



Photo Credit: Stephanie Glenn

## Karla Dean Honored with Texas Outstanding Biology Teacher Award



Double Bayou stakeholder, Karla Dean, received the Texas Outstanding Biology Teacher Award (OBTA) in April. This award is given by the National Association of Biology Teachers to recognize biology teachers who demonstrate expertise and enthusiasm in the classroom, and who use their skills to guide students to a better understanding of biology and science methods.

Candidates for the award are nominated by colleagues, administrators, or students, and are then selected by a committee of university professors and previous OBTA awardees.

Ms. Dean is a graduate of Texas Tech University, with a B.S. in Animal Science Production. She also holds a Master of Arts degree in liberal studies from Rice University. Currently teaching at Anahuac High School, her teaching curriculum includes Integrated Physics and Chemistry, AP Biology, AP Environmental Science, and Forensic Science.

## Double Bayou: We Have a Stakeholder-Approved Plan!

At their January 19 general meeting, Double Bayou stakeholders approved the draft *Double Bayou Watershed Protection Plan*, agreeing that it was ready to go out for comment by the general public. The Plan was posted on January 27, 2016, for a 30-day public comment period, which ended on February 26, 2016. No additional comments were received.

The final draft of the Plan was sent to the U.S. EPA on March 10, 2016, for review for consistency with the nine elements of successful watershed plans (see sidebar, page 2).

Links to the final draft Plan may be found at: <http://www.doublebayou.org/wpp-document/>

What makes up the *Double Bayou Watershed Protection Plan*? It is a compendium of all that's been



learned through this project about the watershed and water quality of Double Bayou, and of all the stakeholder-identified voluntary goals and measures for improving water quality in the bayou.

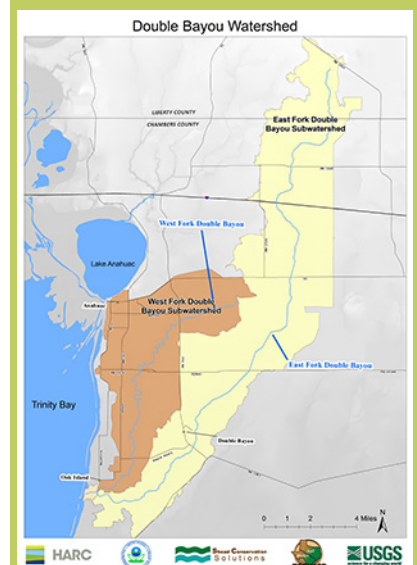
The eight chapters in the Plan are:

1. Watershed Management
2. State of the Double Bayou Watershed
3. Public Participation

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*We Have a Stakeholder-Approved Plan! cont.*

4. Water Quality
5. Pollutant Sources and Loads
6. Management Measures
7. Outreach and Education Management Measures
8. Project Implementation

The chapters on voluntary management measures are the heart of the plan. These address major categories of bacteria sources identified as potentially contributing to the impairments in the East and West forks of Double Bayou.

- » Wastewater collection system infrastructure
- » Septic systems
- » Agriculture
- » Wildlife and non-domestic plants/animals
- » Recreation

Other management measures that focus on outreach and education

will increase public understanding and involvement in water quality improvements. Monitoring measures will help assess progress.

Because there is no one culprit for the high bacteria levels in the bayou, there is no one silver bullet to reduce the levels. It will take a combination of many measures. There is something for everyone to do to help improve water quality.

The Houston Advanced Research Center and its partners – the Texas State Soil and Water Conservation Board, the Galveston Bay Estuary Program, Shead Conservation Solutions, and the U.S. Geological Survey – appreciate all the time and effort the stakeholders dedicated to the development of the Plan over the past three years.

## The “Nine Elements” of a Successful Watershed Protection Plan

A watershed-based plan has the goal of improving water quality within a specific watershed. But how does one develop a plan that will accomplish water quality improvements?

In 2002, the U.S. EPA identified nine key elements of watershed-based plans that lead to successful implementation – that is, where water quality actually improves:

- a. Identify causes and sources of pollution.
- b. Estimate load reductions expected.
- c. Describe management measures and targeted critical areas.
- d. Estimate technical and financial assistance needed.
- e. Develop an information and education component.
- f. Develop a project schedule.
- g. Describe interim, measurable milestones.
- h. Identify indicators to measure progress.
- i. Develop a monitoring component.

Appendix C of the *Double Bayou Watershed Protection Plan* lists the sections in the plan that address each of these nine elements. Besides leading to success, having a plan that’s found to be consistent with the nine elements leads to being eligible for implementation funding through EPA’s 319 grant program.

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



## Riparian Buffer Planning Tool Debuts on H-GAC Website



The Houston-Galveston region is experiencing a wide range of water quality issues, many of which are linked to contaminants from stormwater runoff. In an effort to improve water quality, landowners have the opportunity to protect or create riparian buffers - undisturbed vegetated buffers along waterways - on their property, to protect a waterway naturally from the impact of adjacent land uses.

State and federal agencies have funding and incentive programs available to assist and encourage landowners to implement riparian buffers. However, resources and information are widely dispersed and often difficult to obtain.

H-GAC, in a collaborative effort with local agricultural agency representatives and conservation professionals, developed an online Riparian Buffer Planning Tool to house all pertinent information that landowners need to implement riparian buffers.

Tabs provide a step-by-step format users can follow to learn more about riparian buffers and current water quality related issues. Users can also access interactive mapping tools, information about available incentive programs, a cost share payment calculator, and contact information for agency representatives and technical professionals. Visit <http://www.h-gac.com/go/riparian>, or contact Paniz Miesen at 832-681-2523 to learn more.

*Adapted, with permission, from an article in the Texas Stream Team newsletter, 2016, #1 edition.*

## A Local Perspective: Q&A with Bertha White

Periodically, the Double Bayou WPP project team will ask local participants to share their thoughts about the project and its activities. This edition features Bertha White's responses.



### What watershed interest do you represent?

Landowner, resident, and rancher.

### Why have you chosen to participate in the Double Bayou WPP project?

Since I have these watershed interests, I need to be educated on how to keep them safe, clean, and pollution-free. This is the reason I started going to the meetings: to learn more about the high levels of nutrients found in the East Fork where I live.

### How do you think this project will help the county?

Educating the public will help us save

our environment and our habitat. The bacteria and toxic substances that are harmful to us, from the farms, fields, and shipping and industrial activities, will be decreased after learning the danger of it.

### What would you most like to see come out of this project?

The entire Double Bayou Watershed lies within the Northern Humid Gulf Coastal Prairies EcoRegion. I support the overall good report of the proper nitrogen and phosphorus levels for the plant growth and aquatic life. With humans, pets, and wildlife being threatened, I think government will assist us with this project.

### Please share with us something you have learned through your participation in this project about the Double Bayou Watershed and water quality.

Humans can get sick from consuming or coming into contact with contaminated water, sediment, and seafood, by toxic substances and bacteria. The septic system and the feral hog information was very helpful.

## 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 has resulted in a stakeholder-driven, written plan to achieve stream water quality standards through voluntary actions: the *Double Bayou Watershed Protection Plan*.



### Key Project Acronyms

**DBWP** = Double Bayou Watershed Partnership

**DO** = Dissolved Oxygen

**GBEP** - Galveston Bay Estuary Program

**HARC** = Houston Advanced Research Center

**TCEQ** = Texas Commission on Environmental Quality

**TMDL** = Total Maximum Daily Load

**TSSWCB** = Texas State Soil and Water Conservation Board

**USEPA** = United States Environmental Protection Agency

**USGS** = United States Geological Survey

**WPP** = Watershed Protection Plan

**WWTF** = Wastewater Treatment Facility



## What's Next for Double Bayou?



Now that stakeholders have approved the Double Bayou Watershed Protection Plan, the next phase of this project will be to follow up on the Plan's stakeholder recommendations for how to improve water quality in Double Bayou.

In the chapter on implementation, the Plan details many possible steps, all of which are voluntary, and dependent on obtaining suitable funding. Some of the measures are broad-based, and some are focused on addressing particular sources.

The Trinity Bay Soil and Water Conservation District has a grant application currently pending with the Texas State Soil & Water Conservation Board ("TSSWCB"). This funding would support the recommended measure to develop and update Water Quality Management Plans on agricultural lands (see related article on p. 5). A technician would be located in

Anahuac, and shared with the Cedar Bayou watershed.

The City of Anahuac is applying for funding assistance that would help with repairs of their wastewater collection system.

Another funding avenue through TSSWCB could be a nonpoint source implementation grant. Such a grant would support a local full-time watershed coordinator to guide and assist with implementation of many of the recommended management measures.

Additional free training resources will continue to be offered through TSSWCB and Texas AgriLife Extension. Stay tuned for news of these.

Meanwhile, stakeholders can be ambassadors for Plan implementation by talking with friends and neighbors in the watershed.

## Other Watershed Projects: Success in Plum Creek

The Plum Creek Watershed Partnership (PCWP) has much to celebrate in its tenth year, as well as much work to do in order to continue to improve the water quality of Plum Creek. Since its first meeting, the PCWP has increased awareness throughout the watershed of how human activities and wildlife in the watershed affect water quality.

Plum Creek was placed on the Texas 303(d) list in 2004, due to elevated bacteria levels. In 2006, TSSWCB and Texas A&M AgriLife Extension worked with local stakeholders to establish the Plum Creek Watershed Partnership. Two years later, the *Plum Creek Watershed Protection Plan* was published, and in 2009, it became the first WPP in Texas to be accepted by the EPA.

In 2014, Plum Creek remained on the 303(d) list of the 2014 Texas Integrated Report for elevated bacteria levels, and for concerns for depressed dissolved oxygen levels, impaired habitat, and nutrient enrichment. However, because of the Plum Creek WPP, TCEQ has categorized Plum Creek as a Category 4b stream, meaning that regulatory action is not scheduled as "other control requirements are reasonably expected to result in attainment of all standards."

Stakeholders have implemented WQMPs over thousands of acres of agricultural lands within the watershed. A 12-party Interlocal Agreement has ensured support for a watershed coordinator, to help plan and implement measures to improve water quality in Plum Creek.

Plum Creek is also home to the Caldwell County Feral Hog Task Force, which was formed through the leadership of the watershed coordinator. The task force has documented the removal of over 9,000 feral hogs in Caldwell County since its inception in 2013.

Stakeholders have remained engaged over the initial ten years and continue to work toward water quality improvement within Plum Creek.

## Texas A&M AgriLife Extension Wild Pig Newsletter

# Wild Pig Newsletter

The Texas A&M Wildlife Extension Service announced the publication of the first issue of their *Wild Pig Newsletter*. The Spring 2016 issue includes an introduction to the wild pig team; a feral hog management app for iPhone, iPad, and iPod devices;

and new online continuing education courses.

The newsletter may be viewed at <http://feralhogs.tamu.edu/wild-pig-newsletter/>

## Management Measure Highlight: Water Quality Management Plans (WQMPs)



Water Quality Management Plans (WQMPs) are an essential part of watershed protection plans (WPP). Each plan is tailored to the needs of an individual farm or ranch, to meet a producer's management objectives, and to prevent or reduce nonpoint source pollution, to levels that are consistent with state water quality standards. As the Texas State Soil and Water Conservation Board (TSSWCB) recently noted, "Every acre is unique."

A WQMP is developed in partnership with the professional conservationists of the TSSWCB and the Natural Resources Conservation Service. The first step is to contact the local Soil and Water Conservation District (SWCD). The local district for the Double Bayou watershed is SWCD #435 (Trinity Bay). The TSSWCB website also has details on the process and on the criteria for a plan to be certified by the SWCD (<http://www.tsswcb.texas.gov/en/wqmp>).

The Double Bayou WPP recognizes that "voluntary site-specific management plans are the best way to implement management measures on local farms and ranches." Stakeholders recommended developing a total of 52 WQMPs for the watershed, to accomplish the goals for water quality improvement. Some plans are already in place, and can be updated, such as for landowner change, conversion from crops to pasture or hay, addition of land, or selling of land.

Stakeholders suggested the following management measures, which could be part of a WQMP, to address nonpoint source runoff from agriculture and livestock:

- Prescribed Grazing
- Alternative Water Sources
- Stream Crossings
- Grade Stabilization Structures
- Cross Fencing
- Shade Structures
- Riparian Herbaceous Buffers
- Buffer Zones
- Nutrient Management

Development of a WQMP is free to producers. Although implementing some of the measures in a plan may have associated costs, certification of a plan can enable producers to receive financial incentives for implementation.

To support plan development in the watershed, stakeholders recommended creating the position of WQMP Technician, who would provide assistance to landowners in developing and implementing WQMPs.



### TSSWCB, with the USDA NRCS, Implement New Technical Assistance Program for Coastal Rehabilitation

The Texas State Soil and Water Conservation Board, along with the USDA Natural Resources Conservation Service, have implemented a new project offering technical assistance and planning to participating farmers, ranchers, and landowners engaged in protecting and enhancing healthy habitats for Gulf Coast migratory birds and other wildlife. The restoration agreement between the two agencies will facilitate the development and adoption of voluntary conservation plans and practices among landowners, as well as expanding wildlife habitat restoration efforts.

The Gulf Coast Conservation Planning Project will provide assistance in 32 counties along the Gulf Coast, including Chambers County. It will encourage and assist efforts in wetland creation and restoration, wildlife habitat management, riparian buffer maintenance, and improving soil health, among many other efforts.

Technical assistance in developing conservation plans will be made available to landowners for free.

To learn more about this technical assistance program, contact your local NRCS field office or SWCD staff or visit:

<http://www.tx.nrcs.usda.gov>.



## Latest Water Quality Listing for Double Bayou



The new listing status of Double Bayou water quality was presented in the most recent report of impaired waters in Texas, by the Texas Commission on Environmental Quality (TCEQ), which is updated every two years. Stakeholders who have been participating in the Double Bayou Watershed Partnership know this story, but new readers might not have learned about the updated status.

As of November 2015, the U.S. Environmental Protection Agency approved the new list of impaired waters in the *2014 Texas Integrated Report*. Double Bayou's status on this report is based on the most recent assessment of seven years of quality-assured water monitoring data, from December 2005 through November 2012.

The final draft of the *Double Bayou Watershed Protection Plan* has referred to the listing in the previous *2012 Texas Integrated Report*. In that report, the West Fork of Double Bayou had been listed as impaired both for elevated levels of bacteria and for low dissolved oxygen levels, but the East Fork was not listed as impaired for either.

The new 2014 report continues to list the West Fork of Double Bayou as impaired both for elevated levels of bacteria and low dissolved oxygen levels. The status of the East Fork has changed: the East Fork is now also listed as impaired for elevated levels of bacteria.

Although we would all wish that the East Fork were not on the list, the listing of the East Fork as impaired for bacteria will not change the management measures in the WPP.

During the WPP project, the water quality sampling showed elevated bacteria levels in both forks, so the management measures identified by stakeholders were planned to help improve water quality in both the West Fork and the East Fork of Double Bayou.

The *2014 Texas Integrated Report* may be found here: <https://www.tceq.texas.gov/waterquality/assessment/14twqi/14txir>. (The Double Bayou listings are on page 93 of 106 in the report.)

Please feel free to contact us with any questions about the listing:

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### Upcoming Events

Plan Wrap-Up Meeting:  
July 19, 2016



### Thanks

Our thanks to the following for providing recent support to the Double Bayou Watershed Partnership, since the previous newsletter:

For meeting space, equipment, and set-up –

- Chambers County

For refreshments –

- Samson Energy

Please add your thanks to ours, when next you see these folks!



### Useful links from our website:

WPP Document:  
<http://www.doublebayou.org/wpp-document/>

Meeting Archives:  
<http://www.doublebayou.org/double-bayou-meetings/>

Tools and Resources:  
<http://www.doublebayou.org/toolsresources/>



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