

Management Practices and Local Resources

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Texas Water Resources Institute

<http://texasriparian.org> and

<http://www.facebook.com/TexasRiparianAssociation>

Hindrances to Healthy / Functional Riparian Areas:

- Farming too close to the bank
- Mowing, spraying close to the creek
- Manicured landscapes next to the creek
- Chronic grazing concentrations in creek areas
- Excessive deer, exotics, hogs in creek
- Burning in riparian area
- Removal of large dead wood
- Artificial manipulation of banks / sediment
- Excessive vehicle traffic in creek area
- Poorly designed road crossings / bridges
- Excessive recreational foot traffic
- Excessive alluvial pumping or other withdrawals



Visual Indicators of Stream Health Include:

<http://texasriparian.org/wp-content/uploads/2013/02/Stream-Visual-Assessment-Protocol-2.pdf>

- Channel Condition
- Access to Floodplain and Hydrologic Alteration
- Riparian Zone
- Bank Stability
- Water Appearance
- Nutrient Enrichment
- Barriers to Fish Movement
- Instream Fish Cover
- Pools
- Invertebrate Habitat



Other factors if applicable include:

- Canopy Cover
- Manure Presence
- Salinity
- Riffle Embeddedness
- Macroinvertebrates Observed
- Fish Species Observed



Management and Stewardship

- The impacts of stream flow and water quality are cumulative as the water moves down the system.
- Management upstream can lead to positive or negative impacts downstream.
- As you assess the stream and riparian ecosystem think about what may be hindering it.
- Has something caused a change in the water, sediment or vegetation?
- Management activities should protect healthy systems or allow recovery to return to a healthy functioning system.
- Land and Water Stewardship!

What You Can Do

- Properly Manage:
 - Lawn and garden
 - Fertilizer and Pesticides
 - Household chemicals
 - Water use and conservation
 - Reduce bare ground/erosion



The Role of Management Practices

- Control surface runoff
- Minimize pollutants
- Ensure sound pest and nutrient management
- Optimize production
- Reduce Flows/Erosion
- Water Quality
- Improve Soil Health



Urban/Suburban/Home

- | Activities | BMPs |
|---------------------------------------|---|
| ■ Construction/paving | ■ Minimize Impervious Surfaces to reduce runoff |
| ■ Wastewater disposal | ■ Infiltration Systems |
| ■ Fertilizer and pesticide use | ■ Detention Systems |
| ■ Irrigation | ■ Retention Systems |
| ■ Disturbing and Creating Bare Ground | ■ Constructed Wetlands systems |
| | ■ Filtration Systems |
| | ■ Vegetated Systems |

Managing Your Landscape and Garden

- | | |
|--|--|
| ■ Properly Design Home Landscape | ■ Properly Manage Weeds |
| ■ Minimize impervious surfaces | ■ Cut or pull weeds before they go to seed to keep them from spreading |
| ■ Use grasses, trees, and natural landscaping features | ■ Minimize areas of disturbance (bare ground) to prevent weeds from establishing |
| ■ Select native plants adapted to region and climate | ■ Select the correct herbicide, follow label and use only as needed |
| ■ Mulch bare soil or plant with vegetation | |

Agricultural BMPs

- | | |
|---|--|
| ■ Nutrient management | ■ Cover /green manure crops |
| ■ Pest management | ■ Sediment control basins |
| ■ Irrigation water management | ■ Terrace |
| ■ Grazing Management | ■ Grassed Waterways |
| ■ Conservation tillage | ■ Drop Structure |
| ■ Contour farming | ■ Livestock manure and wastewater management |
| ■ Buffer/filter strips (Protect Riparian Areas) | |

Manage for Soil Health

Follow four basic soil health principles to improve soil health and sustainability:

1. Use plant diversity to increase diversity in the soil.
2. Manage soils more by disturbing them less.
3. Keep plants growing throughout the year to feed the soil.
4. Keep the soil covered as much as possible.



What are the benefits of healthy soil?

1. Healthy soil holds more water (by binding it to organic matter), and loses less water to runoff and evaporation.
2. Organic matter builds as tillage declines and plants and residue cover the soil. Organic matter holds 18-20 times its weight in water and recycles nutrients for plants to use.
3. One percent of organic matter in the top six inches of soil would hold approximately 27,000 gallons of water per acre!
4. Most farmers can increase their soil organic matter in three to 10 years if they are motivated about adopting conservation practices to achieve this goal.



Austin Grow Zone

- Establish a "Grow Zone" along both banks of the creek, approximately 25 ft.
- Allow for passive/natural plant growth in entire buffer area.
- Monitor for changes over time and apply adaptive management approaches where necessary.
- Coordinate periodic trash removal, weed/invasive vegetation management, and native seeding/planting.
- Install educational and demarcation signage where appropriate



Access to Streams

- Restricting access to specific points along a stream should be a primary goal.
- This will eliminate most of the bank erosion caused by livestock and human traffic as well as potential livestock injuries.
- Develop access ramps or trails with hardened surfaces such as coarse gravel over geotextile and slopes of 6:1 or flatter.
- These should allow easy access to pools within the stream that livestock prefer over riffles.
- Locating shade, salt, minerals, and winter feeding sites in portions of the pasture away from the stream will help reduce the time livestock spend at or adjacent to the water.

Managing Invasive Species

- Noxious and Invasive species Plant any species that has a serious potential to cause economical or ecological harm to agriculture, native plants, ecology and waterways.
- Invasives are affecting aquatic, riparian and upland areas throughout the state, and critical habitats are at risk.
- The Texas Department of Agriculture currently lists 30 noxious weeds proliferating in Texas: giant salvinia, giant cane (*Arundo donax*), Chinese tallow tree are some of the most potent invaders.
- Feral Hogs are estimated to cause an estimated \$52 Million in damage annually in Texas and are increasing in numbers.
- Manage to reduce invasive species.

Pesticides

- Whether in agricultural operations or in urban environments, the improper application, handling or disposal of pesticides can lead to water pollution.
- AgriLife Brush Busters Website: <http://texnat.tamu.edu/about/brush-busters/>
- TDA Website: <https://texasagriculture.gov/RegulatoryPrograms/Pesticides.aspx>
- Spray formulations can drift with the wind or vaporize into the air.
- Other formulations can leach into ground water or be carried into surface water by rainfall or irrigation runoff.
- Even pesticides in formulations that bind them to soil particles can find their way into surface waters if soil is eroded by wind or water.

B:6050 Pesticide Properties that Affect Water Quality. By: Paul A. Baumann, John A. Jackman, Douglas Stevenson

Use of Pesticides and Fertilizers

- | Pesticides | Fertilizers |
|--|---|
| ■ Apply carefully and ONLY the amount needed | ■ Test your soil! |
| ■ Consult qualified pest professional | ■ Use ONLY the amount needed |
| ■ Never discard leftover product down household drains or toilets | ■ Apply when plants are actively growing, not when they are dormant |
| ■ Dispose old or unused products at local hazardous material collection events | ■ Calibrate spreaders to obtain proper rate |
| | ■ Sweep up excess off sidewalks/driveways |

Actions to Protect your Water Supply

- Keep records on each well: location, maintenance, and WQ test results
- Manage potential sources of contamination (i.e. septic systems, animal feedlots, animal waste)
- Monitor the quality of stream and well water
- Have water tested whenever you suspect contamination or notice change is color, taste, or odor.



Water Well Testing FAQs

How often should the well be tested?

- Annually for bacteria.
- Every few years for general chemistry such as nitrates and salts.
- As frequently as needed for other contaminants of concern (<http://water.epa.gov/drink/contaminants/index.cfm>)

How much will it cost?

- Varies depending on analyses selected.
- Basic *E. coli* test should be less than \$50.

How do I find a lab?

- County Health Departments
- NELAC-certified labs on TCEQ website

Local Resources

- TSSWCB / SWCD
- USDA NRCS
- AgriLife Extension
- TPWD
- Texas A&M Forest Service
- Regional water and groundwater districts
- River Authority
- Watershed Partnership
- Feral Hog Resources

Texas State Soil and Water Conservation Board

- Headquarters in Temple, Texas
- Nonpoint source Program:
<http://www.tsswcb.texas.gov/managementprogram>
- Contact: Loren Warrick, Riparian Project Manager
 - lwarrick@tsswcb.texas.gov, 254-773-2250 ext. 248
- Website: <http://www.tsswcb.texas.gov/>
- TSSWCB Field Representative
Adrian Perez
aperez@tsswcb.texas.gov

USDA Natural Resources Conservation Service Programs

- Technical Assistance Programs
 - Conservation Technical Assistance (CTA)
- Financial Assistance Programs
 - Environmental Quality Incentive Program (EQIP)
 - Conservation Stewardship Program (CSP)
 - Agricultural Management Assistance Program (AMA)
- Easement Programs
 - Agricultural Conservation Easement Program (ACEP)
 - Healthy Forests Reserve Program (HFRP)
- Partnership Programs
 - Regional Conservation Partnership Program (RCP)

USDA Natural Resources Conservation Service Programs

- The web link for this information can be found at:
<http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/farmbill/>
- http://efotg.sc.egov.usda.gov//efotg_locator.aspx
(Field Guide)
- <http://plants.usda.gov/java/> (Plants Database)
- <http://websoilsurvey.nrcs.usda.gov/app/> (Soil Survey)

Texas AgriLife Extension Service

AgriLife Extension provides research-based information, educational programs, and technical assistance in the following core service areas:

- Agriculture
- Health and Family Development
- Community & Economic Development
- Environmental Stewardship
- Youth Development

AgriLife Extension Website:

<http://agrilifeextension.tamu.edu/>

Texas Parks and Wildlife Department

- Melissa Parker, Conservation Ecologist
 - Melissa.Parker@tpwd.texas.gov / 512-754-6844 e. 235
- Ryan McGillicuddy, Conservation Ecologist
 - ryan.mcgillicuddy@tpwd.texas.gov / (512) 389-8622
- Find local regional biologists:
 - http://www.tpwd.state.tx.us/landwater/land/technical_guidance/biologists/

Texas A&M Forest Service

- Contact Texas A&M Forest Service Programs:
 - <http://texasforestservicetamu.edu/main/article.aspx?ctrl=13>
- Hughes Simpson, Department Head in College Station
 - Email: hsimpson@tfs.tamu.edu / 979-458-6658
- Shane Harrington, Program Lead in College Station
 - Email: sharrington@tfs.tamu.edu / 979-458-6650
- Lori Hazel, Water Resources Staff Forester II in Temple
 - Email: lhazel@tfs.tamu.edu / 254-773-8481
- Thomas Dimmitt, Staff Forester I in Lufkin
 - Email: thomas.dimmitt@tfs.tamu.edu / 936-639-8182
- Mac Martin, Staff Forester I in Houston
 - Email: mac.martin@tfs.tamu.edu / 713-688-8931
- Jeffrey McFall, Staff Forester I in San Antonio
 - Email: jmcfall@tfs.tamu.edu / 210-494-1742
- Donna Work, Biologist IV in Lufkin
 - Email: dwork@tfs.tamu.edu / (936) 639 - 8191

Texas A&M Forest Service

- Texas Forest Service Best Management Practices:
 - <http://texasforestservicetamu.edu/main/article.aspx?id=15307>
- Texas Forest Service: Forests and Water:
 - <http://texasforestservicetamu.edu/main/article.aspx?id=15306>
- Texas A&M Forest Service: Water Resources Blog
- Texas Forest Information:
 - <http://www.texasforestinfo.com/>
- Texas Forest Info Mobile Apps:
 - <http://texasforestinfo.tamu.edu/MobileApps/Index.html>

TEXAS A&M FOREST SERVICE

Texas Forest Information Portal

Home Support Contact Sign Up

FRESH, CLEAN WATER
Forests protect water quality. They absorb rainfall, slow and filter stormwater runoff, reduce floods, and help maintain watershed resilience. Healthy and sustainable forests provide many benefits, services, and products - including clean water.

Discover & Explore an array of maps depicting forest conditions

Query & Download data and reports on a variety of forest interests

Applications

Timber Supply Analysis Forest Distribution Forest Ecosystem Values Economic Impact

Map My Property Urban Tree Canopy Forest Products Directory Timber Decision Simulator

Tree Trails Forest Drought Plan My Land Operation My City's Trees

Forest Action Plan Mobile Apps Story Maps Gallery

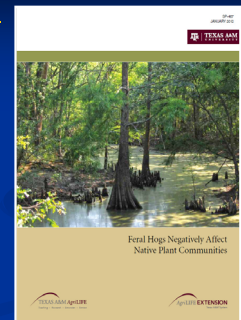
TCEQ – NPS Program

- Central Office: TCEQ -
12100 Park 35 Circle, Austin, TX, 78753
512-239-6682
nps@tceq.texas.gov
- Website:
 - <https://www.tceq.texas.gov/waterquality/nonpoint-source/>

Feral Hogs

- <http://pcwp.tamu.edu/FeralHogs/>
- <http://feralhogs.tamu.edu/>
- <http://overtontamu.edu/topics-new/wild-pigs/#.WBi5qC0rkUI>
- <http://feralhogreports.tamu.edu/>
- Publication links
- Site visits for landowners
- Presentations for groups

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Texas Stream Team

- Texas Stream Team works with [partners](#) to train citizens as certified water quality monitors.
- Texas Stream Team provides education to the public and at schools about [nonpoint source pollution](#) that harms water quality.
- Environmental data is made available to the public via our online [Dataviewer](#) - <http://www.meadowscenter.txstate.edu/Service/TexasStreamTeam/data maps/Dataviewer.html>

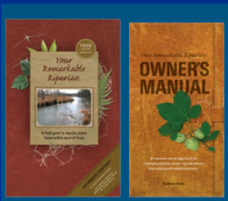


Texas Stream Team's Riparian Evaluation & Macroinvertebrate Bioassessment Program

- Assess the health of waterways based on the riparian habitat and the aquatic insects that are present there.
- TST's biomonitor citizen scientists assess the health of lakes, rivers, streams or estuaries based on the riparian habitat and the aquatic insects that are present there.
- TST's Riparian Assessment Trainings focus on the nature and function of stream and riparian zones, and the benefits and direct impacts from healthy riparian zones.

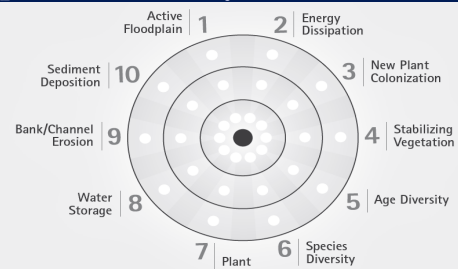


Your Remarkable Riparian



- Field Guide to riparian plants found within most of Texas
- Cultivates awareness and appreciation for riparian plants and the role they play in the production of abundant, clean water
- Used as a companion to complete and submit forms with one to four photos to report observations to Texas Stream Team

Riparian Bull's-Eye Evaluation Tool



Ten riparian indicators to guide your eye in assessing riparian landscapes for their function and identifying activities that may be hindering the natural riparian recovery process

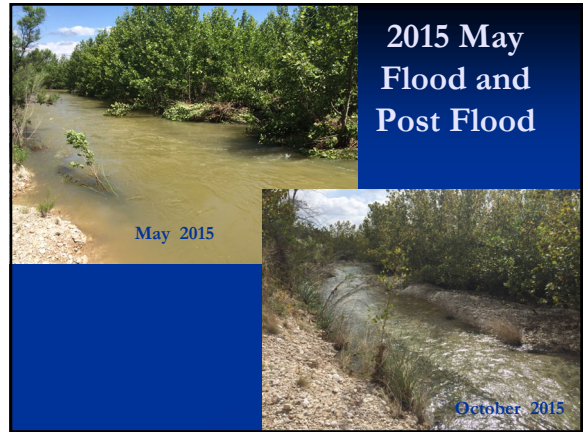
More Information on Texas Stream Team



- Jenna Walker, Program Manger
 - [512-245-9148](tel:512-245-9148)
 - jwalker@txstate.edu
- Website: <http://www.meadowscenter.txstate.edu/Service/TexasStreamTeam.html>

Photo Monitoring

- Repeating photographs at set locations will allow better assessment of current conditions and changes over time.
- Location selection: critical sites along the stream where the force of moving water has the potential for detrimental impacts
 - A tributary or high runoff location
 - Where the stream changes course – point bar or bend
 - Sites that are easily accessible and representative



Texas A&M Gardens and Greenway

White Creek Stabilization



SITE INVESTIGATION ANALYSIS

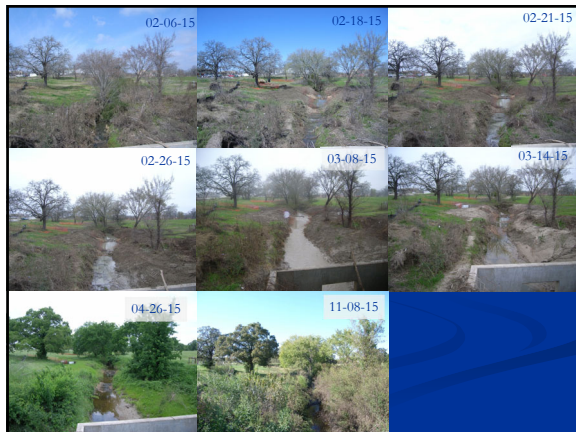
white creek restoration concept

Developed - May 28, 2014

TEXAS A&M GARDENS & GREENWAY white creek restoration

Engineered Rock Riffle (ERR)

Bank protection plan

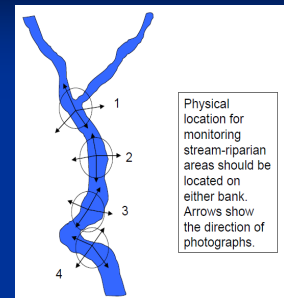


Permanent Photo Point Method

- Four photographs should be taken at each observation site:
 - 1) upstream showing the nearest bank, stream channel and opposite bank if possible,
 - 2) perpendicular to the stream of the opposite bank,
 - 3) perpendicular to the stream away on the bank where the observer is standing, and
 - 4) downstream showing the channel and both banks if possible.
- With a felt pen and a yellow paper pad (white is too bright), make a sign to include in the photo scene.
- Include some identification (stream name, range site, etc.) concerning the specific scene being photographed and the date.

Key Locations to Monitor

- Each location should be permanently marked for future evaluations using a steel stake or on-the-ground reference plus GPS coordinates if possible.
- locate the permanent reference point a "safe" distance inland
- Make a map of the stream showing the location of each permanent marker and the monitoring point.



Thank You!

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