

**Guadalupe-Blanco River Authority
2009 Basin Highlights Report**



Introduction

This report highlights the activities that occurred in 2008 in the Guadalupe River Basin and the Lavaca-Guadalupe Coastal Basin under the Clean Rivers Program (CRP). The CRP is managed by the Texas Commission on Environmental Quality (TCEQ), and funded entirely by fees assessed to wastewater discharge and water rights permit holders. The Guadalupe-Blanco River Authority (GBRA) together with the Upper Guadalupe River Authority (UGRA) carry out the water quality management efforts in the basins under contract with TCEQ. The activities described in this report include water quality monitoring, a review of the 2008 305b Water Quality Inventory and public communications efforts. Information on other water quality studies, planning efforts and events that could impact water quality are also included in the *2009 Basin Highlights Report*.

This Year's Highlights

The drought of 2008-09 is on track to go down as one of the worst droughts in Texas history (see section The Drought of 2008-09). However, the decrease in rainfall and subsequent diminishing stream flow did not result in major changes in the water quality of the main stem in 2008. Receiving streams (streams that are the final destination of treated wastewater) have become more effluent-dominated, as seen at the two monitoring locations on Plum Creek. Nitrate-nitrogen and total phosphorus concentrations at the Plum Creek stations are some of the highest in the river basin. Less base flow from Canyon Reservoir resulted in longer water residence times in the run-of-river hydroelectric impoundments along the middle Guadalupe River. The longer residence time promoted higher chlorophyll *a* concentrations in Lake McQueeney which ranged from below detection in January 2008 to 24.8 milligrams per liter in September. The smaller tributaries throughout the upper watershed have become dominated by pools rather than by normal runs and riffles.

The Comal River was affected by elevated bacterial concentrations coming from its major tributary, the Dry Comal, causing the site at Hinman Island on the Comal River to exceed the stream standard for contact recreation five times in 2008. The Dry Comal is a very large, mostly rural watershed, but the monitoring site is in an urban setting. The City of New Braunfels was contacted for possible sewer main breaks. The collection system was inspected and found to be in good shape, with no leaks. No other cause for the elevated numbers was identified.

In 2007, at the request of stakeholders concerned about the *in situ* mining of uranium in Goliad County, water samples from Coletto Creek were analyzed for background

concentrations of uranium and its radioactive by-products. No detections were measured above the minimum analytical limit of the method. Sediment samples taken at the Kerrville-Schreiner Park site on the Guadalupe River were analyzed for metals and organic compounds associated with urban runoff. Total petroleum hydrocarbons were detected (1630 micrograms per kilogram) in the sediment but no benzene, ethylbenzene, toluene and xylenes (BTEX) compounds were detected. All sediment metals concentrations at the Kerrville site were below the TCEQ screening concentrations. Sediment samples collected from the San Marcos River below the City of San Marcos and the San Marcos River at Luling were analyzed for organic compounds associated with urban runoff. No measurable concentrations of total petroleum hydrocarbons (TPH) or BTEX were detected. A water sample collected at Plum Creek at CR135 was analyzed for TPH and BTEX; no compounds were detected. Metals in sediment were analyzed at the Geronimo Creek site, and aluminum, copper, nickel and chromium were detected but well below the TCEQ screening concentration.

A new sampling location has been established in the main stem of the Guadalupe River to replace the sampling location at Dupont in Victoria County. The Dupont site was discontinued due to lack of access to the area downstream of the facility's effluent discharge point and mixing zone. The site on the Guadalupe River near the community of Hochheim, off of SH-183 will be monitored quarterly for flow, field parameters, conventional parameters, and bacteria.

GBRA continues to support Texas Stream Team monitors in the river basin. Groups are monitoring on the Blanco River and its tributaries near Wimberley; the Guadalupe River and tributaries downstream of the release from Canyon Reservoir (Lindheimer Master Naturalists-New Braunfels); Lake Placid on the Guadalupe River near Seguin; and Plum Creek and its tributaries in Caldwell and Hays Counties.

The data collected by CRP are not just for use by TCEQ and GBRA. The data are being used to develop watershed protection plans for Plum Creek, Cypress Creek and Geronimo Creek. Additional comprehensive monitoring is occurring in these watersheds, through funding by Clean Water Act 319(h) grants administered by TCEQ and the Texas State Soil and Water Conservation Board, utilizing the labor and analysis costs through CRP activities as match.

How Can You Get Involved?

GBRA and UGRA promote communication and participation from the general public. Anyone who is interested in volunteering, or has a specific concern may send an e-mail addressed to dmagin@gbra.org or write a letter to Debbie Magin, 933 East Court Street, Seguin, TX 78155. Indicate the topics you are interested in and provide enough information to receive mailed notices of meetings and reports. This information will help participants develop sub-watershed groups that have specific interests and may become involved in designing and providing input on special studies. Public participation is highly encouraged in meetings and input on water quality issues in the basin.

Additional Resources

Link to State Coordinated Monitoring Schedule: <http://cms.lcra.org/>

Link to Texas Clean Rivers Program Resources (including historical data and maps):

<http://www.tceq.state.tx.us/compliance/monitoring/crp/data/crp-resources.html>

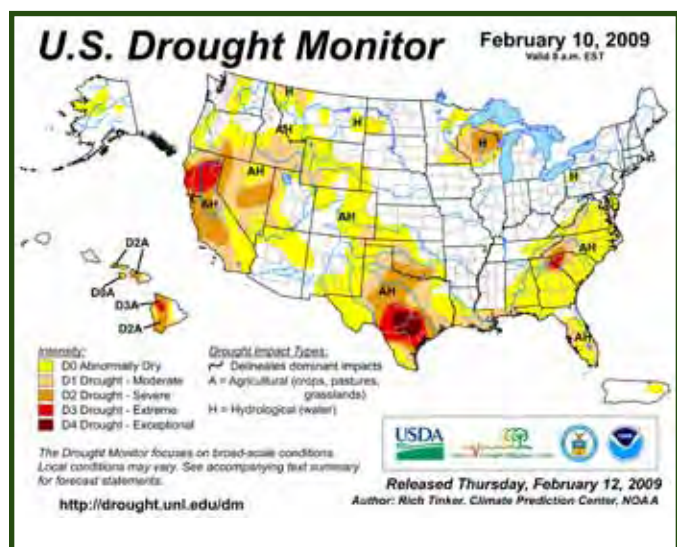
GBRA Clean Rivers Program page: www.gbra.org/CRP/Default.aspx

TCEQ Real-time Water Quality Monitoring Network: http://www.tceq.state.tx.us/assets/public/compliance/monops/water/wqm/tx_realtime_swf.html

The Drought of 2008-09

The drought of 2008-09 is making history. The period between September 2007 and December 2008 recorded only 16.4 inches of rain at the San Antonio National Weather Service Station, becoming the driest 16-month period on record. Previously, 1955-56 held that record, with only 17.71 inches of rain. The U.S. Drought Monitor map (shown below) is issued by the Western Regional Climate Center. The conditions show that the Guadalupe River Basin has experienced “extreme” to “exceptional” drought conditions over the last year. Another statistical tool that meteorologists use to gage the severity of drought is the Palmer Drought Severity Index (PDSI). PDSI is an index that takes into account various meteorologic and hydrologic factors such as precipitation, evaporation and soil moisture. South Central Texas and the Edwards Plateau score in the moderate to severe drought range (-3.7). Comparing this PDSI to historical, the period of 1983-85 had a score of -3.1; 1996-98 had a peak score of -4.2 and the drought of record in the 1950’s, scored approaching -6.0. According to StormFax.com, in late 2007 through early 2008, the United States was in a La Niña weather pattern. La Niña weather is created when the sea surface temperatures in the tropical Pacific Ocean fall below normal. This phase is characterized by warm winters in the southeastern U.S. Conversely, El Niño, above average sea surface temperatures, creates conditions that are characterized by large scale weakening of the trade winds and warming of the surface layers in the equatorial eastern and central Pacific Ocean. El Niño is synonymous with large scale, climatically-significant warm events, and wet periods in the southern U.S. For additional information and current drought monitor maps visit <http://drought.unl.edu/dm/archive.html>.

No significant changes in water quality was noted in 2008, nor the need for water use restrictions because early to mid 2007 was a very wet year and contributed a significant volume to recharge. Without rain, as the demand on groundwater picks up in the spring of 2009, the flow from springs and seeps will diminish, severely affecting the base flow of the



Guadalupe, Comal, San Marcos and Blanco rivers. Endangered species living in the Comal and San Marcos rivers could be affected as flows drop off, and longer residence times promote higher water temperatures. The streams will become more effluent-dominated, until such time as the reuse of wastewater is in greater demand and then even that flow will not be returned to the stream.

Table of Water Quality Impairments and Concerns from the 2008 305(b) Texas Water Quality Inventory and 303(d) List of Impaired Waterbodies

Segment Number	Area	Parameter of Impairment	Parameter of Concern
1801	Guadalupe River Tidal		Nitrate-Nitrogen
1803A	Elm Creek (entire water body)	DO ¹ , Bacteria	
1803B	Sandies Creek (from the confluence with Elm Creek to upper end of water body)	DO	
1803B	Sandies Creek (from the confluence with Guadalupe River to the confluence with Elm Creek)	DO, Bacteria	
1803C	Peach Creek (lower 25 miles)	Bacteria	
1803C	Peach Creek (from 1.2 miles down-stream of FM 1680 in Gonzales County to confluence with Elm Creek in Fayette County)	DO, Bacteria	
1804C	Geronimo Creek (entire water body)	Bacteria	
1805	Canyon Lake (entire water body)	Mercury in fish tissue	
1805²	Canyon Lake (upper end of segment)		Nitrate-Nitrogen, Ortho-phosphate
1805	Canyon Lake (north end Crane's Mill Park peninsula to south end Canyon Park)		Ortho-phosphate
1805	Canyon Lake (lower end from dam to Canyon Park)		Ortho-phosphate
1806	Guadalupe River above Canyon Lake (from 1 mile upstream of Flat Rock Dam to the confluence with Camp Meeting Creek)	Bacteria	
1806	Guadalupe River above Canyon Lake (from 25 miles upstream of the lower end to the confluence with Big Joshua Creek)	Bacteria	
1806A	Camp Meeting Creek (entire water body)	DO	
1810	Plum Creek (from approximately 0.5 miles upstream of SH 21 to upper end of segment)	Bacteria	DO, Total phosphorus
1810	Plum Creek (from approximately 2.5 miles upstream of confluence with Clear Fork Plum Creek to approximately 0.5 miles upstream of SH 21)		Total phosphorus, Ortho phosphate, Ammonia-Nitrogen
1810	Plum Creek (confluence with San Marcos River to approximately 2.5 miles upstream of confluence with Clear Fork Plum Creek)	Bacteria	
1813	Upper Blanco River (from Hays CR 1492 to Blanco CR 406)		DO
1815	Cypress Creek (lower 7 miles of segment)		DO
1817	North Fork of Guadalupe River (entire water body)		DO

¹ Dissolved Oxygen. If DO is listed as a concern then the mean concentration exceeded the screening level for a grab sample.

² Bolded text is new listing in the 2008 inventory.

Stream Segments

Water Quality Projects/Issues

Segment 1804

New Braunfels Utilities Releases Results of Water Quality Study on Lake Dunlap

The New Braunfels Utilities (NBU) was required to perform a water quality study on Lake Dunlap, a hydroelectric impoundment, located just downstream of the city of New Braunfels. NBU operates three wastewater treatment plants that discharge upstream of or into the impoundment. The study was conducted over two years. The purpose of the study was to determine if nutrient limitation on point source discharges from the NBU wastewater treatment plants would prevent growth of excessive vegetation. Based on the results from the sampling events and the bioassay investigations, the river system upstream of the wastewater treatment plants and downstream of the Comal River appears to be nitrogen-limited. Chlorophyll *a* growth was directly attributable to increases in nitrate concentrations. The results of the bioassays indicate that growth is independent of orthophosphate concentrations. The study demonstrates that the system is nitrogen-limited and that the water quality of the system is directly related to the percentage of flows from the Guadalupe and Comal rivers. (New Braunfels Utilities) **To get more information:** <http://www.nbutexas.com>

Segment 1810

Plum Creek Watershed Protection Plan Completed and in the Implementation Phase

The Plum Creek Watershed Partnership (PCWP) has completed the Watershed Protection Plan (WPP) for Plum Creek and its tributaries in Hays and Caldwell counties. In 2004, Plum Creek was identified as impaired for *E. coli* bacteria, with concerns for nutrients. The Texas State Soil and Water Conservation Board (TSSWCB) selected Plum Creek for the development of the WPP. The project was facilitated by the Texas AgriLife Extension Service. Load duration curve analysis indicated that both point and non-point sources contribute to the impairment. Based on stakeholder input and land use analysis, sources of the pollutants include urban sources, such as urban runoff and pet waste, as well as agricultural activities and wildlife sources (deer and feral hogs). As a result of the watershed planning efforts, other grant funded projects are active in the watershed. A grant from the TCEQ and the US EPA is funding several education and outreach projects. In this project, over seven tons of illegally dumped waste was removed from the stream; training was provided for municipal officials, on-site septic systems maintenance providers and homeowners; and on-line educational modules are in development, covering topics such as wastewater treatment, on-site septic systems and disposal of household hazardous wastes. The TSSWCB is funding a monitoring project that is collecting both baseline water quality data as well as data from Plum Creek and its tributaries under wet weather conditions. The WPP has moved into the implementation phase. Grant funding received for this phase is covering urban nonpoint source pollution management strategies for the City of Kyle, feral hog management education in the rural portions of the counties, and nonpoint source pollution outreach and education. Technical and financial assistance for farmers and ranchers is also being funded. The Texas AgriLife Extension will continue to work in the watershed for three more years. (Texas AgriLife Extension Service)

To get more information: <http://plumcreek.tamu.edu/> and <http://www.gbra.org/PlumCreek/>

Segment 1806

Upper Guadalupe River Implementation Plan Underway in Kerrville

A portion of the Guadalupe River above Canyon Lake is included in the Texas List of Impaired Waters (also called the 303(d) list). This area exceeded the state standard for *E. coli* bacteria and a Total Maximum Daily Load Study (TMDL) was completed. The TMDL determined the maximum amount of *E. coli* bacteria the river could accept and still maintain its use for contact recreation. An implementation plan (I-Plan) is currently underway to put the TMDL into action by outlining the steps necessary to reduce the bacteria load. The Upper Guadalupe River Authority (UGRA) is working with TCEQ to develop the TMDL I-Plan. Routine monitoring will provide better identification of *E. coli* sources as well as evaluation of control measures. (UGRA) **To get more information:** <http://www.ugra.org/projects.html>

Segment 1815

Cypress Creek Project in Wimberley (Hays County)

Understanding that new development is certain, the Cypress Creek Project will create a watershed management plan to ensure that the water quality of the creek improves and remains healthy. The project is being facilitated by the Texas River Systems Institute, through funding provided by TCEQ and US EPA. Phase one of the project will focus on stakeholder recruitment, education and input, which are key to the development of a Decision Support System (DSS). The DSS is a free computer-based tool for decision-makers, local planners and stakeholders to use to examine the impacts of proposed development activities and land management practices on water flows and water quality in Cypress Creek. (Texas River Systems Institute) **To get more information:** <http://cypresscreekproject.org/about.html>

Segment 1804A

Development of Geronimo Creek WPP Funded by TSSWCB

Geronimo Creek and its tributary, Alligator Creek, are located in Guadalupe and Comal counties. The 2008 Texas Water Quality Inventory listed Geronimo Creek as impaired for *E. coli* bacteria, with a concern due to elevated nitrate-nitrogen. The TSSWCB and the US EPA have funded the development of a watershed protection plan for the creek. The study will collect additional water quality data over twelve months and will use the data to develop a model of the creek to determine the sources of the impairments and the load reductions needed to bring the stream back into compliance with stream standards.

To get more information: Debbie Magin, dmagin@gbra.org or Nikki Dictson, ndictson@tamu.edu and www.tsswcb.state.tx.us/watersheds#geronimocreek

Segment 1803

New CRP Monitoring Site on Guadalupe Near Gonzales

A new monitoring location has been established on the Guadalupe River located near the community of Hochheim, southeast of Gonzales, on US Hwy 183. The site will be monitored quarterly. It replaces the Dupont site near Victoria, which was discontinued due to the lack of access to a proper sampling location downstream of the industrial complex.

To get more information: <http://www.gbra.org/CRP/WaterQualityDataCollection.aspx>

Stream Segments

Water Quality Projects/Issues *(continued)*

Segment 1810 and 1808

Regional Water and Wastewater Planning Study for Caldwell County

GBRA and Caldwell County received funding from the Texas Water Development Board to conduct a regional planning study for the county. The study is assessing the ability of current development and municipal infrastructure to serve proposed growth in the county, while protecting the water quality of Plum Creek and the San Marcos River. Regional water supply and wastewater treatment alternatives will be evaluated. The process relies on stakeholder inputs and consensus on proposed regional alternatives. This study supports implementation of the wastewater components in the Plum Creek Water Protection Plan.

To get more information: Debbie Magin, dmagin@gbra.org or Alan Thompson, Alan.Thompson@klotz.com

Segment 1807

Gain/Loss Study Underway on Coletto Creek

An examination of the hydrology and groundwater recharge/discharge in the upper Coletto Creek is being conducted by the U.S. Geologic Survey. Surface water from the Coletto and Perdido creeks and groundwater data from the Chicot and Evangeline aquifers are being collected. The watershed is mostly rural, but is undergoing land use changes, including a renewed interest in uranium mining. The study will provide basin information that can be used to develop appropriate natural-resource management strategies. (Goliad County Groundwater District) **To get more information:** Goliad County GCD, gcgcd@att.net

All Segments

Guadalupe-Blanco River Trust to Develop Continuous Water Quality Monitoring Network

The Guadalupe-Blanco River Trust (Trust), GBRA, TCEQ and the U.S. Geological Survey are partnering to launch the Guadalupe River Basin Monitoring Network. The Guadalupe River Basin Monitoring Network will be a system of water quality monitors in streams and rivers in the Guadalupe River Basin that collect data at regular intervals, some as often as every 15 minutes. Data will be used for flood-control planning, water quality regulation, and to allow the TCEQ and project partners to detect water quality events in near-real time. Accessing such data allows agencies to take immediate action to remediate problems, thereby minimizing the impact to the environment and people of the area. The network will be accessible over the Internet as will the data that the network collects. (Trust) **To get more information:** <http://www.gbrtrust.org>

Segment 1802

Exelon Nuclear Plant Proposed for Victoria County

Exelon Nuclear has selected Victoria County as its site in southeast Texas for a federal license application that would allow construction and operation of a new nuclear plant should the company decide to build one. After conducting in-depth field investigations and research as part of the company's site selection process, Victoria County was identified as the site best suited to satisfy NRC requirements as well as other federal and state laws and regulations. Exelon Nuclear submitted the Combined Construction and Operating License application (COLA) to the federal Nuclear Regulatory Commission in September 2008. The Victoria County site, which was identified in the license application, is an 11,500-acre tract about 20 miles south of Victoria in Victoria County. If built, the facility at the site will use a man-made freshwater lake for cooling. A combined construction and operating license is required for construction of a new nuclear energy plant, but the application does not imply that Exelon has made a commitment to build a plant. Among the various conditions that must be resolved to Exelon's satisfaction before any formal decision to build are: a solution to used fuel disposal, broad public acceptance of a new nuclear plant and assurances that a new plant using new technology can be financially successful. No decisions have been made about when or if the nuclear facility will be built in Victoria County. (Exelon)

To get more information: <http://www.exeloncorp.com/>

Segments 1808, 1811, and 1814

Recovery Implementation Program Being Conducted to Protect Endangered and Threatened Species at Comal and San Marcos Springs

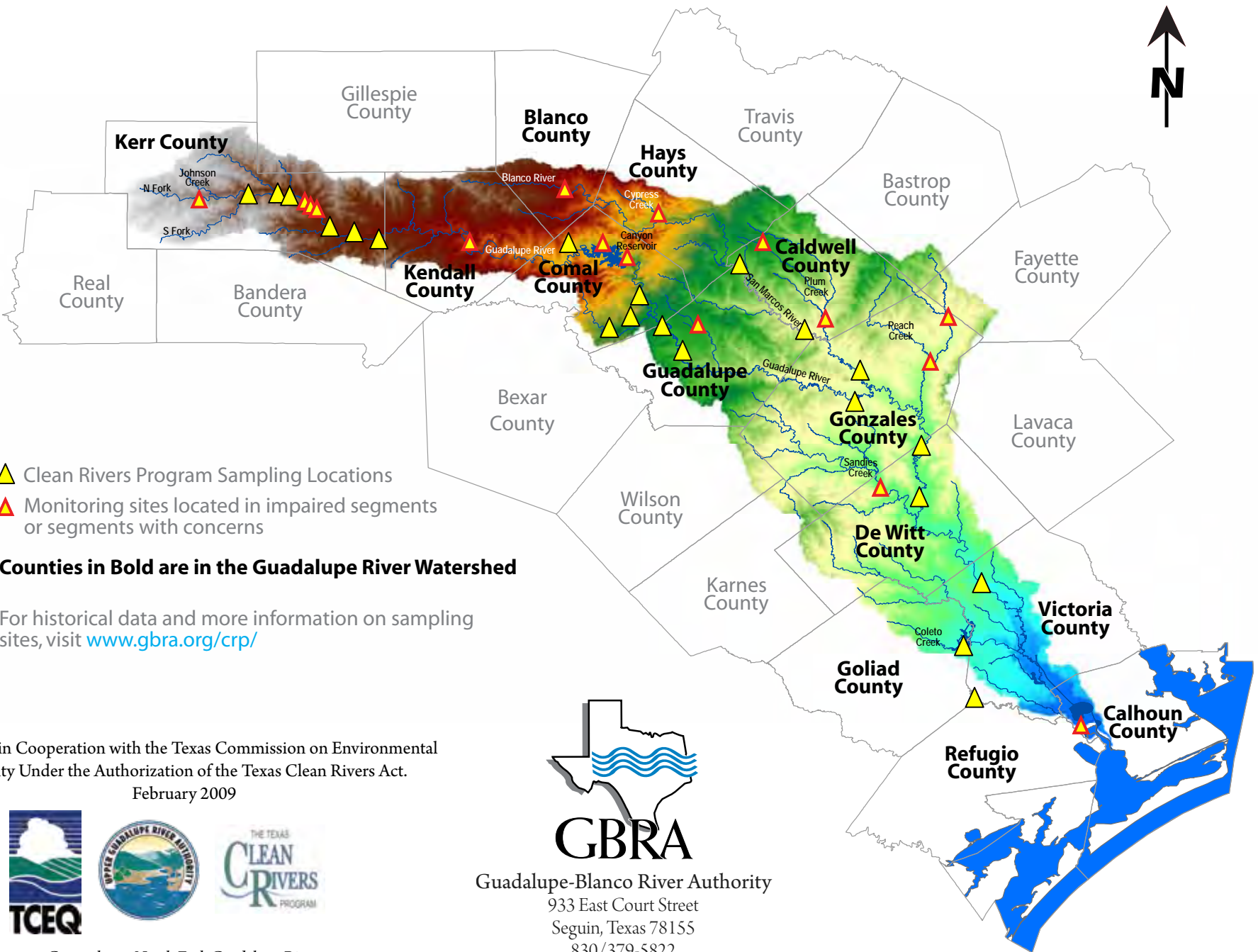
The Edwards Aquifer is in the second year of a Recovery Implementation Program (RIP). A RIP is a multi-stakeholder initiative that seeks to balance water use and development with the recovery of federally listed endangered or threatened species. RIPs use a long-term interdisciplinary approach of policy formation, scientific research, habitat restoration, and education. Stakeholders develop a comprehensive document that outlines goals, activities, timelines, measures of success, and roles of the participants, who then sign a cooperative agreement to implement the activities. The Edwards Aquifer RIP's 26-member steering committee includes representatives of state and regional water agencies, municipalities, industries, agriculture, environmental organizations and the public. The procedural tasks have been completed and the Expert Science Sub-committee is tackling the difficult questions, including the necessity to maintain minimum spring flows. The Edwards Aquifer Authority, state agencies and the U.S. Fish and Wildlife Service are required to approve and execute a RIP agreement by the Fall of 2012. (Votteler) **To get more information:** <http://earip.tamu.edu/> or Todd Votteler, tvotteler@gbra.org

All Segments

Aerobic On-Site Treatment Systems Training Offered to Homeowners

Recognizing that failing aerobic on-site treatment systems for domestic sewage have the potential for environmental and public health hazards, GBRA and the Texas AgriLife Extension developed an eight-hour homeowner training course on the operation and maintenance of aerobic wastewater treatment systems. The course was first presented in Comal County and was very well received. The class will be offered again in the Summer of 2009 in Caldwell and Hays counties. Homeowners are taking on the maintenance of their own systems because of frustration with maintenance providers. Home aerobic wastewater treatment systems dispose of the treated, disinfected wastewater on the ground by spray irrigation. If the disinfection system or spray heads fail, the untreated wastewater can expose the homeowner, the family and the environment to harmful pathogens. In order to sustain the program, a "train the trainer" course will be offered to county designated representatives so that they can offer the class in their jurisdiction on a frequent basis. For more information on the class, contact Debbie Magin at GBRA. **To get more information:** <http://www.gbra.org/septic.swf>

Guadalupe River Basin



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Cover photo: North Fork Guadalupe River,
taken by Daniel Cuevas, UGRA



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