Texas Riparian and Stream Ecosystem Education Program

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To improve the management of these sensitive and vital ecosystems, riparian education programs are needed regarding the nature and function of riparian zones, their benefits, and BMPs for protecting them. This will not only reduce NPS pollution, it will provide tremendous ecosystem service benefits and direct economic benefits to the community.

Texas Riparian & Stream Ecosystem Education

- Promote healthy watersheds and improve water quality through riparian and stream ecosystem education
- Increase citizen awareness, understanding and knowledge of the nature and function of riparian zones, their benefits and management practices to protect them and minimize NPS pollution
- Enhance interactive learning opportunities for riparian education across the state and establish a larger, more informed citizen base working to improve and protect local riparian and stream ecosystems through online tools
- Connect landowners with local technical and financial resources to improve management and promote healthy watersheds and riparian areas

Education

- Deliver a minimum of 25 riparian education programs to participants in prioritized watersheds, typically watersheds with watershed planning or total maximum daily load efforts due to impaired water quality
- Coordinate 3 Modified Proper Functioning Condition/ trainings to agency personnel and water professionals
- Coordinate 2 statewide riparian conferences

Collaborators

- Texas Water Resources Institute
- Texas State Soil and Water Conservation Board
- Texas Riparian Association
- Texas A&M Forest Service
- Texas Parks and Wildlife Department
- USDA Natural Resources Conservation Service
- Nueces River Authority
- Texas A&M AgriLife Research, Ecosystem Science and Management Department
- Texas Tech University Llano River Field Station

Riparian Team

First	Last	Org.
Blake	Alldredge	AgriLife Extension
Kevin	Anderson	TRA/Austin
Tom	Arsuffi	Texas Tech - LRFS
Bill	Carter	TCEQ
Russell	Castro	USDA NRCS
Nikki	Dictson	AgriLife Extension
Gary	Garrett	TPWD
Wesley	Gibson	TSSWCB
Thom	Hardy	MCWE, Texas State University
Fouad	Jabar	AgriLife Extension
Sky	Lewey	NRA
Peter	McKone	TCU/Atkins
Georgianne	Moore	TAMU ESSM
Steve	Nelle	Retired NRCS
Melissa	Parker	TPWD
Anne	Rogers	TRA
Hughes	Simpson	TFS
Kevin	Wagner	TWRI

Draft Agenda

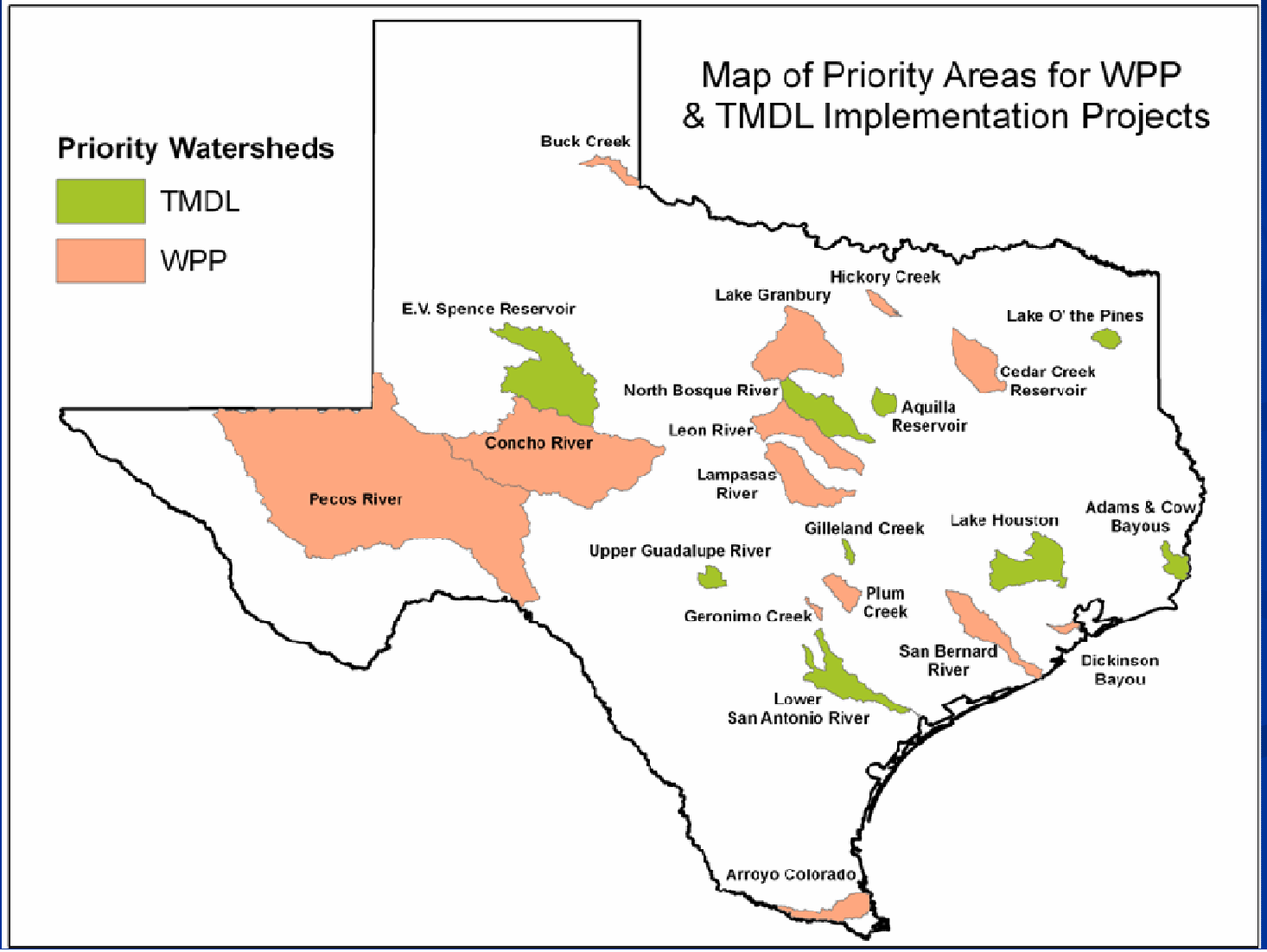
Texas Riparian and Stream Management Program

Draft General Agenda

8:00	Meeting Registration
8:30	Workshop Introductions and Overview
9:00	Riparian and Watershed Management Principles
9:45	Break
10:00	Basic Stream Hydrology or Cowboy Hydrology
10:45	Break
11:00	Riparian Vegetation and Their Function
11:45	Management Practices and Local Resources
12:00	Lunch Presentation related to the local watershed/region or Lane's Balance Demonstration Activity/ TPWD presentation
1:15	Review and Post Survey
1:30	Trip to the River (If there is a large group we can break into 2 or more groups and switch)
4:00	Wrap up and Head for Home!

Texas Water Resources Institute
Texas A&M Forest Service
TSSWCB
Texas Parks & Wildlife

Map of WPP and TMDL Implementation Projects



Drafting Schedule of Workshops

	Tentative Schedule
	Tentative Month
	TBD
	To Be Contacted

Watershed	Potential Month	Year	Watershed Coordinators	Affiliation	Counties
Carters Creek	Potentially May?	2013	Lucas Gregory	TWRI	Brazos County
Plum Creek Watershed	June (week of 17th or next)	2013	Nick Dornak	PCWP	Caldwell, Hays, and Travis Counties
Upper Llano River watershed	October-13	2013	Tom Arsuffi	Texas Tech LRFS	Edwards, Kerr, Kimble, Menard, Real, and Sutton Counties
Geronimo Creek Watershed	Sept?	2013	Ward Ling	AgriLife Extension	Guadalupe and Comal Counties
Buck Creek Watershed	Sept/Oct 13	2013	Lucas Gregory	TWRI	Childress, Collingsworth and Donley Counties
Lampasas River Watershed	Spring 2014	2014	Lisa Prcin	AgriLife Research	Bell, Burnet, Coryell, Hamilton, Lampasas, Mills, and Williamson Counties
Attoyac Bayou	Early 2014	2014	Lucas Gregory	TWRI	Rusk, Nacogdoches, San Augustine and Shelby Counties
Pecos River Watershed	Early 2014	2013	Lucas Gregory	TWRI	Crane, Crockett, Pecos, Reeves, Terrell, Upton, and Ward Counties
Big Cypress Creek Basin – LOP	mid 2014?	2014	Thomas/Dictson/Gregory	NETMWD/TWRI	Morris, Upshur, Cass, Marion, and Harrrison
Leon River	late 2013/early 2014	2014	Dickie Clary	Hamilton County	Hamilton, Comanche and Coryell Counties
Cedar Creek Watershed	Discussing dates		Clint Wolfe	AgriLife Research	Henderson, Kaufman, Rockwall and Van Zandt Counties
Trinity River	Discussing dates		Blake Alldredge	AgriLife Extension	Middle Trinity Counties
Gilleland Creek	Discussing dates		Lauren Young	TCEQ	Travis County
Hickory Creek	Left Message		David Hunter/Banks	City of Denton	Denton County
San Bernard River Watershed			Aubin Phillips	H-GAC	Austin, Colorado, Wharton, Fort Bend, and Brazoria Counties
Upper San Antonio River					Bexar County
Guadalupe River Above Canyon Lake			Lauren Young	TCEQ	Kerr, Kendall, and Comal Counties
Petronila Creek			Lauren Young	TCEQ	Kleberg and Nueces Counties
Concho River					Tom Green County
Bastrop Bayou				HGAC	Brazoria County
Lower Nueces			Rocky Freund	Nueces River Authority	Jim Wells, Nueces, and San Patricio Counties
Cedar Bayou			Justin Bower	H-GAC	Harris and Chambers Counties
Arroyo Colorado			Jaime Flores	TWRI	Cameron, Hidalgo, and Willacy Counties
Dickinson Bayou			Charriss York	AgriLife Extension	Brazoria and Galveston Counties
Double Bayou			Stephanie Glenn	Houston Advance Research Center	Chambers County

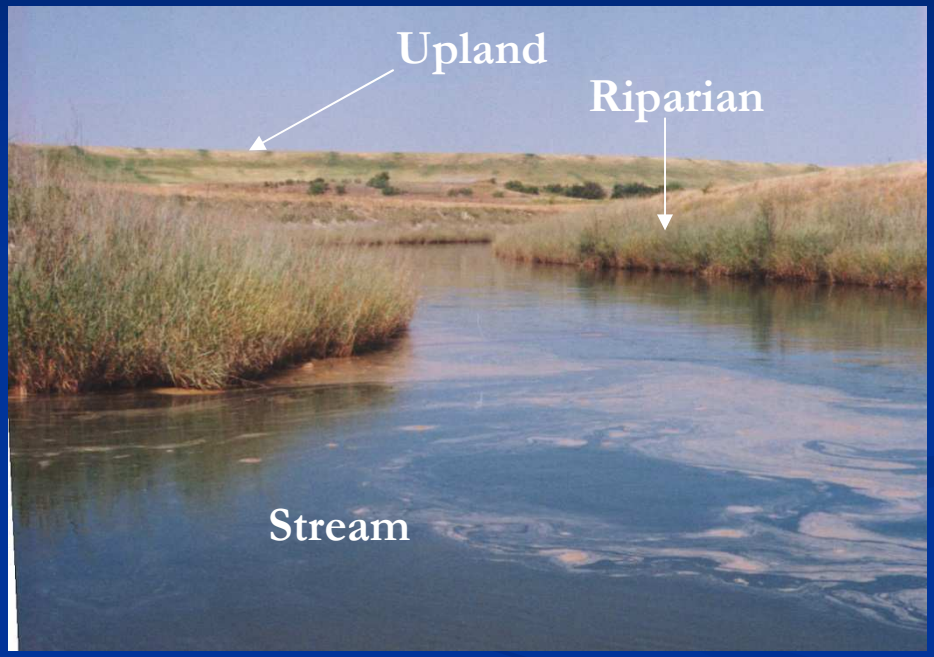
Creeks and Riparian Areas are Important

- The State of Texas has more than 200,000 miles of rivers and streams. These rivers and streams have riparian zones and floodplains that together comprise corridors of great economic, social, cultural, and environmental value.
- Many WPP and TMDL Implementation projects are ongoing across the state to improve WQ in watersheds
- Creeks / Riparian Areas are special places; they need preferential treatment
- To manage or restore creeks you must understand them and then address the hindrance that is inhibiting natural restoration

Watershed

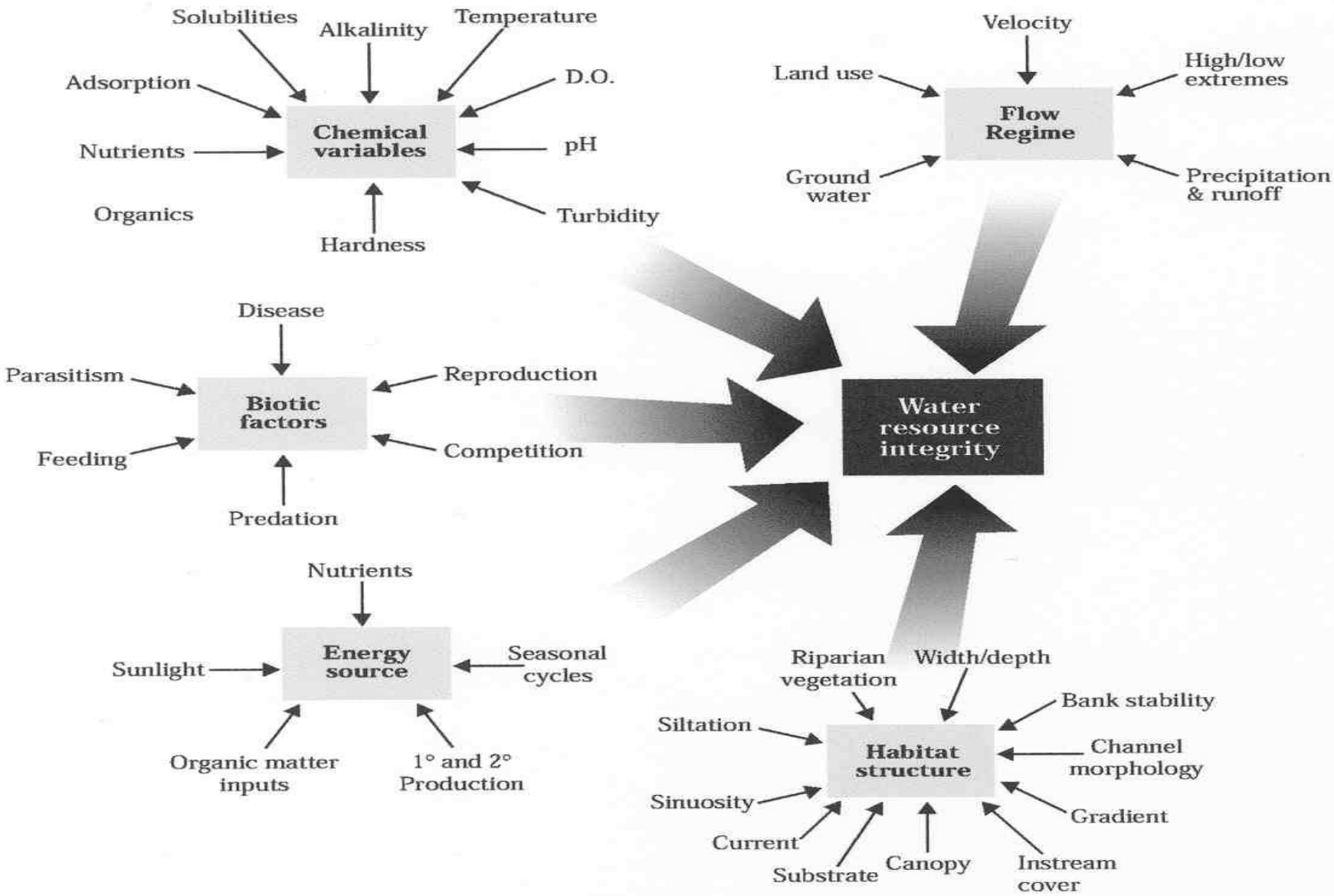
A Watershed can be characterized as consisting of:

- Upland
- Riparian zone
- Stream system



Each watershed functions as an ecosystem, i.e., each component affects the rest of the system including the benefits or negative impacts. As water flows through the system the impacts are cumulative.

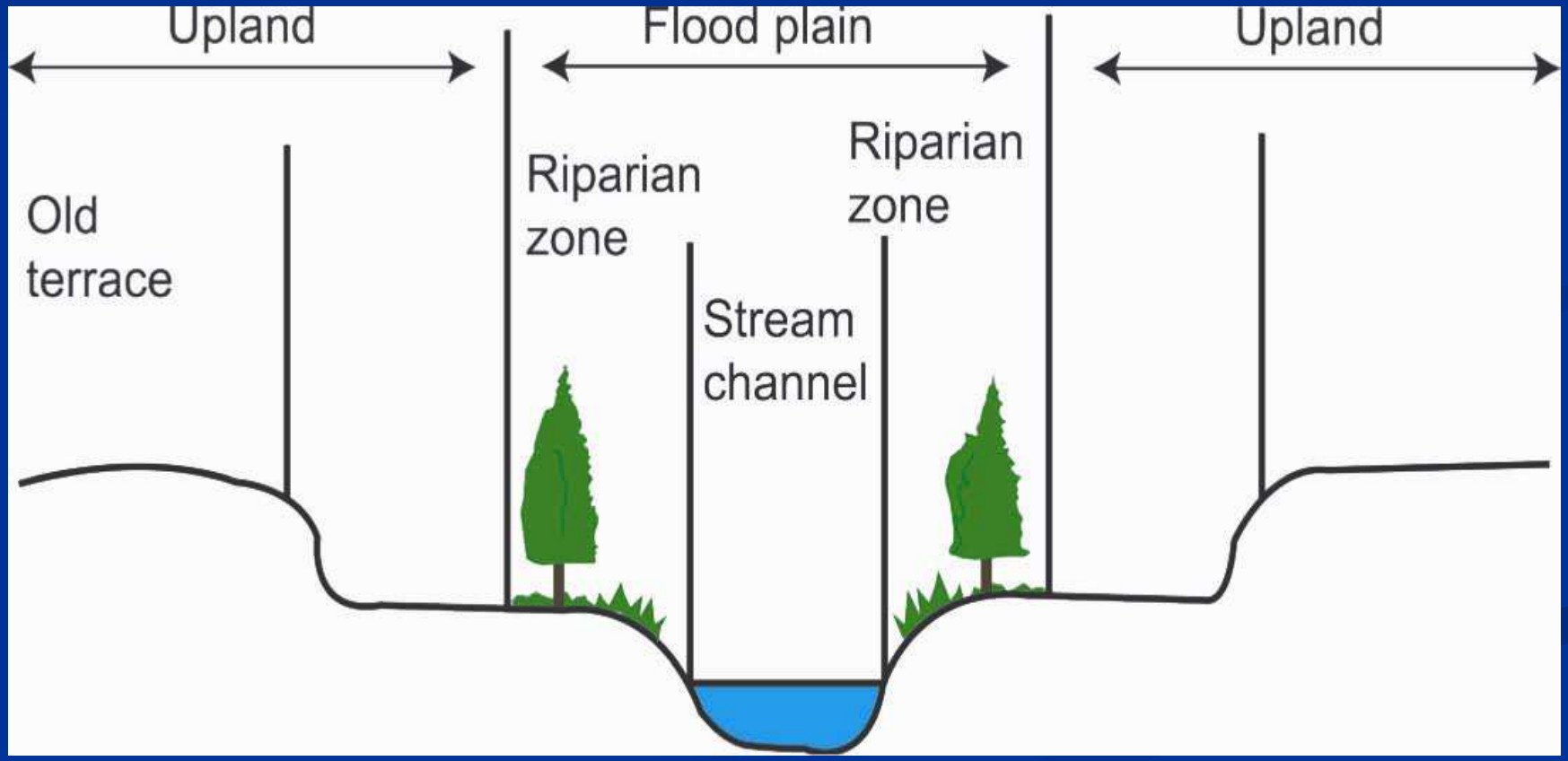
Watersheds are Complex Systems



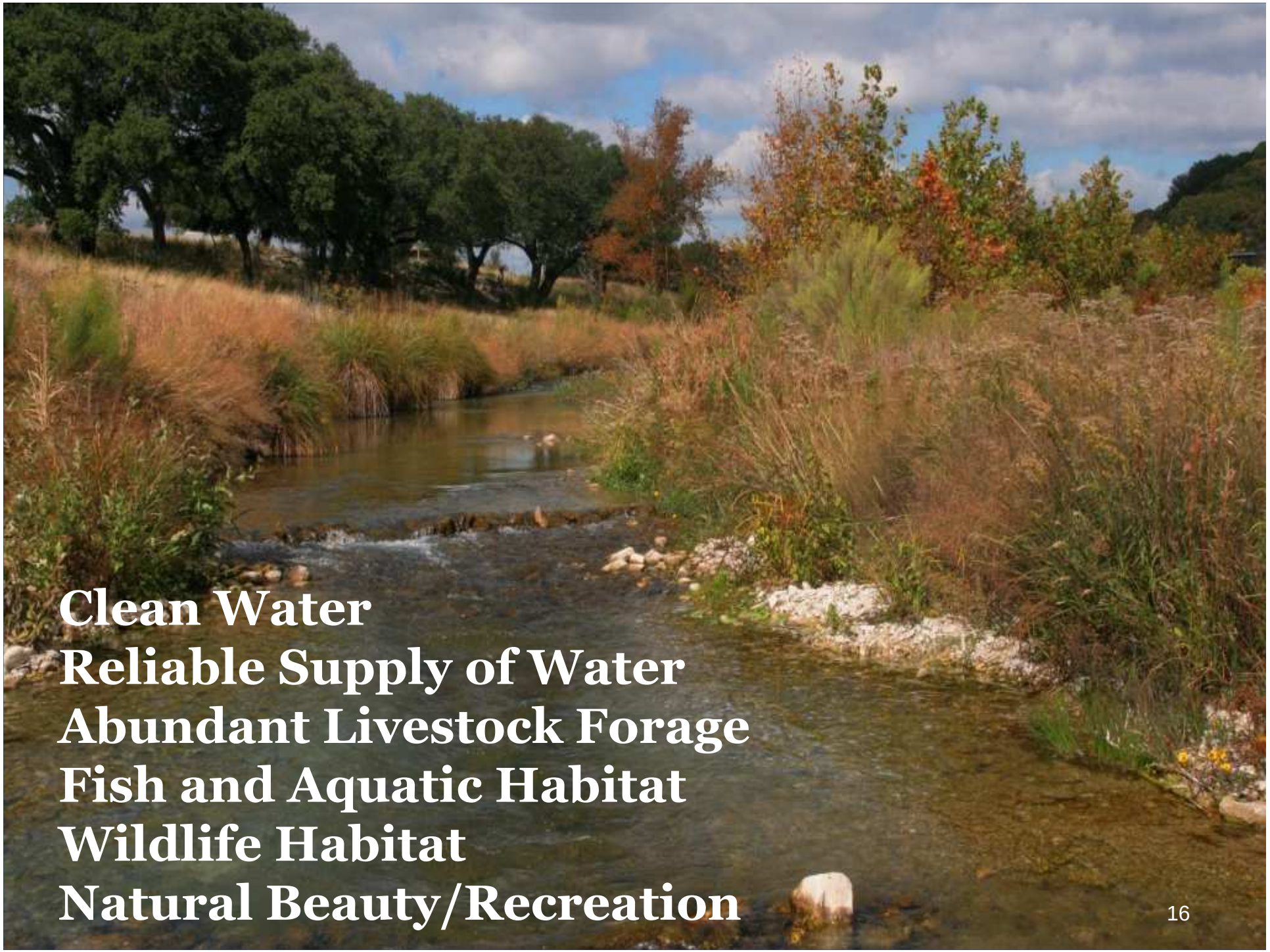
What is a Riparian Area?

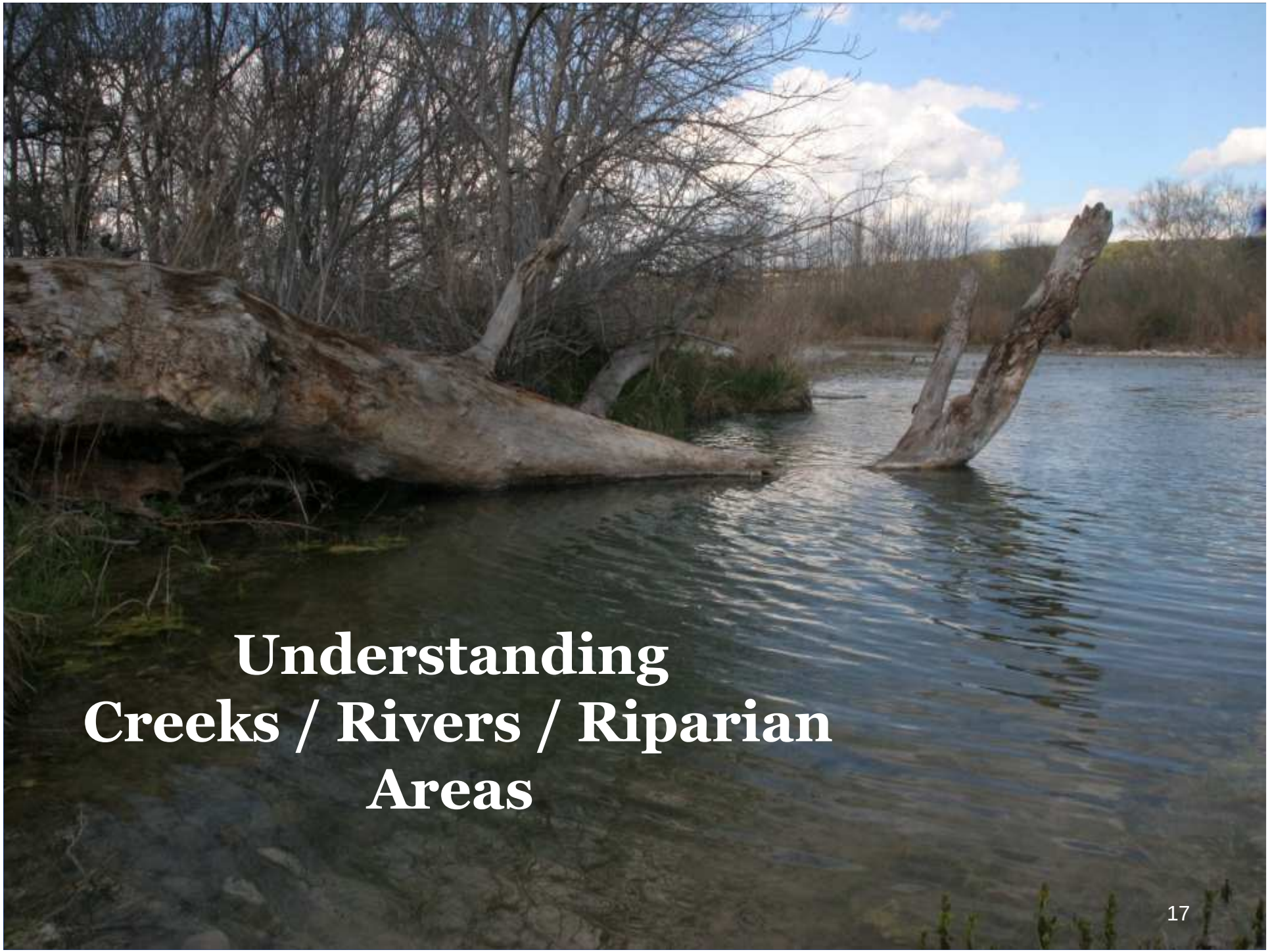
Riparian Zone

The Riparian Zone is the interface between the upland and aquatic habitats, usually the green zone.

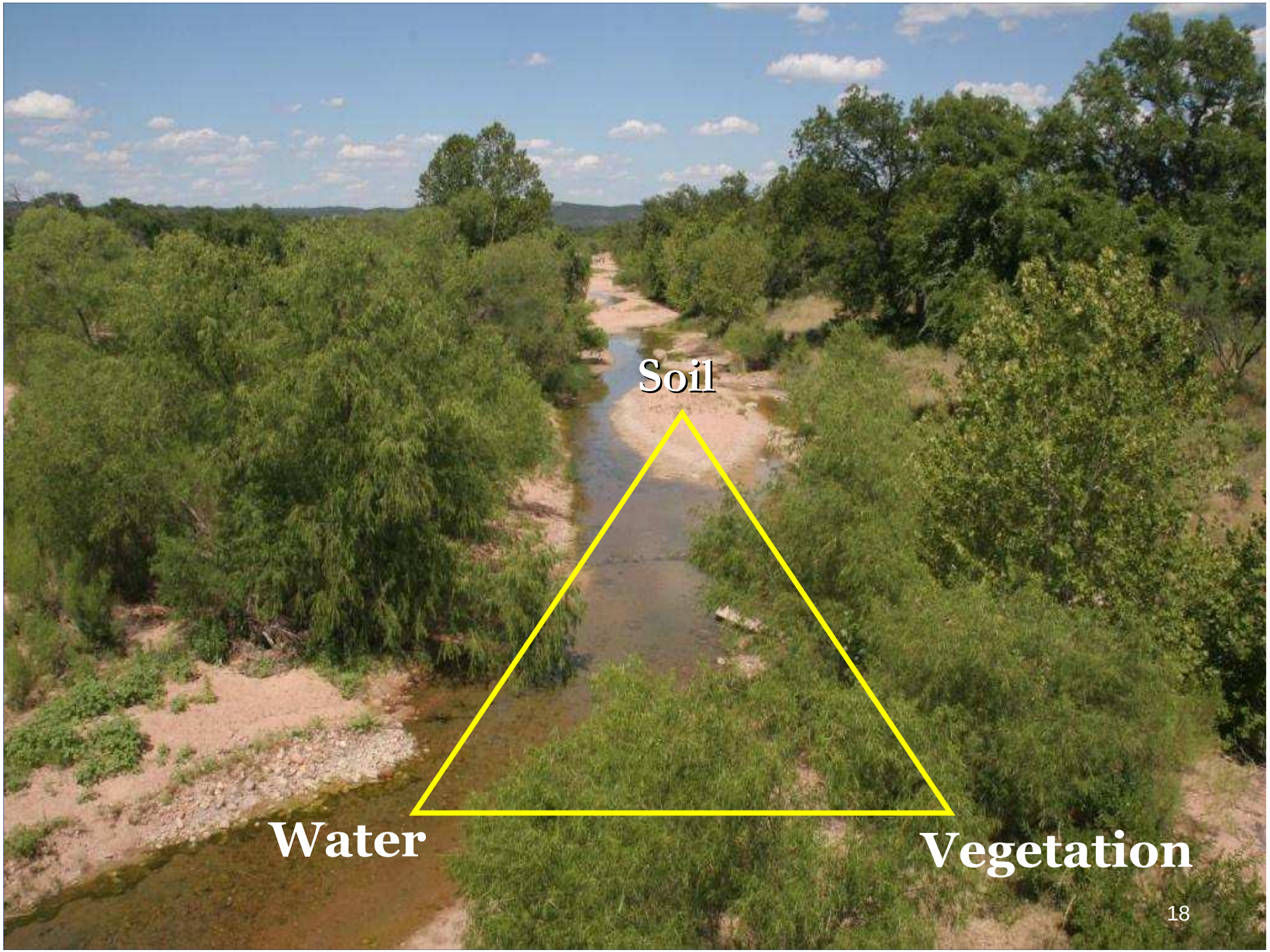


What are the values you appreciate about healthy creeks and riparian areas?


Clean Water
Reliable Supply of Water
Abundant Livestock Forage
Fish and Aquatic Habitat
Wildlife Habitat
Natural Beauty/Recreation



Understanding Creeks / Rivers / Riparian Areas


Soil
Water
Vegetation

What is a properly functioning riparian area?

Properly Functioning Riparian Area

Adequate vegetation, landform or large woody material to:

- Dissipate stream energy
- Stabilize banks
- Reduce erosion
- Trap sediment
- Build / enlarge floodplain
- Store water
- Floodwater retention
- Groundwater recharge
- Sustain baseflow

- Water quality
- Water quantity
- Forage
- Aquatic habitat
- Wildlife habitat
- Recreational value
- Aesthetic beauty

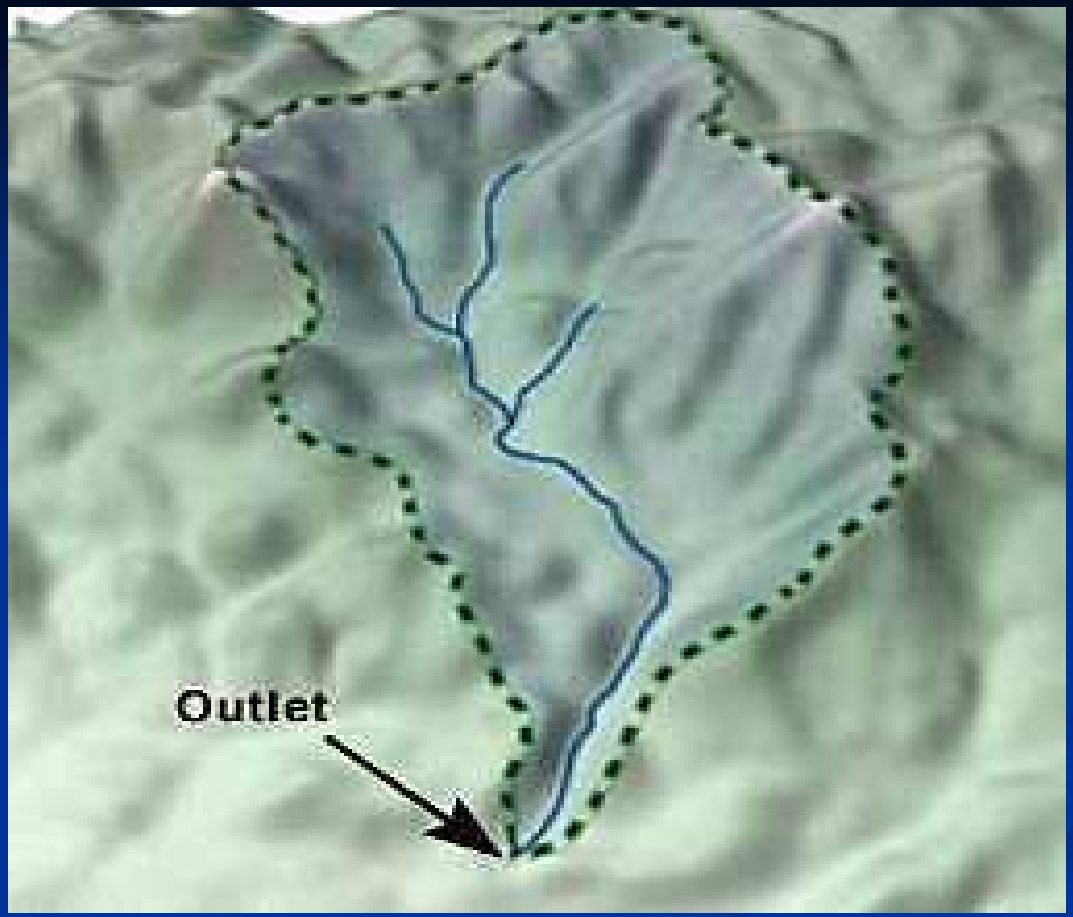
Physical Function → **Values**

Factors Affecting the Fate of Rainfall

Many factors determine what happens to the rainfall received. Some of the primary factors include:

- type, quantity, and density of vegetative cover
- storm intensity and duration
- soil moisture prior to the storm event
- soil water holding capacity
- and slope

These factors affect how much evaporates, infiltrates, moves through vegetation, and the amount and velocity of overland flow which may erode the soil surface and enter the stream.



Watershed
vs.
Catchment

Water Shed
Water Catchment
Photo provided by
Steve Nelle, NRCS

Management for Healthy Watersheds

- We need to capture and store as much water as possible for the inevitable droughts and increasing demand to support plant and human growth.
- The largest potential storage reservoir is the upland and floodplain soils. Past and current management has reduced rainfall and flood water capture on-site.
- Reservoirs have high evaporative losses and decreasing storage capacity due to sedimentation. Most have exceeded their original life expectancy.

Creeks are also water shedding or water catching creek systems

Healthy Systems

A healthy riparian vegetation zone is one of the most important elements for a healthy stream ecosystem.

The quality of the riparian zone increases with the width and the complexity of the woody vegetation within it.

A healthy stream and riparian system is functioning properly when it has adequate vegetation, land form, or large woody debris present to perform the following benefits.

Healthy ecosystems are associated with healthy hydrologic indicators.

Properly Functioning Riparian Area

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Physical Function → **Values**

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

Restoration, Protection and Monitoring of our Stream Systems is Needed

For riparian zones/streams that are not functioning properly, “changes have to be made that allow them to recover (e.g. acquire adequate vegetation). Recovery starts with acquiring the right element (s) to dissipate energy, which puts the physical processes into working order” (Prichard 1998).

Thanks!