



# Using Natural Stable Channel Design Features in Channel Conveyance Improvement Projects

SAME WOTUS 2024 | Jonathan Holley, CPESC, CPSWQ  
Environmental Services Department Manager

# Harris County Flood Control District

- A special purpose district created in 1937 by the Texas Legislature in response to floods that devastated the Houston area in 1929 and 1935
- Serves as a local partner to leverage federal dollars for flood damage reduction
- Harris County Commissioners Court serves as our board of directors or governing body

# Our Mission

Provide flood damage reduction projects that work, with appropriate regard for community and natural values.



# Outline

- Drainage Network and Flood Control Tools
- Channel Modifications
- Natural Stable Channel Design Features
- Tree Planting

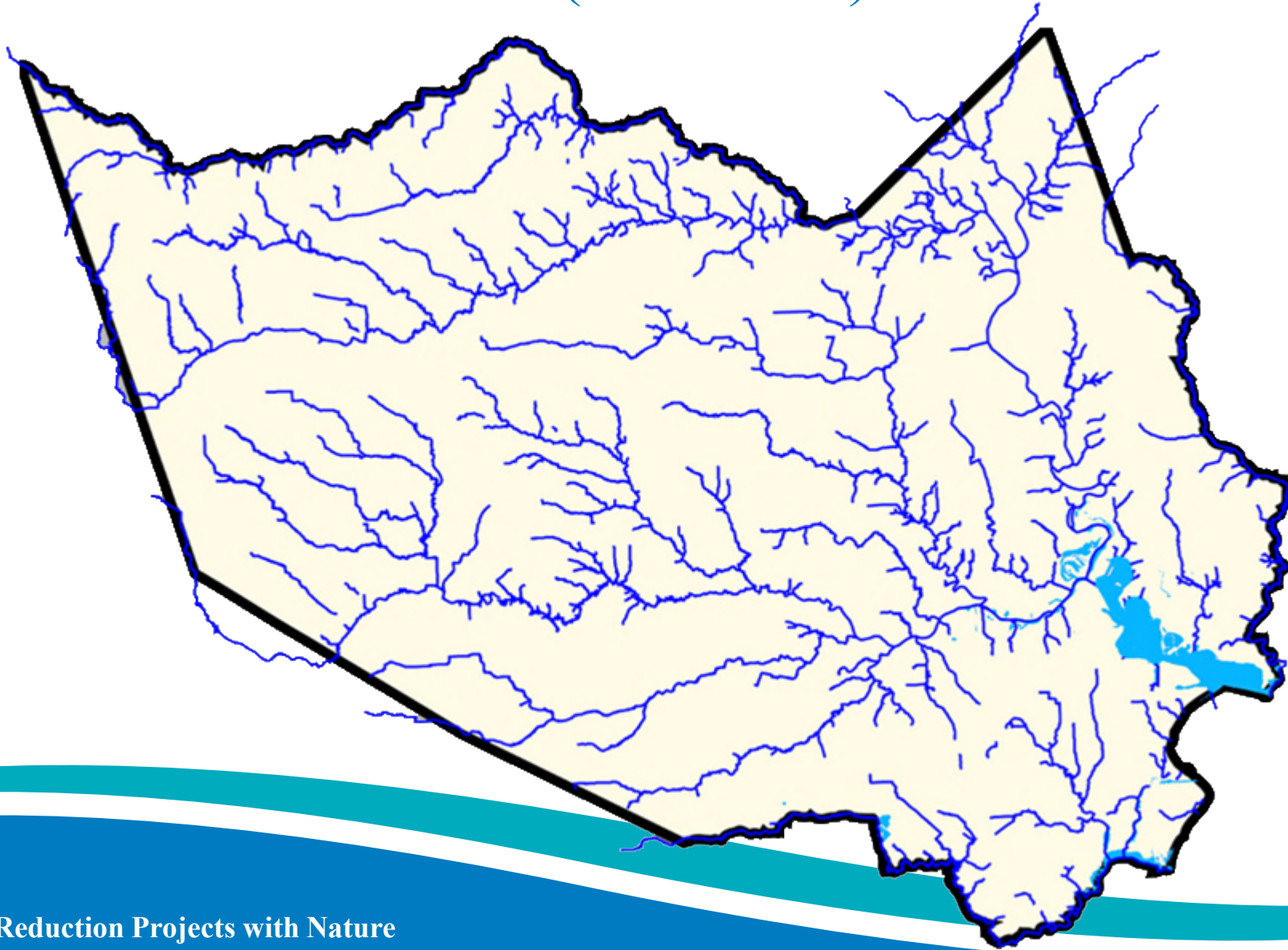


# Why is Harris County Flood Prone?

- Prone to extreme rainfall, including tropical storms and hurricanes
- Flat, slow-draining landscape
- Clay soils that do not soak up excess rainfall quickly

# Drainage Network

# Natural Channel Network (800 miles)





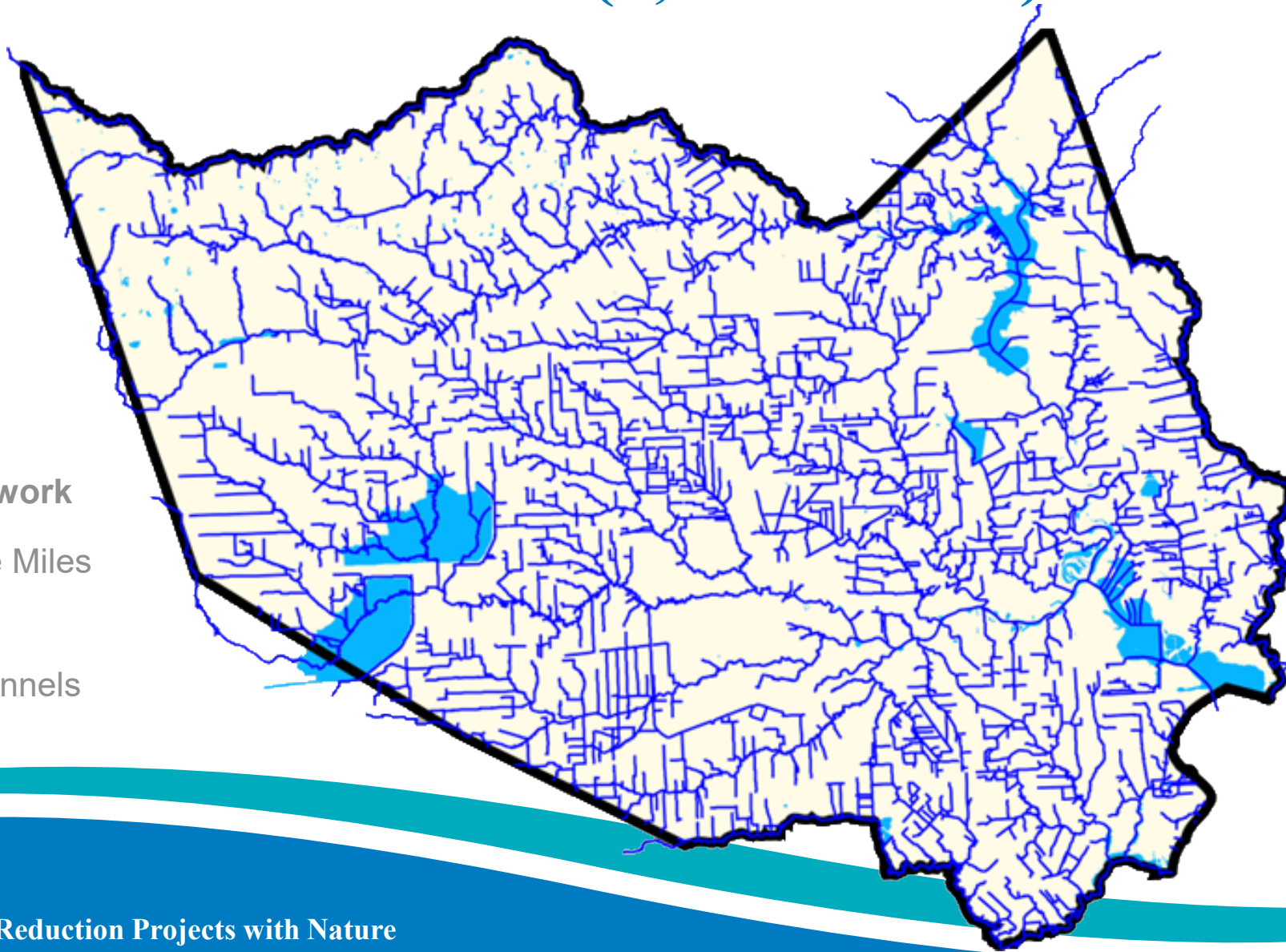
# Total Channel Network (2,500+ miles)

## Open Channel Network

Area = 1756 Square Miles

1500 ± Channels

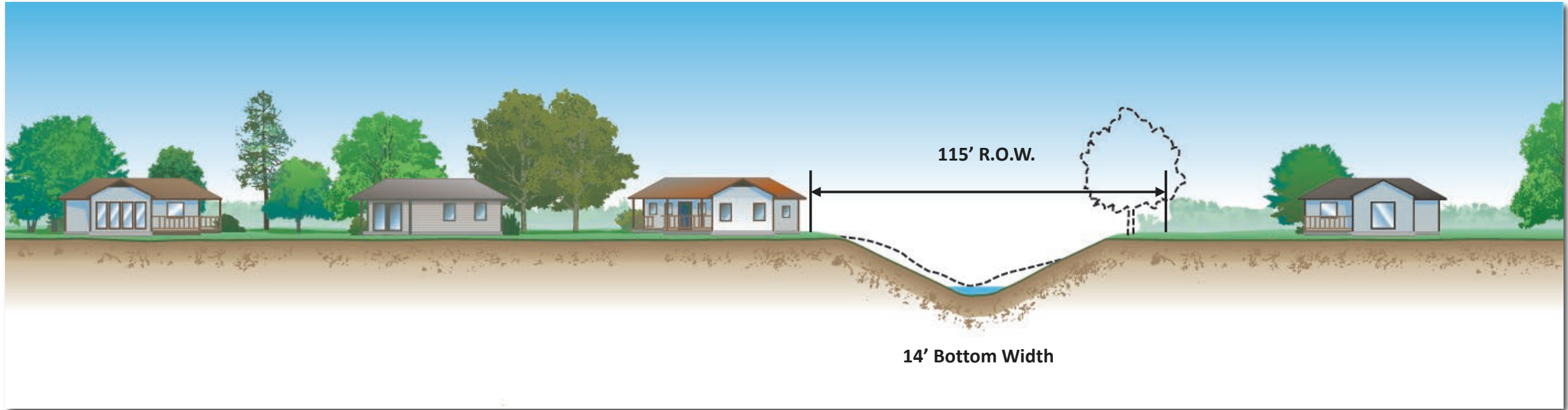
2500 ± Miles of Channels



# Channel Modifications

# Channel Modifications

## Concrete Lined





# Major Channel Modifications

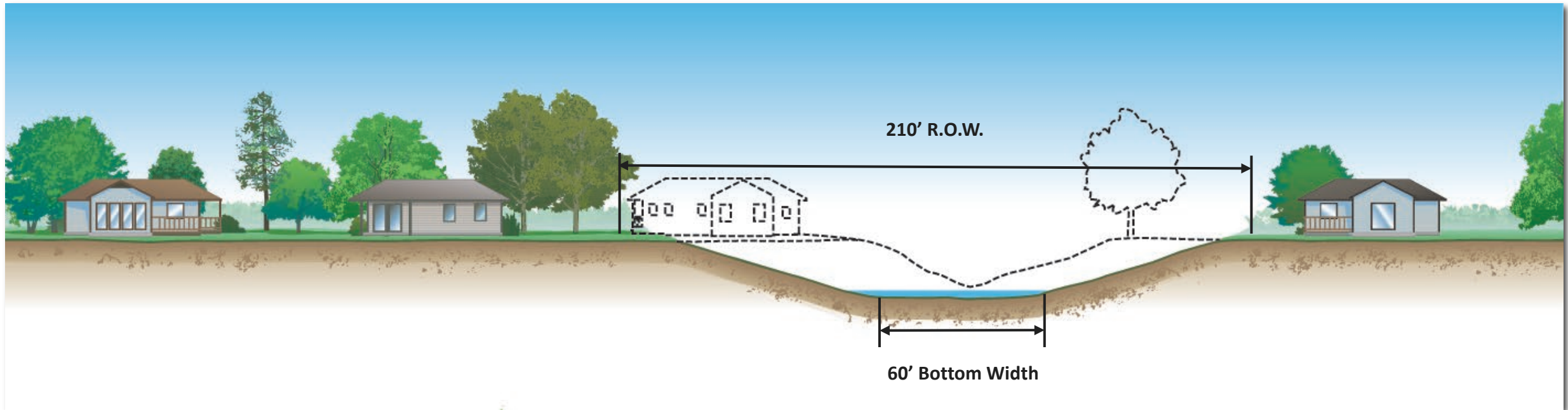


~6% of Harris County channels are concrete lined



# Wider, but greener

## Grass Lined





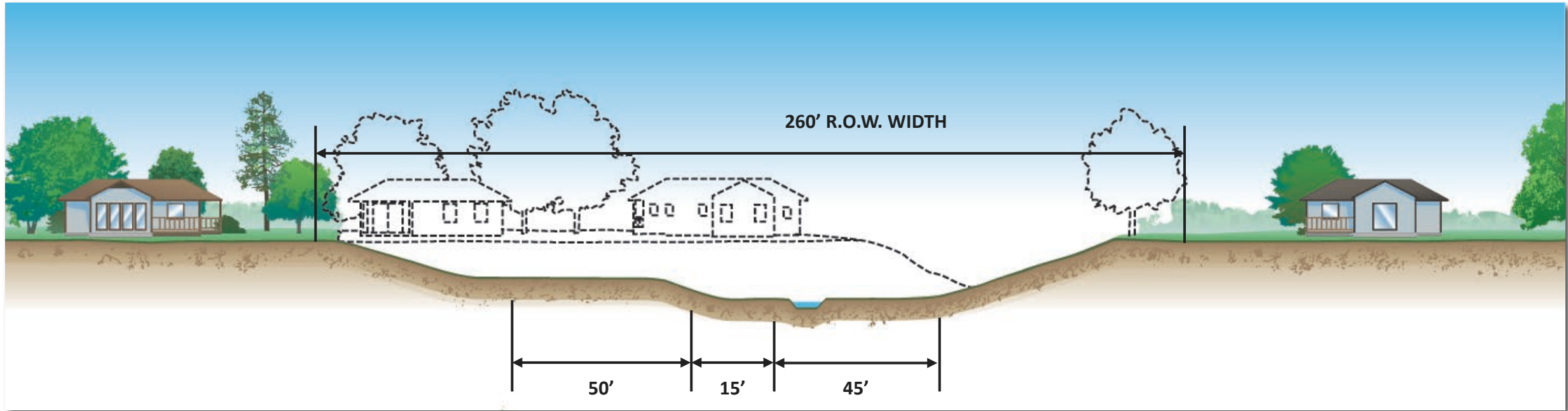
# Major Channel Modifications

~45% of our man-made channels are grass lined



# Major (Enhanced) Channel Modifications

## Stream Corridor





24%



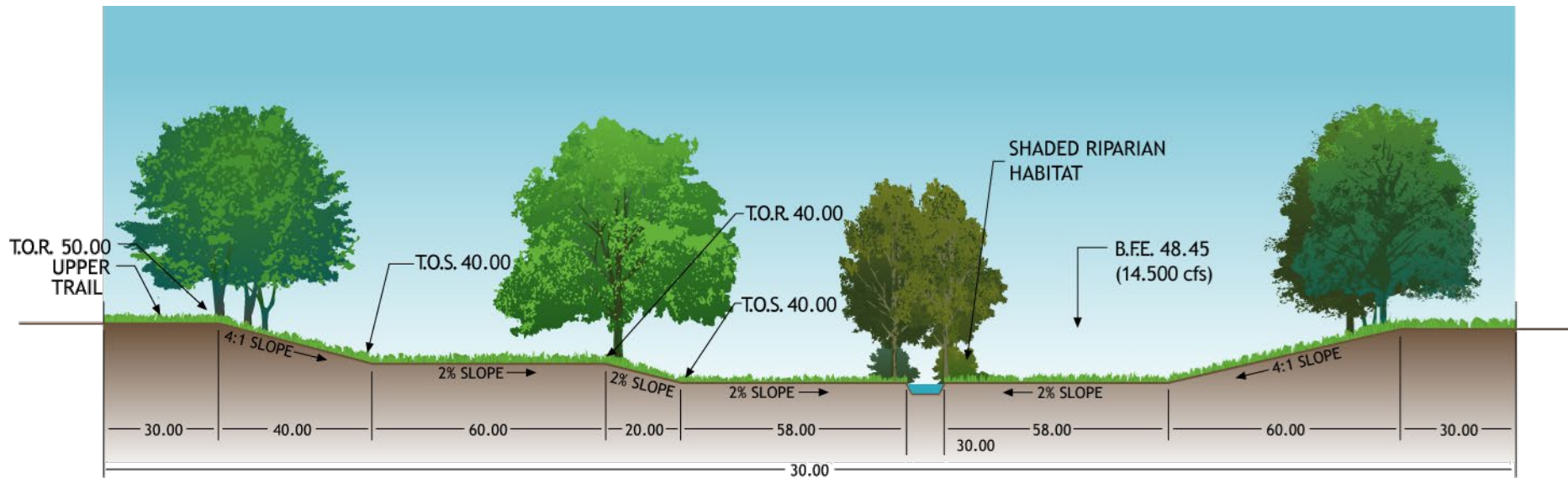
3. Significant Modifications allowed to naturalize



# Natural Stable Channel Design Features



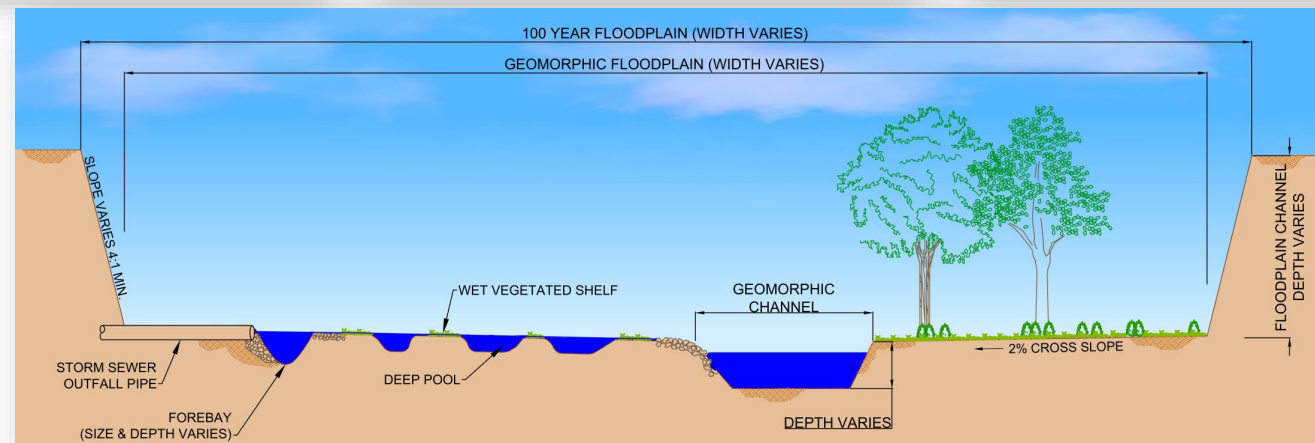
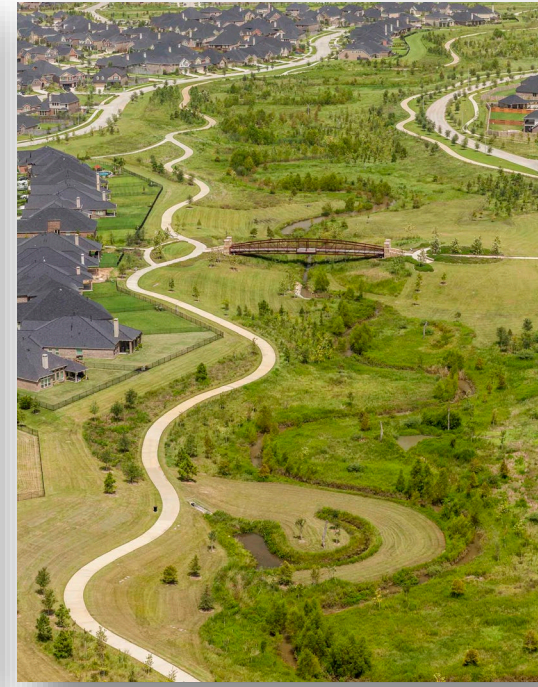
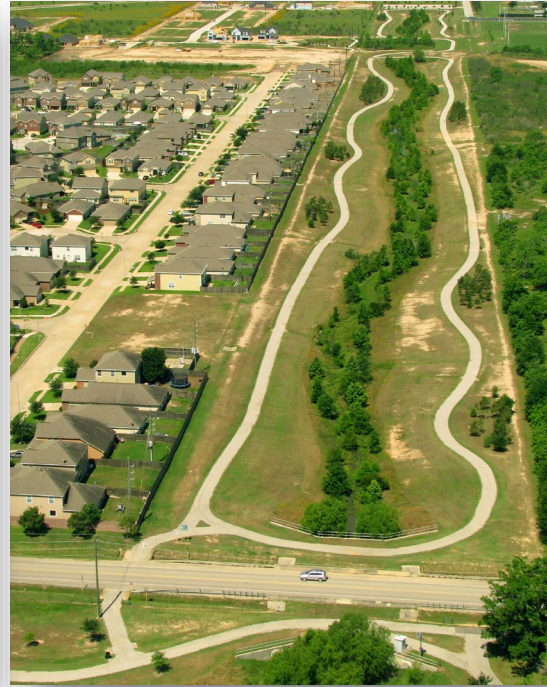




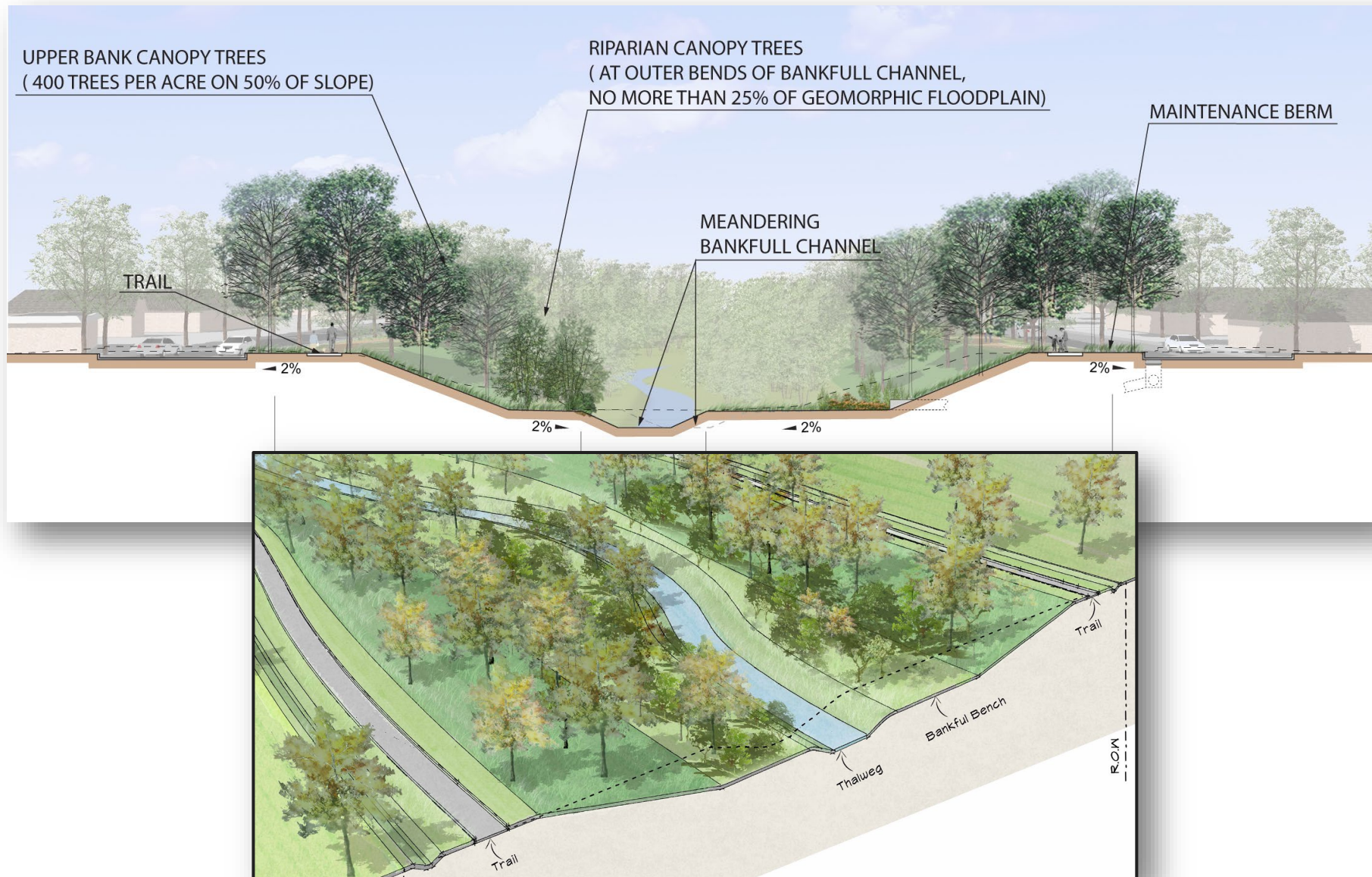
BASE CHANNEL WITH FLOOD BENCH



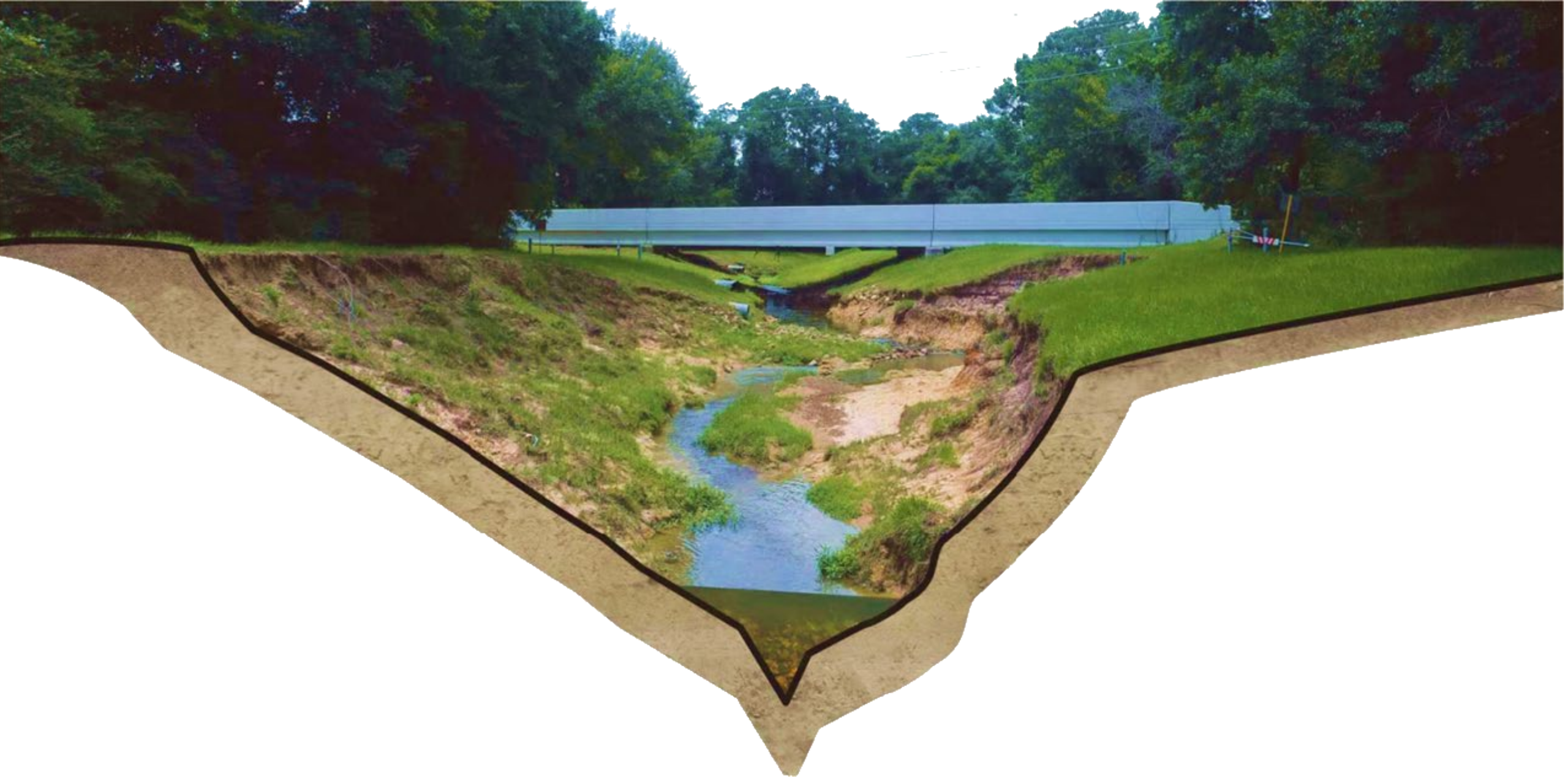




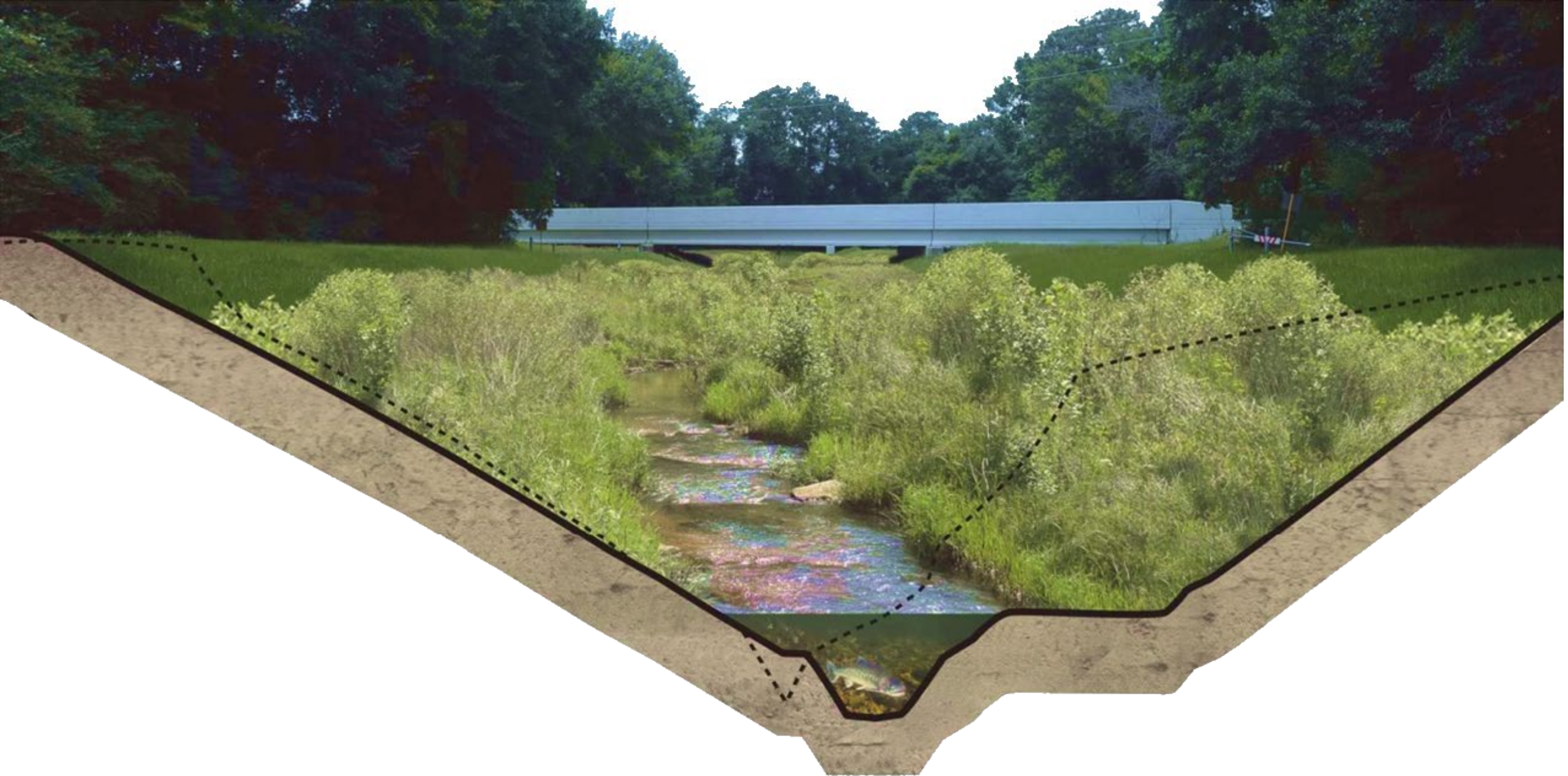




















Stormwater  
Treatment  
Wetlands

Native Tree  
Plantings

Constructed Riffle

Pool

Naturally  
Meandering Low  
Flow

Tributary to Big Gulch at Jim and JoAnn  
Fonteno Family Park (Unit No. P107-03-00)



P107-03-00

# Big Gulch Tributary







**Before**





After



P133-00-00

# Greens Bayou Tributary





# Rummel Creek



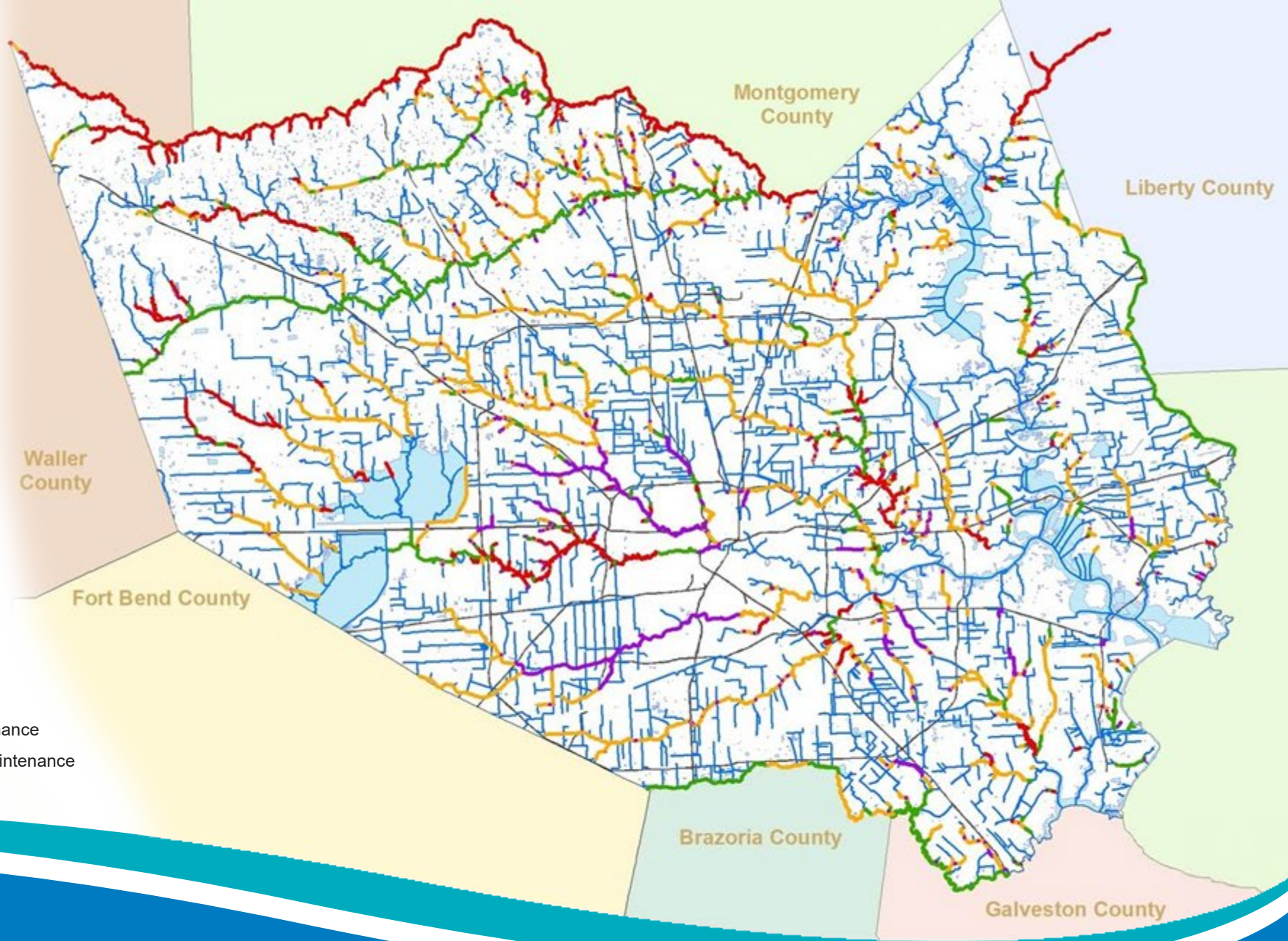


# Channel Modifications





# Harris County Flood Control District Channel Modifications



## Legend

- No Modifications
- Significant Modifications – Allowed to Naturalize
- Major Modifications – Grass, Mowing, Routine Maintenance
- Major Modifications – Concrete, Mowing & Routine Maintenance

# Tree Planting



# Channel Level 1 Planting





# Reforestation of a Dry Bottom Stormwater Detention Basin

E500-06-00 (9-years)





## Planting Zones



# Buffalo Bayou Park Revegetation & Biostabilization

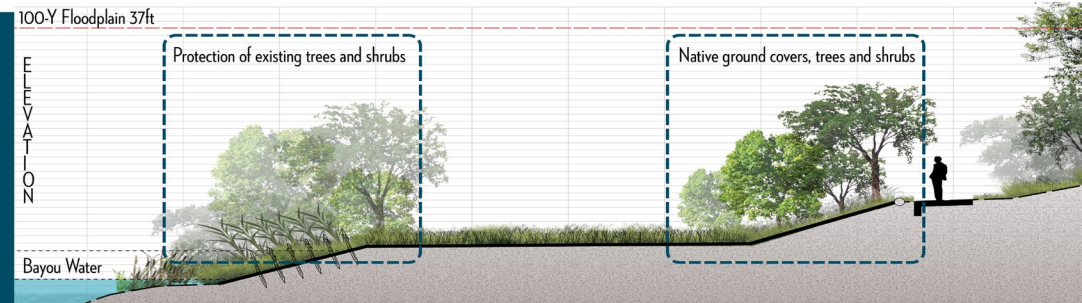


## BUFFALO BAYOU PARK STREAM BANK RESTORATION

### Native Plants Growing Along the Bayou



Buffalo Bayou Partnership and Harris County Flood Control District are spearheading a stream bank restoration project along 11 acres of the bayou's edge. As this vegetation grows, the tree roots and vegetated cover will help reduce erosion, build bank stability, and contribute to valuable habitat for wildlife. At the site, you'll find live-stake willows along with a mix of native hardwood trees and riparian grasses. In addition, biodegradable coir logs have been installed at the top of the bank to slow down the flow of surface water runoff to further protect the bank. For more information, please scan the QR code.



### Planting Zone Illustration

Riparian vegetation slows and dissipates floodwaters during high stream flow events. This is essential for preventing erosion damages, and improving aquatic biodiversity and water quality.



### Established Riparian Vegetation

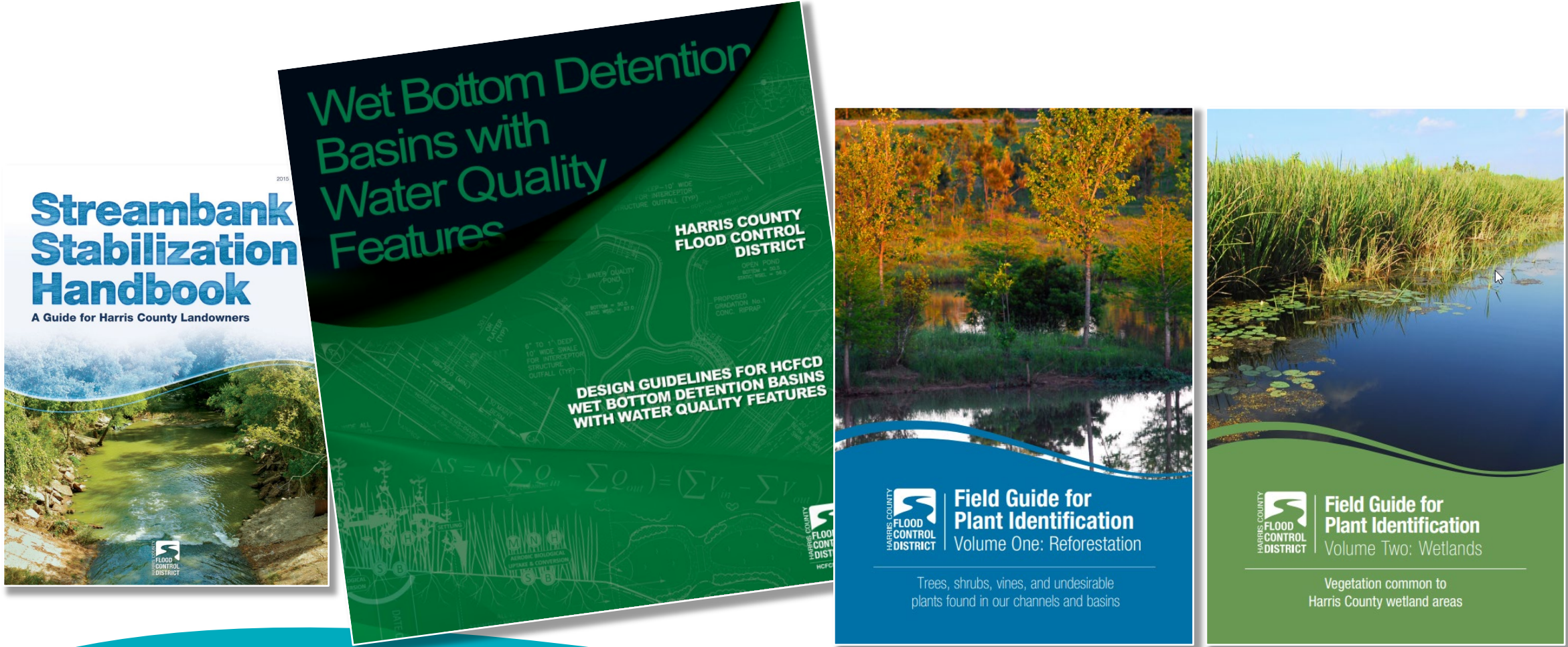


# Habitat Management & Protection





# Guidelines & Best Practices







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