



# Texas Wetland News

and WETLAND CONSERVATION PLAN UPDATE

4200 Smith School Road • Austin, TX 78744  
www.tpwd.state.tx.us/wetlands/publications



**AUGUST 2004**

## TEXAS WETLAND DISCOVERY TRUNKS NOW AVAILABLE FOR EDUCATORS

Twenty-five “Wetland Discovery Trunks” – educational materials for loan – are available at various sites around the state for teachers and people who are working with youth. The trunks include activity ideas, background information, the “Texas Treasures: Wetlands” pamphlet and some basic field equipment for studying local wetlands. The list of loaner sites is available at:

[www.tpwd.state.tx.us/edu/trunks/wetlandstrunk.phtml](http://www.tpwd.state.tx.us/edu/trunks/wetlandstrunk.phtml)



## WANT TO GET ON THE MAILING LIST?

If you would like to be added to the mailing list or would like to submit an article for the next issue of the Texas Wetlands News, contact:

Jennifer Key,  
Inland Fisheries Division  
4200 Smith School Road  
Austin, Texas 78744  
or e-mail –  
[jennifer.key@tpwd.state.tx.us](mailto:jennifer.key@tpwd.state.tx.us)

# Lake Waco Wetlands

## More than just a mitigation project

*Contributed by Melissa L. Mullins*

In the fall of 2001, the City of Waco and project partners began creating a freshwater marsh on property leased from the U.S. Army Corps of Engineers near Lake Waco as part of mitigation required for raising the level of the lake seven feet. Beginning with a small “nursery” site, four wetland cells totaling 180 acres have been completed. Water from the North Bosque River is pumped into the upper end of the wetland, gravity flows through the cells, and is returned to the North Bosque River just above Lake Waco.

What makes the Lake Waco Wetlands Project more than just a cattail marsh? From its inception, project leaders have sought the involvement of the local community at many levels, resulting in a multi-functional project with wide buy-in and community support. The project is largely the brain-child of Tom Conry, a program manager with City of Waco Water Utilities, who has past experience with similar projects. Conry says the project was a “joint effort” from the beginning, with support from numerous other city employees, the City Council and outside partners. After assistance from the Corps in identifying a feasible site, the design work was conducted

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## Lake Waco Wetlands Project, continued

by Wetland Technologies, Inc. out of Houston. Conry admits surprise at how quickly the project took off. “This was just a field, and it has turned into something really special and unique. The geology professors tell us we have true wetland soils.”

One wetland function that city leaders are hopeful about is water quality improvement. The Texas Commission on Environmental Quality (TCEQ) released a total maximum daily load (TMDL) and associated implementation plan for phosphorous for the North Bosque watershed. Both point and non-point sources of phosphorous in the watershed were identified from dairies and from municipal wastewater treatment plants. Lake Waco, the source of drinking water for Waco and many surrounding communities, was not included in the TMDL. However, the City of Waco has experienced dramatically increased costs in recent years to treat taste and odor problems caused by algae blooms in the lake, which many contend are exacerbated by excessive nutrient input from upstream dairies. Research into nutrient transformations through the Lake Waco Wetlands is underway, and it is already apparent that turbidity decreases across a gradient in the wetland. The wetland “treats” 11 million gallons a day (approximately 20% of the annual

average flow of the North Bosque), so a dramatic effect on lake water quality may not be apparent; however, project supporters feel that any improvement in water quality is a step in the right direction.

Another important function of the Waco Wetlands Project is the establishment of wildlife habitat. Approximately 24 species of aquatic macrophytes are currently found at the wetland. Efforts were made from the beginning of the project to establish native aquatic vegetation, and aggressive species such as cattails (*Typha* spp.) were not planted. Unsurprisingly, cattails are now abundant in the wetland area, and the city is working to control non-native species such as *Hydrilla* and *Arundo donax* (giant cane). Changes in the plant community over time are being tracked.

A variety of wildlife species inhabit the wetland – for example, the local chapter of the Audubon Society has documented 132 species of birds at the wetland to date, and data was collected for Texas Amphibian Watch last year documenting six



species of frogs calling. Ducks and geese have been abundant, and roseate spoonbills have made surprise appearances. Some less desirable inhabitants of the wetland site have included nutria.

Baylor University has been an active partner with the City of Waco in the wetland project from the beginning. Dr. Robert Doyle provided assistance in plant selection and establishment, and now teaches a wetland ecology course utilizing the Lake Waco Wetlands as an outdoor classroom and research project site. Several students are conducting graduate-level research in biology at the wetland, and other departments such as Geology and Environmental Studies have also been active in the project. The completion of an on-site 5,000 square-foot Research and Education Center this fall will further facilitate student research and teaching opportunities.

The community outreach and education aspect of the wetland project has exceeded expectations and shows signs of increasing in the future. "Community support and involvement have without a doubt been the greatest success story of the wetland so far" says Conry. "We've given out over 3,000 t-shirts during wetland plantings. We want to continue to build on that success and expand educational opportunities for people." Planting weeks targeted at local schools have been held, and groups such as boy scout troops have worked on community service activities including the erection of a bird viewing platform and owl nest boxes.

The city recently hired a full-time Wetland Coordinator, who will be housed at the Research and Education Center. Nora Schell says her vision for the wetland includes "people of all ages using it for site seeing, nature watching, birding and overall ecosystem education." She hopes to be able to assist educators in identifying wetland education curricula that are aligned with state standards, and notes that both indoor and outdoor facilities will be available. The center will house educational displays as well as teaching and research labs, and Schell expects that it will be used for workshops and specialized training events. Visitors can enjoy walking along the existing maintenance roads to and through the wetland, and a concrete trail to allow visitors with limited mobility to readily access the wetland is being constructed to a nearby overlook.

The Lake Waco Wetlands have been nominated for inclusion in Texas Parks and Wildlife Department's Prairies and Pineywoods Wildlife Trail map. The Department was also asked to participate in the recently formed Lake Waco Wetlands Advisory Committee and has active representation on the Research and Education subcommittee. For additional information about the Lake Waco Wetlands Project, visit the city's Web site at: [www.waco-texas.com/city\\_depts/waterutilities/wetlands.htm](http://www.waco-texas.com/city_depts/waterutilities/wetlands.htm) or contact Nora Schell at [noras@ci.waco.tx.us](mailto:noras@ci.waco.tx.us) or (254) 750-1671.



# Volunteers Work to Rebuild 'Potholes'

Writer: Lorri Jones, (281) 855-5620, [lv-jones@tamu.edu](mailto:lv-jones@tamu.edu)  
 Contact: Marissa Sipocz, (281) 218-6253, [m-sipocz@tamu.edu](mailto:m-sipocz@tamu.edu)

In Harris County, the idea of restoring a pothole to its original condition would not be popular with commuter traffic!

However, volunteer Master Naturalists are helping to restore a prairie pothole complex that is not part of the highway system, but is part of a unique habitat in Sheldon Lake State Park.

Prairie potholes are pockets of still water characterized by few trees, warm, dry climates and prairie plants that establish around the water holes. They are critical resting, feeding and nesting habitats for migratory waterfowl and other wildlife, such as coyotes, burrowing owls, prairie dogs and insects.

The Texas Parks and Wildlife Department contracted with Texas Cooperative Extension's Coastal Watershed Program for the vegetation restoration. Marissa Sipocz, wetlands restoration team leader, said planting native grasses and other vegetation was a perfect match for Master Naturalists.

The pothole complex in Sheldon Lake Park has a common history with many North American potholes. For the past 40 years it has gradually been flattened and drained by farming, because prairie potholes are highly suitable for agricultural production.

This eight-acre project complex is just one example of ecosystems being restored by the Gulf Coast Chapter of Master Naturalists. Volunteers complete 50 hours of classroom training on the habitats along the Gulf Coast, animals, plants and grasses that are native to each habitat, and other information unique to the region. After completing the classroom segment, members must contribute 50 hours of community service in order to receive the Master Naturalist designation.

Richard Conner, a Master Naturalists project coordinator, said his classmates chose the pothole complex

project for their community service after Sipocz visited their class and described what needed to be done.

"Mind you, at our first visit to the site, it was nothing more than some wooden surveyor's stakes and flagging marking the boundaries of what would someday become a seasonal wetland prairie pothole," Conner said.

The class started planting in November. The Texas "gumbo" clay was dry from lack of rain, and completing the first plantings was quite an effort, he said.

"Of course, planting when it is wet presents a different set of challenges," Conner said with a laugh. "The mud will suck your boots off your feet, and staying upright can be difficult."

In addition to the Naturalists, Ducks Unlimited participates in the project by funding the earth work to rebuild the high and low areas characteristic of wetlands.

Texas Parks and Wildlife Department's Ted Hollingsworth said working with Extension is one of the most cost-effective partnerships for restoring the wetlands because of the access to numbers of trained volunteers.



"The group of volunteers that Marissa had developed and trained has done fantastic work on other wetlands restoration projects," Hollingsworth said. "It is an excellent partnership of all the groups involved."

**"The mud will suck your boots off your feet..."**

# Habitat Restoration in the Arroyo Colorado to Reduce Nonpoint Source Pollution

The tidal segment (2201) of the Arroyo Colorado has been designated as having high aquatic life use by the state of Texas; however, it is currently included in the 2000 Texas Clean Water Act Section 303(d) List due to dissolved oxygen concentrations in the upper 11.4 km (7.1 miles) of the segment sometimes being lower than the criteria established to assure optimum conditions for aquatic life. In 2002, the Texas Commission on Environmental Quality (TCEQ) completed the first phase of an effort to develop a Total Maximum Daily Load (TMDL) to address low dissolved oxygen conditions in the tidal segment of the Arroyo Colorado. The TCEQ is facilitating local efforts to develop a Watershed Protection Plan through a stakeholder group known as the Arroyo Colorado Watershed Steering Committee. The Steering

Committee has formed several workgroups to address and develop the five major components of the Arroyo Watershed Protection Plan: 1) wastewater infrastructure, 2) agriculture issues, 3) habitat restoration, 4) refinement of TMDL Analysis and 5) outreach and education. Each workgroup is responsible for developing recommendations for improving water quality including significant reductions in current loadings of pollutants, enhancement of assimilative capacity, increased public awareness of the problems and further study to improve understanding of the factors that cause low dissolved oxygen conditions in the Arroyo Colorado.

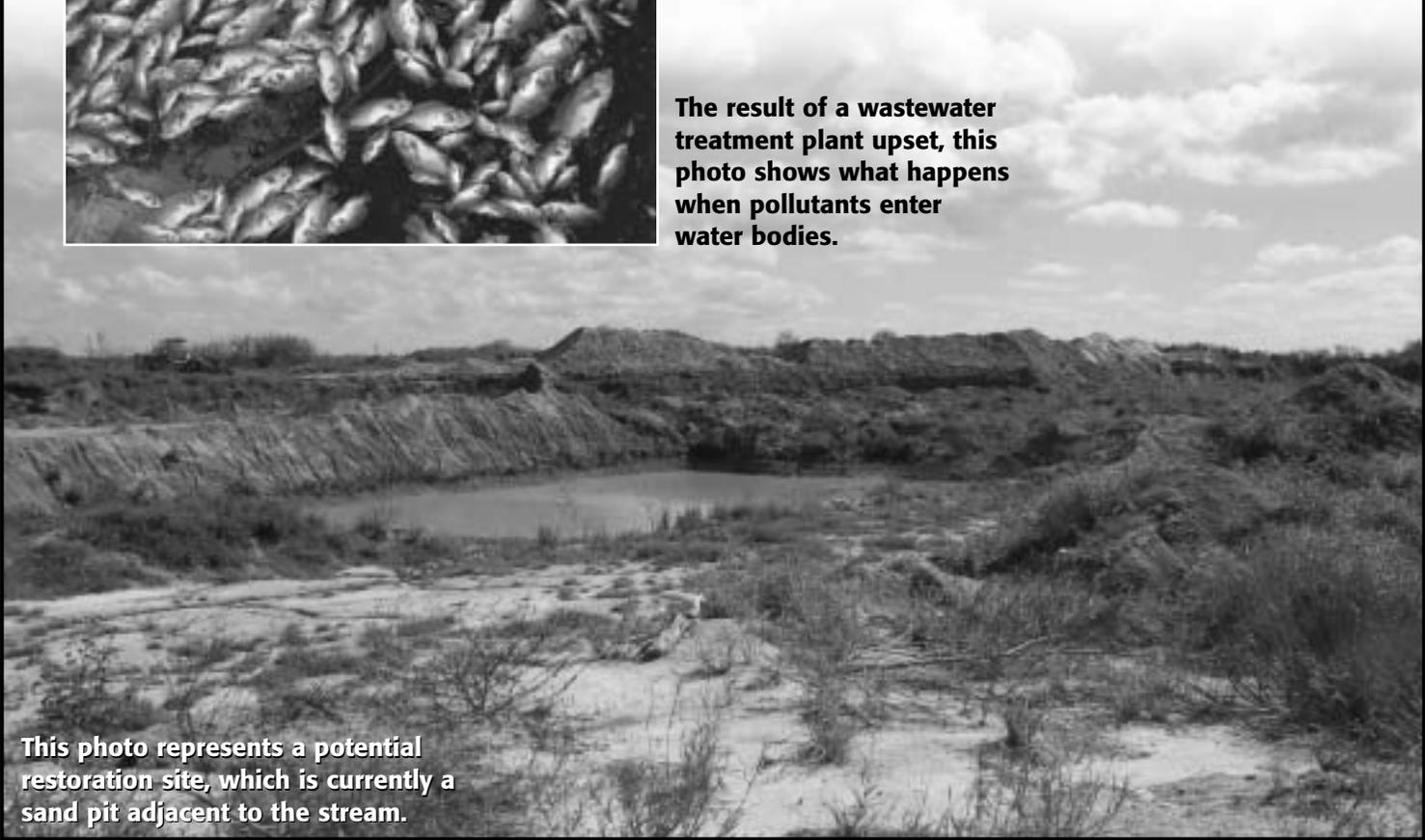
The Arroyo Colorado originated as a distributary of the Rio Grande, but has been altered by dredging (in the lower reach) and channelization. It extends from approximately two miles southwest of Mission, Hidalgo County, approximately 144 km (90 miles) northeastward to the Laguna Madre in Cameron County, Texas (GLO 1995).

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**The result of a wastewater treatment plant upset, this photo shows what happens when pollutants enter water bodies.**

**This photo represents a potential restoration site, which is currently a sand pit adjacent to the stream.**





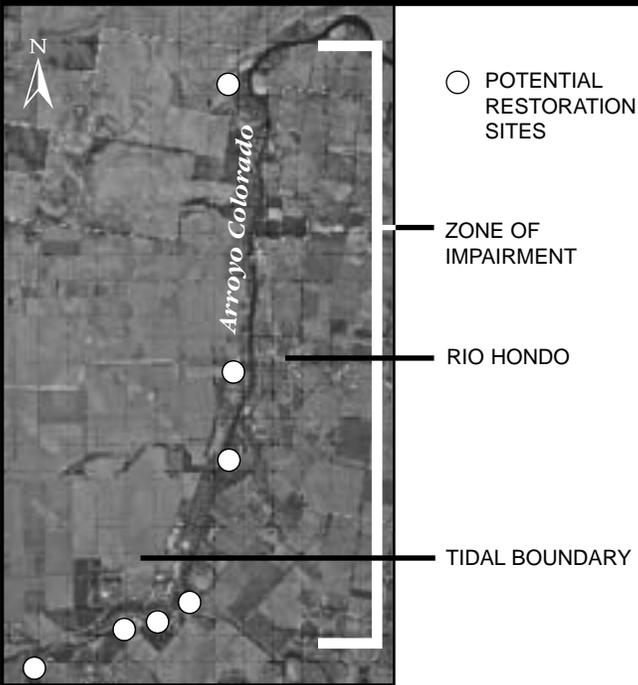
**An existing drainage canal that has the potential for beneficial channel modifications in order to create better fish and wildlife habitat and to assimilate more nonpoint source pollutants.**

The Arroyo Colorado is divided into two segments. The above tidal reach (Segment 2202) starts at Mission and extends 101.5 km (63 miles) to a point 0.1 km (328 feet) below Cemetery Road near the Port of Harlingen, Cameron County (Davis 1989). The tidal reach (Segment 2201) extends 42.1 km (26 miles) from the lower boundary of the nontidal segment to the Laguna Madre. At its beginning, the Arroyo Colorado channel is a maintained channel until Mercedes, where it continues as a natural channel until the tidal reach begins southeast of Harlingen where it becomes a dredged navigation canal that extends from the Turning Basin in the Port of Harlingen to the Laguna Madre.

Hydraulic conditions of the stream channel support rapid, unrestricted flow due to the steep-walled configuration of the pilot channel, absence of vegetation, extensive channelization and absence of impoundments (GLO 1995). The watershed area of the Arroyo Colorado is 1,810 km<sup>2</sup> (704 square miles), however, natural overland drainage is restricted by the level topography and intense land development within the drainage area. The Arroyo Colorado primarily serves as a floodway for overflow waters from the Rio Grande. Secondary uses include commercial navigation and recreational boating and fishing. Perennial flow is maintained by municipal wastewater discharges and supplemented by irrigation return flows and urban runoff.

The Habitat Restoration Workgroup, led by Texas Parks and Wildlife Department (TPWD) with the financial support of an Environmental Protection Agency funded grant through the TCEQ, will investigate and recommend habitat modifications and restoration measures that will reduce nonpoint source pollution to the Arroyo Colorado or mitigate existing physical conditions that aggravate poor water quality conditions in the stream as part of the Watershed Protection Plan. Texas Parks and Wildlife Department staff have identified five potential restoration sites within the 7.1-mile zone of impairment in the tidal segment of the Arroyo Colorado and more upstream from the zone in the non tidal segment of the stream. Potential habitat restoration sites identified include old borrow pits, gravel mines, cutoff river channels and drainage channels.

The TCEQ and TPWD have applied to the Texas Coastal Coordination Council for NOAA 309 funds, administered through the Texas General Land Office, to conduct a feasibility study to help the Habitat Restoration Workgroup select suitable sites and projects for habitat restoration and increasing assimilative capacity and dissolved oxygen content in the Arroyo Colorado. The desired outcome of the Arroyo Colorado Habitat Restoration Feasibility Study is a technical engineering report that would provide the Habitat Restoration Workgroup with the background information and the preliminary locations, designs and costs for suitable habitat restoration projects that meet



the goals of the Watershed Steering Committee and the constraints of managers and users of the Arroyo Colorado. The final engineering report would serve as the basis from which the Habitat Restoration Workgroup would develop and write its portion of the Watershed Protection Plan. It would also serve as a preliminary action plan for the Workgroup so that it could begin seeking sponsors and funding to implement preferred restoration projects on the Arroyo Colorado.

The establishment of the Habitat Restoration Workgroup and the feasibility study address recommended wetland habitat conservation actions of the *Texas Wetlands Conservation Plan* (TPWD 1997) and the *Texas Coastal*

*Management Program*. Tasks that the Habitat Restoration Workgroup will accomplish over the next two years include:

- Compilation of background and technical information.
- Assessment of current and proposed channel management policies and methods.
- Evaluation of potential habitat restoration sites and preliminary engineering.

The next meeting of the Habitat Restoration Workgroup will be on Aug. 13, 2004, in Weslaco. For more information on the Arroyo Colorado Habitat Restoration Workgroup, please contact Kay Jenkins, program specialist at TPWD, at (361) 825-3245 or at [kay.jenkins@tpwd.state.tx.us](mailto:kay.jenkins@tpwd.state.tx.us). For more information on the Arroyo Colorado TMDL or the Watershed Steering Committee, please contact Roger Miranda, geochemist at TCEQ at (512) 239-6278 or at [rmiranda@tceq.state.tx.us](mailto:rmiranda@tceq.state.tx.us)

#### References

- GLO. 1995. Coastal Impact Monitoring Program. Report of Literature Review on Discharges from the Rio Grande and Arroyo Colorado and their Impacts. Texas General Land Office, Austin, Texas. GLO - 9/95 - QH541.5W3 C83 1995. 87 pp.
- Davis, Jack 4. 1989. Results of Intensive Priority Pollutant Monitoring in Texas - Phase II. Sabine River near Longview, Upper San Antonio River, Corpus Christi Bay/Inner Harbor, Arroyo Colorado, Sabine/Neches River Tidal. Texas Water Commission, LP89-07, December 1989. 333 pp.



Taken March 17, 2004 after a large rain event, this photo represents the typical shoreline and a drainage outfall in the impaired section of the Arroyo Colorado.



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