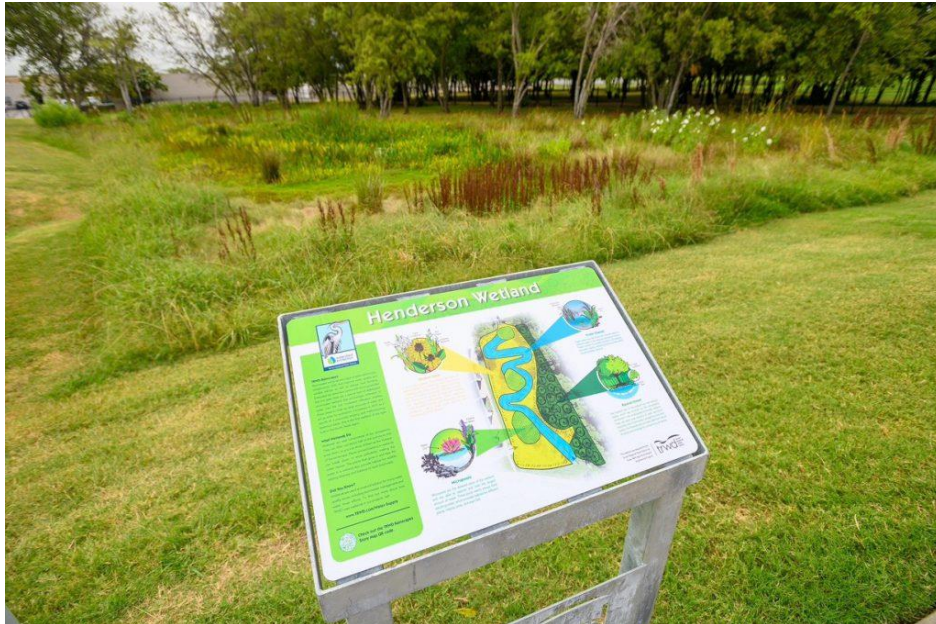
Rainwater harvesting (AgriLife)



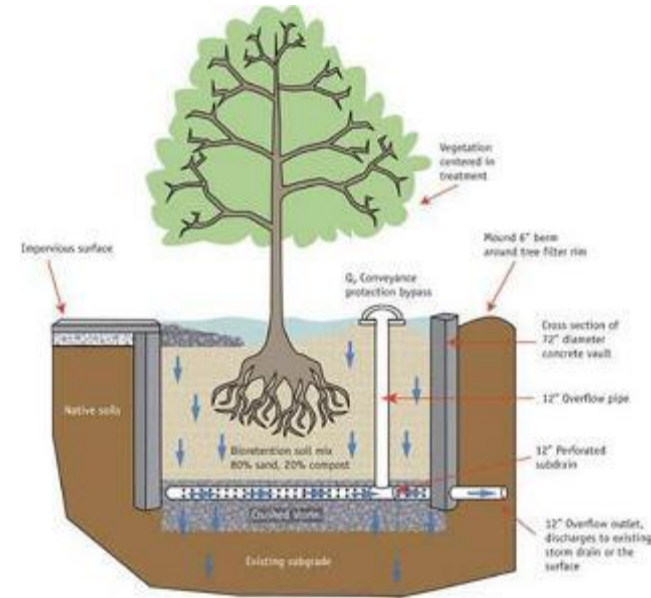
Permeable pavement (AgriLife)

Other GSI

- Tree box
- Bioswale
- Constructed wetland



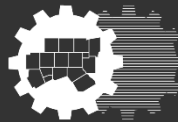
Constructed wetland features (TRWD)



Tree box (New Jersey Agricultural Experiment Station, [2013](#))



Bioswale/bioretention at a parking lot (AgriLife)



North Central Texas
Council of Governments

Integrated Transportation and Stormwater Infrastructure (TISI) Study



Funded by the Texas General Land Office,
Community Development Block Grant,
Disaster Recovery Program.



Also Funded by the Texas Water Development Board
and Texas Department of Transportation.

Project Team Members:

A working group of partners and stakeholders to carry out a comprehensive planning effort in Wise County and portions of Dallas, Denton, Ellis, Johnson, Parker, and Tarrant counties



integrating **Transportation**
& **Stormwater Infrastructure**



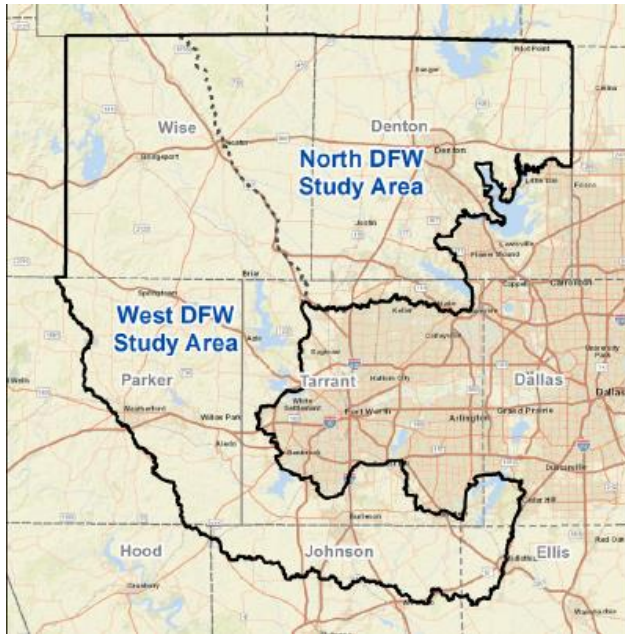
North Central Texas
Council of Governments



US Army Corps
of Engineers®



UNIVERSITY OF
TEXAS
ARLINGTON



TEXAS A&M
INSTITUTE FOR A DISASTER
RESILIENT TEXAS

TEXAS A&M
AGRI LIFE

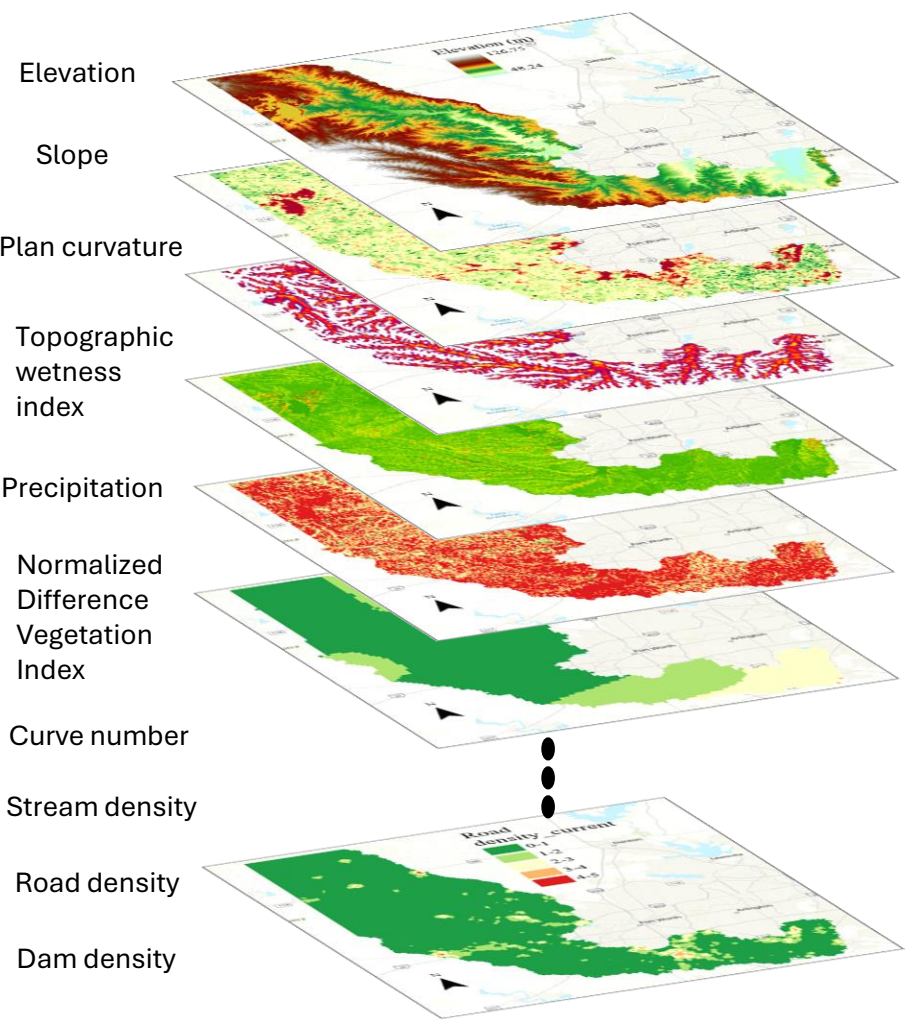
Timeline & Budget:

3+ years and \$10 million

Funding Partners

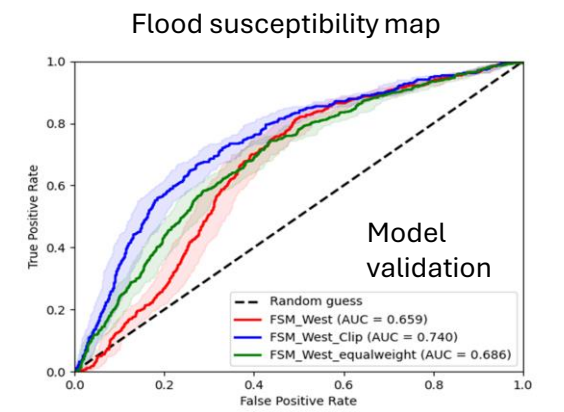
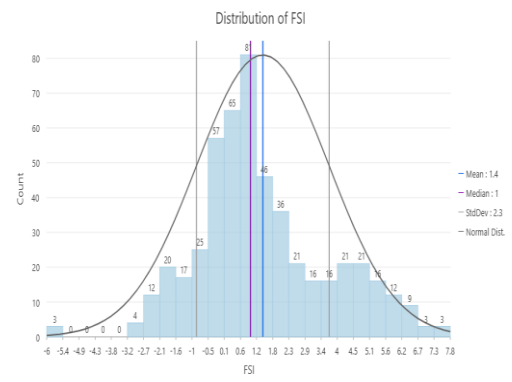
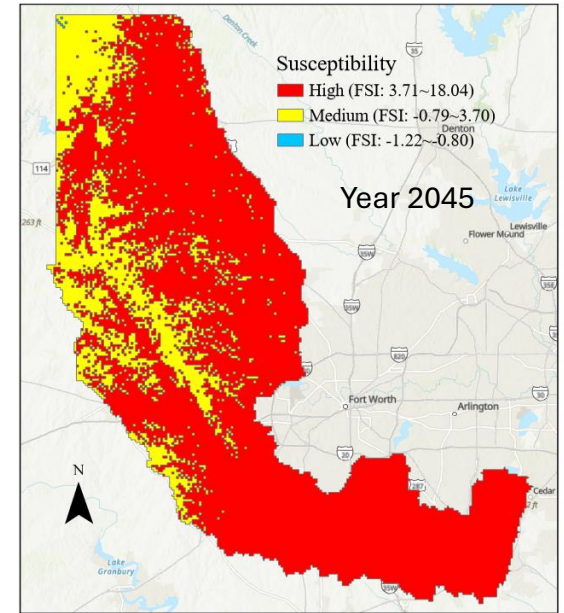
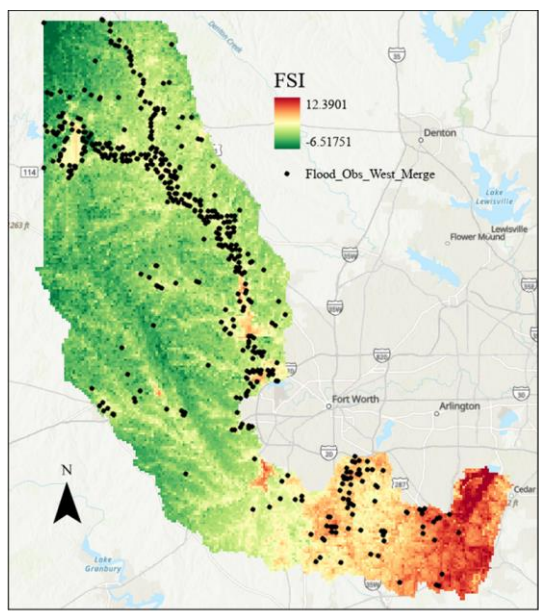
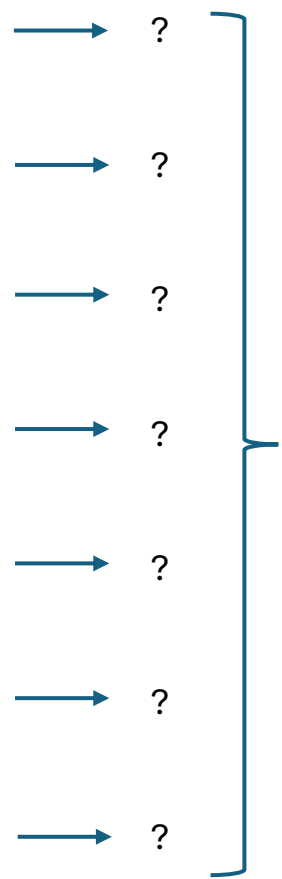
- Federal Emergency Management Agency
- Texas Water Development Board
- Texas Department of Transportation / Federal Highway Administration
- Texas General Land Office

Stacking model in regional scale



Overlay geospatial analysis

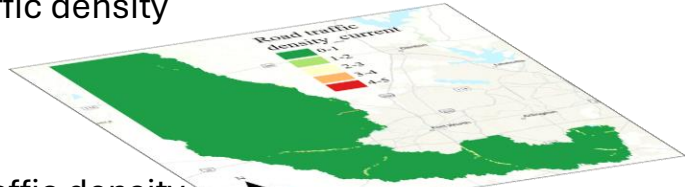
weight ← AHP (Analytic Hierarchy Process) method



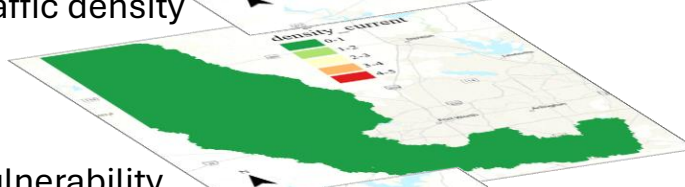
Receiver Operating Characteristic (ROC) curve

Stacking model in regional scale

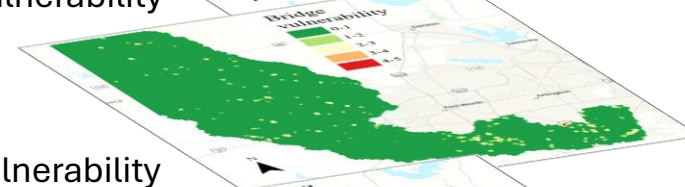
Road traffic density



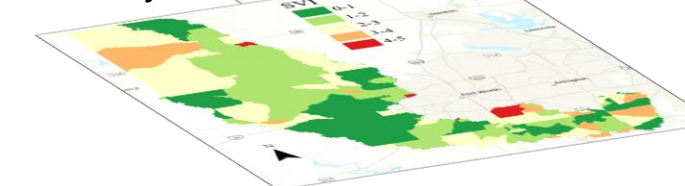
Bridge traffic density



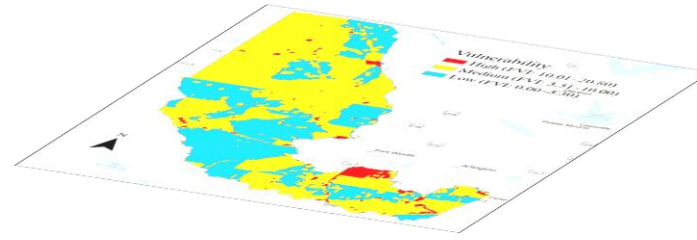
Bridge vulnerability



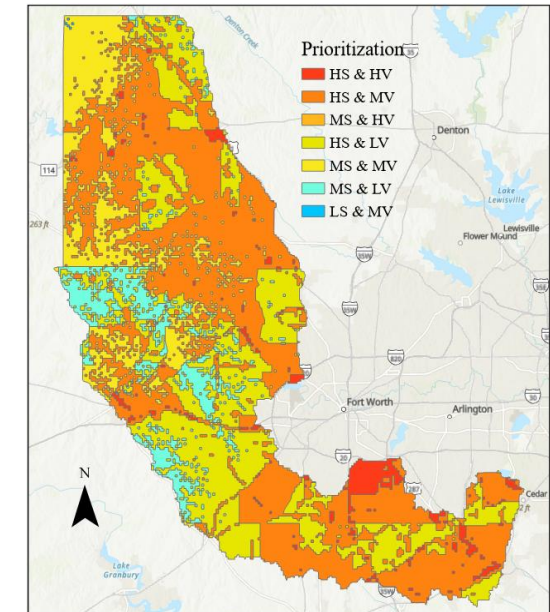
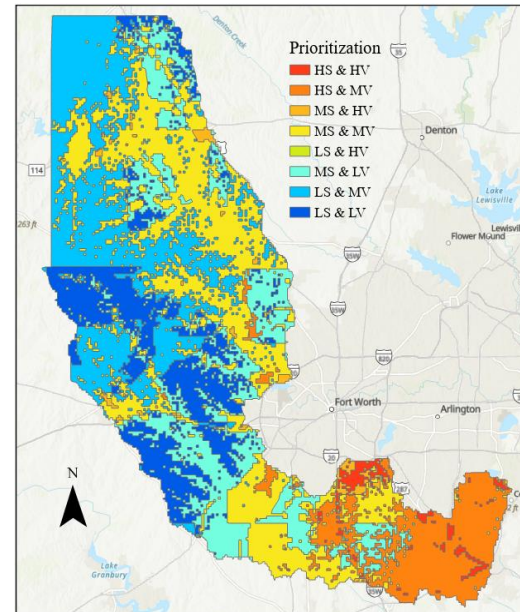
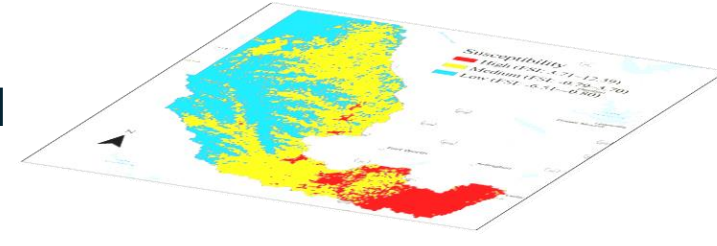
Social vulnerability index



Flood vulnerability map



Flood susceptibility map



- Identify some areas with both high flood potential and low resilience, pilot area candidate
- Help with efficient resources allocation
- Effective for large-scale area

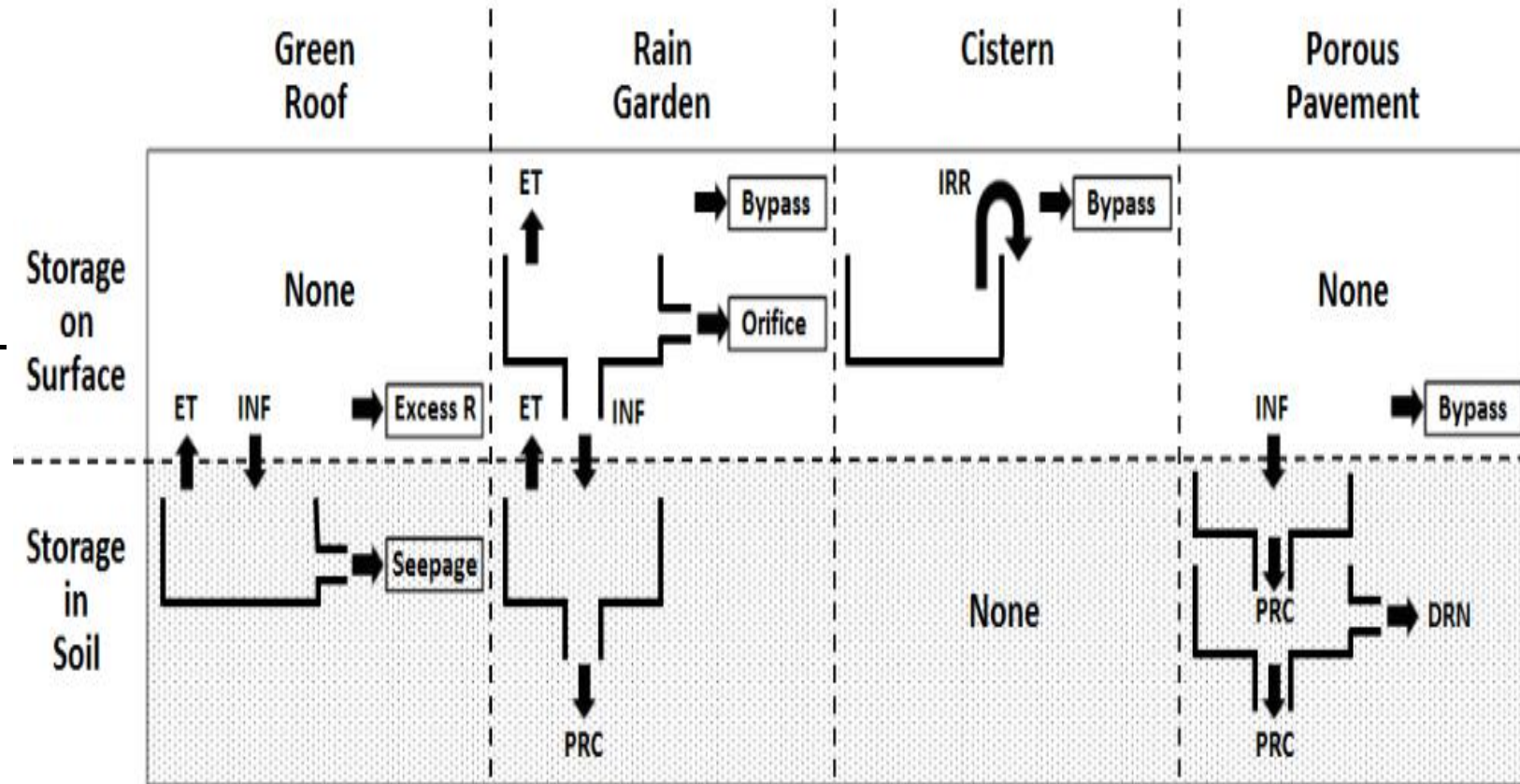
Flood control prioritization map (Left: current; Right: future)

SWAT modeling in watershed scale

- Where can GSI most effectively enhance urban flood management within the TSI study area?
- It is nearly impossible to run H&H model in a regional scale (covering several counties) as we have in TSI study
- Maps that identifies flood prone areas and ideal locations for implementation of GSI

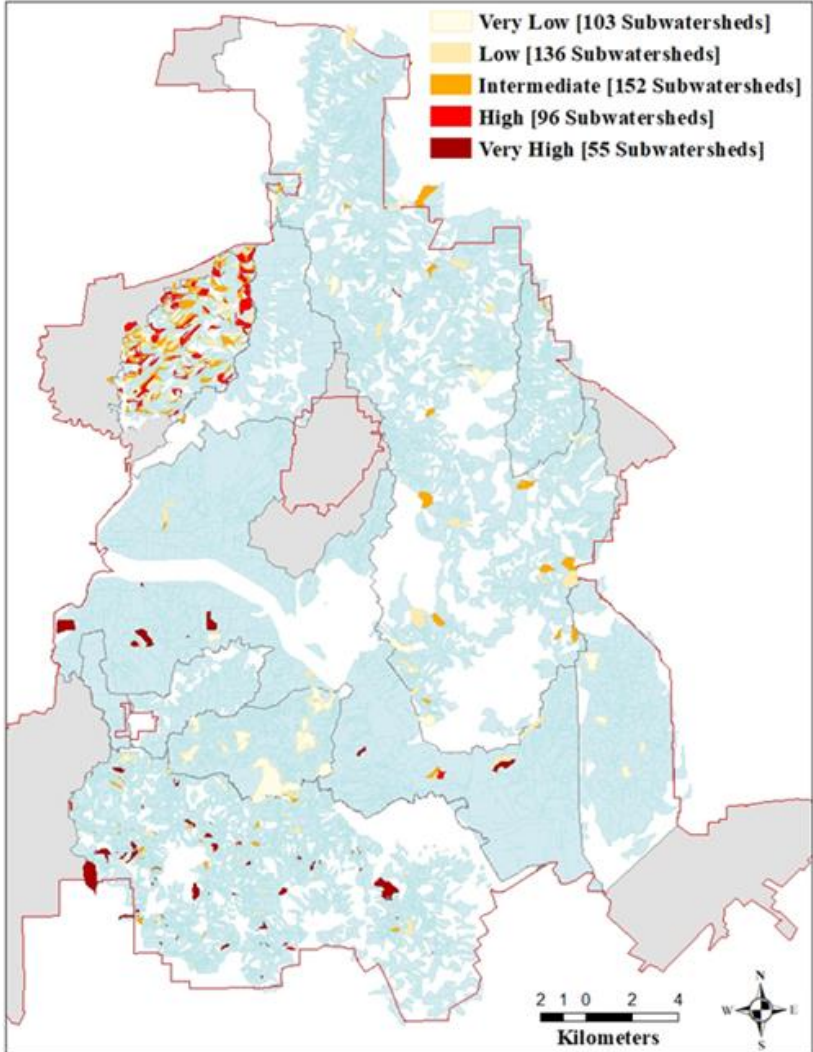
GSI Representation in SWAT

- ▶ GSI is represented in layers
- ▶ Watershed is discretized into multiple sub-watersheds
- ▶ Sub-watershed is further subdivided into HRU's
- ▶ HRU consist of homogenous land use management and soil characteristics
- ▶ GSI is placed in an HRU,
- ▶ A subbasin contains 7-10 HRU's

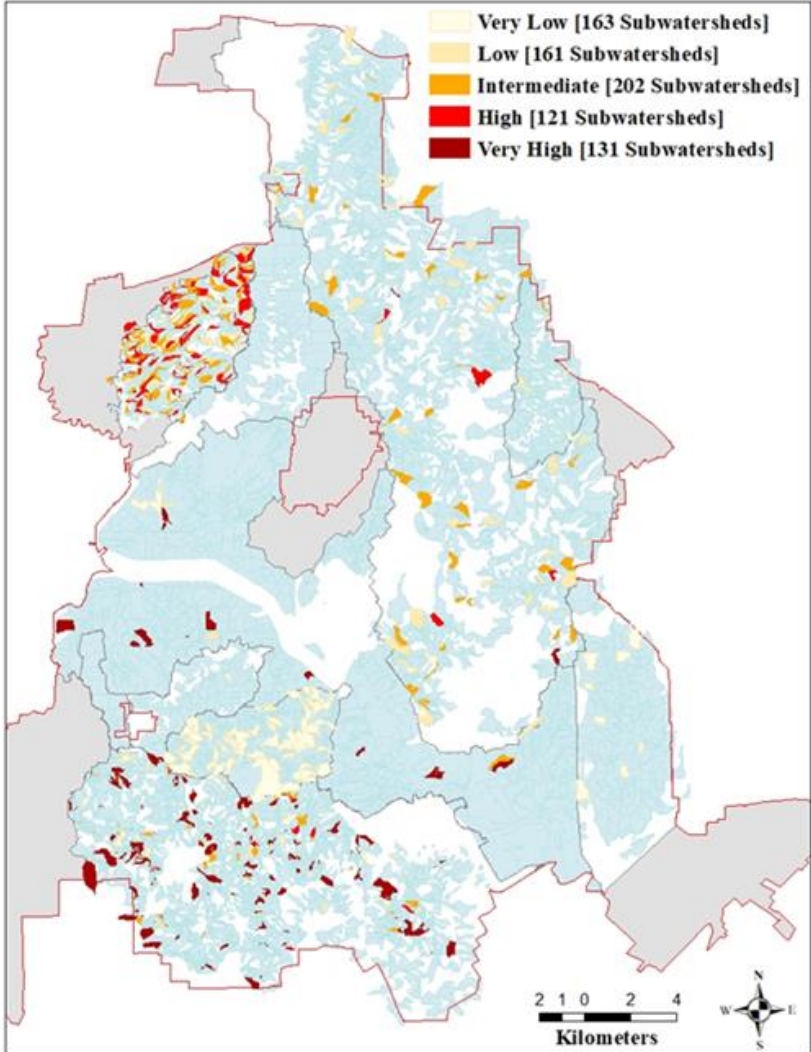


GSI Opportunity Subwatersheds for Stormwater Flooding Management, Ranked by Severity

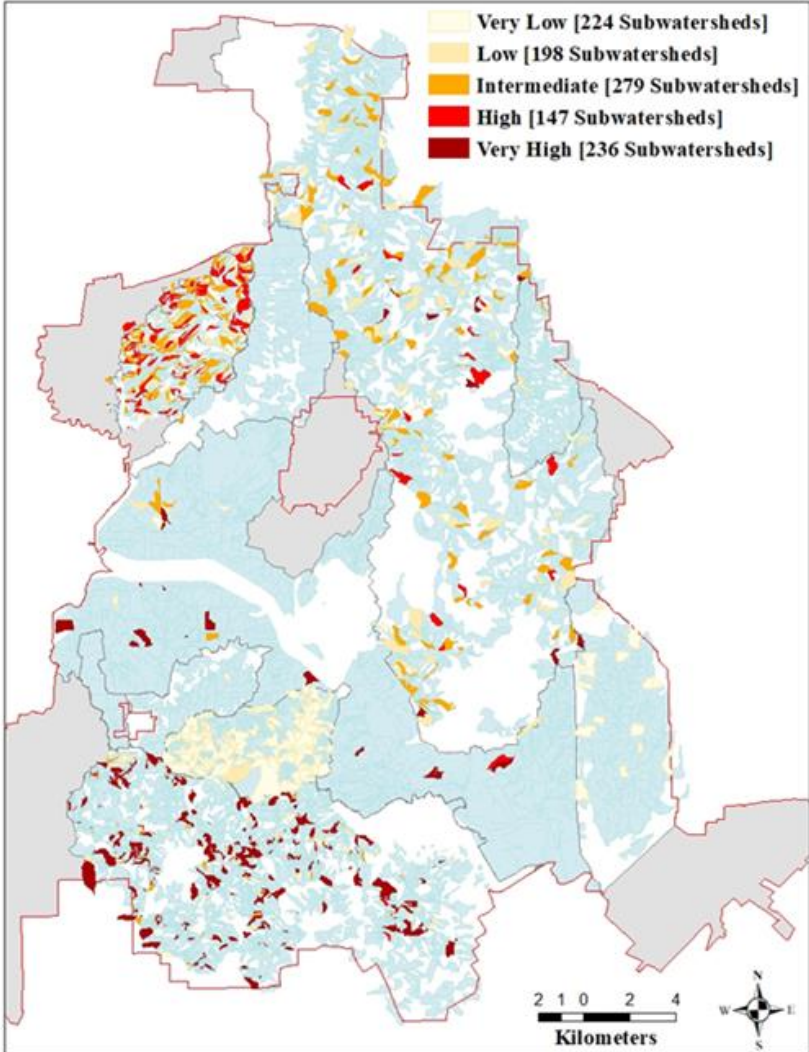
Current Conditions Pre GSI



**2-year (50%)
storm (4")**



**10-year (10%)
storm (6")**



**100-year (1%)
storm (9.5")**

Identify & Quantify Potential Green Stormwater Infrastructure Opportunity

Bioretention



Raingarden



Rainwater Cistern



Spatial Rule

- PARKS & TRAILS:** 10 % of area
- PLANTING STRIPS & MEDIANS:** 35% of available planting strip and vegetated medians
- PARKING LOTS:** 10% of parking lot area
- DESIGNATED COMMERCIAL SIDEWALKS:** x% of commercial sidewalks \geq 8 feet wide

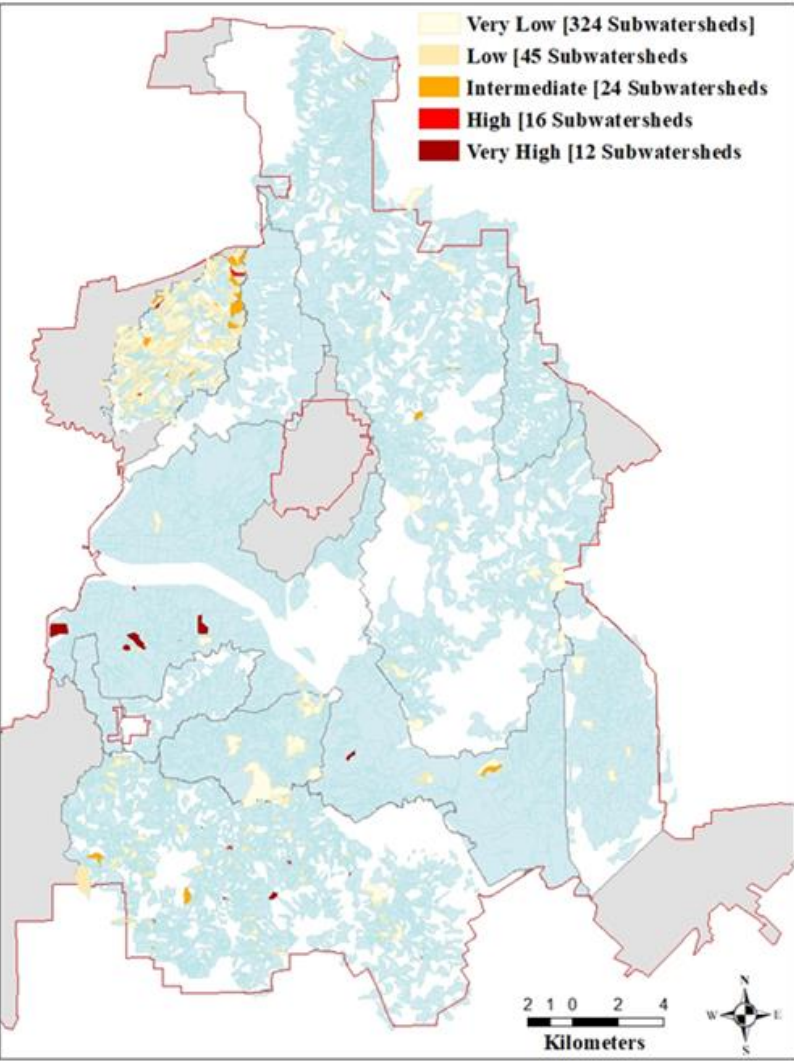
- RESIDENTIAL & COMMERCIAL SITES:**
(200 ft² raingarden for every structure)

of Residential and commercial structures

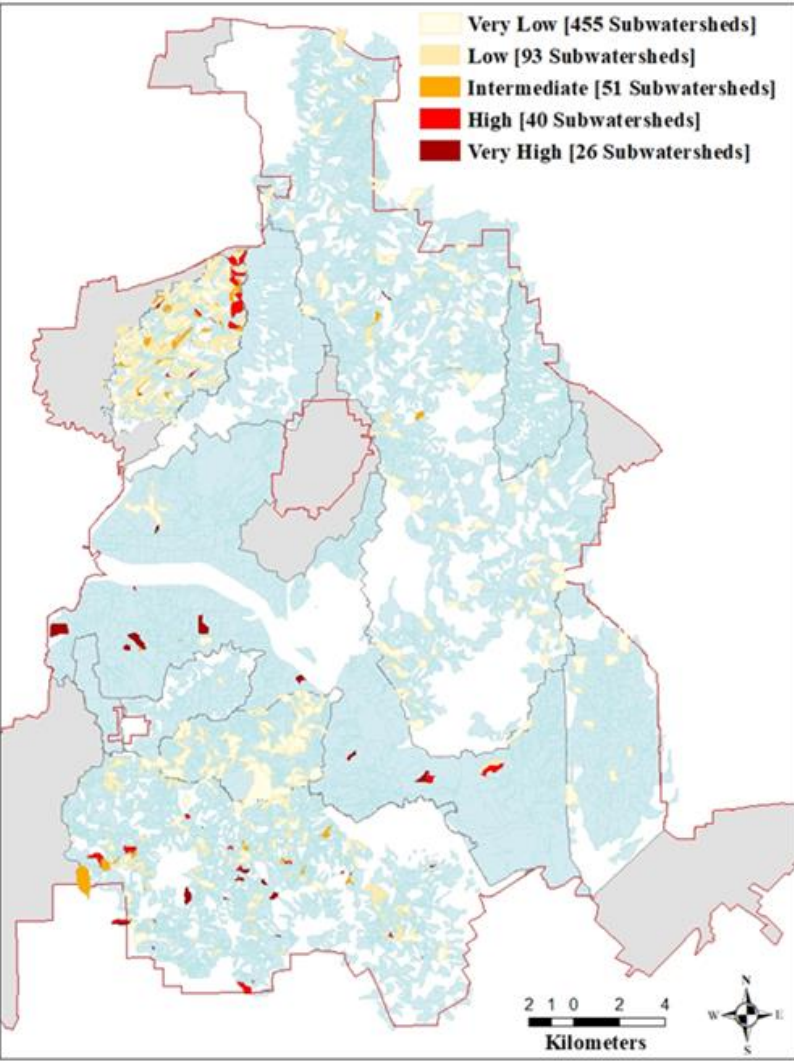
750 Gallon (1000 gallon tank; 75% empty)

GSI Opportunity Subwatersheds for Stormwater Flooding Management, Ranked by Severity

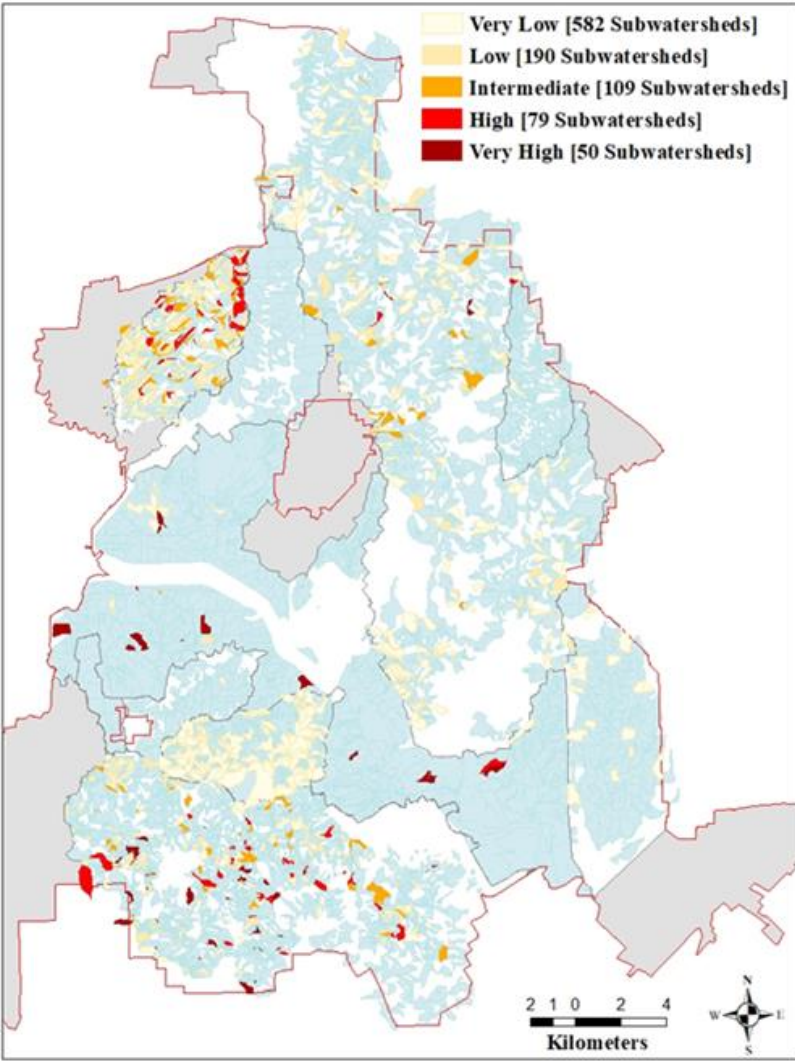
Current Conditions Post GSI



**2-year (50%)
storm (4")**



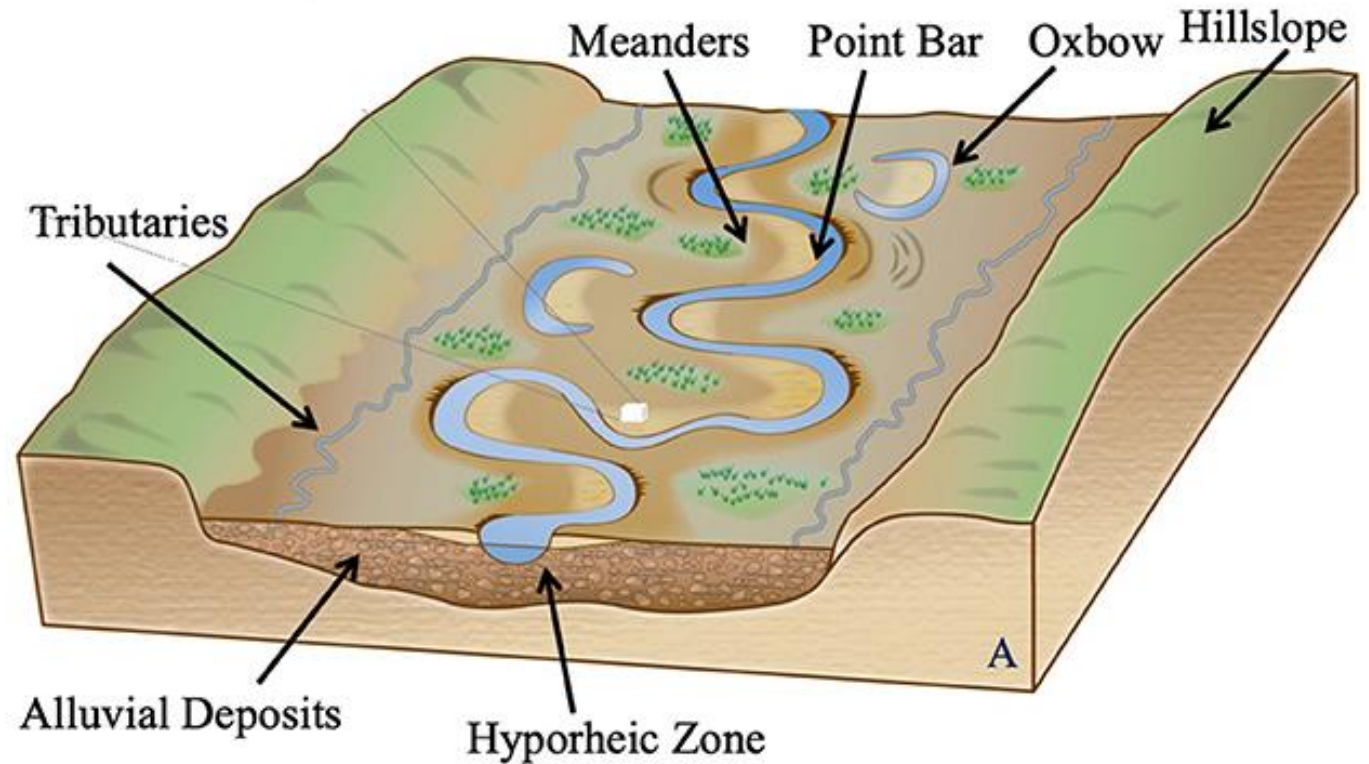
**10-year (10%)
storm (6")**



**100-year (1%)
storm (9.5")**

Linking H&H Modeling for Comprehensive Flood Management

- UT Arlington and USCOE developing H&H model (HEC-RAS or HEC-HMS) for streams
- Watershed model (SWAT) will be linked to H&H Model
- Combined model will be used for environmental constraints (e.g. minimum flows)



THANK YOU!



Special Presentation: *Watershed Protection Assistance for TRWD's Water Supply Reservoirs*

Aaron Hoff, Tarrant Regional Water District



Watershed Protection Assistance for TRWD's Water Supply Reservoirs

Upper Trinity River Basin CC

Aaron Hoff, Watershed Programs Coordinator

8/26/2025



Goals

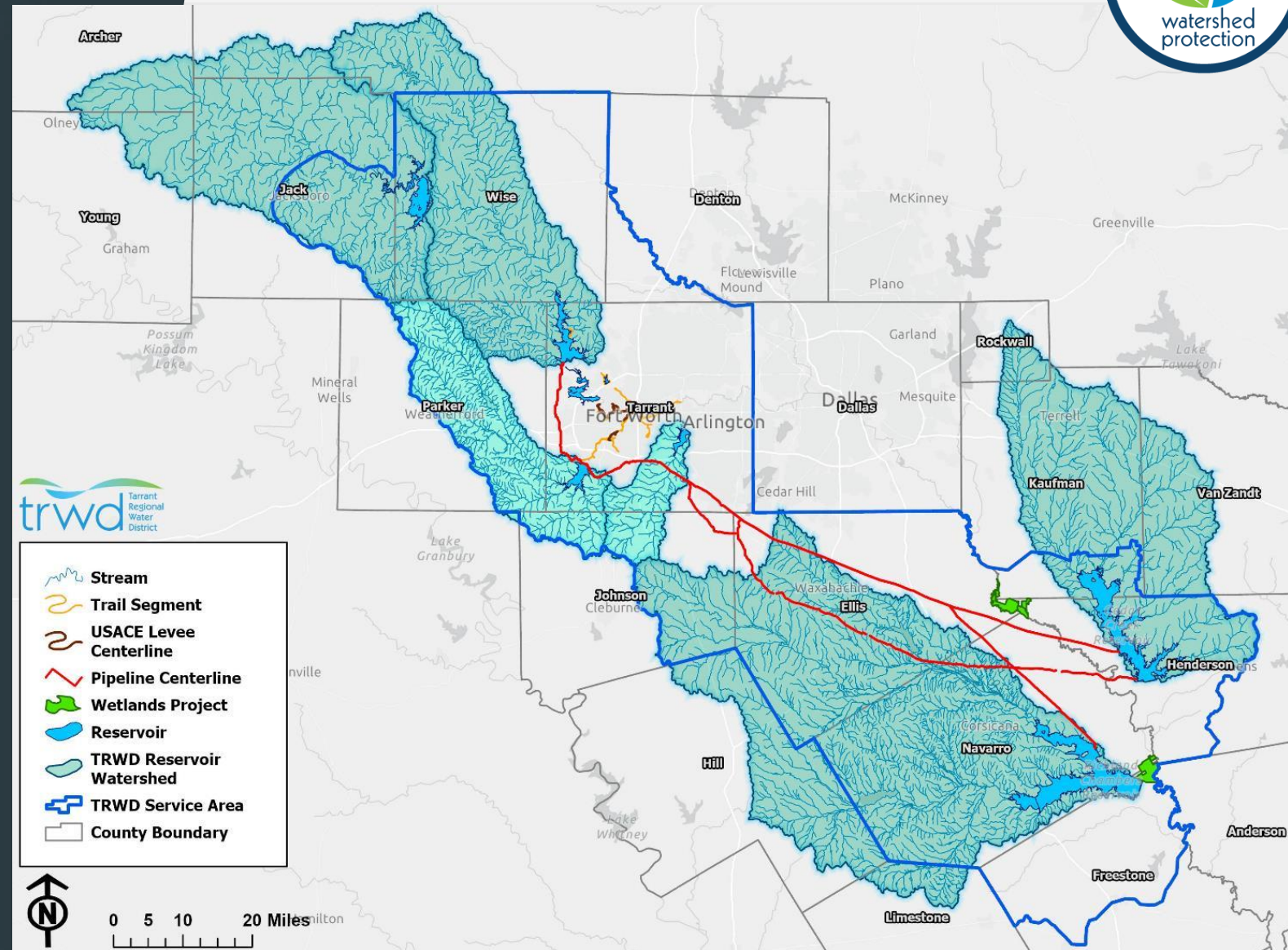
- ▶ Answer the question: why does a raw water provider care about wildlife habitat and ag lands so much?
- ▶ Make the connection between rainfall, erosion, and water supply
- ▶ Showcase watershed protection incentive programs
- ▶ Learn about best management practices (BMPs)
- ▶ Tie rural practices to urban areas



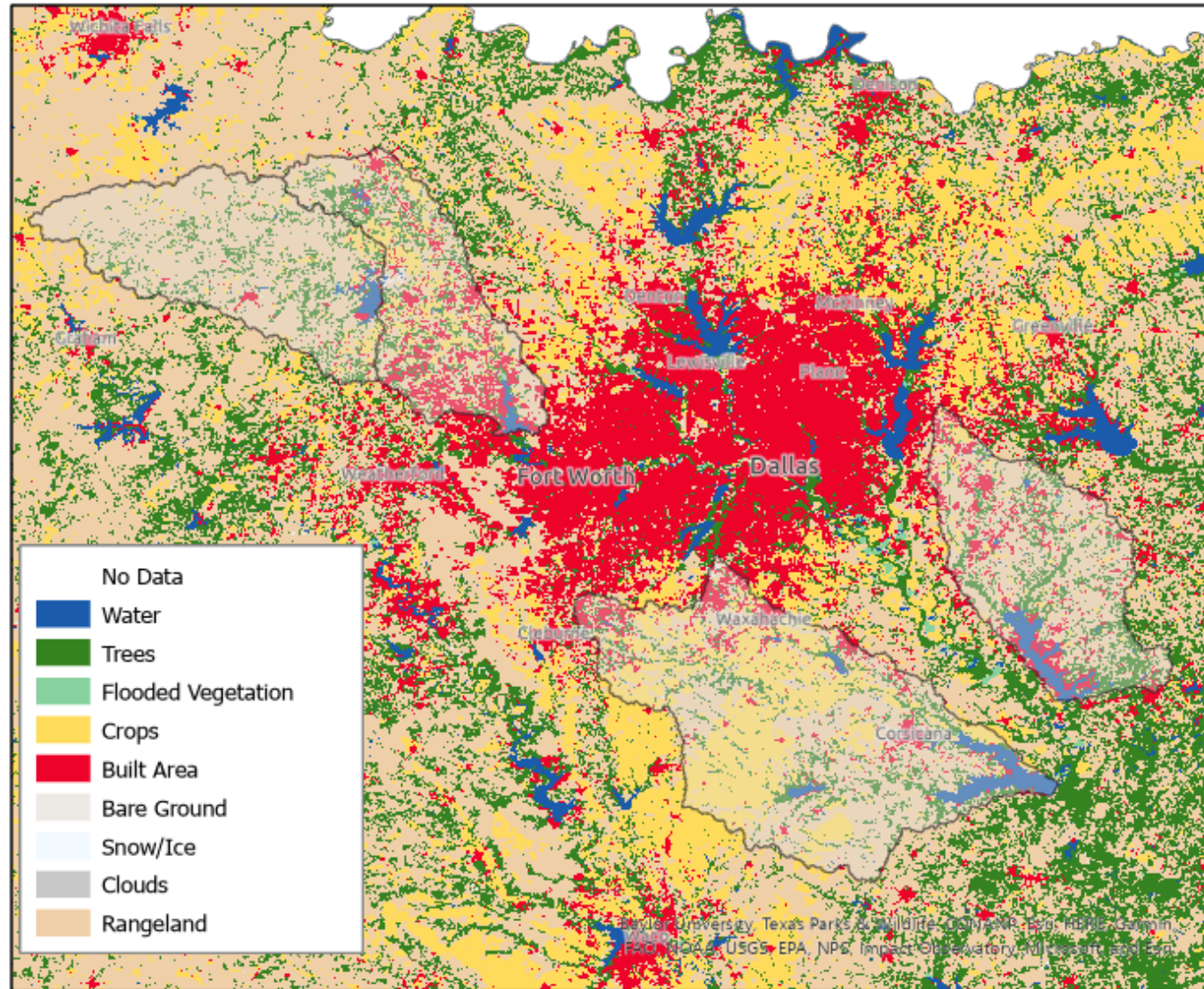


What is TRWD?

- ▶ Owns and operates 4 reservoirs
- ▶ Water supply for 70+ customer cities and 2.4 million+ end users
- ▶ Over 5,000 sq miles of watershed area
- ▶ 2,000 ac water reuse wetland project
 - ▶ Planned 3,000 ac project by 2030



Regional Considerations



Wildlife Habitat = Infrastructure

- ▶ Healthy habitats = healthy water
- ▶ Open space and functional ecosystems = INFRASTRUCTURE

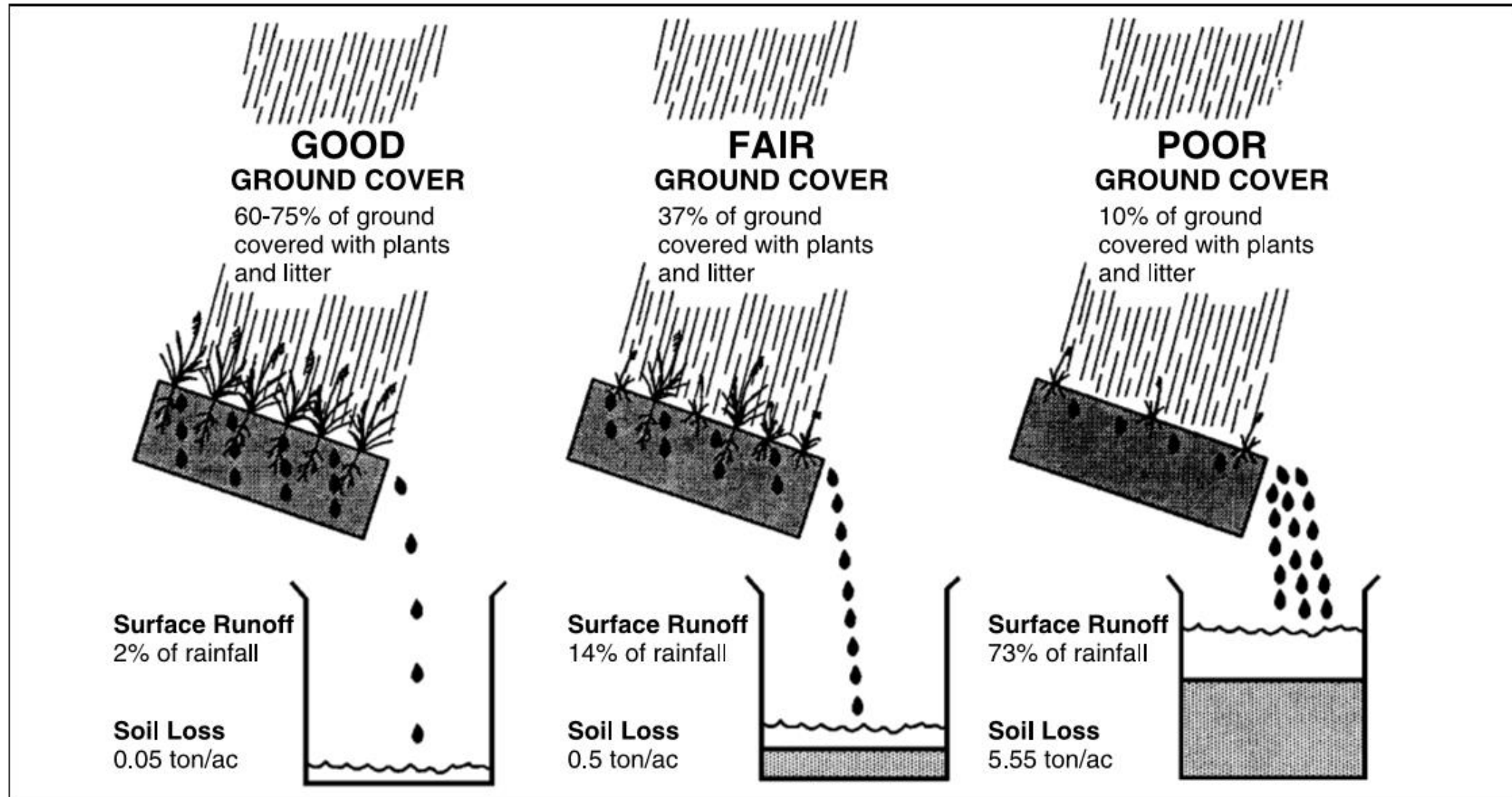


VS



Figure 5. Stages of a bermudagrass planting from early June through late August. Source: Larry Redmon

Water Supply and Quality Issues

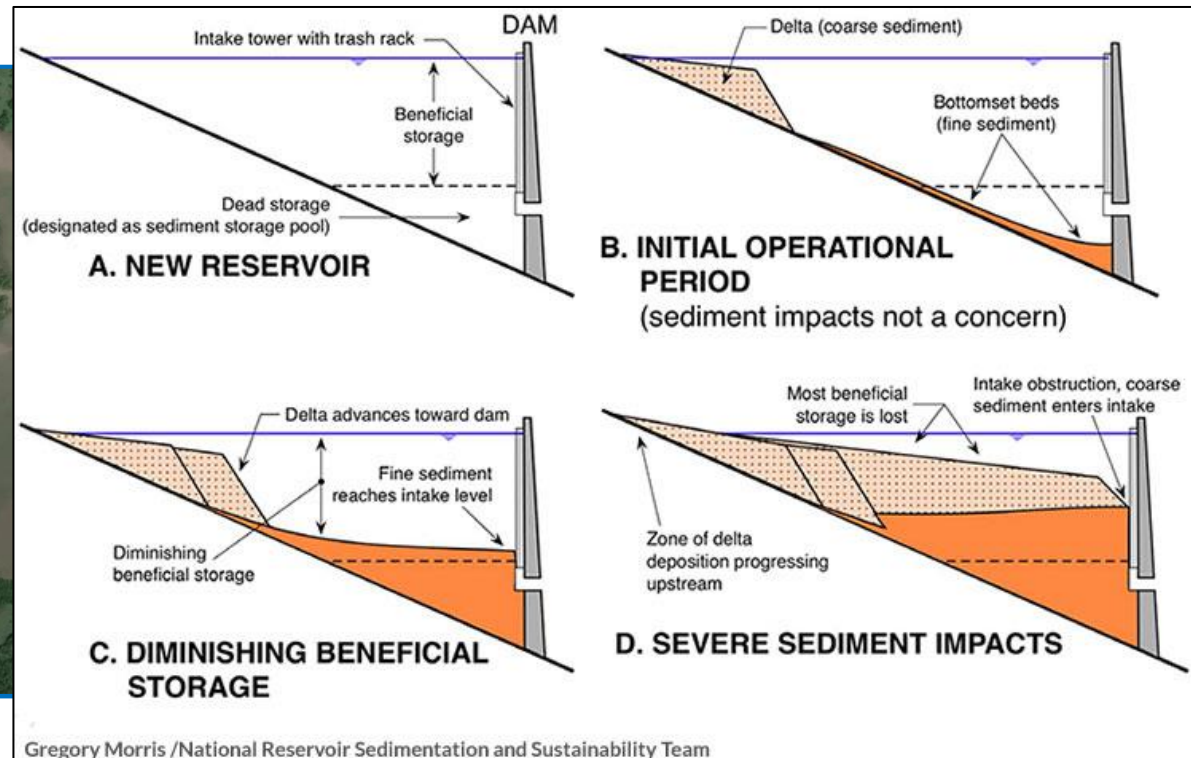


From Erosion to Sedimentation



Threatened Water Quality *and* Quantity

- ▶ Result of excessive erosion in watershed
- ▶ Legacy pollutants
- ▶ Transports nutrients downstream
- ▶ Decreases storage



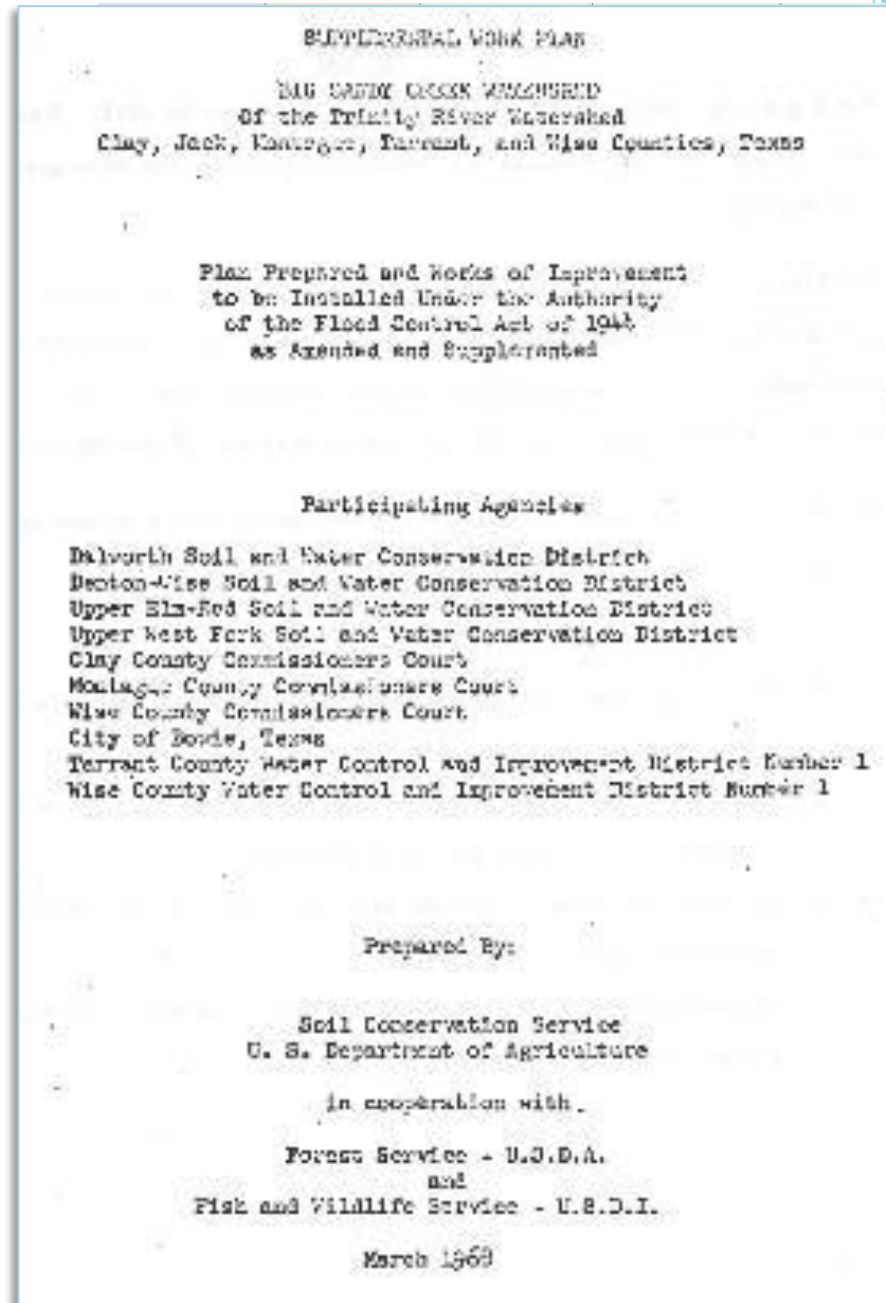
TRWD Support through Partnerships

Targeted funding

- Technical and Financial Assistance

Area-side support

- Education and Outreach
- Event sponsorship





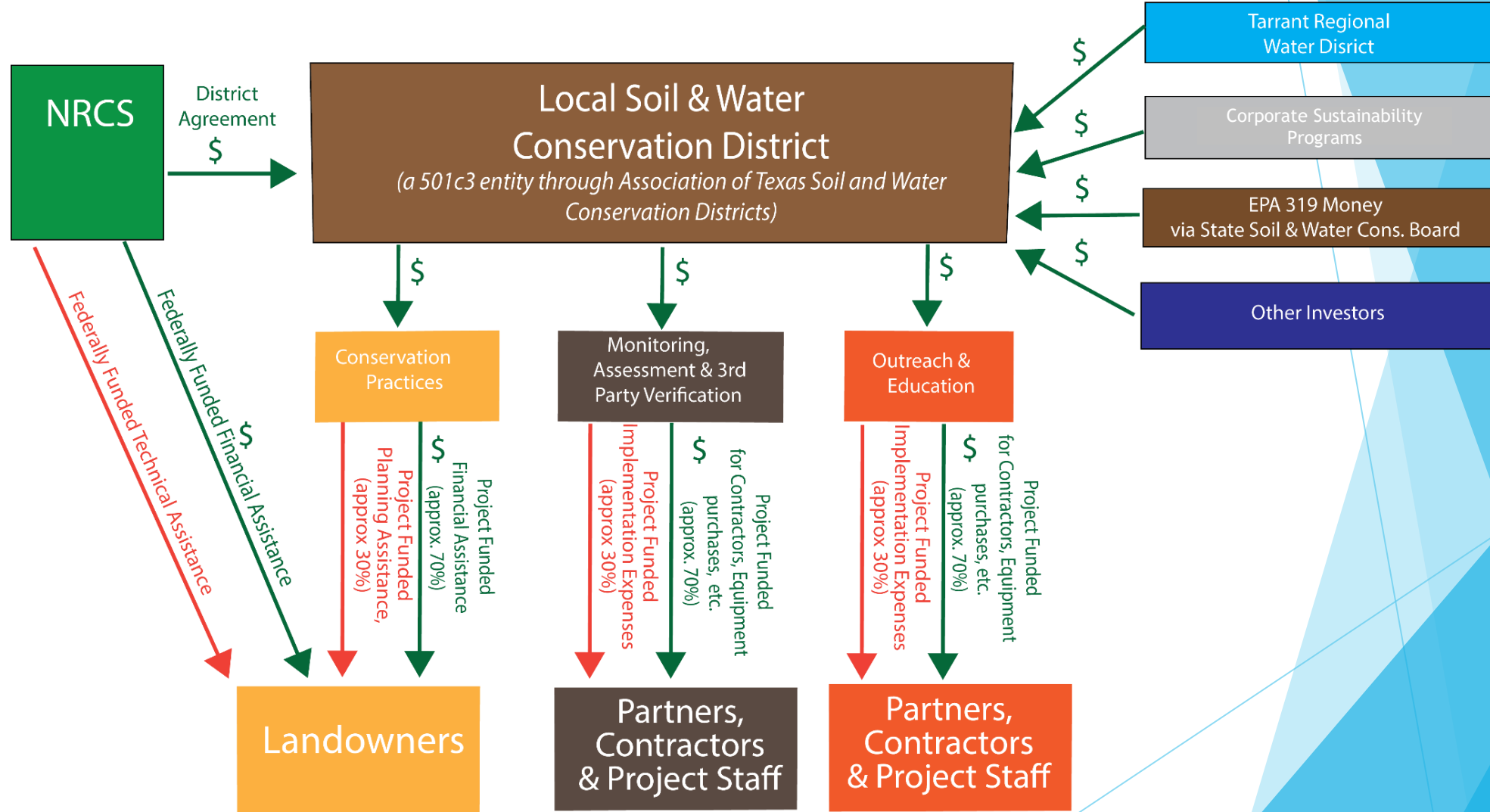
Partnerships

Federal

Soil and Water Conservation Districts

State

Partners





Partnerships

Soil and Water Conservation Districts



Cover Crops

Source: Z. Winslow, USDA

EQIP Contract Cost-share



Herbaceous Weed Control

Source: Iowa NRCS



Lime Application

Source: Stoltz Mfg, LLC



Staff

Source: D. Littlefield, NRCS

- ▶ Watershed Agreements
 - Kaufman-Van Zandt SWCD
 - Trinity-Neches SWCD
 - Navarro SWCD
 - Wise County SWCD
 - Parker County SWCD
 - Jack County SWCD
 - Archer County SWCD

Hill Country
Soil and Water Conservation District
Serving Bennett and Lampasas Counties

WE'RE HIRING!

Conservation Technician

- Work with farmers and ranchers to develop water quality management plans
- Assist producers in obtaining and utilizing cost-share funding to implement conservation best management practices on acreage.
- Degree in Agriculture, Natural Resources or related field preferred
- Position located in Lampasas, TX

SEE FULL POSITION DESCRIPTION AND DOWNLOAD APPLICATION AT WWW.LAMPASASRIVER.ORG

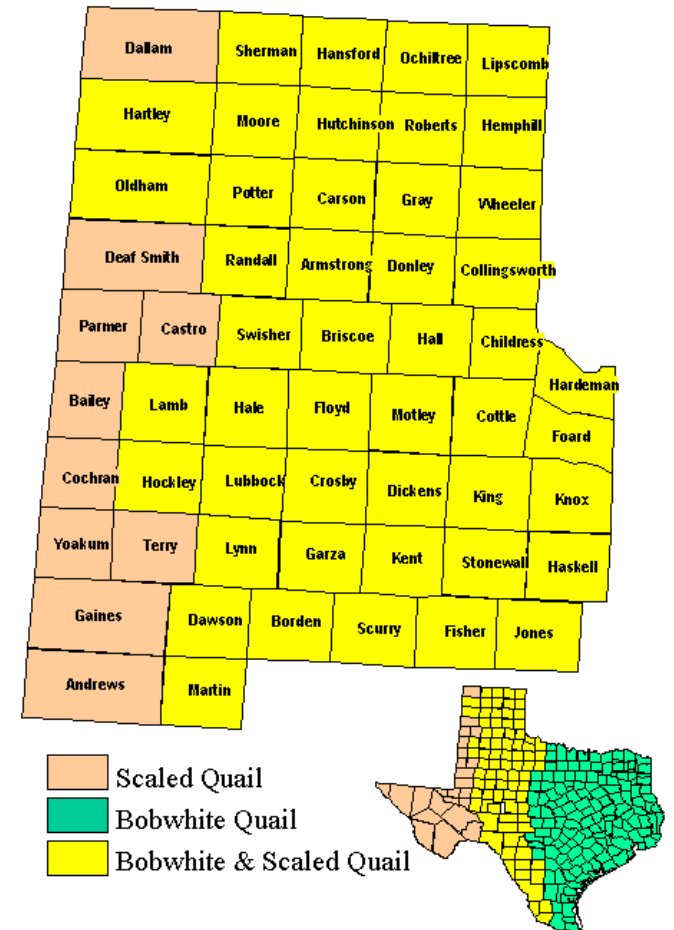
Or contact Diane for more information at Diane.Burton@tx.nacdnet.net • (512) 756-4651

Western Navarro Bobwhite Recovery Initiative

- ▶ Native Texas bird that has suffered population decline primarily due to habitat loss
 - ▶ Conversion of native range into farmland or introduced forages
- ▶ Valued for game and heritage

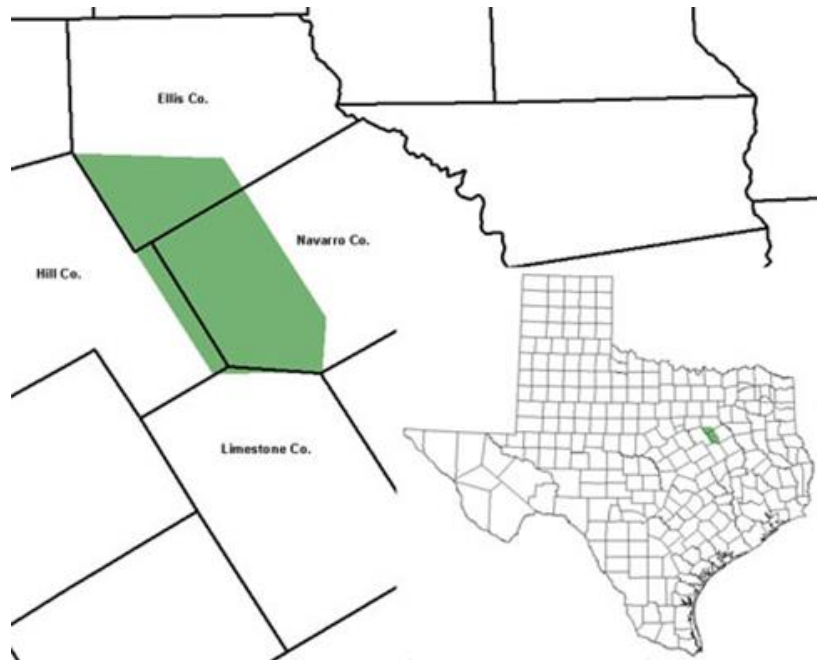


General Distribution of Scaled and Bobwhite Quail in Texas Panhandle





Western Navarro Bobwhite Recovery Initiative



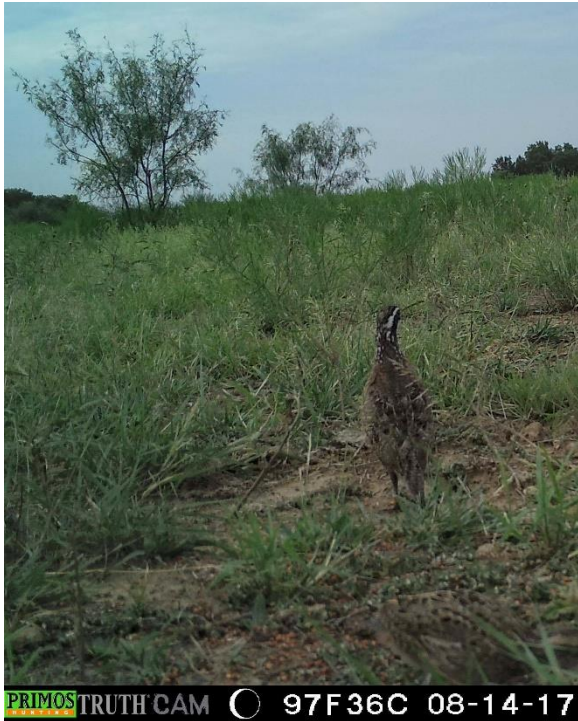
- ▶ Pilot program with local nonprofit
 - ▶ Heavy involvement of local landowners, Texas Parks and Wildlife Dept, Quail Forever, and NRCS
- ▶ Small grant/agreement paid by TRWD
 - ▶ What's good for land is good for water
 - ▶ Paid through a demo/special projects budget controlled by Watershed Protection Program
 - ▶ More liquid funds with less red tape and wait time than federal or state programs



Western Navarro Bobwhite Recovery Initiative

Western Navarro Bobwhite Recovery Initiative

- ▶ Results so far:
 - ▶ 2021: Habitat Enhancement Program, 121 ac
 - ▶ 2022: Native seed purchase, 60 ac
 - ▶ 2023: Native prairie restoration prep & seeding, 257 ac



Partnerships

Planned Grazing Fencing Kit - Demonstration Project

- ▶ Partnership with Blackland Prairie Grazing Lands Coalition
- ▶ Electric fence to rotate grazing or create an exclusion zone
- ▶ Deployed as a livestock exclusion around a heavily eroded washout on a ranch in the Richland-Chambers Reservoir watershed



Partnerships

Technical vs Financial Assistance



Acres in Conservation Practices that address water quality

Eagle Mountain

Planning Assistance	210,262 acres
Funding Assistance	41,737 acres

Acres in Conservation	251,999
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TOTAL FUNDS	\$2,000,000
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Cost of Conservation:
\$7.94 per acre

Richland/Chambers

Planning Assistance	101,605 acres
Funding Assistance	74,195 acres

Acres in Conservation	175,800
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TOTAL FUND	\$7,800,000
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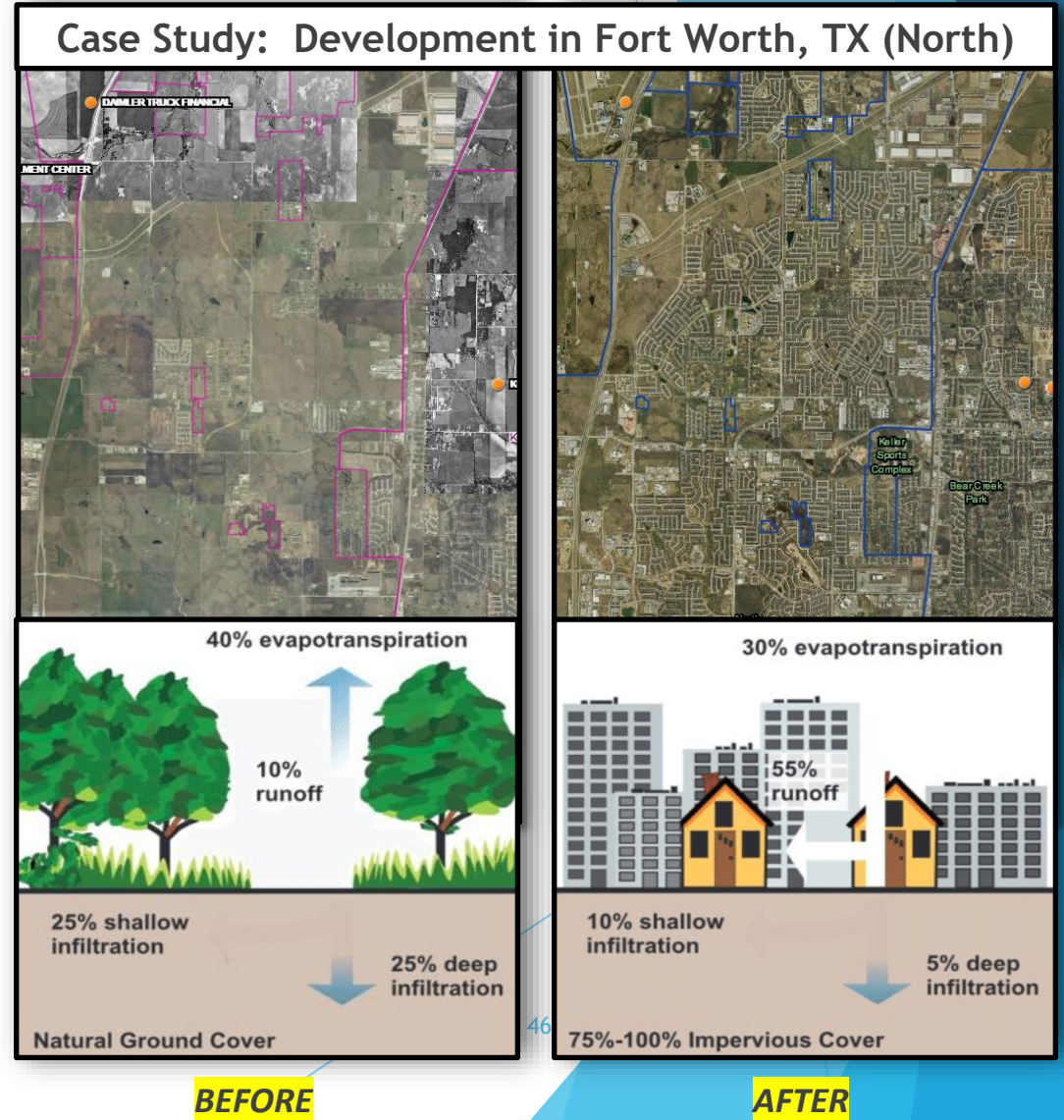
Cost of Conservation:
\$44.37 per acre

FY 2012-2015

Urbanization Challenges



Case Study: Development in Fort Worth, TX (North)



BEFORE

- 40% evapotranspiration
- 10% runoff
- 25% shallow infiltration
- 25% deep infiltration
- Natural Ground Cover

AFTER

- 30% evapotranspiration
- 55% runoff
- 10% shallow infiltration
- 5% deep infiltration
- 75%-100% Impervious Cover

TRWD Rainscapes, Fort Worth Campus



TRWD Rainscapes Henderson Wetland

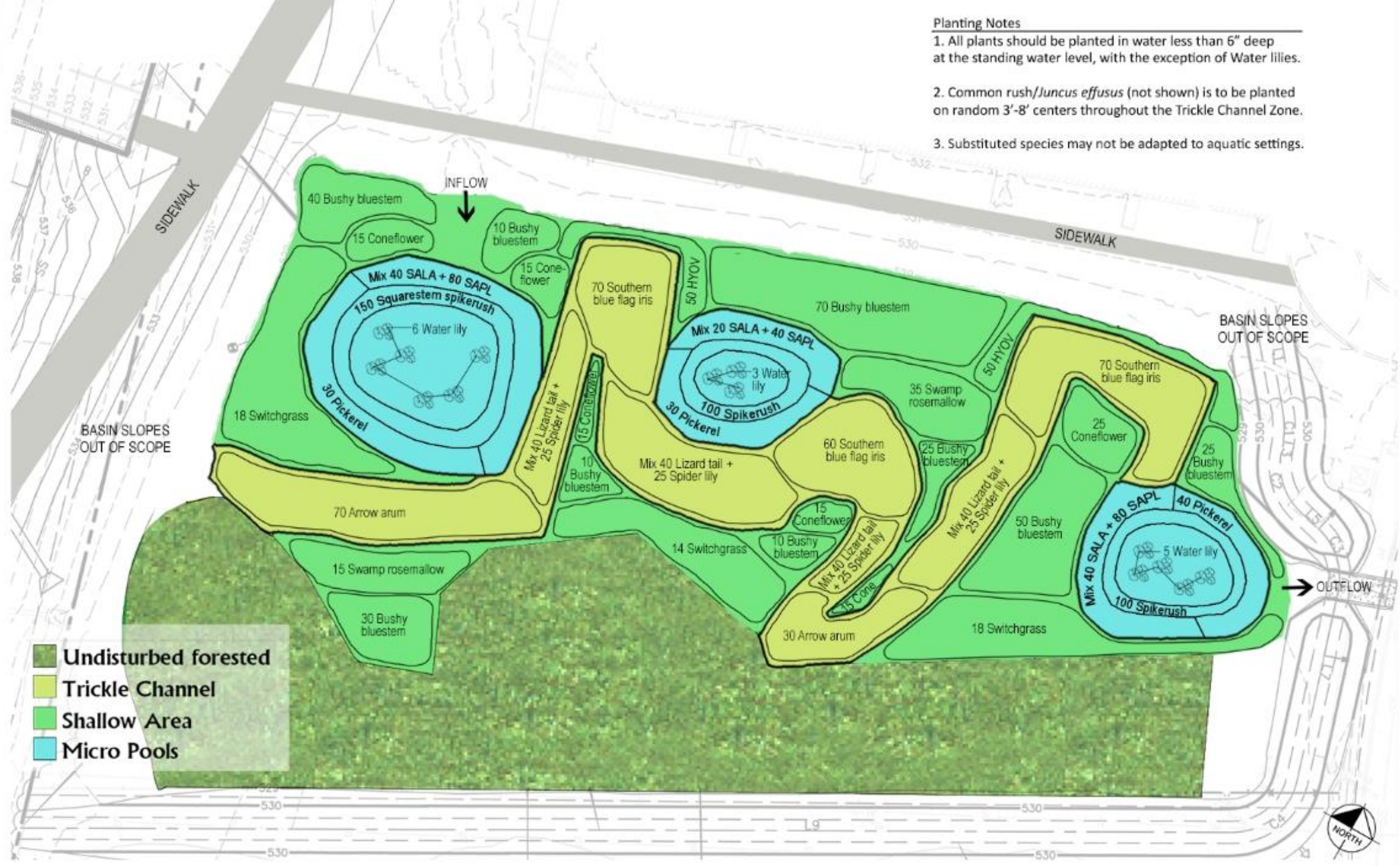


2018



Planting Notes

1. All plants should be planted in water less than 6" deep at the standing water level, with the exception of Water lilies.
2. Common rush/*Juncus effusus* (not shown) is to be planted on random 3'-8' centers throughout the Trickle Channel Zone.
3. Substituted species may not be adapted to aquatic settings.



Undisturbed forested
 Trickle Channel
 Shallow Area
 Micro Pools



2019



2020

2021



2023



trwd

bwt

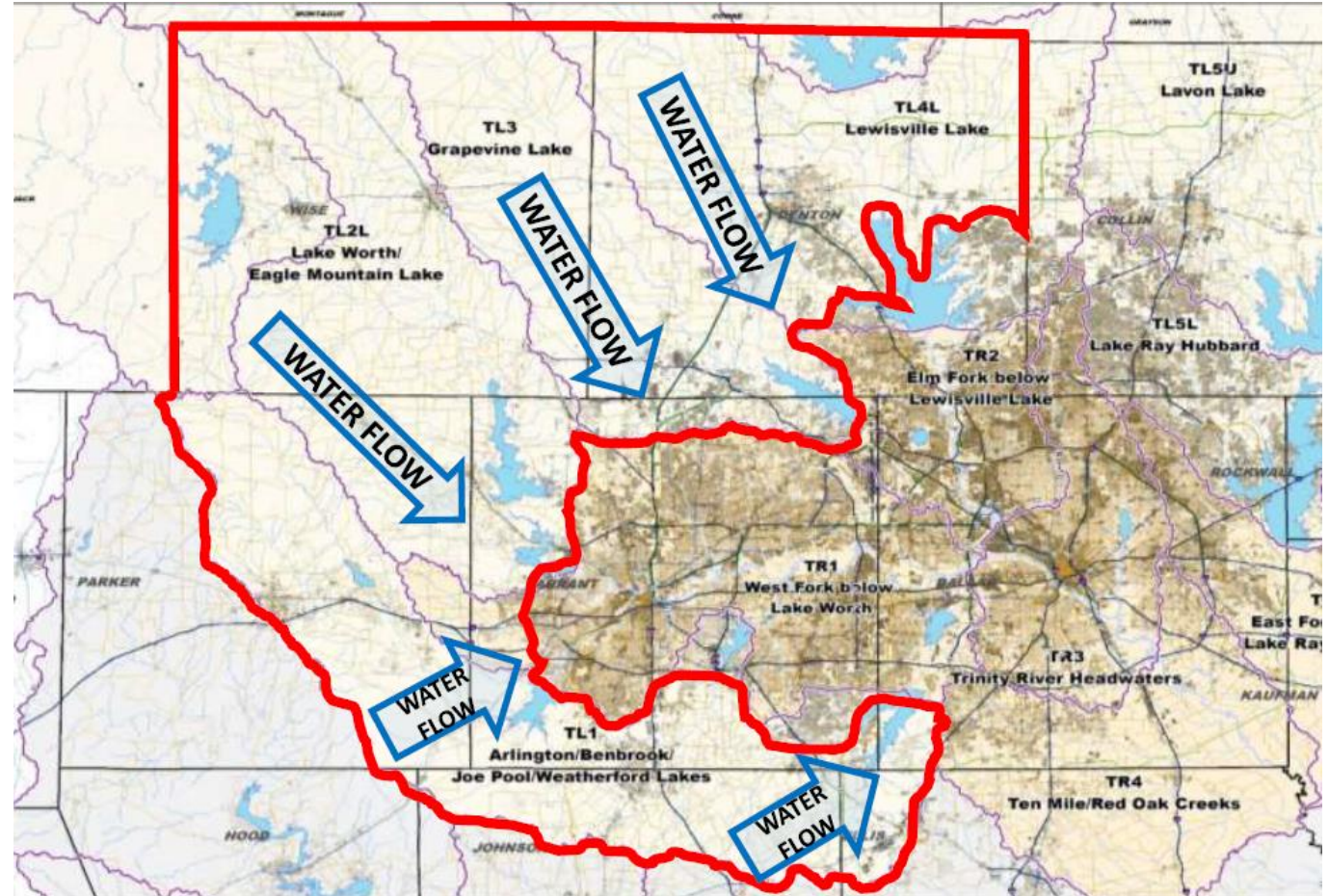
Watersheds for Wildlife: TRWD Programs

- ▶ Shannon Wetlands and Richland Creek Wildlife Management Area



Integrated Transportation and Stormwater Infrastructure (TSI) Initiative

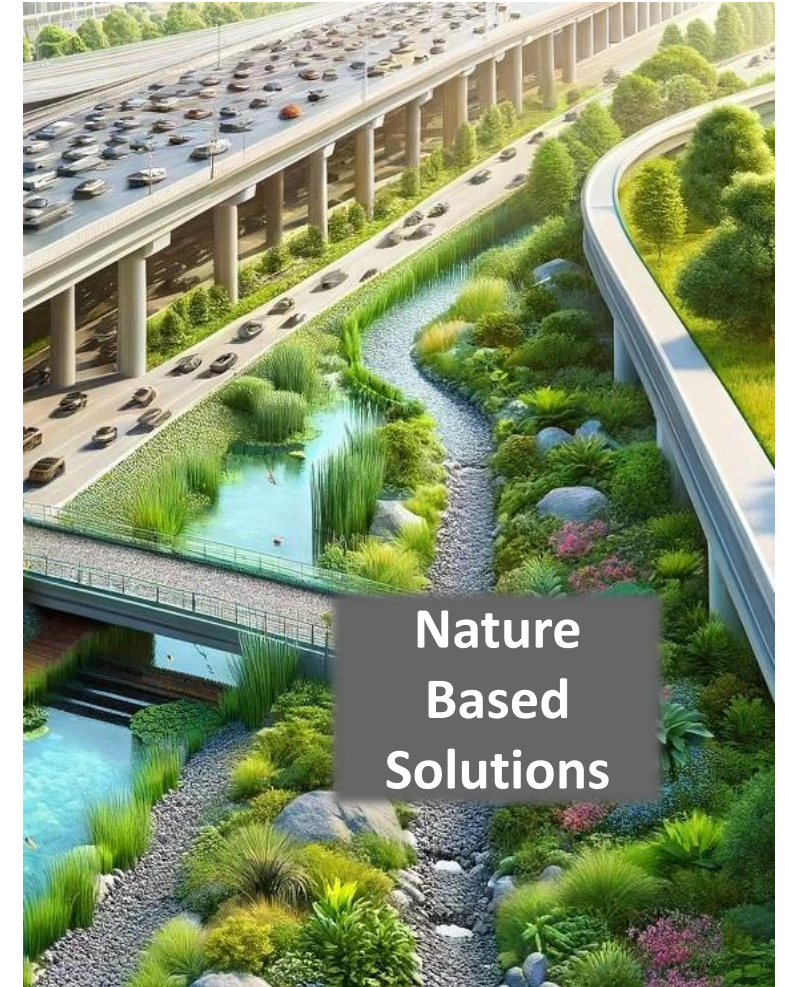
- Integrate stormwater management, urban development, transportation, and environmental planning
- Identify impacts and alleviate risks from flooding
- Get ahead of growth
- Reduce costs



Stakeholder Engagement

1. Identifying Stakeholders
2. Prioritizing Local Governments for Outreach
3. Preparing for Outreach to Local Governments
4. Following Up After Outreach to Local Governments
5. Reaching Rural and Agricultural Audiences
6. Reaching Business Audiences

Result: A menu of options & integration where it makes sense



*Note that these images were made with AI to appease our robot overlords that will eventually rule over all humankind**

Green Stormwater Infrastructure Integration

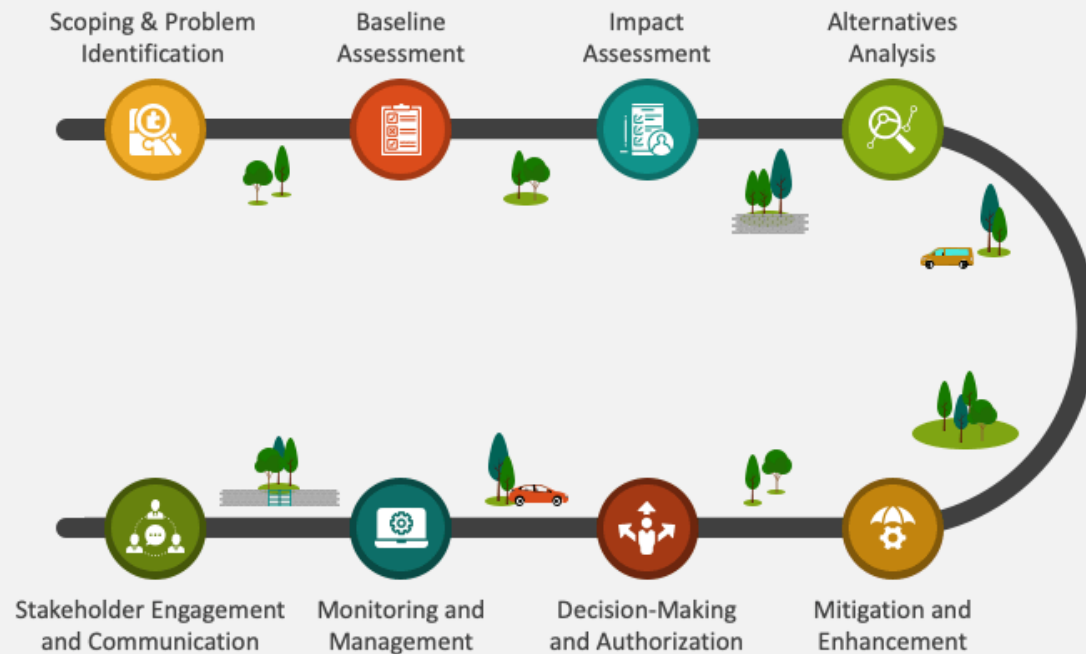
10% of the park converted to bioretention area



Environmental Planning – what is it?

ENVIRONMENTAL PLANNING

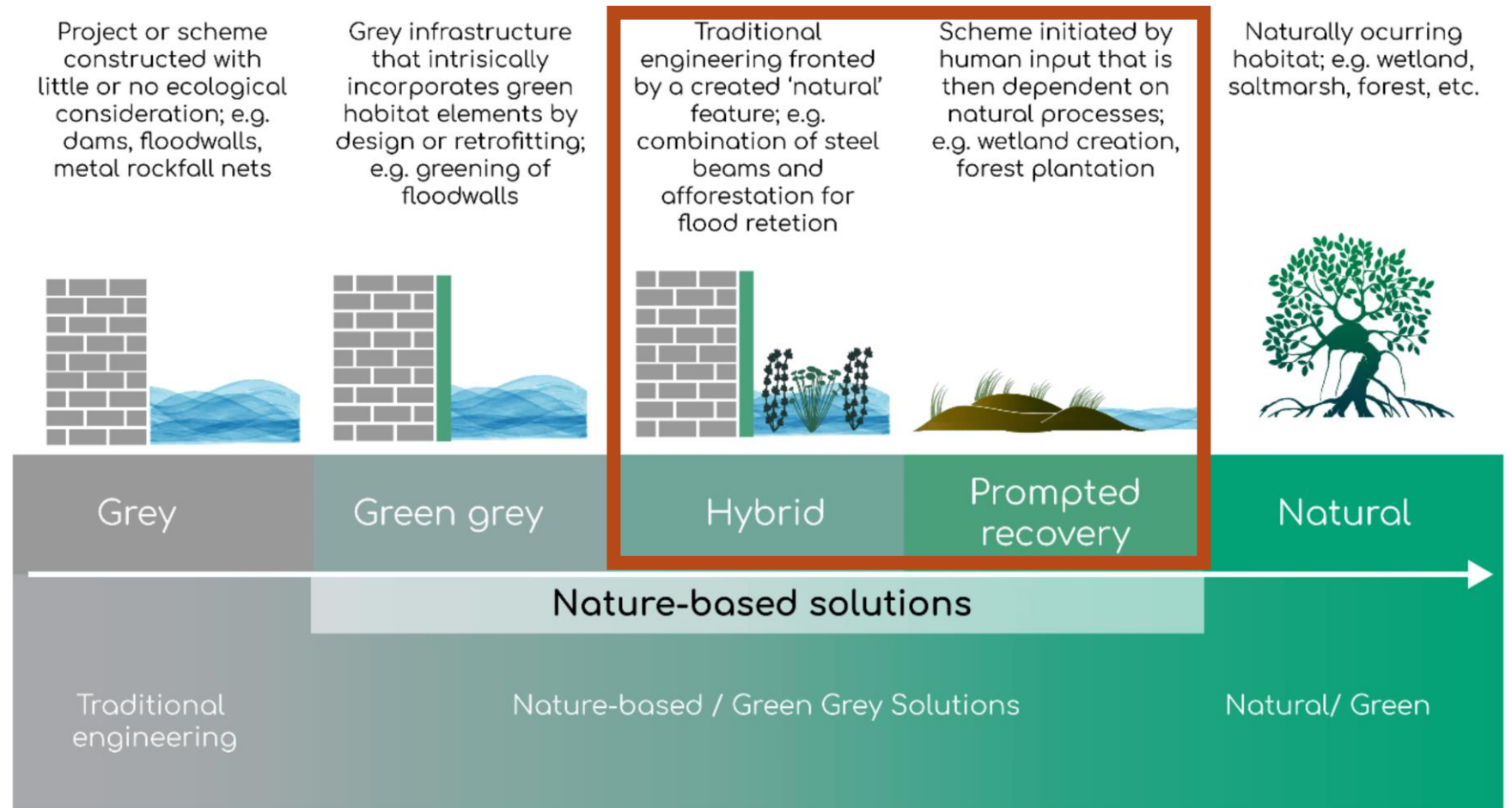
Environmental Planning Process



3.2.9	Optimization study: model ideal location and sizing for ponds and other drainage/flood control structures, and consider potential alternatives to reduce downstream flows.
3.2.8	Planning tool with map of vulnerable areas to identify design criteria and opportunities for environmental stewardship as potential revenue
3.3.1	Memo documenting review of ongoing planning and infrastructure efforts related to green stormwater infrastructure and nature based solutions
3.3.9	Web-based map that identifies flood prone areas and ideal locations for implementation of GSI and NBS
3.3.6	Fact sheets on GSI and NBS applications illustrating project economics
3.3.7	Documented ROI of identified GSI and NBS applications using Economic & Environmental Benefits of Stewardship tool, to produce a menu of options for communities
3.3.3	List of GSI and NBS suitability index based on geological, social, and environmental parameters and ranking of project types and locations
3.3.5	Financial pro forma, benefit cost analysis tool for various GSI and NBS applications
3.3.2	Environmental and wetland analysis memo (mitigation banking considerations)
3.3.4	Literature review of ROI for developers and cities that have preserved floodplain areas and implemented GSI
3.5.1	Document potential options or incentives to provide for conservation and preservation of flood-prone and environmentally sensitive areas

Environmental Planning: Know what you know you know

- What GSI/NBS projects have been implemented locally?
- Any local efforts to monetize restoration?
 - Mitigation banks
 - Other revenue generation



Source: Martin JGC, Scolobig A, Linnerooth-Bayer J, Liu W, Balsiger J. Catalyzing Innovation: Governance Enablers of Nature-Based Solutions. *Sustainability*. 2021; 13(4):1971. <https://doi.org/10.3390/su13041971>

GSI/NBS - What works best where?

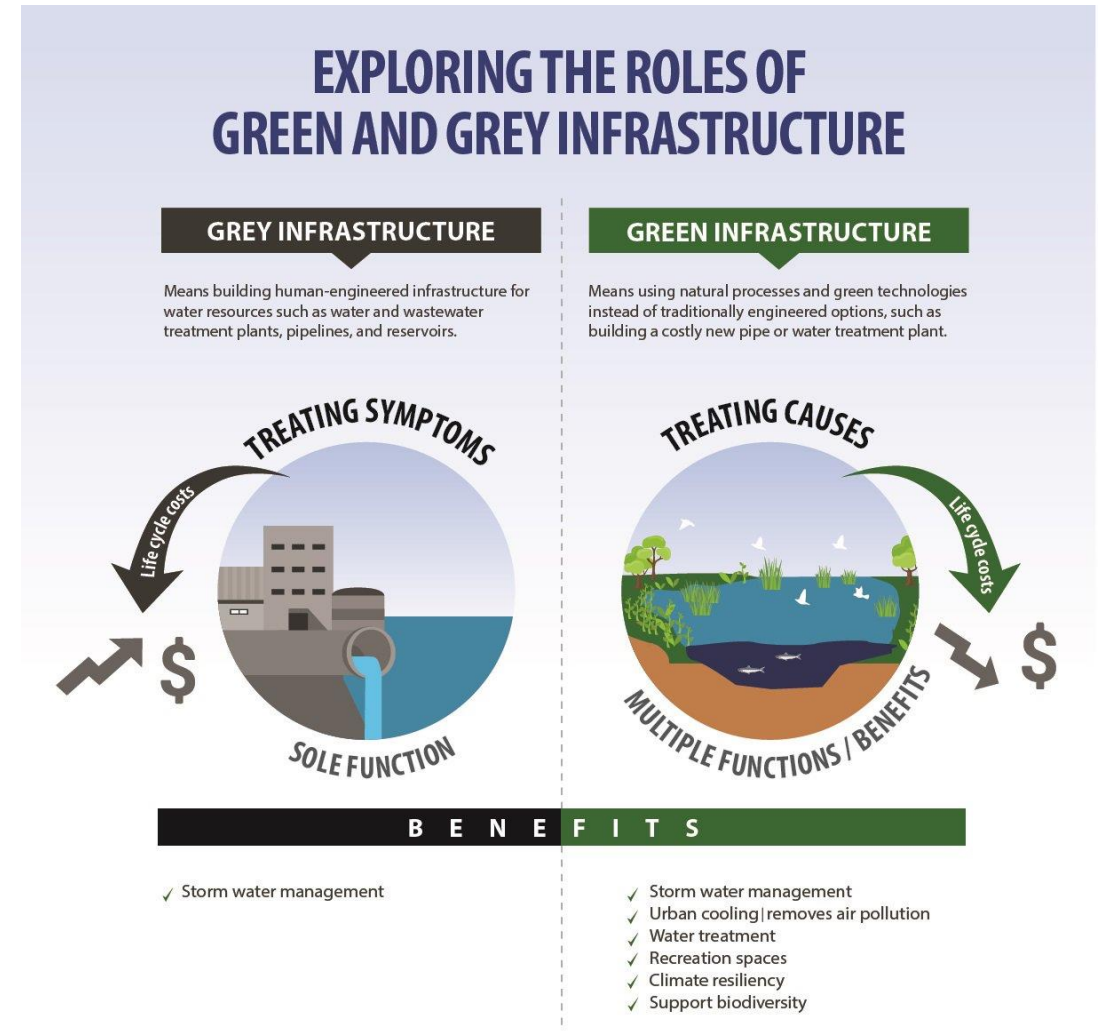
- Map your vulnerable areas
- Index suitable projects for those areas
- Optimize for implementation
 - Alternatives analysis



Source: Stefanakis, Alexandros et. al. (2021). Nature-Based Solutions as a Tool in the New Circular Economic Model for Climate Change Adaptation. Circular Economy and Sustainability. 1. 10.1007/s43615-021-00022-3.

Let's talk \$\$\$ - Support & Empower Communities

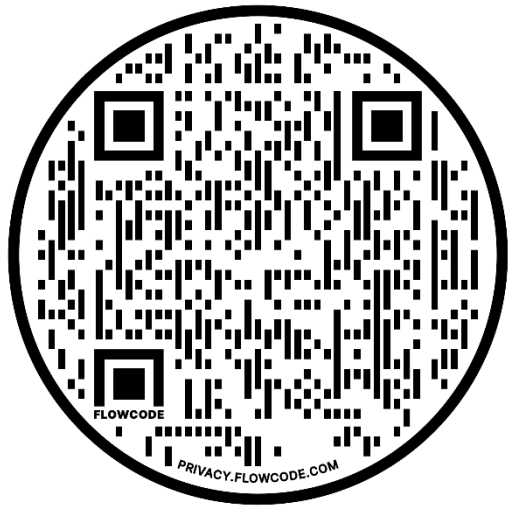
- Talk to developers/municipal staff
 - ROI on implemented GSI/NBS
 - Greenspace preservation
- Don't overlook the Power of Stewardship
 - Social capital
 - Economic & Environmental Benefits
- Make a menu using feedback and existing tools
 - Include cost/benefit analysis
 - What's the best ROI for my community?
- Incentivize conservation/preservation
 - Existing codes, ordinances, and policies
 - Model policies



Change the Perception

Stormwater as a valuable resource, not a nuisance to be gotten rid of or passed on to your neighbor to “deal with”





*"There are idle spots on every farm, and every highway is bordered by an idle strip as long as it is; keep cow, plow, and mower out of these **idle spots**, and the full native flora, plus dozens of interesting stowaways from foreign parts, could be part of the normal environment of every citizen."*

- Aldo Leopold

Contact Info

- ▶ Aaron Hoff, Watershed Programs Manager
 - ▶ aaron.hoff@trwd.com
- ▶ General watershed inquiries: watersheds@trwd.com
- ▶ Our website: <https://www.trwd.com/watersheds/>

Project Updates

Project Updates

- City of Arlington
- City of Dallas
- City of Fort Worth
- City of Grand Prairie
- City of Irving
- City of Plano
- North Texas Municipal Water District
- Tarrant Regional Water District
- Texas A&M AgriLife
- Trinity River Authority
- Upper Trinity Regional Water District

NCTCOG Updates

TMDL Implementation Plan Strategy Redevelopment Update:

- All things I-Plan update meeting: October 2025 virtual via Microsoft Teams

Recap:

- Wastewater Task Force: February 6, 2025
- Stormwater Task Force: February 18, 2025
- Planning & Development Task Force: March 10, 2025
- Pets, Livestock, & Wildlife Task Force: March 26, 2025
- On-Site Sewage Facility Task Force: April 10, 2025
- Monitoring Coordination Task Force: April 29, 2025

NCTCOG Updates

Upcoming Meetings:

- **Water Resources Council:** October 15, 2025 at 10:30 AM, NCTCOG Offices
- **Stormwater Public Education Task Force:** November 2025
- **Joint Pollution Prevention/Illicit Discharge Detection & Elimination Task Forces:** November 2025

Roundtable

Schedule for Next Meeting:

March 2026
9:30 AM
Location TBD

Ideas for next meeting's presentations?

Contact

Joy Imagie-Douglas

Environment & Development
Planner

jdouglas@nctcog.org

(817) 422-5876

Erin Blackman

Environment & Development Senior
Planner

eblackman@nctcog.org


(817) 608-2360

Connect

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 nctcogenv

 youtube.com/user/nctcoged

 EandD@nctcog.org

 nctcog.org/TMDL