



Photo Credit: Stephanie Glenn

Riparian Areas: What are they, and why do they matter?

Lately, riparian areas have been a focus of attention in communities all around Texas. A variety of factors have contributed to this attention, including the many ongoing projects to restore healthy watersheds, but particularly for the effects of riparian areas on water quality, flood control, erosion, and habitat for fish and wildlife.

But just what are riparian areas? Riparian areas are the transition zones between a stream and upland (dry) areas. The interactions of the water, soil, and vegetation in riparian areas are like intermeshing gears, and they determine how well the riparian areas function.

Just what do healthy riparian areas do? It's an impressive list:

- Dissipate stream energy
- Stabilize banks
- Reduce erosion
- Trap sediment
- Build/enlarge floodplain
- Store water
- Retain floodwater
- Recharge groundwater
- Sustain baseflow

The Texas Riparian & Stream Ecosystem Education workshop, held for the Double Bayou watershed on September 24, taught how the intermeshing gears – water, soil, and vegetation – work to accomplish these healthy functions, what practices can impair the functions, and how landowners can be good stewards of riparian areas. Thanks to Clint and Becky Fancher, some of these functions and practices were observed first-hand on their land on the East Fork of Double Bayou.

Watch future newsletters for more information on these topics and more on the role of riparian areas in healthy watersheds.

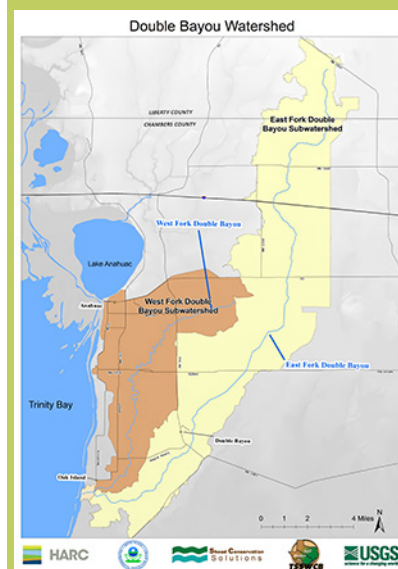
The Double Bayou riparian workshop was produced by the Texas Water Resources Institute, with the support and cooperation of Texas AgriLife Research Extension, Texas Parks & Wildlife Department, Texas Forest Service, USDA Natural Resources Conservation Service, TSSWCB, USEPA, USGS, HARC, Dixon Water Foundation, Chambers County, Nueces River Authority, Shead Conservation Solutions, and Samson Energy.



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If you missed September's riparian workshop, there will be another workshop held on February 27, 2015, in La Marque. For more information on this workshop, please contact Nikki Dictson at 979-458-5915 or n-dictson@tamu.edu.



Cease the Grease!



As the holidays approach, we will all be spending more time in the kitchen. Everyone should be aware of the adverse effects that fats, oils and grease (FOG) can have on drains, pipes and sewers.

When FOG gets poured down the drain, they harden and create clogs, which can cause sewage backup into the home and the neighborhood. Sanitary sewage overflows can cause untreated sewage to enter the environment and pollute waterways such as Double Bayou. It can also damage your home plumbing!

Dispose of FOG properly by removing them from your pots and pans before you wash up.

Do:

- Store fats, oils, and grease in sealed jars or containers and throw them away.
- Recycle your kitchen oil.
- Follow the Galveston Bay Foundation's Cease the Grease campaign and visit their website at ceasethegrease.net for more information.

Don't:

- Pour FOG down the drain.
- Dispose of FOG by dumping it in the yard.

Enjoy the holidays and lots of treats, but cease the grease to keep Double Bayou neat!

Update on Double Bayou WPP Project



Stakeholder Process

Stakeholders have been meeting regularly since May 2013 to learn more about the stream water quality in Double Bayou and to provide input on how to improve it. To date, the Double Bayou WPP project has had 8 general meetings, 4 sets of workgroup meetings, smaller sessions to assist with special topics, and 3 public informational workshops.

Why do stakeholders participate in this ongoing process? The WPP process is an opportunity for local citizens to weigh in on how to have

a healthier watershed – voluntarily – with a minimum of regulatory constraints and a maximum of available resources from all levels of government.

The Double Bayou WPP project will continue until a complete Watershed Protection Plan has been approved by stakeholders and submitted to the TSSWCB and the USEPA (by early 2016).

Potential Sources and Solutions

A major part of the process is stakeholder identification of potential issues and of possible management measures to address them. The project team at HARC was able to take stakeholder estimates of the numbers of potential bacteria sources (including septic tanks, feral hogs, horses, cows, goats, deer and wastewater effluent), and then input that information into a model developed by Texas A&M. (cont. p3)

What is the Double Bayou WPP project?

The Double Bayou Watershed Protection Plan project is one of several projects designed to voluntarily address stream water quality in a tributary of Galveston Bay. Like most of these tributaries, Double Bayou is listed on the State Impaired Waters List (the "303(d) List") for having bacteria levels that are unsafe for human contact in some recreational uses. Many also have too little oxygen to support healthy aquatic life.

Impairments in Double Bayou are not as severe as for most other Galveston Bay tributaries. With voluntary stakeholder involvement it may be possible to improve the stream water quality enough to have it removed from the State Impaired Waters List without drastic measures.

The Double Bayou WPP project will result in a stakeholder-driven, written plan to achieve stream water quality standards through voluntary actions: the Double Bayou Watershed Protection Plan.

Project Acronyms

DBWP = Double Bayou Watershed Partnership

DO = Dissolved Oxygen

USEPA = United States Environmental Protection Agency

HARC = Houston Advanced Research Center

TCEQ = Texas Commission on Environmental Quality

TMDL = Total Maximum Daily Load

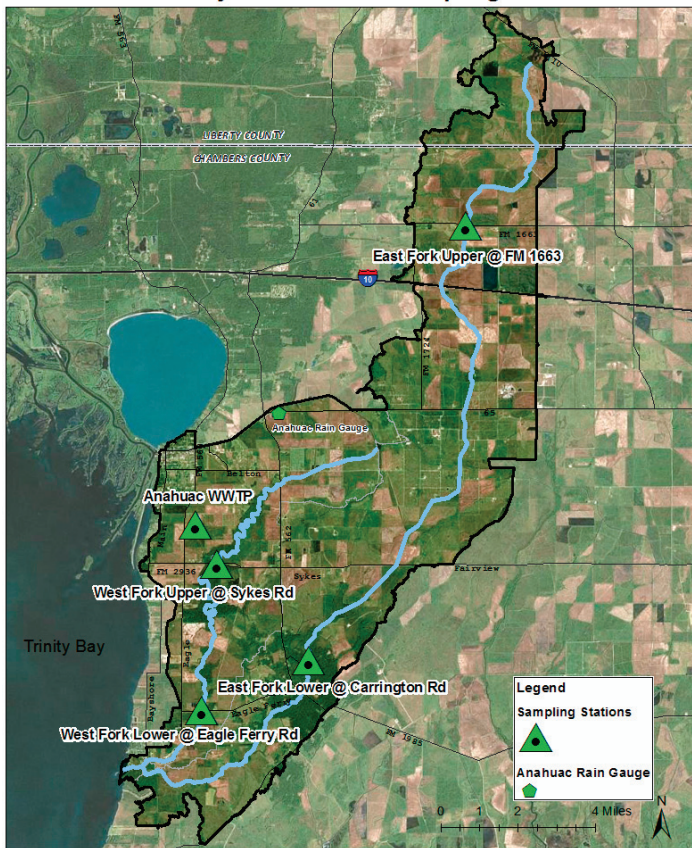
TSSWCB = Texas State Soil and Water Conservation Board

USGS = United States Geological Survey

WPP = Watershed Protection Plan

WWTP - Wastewater Treatment Plant

Double Bayou Watershed Sampling Stations



(Update, continued from p. 2)

The model applies the stakeholder source estimates to the areas where stakeholders said the sources could be found, and then calculates where the relatively largest bacteria contributions in the watershed might be. Certainly, not all of those bacteria will make it into the waterways, but knowing where the biggest sources could be can then help target where the management measures might have the biggest impact.

That next step will take place in upcoming meetings: stakeholders will consider which management measures might work best where, what the costs might be, and what technical assistance is needed to implement those measures.

Water Quality Data

Another resource provided with the project's funding is additional data collection and analysis of the water quality in both the East and West

forks of Double Bayou. Nearly a full year of extensive water quality monitoring has been completed, checked for quality, and examined for patterns.

The project team at USGS collected water samples from five locations on 17 routine (scheduled) dates and four targeted (rain event) dates, from October 22, 2013 through August 12, 2014. The five sampling locations may be seen on the accompanying map: two on the West Fork, two on the East Fork, and one at the wastewater treatment plant discharge to the Anahuac Ditch. The East Fork Upper

station is the only freshwater bayou station; all the other bayou stations are tidal.

Those samples were analyzed for an extensive array of water quality factors, including bacteria, dissolved oxygen, chlorophyll-a, and nutrients (such as ammonia, nitrate, and phosphorus). These water constituents are related to the reasons that the West Fork is listed as impaired, and the East Fork is listed for concern. Specifically, the presence of *E. coli* bacteria in freshwater samples and Enterococcus bacteria in tidal water samples indicate the possible presence of disease-causing pathogens. Also, because DO is essential for healthy aquatic life (fish and other species), levels of DO below the benchmark or State criteria can stress or even cause death of aquatic life.

Stay tuned for more information on the stream water quality of Double Bayou.



Announcing the New Double Bayou Watershed Partnership Website

We are proud to announce the launch of a new website for the Double Bayou Watershed Partnership.

To check out our new look, please visit:

www.doublebayou.org

We will be adding more content in the new year, so bookmark us and keep checking back! We welcome any feedback you might have, so please send comments and suggestions on the website to brandie.minchew@gmail.com.

Other Watershed Projects: Cedar Bayou WPP

Cedar Bayou is a tributary of the Galveston Bay system that forms the boundary between Harris County to the west and Chambers and Liberty counties to the east. Its watershed is about twice the size of the Double Bayou watershed.

As with many streams in our region, including Double Bayou, TCEQ assessed that Cedar Bayou contained high levels of bacteria that made it unsafe for contact recreation. The bayou's ability to support aquatic life was also determined to be impaired.

The Houston-Galveston Area Council launched the Cedar Bayou Watershed Partnership with community partners and stakeholders in September 2011. The partnership is currently developing draft versions of their Watershed Protection Plan.

To learn more about the Cedar Bayou Watershed Partnership, please visit their website at

www.cedarbayouwatershed.com.

Biological Drivers of Feral Hog Behavior



Image credit: Craig O'Neal

At the Feral Hog Workshop in June, attendees learned about how and why feral hogs behave as they do. Food serves as the primary driver for what hogs do, and feral hogs will seek out habitats that provide them with the most advantageous food resources. They are indiscriminate eaters, consuming anything with caloric content. As foragers, they will range far from their water sources at night or during the cooler months. During the summer heat, though, they tend to be nocturnal foragers.

This summer behavior results from a secondary driver of hog behavior: thermoregulation. Because hogs do not have sweat glands to help regulate their body temperature, they rely on water sources to keep from overheating, especially in warmer parts of the year. They follow rivers, creeks, streams, and bayous as they forage for food resources. To keep cool, they wallow in riparian areas and shaded areas, damaging vegetation, which can contribute to erosion. Irrigated land such as rice fields allows hogs to range further from natural water bodies.

Other drivers of feral hog behavior include their social structure, available habitat, and human influences. Hogs travel in family groupings called “sounders,” which can contain up to 50 hogs and consist of one or more adults, plus piglets, and juveniles. Juvenile males break away from the sounder at around 16 months of age. Feral hogs search out habitats that are dense in vegetation and have easily accessible waterways. Human influences such as fencing and agriculture can impact where they are found as well.



Image credit: ghelm4747

All of these drivers can motivate breeding activity in feral hogs. They tend to breed even when resources are scarce. Females may have up to two litters per year containing as many as eight piglets or more in each litter. Females reach sexual maturity at six to ten months, while males mature at four to six months. Feral hogs can live up to eight years, and it is worth noting that Texas has the largest population of feral hogs in the U.S. Current modeling suggests that the Texas population of feral hogs could reach 5 million by 2015.

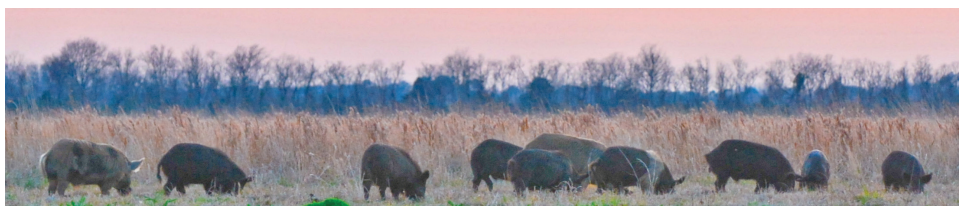


Image credit: Josh Henderson

Upcoming Events

• February 2015: Workgroup Meetings

Watch website/email/mail for meeting dates.

• Tuesday, April 21: General Public Meeting

Our thanks to the following for providing support to the Double Bayou Watershed Partnership:

For meeting space, equipment, and set-up:

- Chambers County
- Chambers-Liberty Counties Navigation District
- Chambers Recovery Team

For refreshments:

- Galveston Bay Foundation
- Samson Energy
- Shead Conservation Solutions

When next you see these folks, please add your thanks to ours!

Project Partners



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