

STRUCTURE, FUNCTION AND ROLE OF RIPARIAN VEGETATION

Jim Rogers, NRCS Wildlife Biologist

EAST TEXAS RIPARIAN AREAS

- Bottomland Hardwood Forests
- Willow oak, green ash, overcup oak with water oak, cherrybark oak, and sweetgum in upper flood plains
- Bald cypress/water tupelo (blackgum)
- Lots of woody debris
- Herbaceous wetlands
- Woody wetlands

BENEFITS OF HEALTHY RIPARIAN VEGETATION

- High quality habitat for both aquatic and riparian species
- Dissipation of flood energy and reduced downstream flood intensity and frequency
- Higher, longer-lasting and less variable baseflow between storm events
- Deposition of sediment in the floodplain, stabilizing it and maintaining downstream reservoir capacity longer
- Debris and nutrient use and filtering in the floodplain to improve water quality and dissolved oxygen levels in the aquatic system
- Riparian vegetation canopies to shade streams and reduce their temperatures, providing a food base for aquatic and riparian fauna
- Fewer invasions of exotic undesirable riparian species
- Higher biodiversity than terrestrial uplands
- “Stabilized” banks, which reduce erosion and protect ownership boundaries
- Increased economic value through wildlife, livestock, timber, and recreational enterprises
- Improved rural land aesthetics and real estate values

WHAT IS A FUNCTIONAL CREEK?

- Dissipate Stream Energy
- Protect Banks/Stabilize Channel
- Reduce Erosion
- Slow velocity of floodwaters
- Sediment dropped
- Sediment trapped, and stabilized
- Build floodplains
- Provide floodwater retention
- Enlarge riparian sponge
- Improve groundwater recharge
- More water for sustained flow

IN A NUTSHELL

- Slows Water Down
- Stabilizes soil
- Creates habitat along the way

AT THE RIPARIAN FRONT

- Soil
- Water
- Vegetation



TYPES OF RIPARIAN PLANTS

- Sedges/Rushes
- Grasses
- Forbs
- Shrubs
- Trees

DUAL PURPOSE

- Above ground slows water
- Below ground holds the soil

DISSIPATES ENERGY

- Dissipation of flood energy and reduced downstream flood intensity and frequency



SEDIMENTATION

- Deposition of sediment in the floodplain, stabilizing it and maintaining downstream reservoir capacity longer
- Debris and nutrient use and filtering in the floodplain to improve water quality and dissolved oxygen levels in the aquatic system

INFILTRATION

- Let's the “Riparian sponge” go to work
- Recharges groundwater (aquifers and available for plants)
- Drought insurance
- Sustained flow

DEAD VEGETATION IS IMPORTANT TOO

- Might not have the roots
- Dissipates flow



STABILIZATION

- “Stabilized” banks, which reduce erosion and protect ownership boundaries
- Root mass 2 to 5 times that of above ground mass
- Intercepting rainfall/reducing splash erosion

HABITAT AND CORRIDORS

- Increased economic value through wildlife, livestock, timber, and recreational enterprises
- Improved rural land aesthetics and real estate values
- High quality habitat for both aquatic and riparian species
- Riparian vegetation canopies to shade streams and reduce their temperatures, providing a food base for aquatic and riparian fauna
- Higher biodiversity than terrestrial uplands

NO ROOM FOR INVASIVES

- Nature's gonna put something there



HOW DOES DESTABILIZATION OCCUR?

- Cattle (trampling and overgrazing/hanging out)
- Overbrowsing
- Hog rootings
- Human disturbance (atv, channelization, disturbance upstream, cement, development, mowing, farming, timber) **Farming, mowing, or spraying weeds too close to the bank**
- **Manicured landscapes next to the creek**
- **Grazing concentrations in creek areas**
- **Excessive populations of deer, exotics, or feral hogs in creek areas**
- **Burning in riparian area**
- **Removal of large dead wood and downed trees**
- **Artificial manipulation of banks / sediment**
- **Excessive vehicle traffic in creek area**
- **Poorly designed road crossings / bridges**
- **Excessive recreational foot traffic in creek area**
- **Excessive alluvial pumping or other withdrawal**

HOW DOES DESTABILIZATION OCCUR?

- Cattle (trampling and overgrazing/hanging out)
- Hog rootings
- Human disturbance (atv, channelization, disturbance upstream, cement, development, mowing, farming, timber)
- Farming, mowing, or spraying weeds too close to the bank
- Manicured landscapes next to the creek
- Overbrowsing/grazing by excessive populations of deer, exotics, or feral hogs
- Burning in riparian area
- Removal of large dead wood and downed trees
- Artificial manipulation of banks / sediment
- Excessive vehicle traffic in creek area
- Poorly designed road crossings / bridges
- Excessive recreational foot traffic in creek area
- Excessive alluvial pumping or other withdrawal







POSITION PLAYERS IN HEALING GAME

- Colonizers
- Stabilizers



STABILITY RATINGS OF RIPARIAN PLANTS SCALE OF 1 - 10

1 = Bare ground

10 = Anchored rock or large anchored logs

6/7 = Acceptable riparian stability *

FIVE WETLAND INDICATOR CATEGORIES

- | | |
|------------------------|------|
| 1. Obligate Wetland | OBL |
| 2. Facultative Wetland | FACW |
| 3. Facultative | FAC |
| 4. Facultative Upland | FACU |
| 5. Obligate Upland | UPL |

OBLIGATE WETLAND OBL

Almost always occur in
wetlands

99% probability

FACULTATIVE WETLAND FACW

Usually occur in wetlands

66-99% probability

Occasionally occur in non-
wetlands.

FACULTATIVE FAC

Equally likely to occur in
wetlands and non wetlands

FACULTATIVE UPLAND FACU

Usually occur in non wetlands

66-99% probability

Occasionally occur in wetlands.

OBLIGATE UPLAND UPL

Almost always occur in
Non-wetlands
99% probability

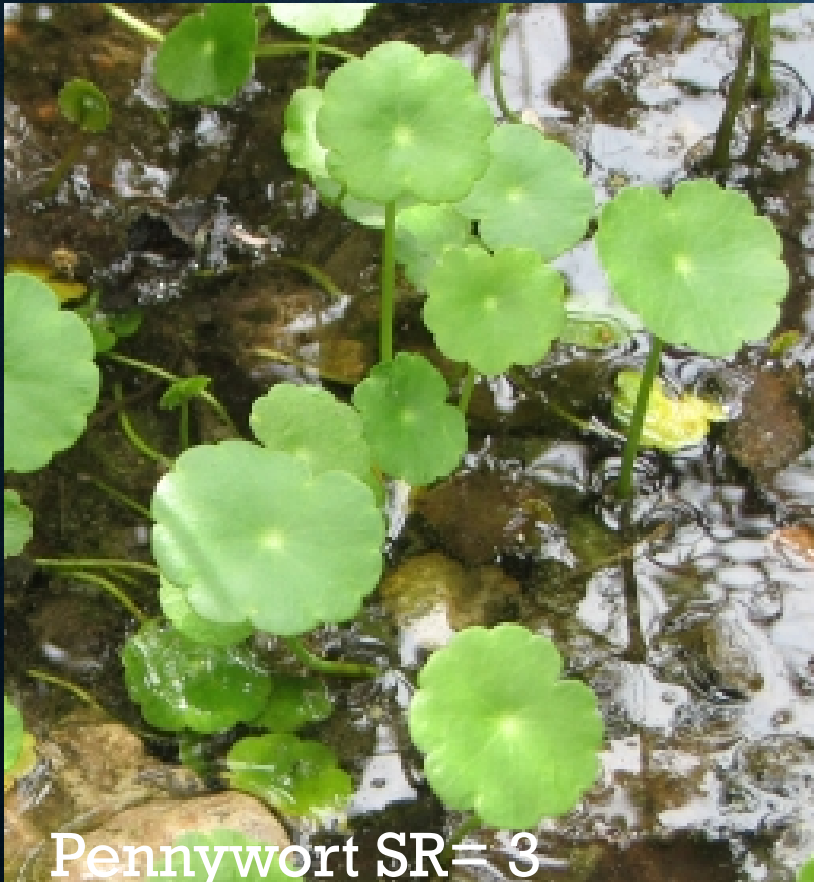
A photograph of a wetland area with shallow water and muddy banks. Various green plants, including small leafy species and taller grasses, are growing along the shoreline. The text 'COLONIZERS' is overlaid in white, bold, sans-serif font at the top center. A bulleted list of three points is overlaid on the left side of the image in the same font style.

COLONIZERS

- **First to appear**
- **Shallow and weak roots/stolons and rhizomes**
- **Essential for recovery during healing process**



COLONIZERS



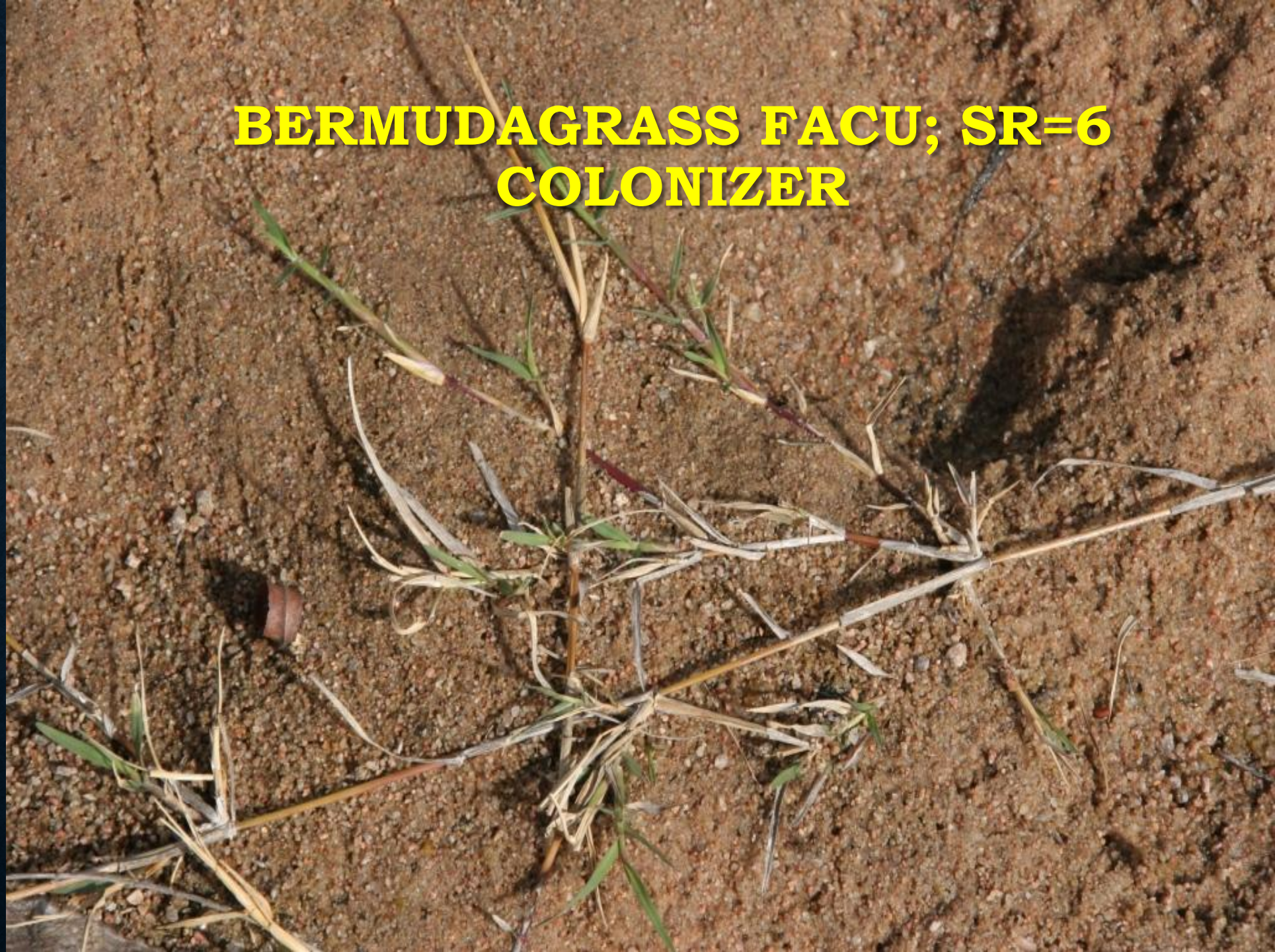
FROGFRUIT – COLONIZER
FAC; SR = 4



A close-up photograph of a Broad-leaf wood-oat (Chasmanthium) plant. The image shows several thin, green, blade-like leaves on the left side. In the center and right, there are multiple long, thin, brownish-tan seed heads (panicles) that are densely packed with small, feathery florets. The background is a blurred mix of green foliage and brown stems, suggesting a natural, possibly wooded or grassy, environment.

Broad-leaf wood-oats *Chasmanthium*
Colonizer, FAC, SR = 5

**BERMUDAGRASS FACU; SR=6
COLONIZER**



STABILIZERS

- Strong, robust plants that dissipate energy from flow
- Protects bank with strong, deep root systems



STABILIZERS

- Herbaceous
- Woody



Eastern gammagrass *Tripsacum*
Stabilizer, FAC, SR = 9



Canada wildrye,
Virginia wildrye,
Stabilizer, FAC,
SR=5/6

**BUSHY BLUESTEM – WEAK
STABILIZER
FACW; SR = 5/6**



A close-up photograph of Black Willow (Salix nigra) branches. The branches are covered with long, narrow, green leaves that have slightly serrated edges. Several catkins, which are clusters of small flowers, are visible hanging from the branches. The background is a blurred mix of brown and green, suggesting a natural, outdoor setting.

BLACK WILLOW *SALIX*
STABILIZER; FACW; SR = 7



American Elm

FAC

SR = 6

DWARF PALMETTO
FACW; SR = 8



A photograph of a swampy landscape. In the foreground, there are several large, green, spiky plants, possibly cacti or succulents, growing in the water. The water is a murky, brownish-yellow color. In the background, there are many tall, thin trees, likely cypresses, with some bare branches and some green leaves. The sky is visible through the trees, showing a blue and white pattern. The overall scene is a natural, somewhat desolate environment.

CYPRESS
OBL; SR = 10



**BULRUSH
(SCIRPUS)
OBL SR = 9**

BUTTONBUSH
(*CEPHALANTHUS*)
STABILIZER OBL; SR = 7



Box elder maple *Acer*
Stabilizer, FACW, SR = 6



**GREEN ASH
STABILIZER, FACW, SR = 6**



Roughleaf dogwood *Cornus*
Stabilizer, FAC, SR = 6



Japanese honeysuckle *Lonicera*
Stabilizer, FAC, SR = 6





Rusty blackhaw *Viburnum*
Stabilizer, FACU, SR = 6



American beautyberry *Callicarpa*
Weak Stabilizer, FACU, SR = 4



Chinese privet, *Ligustrum*
Stabilizer, UPL, SR = 5



HEALTHY INDICATORS/EVALUATION

- High amount of plant cover
- High amount of plant diversity
- Stabilizing root mass
- Multiple age classes of plants
- Plant Vigor

Healthy Indicators????





Plant Vigor-Leaves and Roots

Caring for the Green Zone, Riparian Areas and Grazing Management

Alberta Riparian Habitat Management Project, “Cows and Fish Project”



Plant Vigor





Mid age

Mature

Young age

SOLUTIONS

- Riparian pasture (abbreviated grazing, long rest)
- Off site water/mineral sites
- Riparian buffers
- SMZ (streamside management zones)
- Population management
- Upstream management
- Time
- Water catchment not watershed

A photograph of a forest floor covered in green grass and fallen brown leaves. Several trees with thin trunks and green foliage are visible in the background. The text "The End" is overlaid in white in the center of the image.

The End