

Sulphur River Basin Highlights Report 2007



Sulphur River Basin Authority

*Prepared in Cooperation with the
Texas Commission on Environmental Quality
Under the Authorization of the Texas Clean Rivers Act*

Sulphur River Basin Clean Rivers Program Highlights 2006

Introduction:

The Clean Rivers Program (CRP) is a water quality monitoring, assessment, and public outreach program administered by the Texas Commission on Environmental Quality (TCEQ) which is funded by state-collected fees. The Sulphur River Basin Authority (SRBA) coordinates the Clean Rivers Program for the Sulphur River Basin. Utilizing a watershed management approach, SRBA and TCEQ are working together to identify and evaluate water quality issues and establish priorities for any needed actions. Assisting the Sulphur River Basin Authority (SRBA) with the FY2006 planning, data collection, analysis, and reporting of water quality data were program participants SRBA Steering Committee members, HDR Engineering, Inc., Texarkana College, TCEQ, and the United States Geological Survey (USGS). The goal of these cooperative efforts is to achieve continuing evaluation and supervision of water quality in the Basin by providing appropriate, accurate, and up-to-date data. Monitoring efforts represent a large component of the CRP, providing the raw data and information required to address any concerns regarding water quality issues in the Basin.

The Sulphur River Basin is divided into six watersheds or areas; North Sulphur River Watershed, Sulphur River Watershed, Wright Patman Lake Watershed, Lower Sulphur River Watershed, White Oak Creek Watershed, and South Sulphur River Watershed. A map showing the location of each of these watersheds can be found within this report on page 8. A detailed discussion of each of these watersheds and maps showing the FY2006 sampling locations and the watershed location within the Basin is provided in the Water Quality Data Review section of this report.

2006 Sulphur River Basin Highlights:

Low Water Levels Due to Drought:

The continuing drought and resulting low lake levels within the Sulphur River Basin area remain significant aspects of water concerns in 2006. Impacts of this drought have been far-reaching with low water levels affecting many aspects of our water quality monitoring program. Some stations scheduled to be sampled had either isolated pools or no water which made collection impossible at those locations. Lake levels within the Sulphur River Basin were on a decline throughout 2006, but have recently regained their normal levels.

Days Creek Special Study Summary:

Recently SRBA assisted the TCEQ with a study designed to determine sediment and soil contamination in Days Creek (Segment 0301). This contamination is thought to be the result of creosote discharges from three closed wood treatment plants located upstream from the study sites. The extent and impact of creosote concentrations in sediment was the subject of a TCEQ special study during fiscal years 2004-2005. Completed in 2006, a summary of this special study is available on the SRBA web site.

Regional Water Plan:

The regional water plan for the Sulphur River Basin area (Region D) was approved May 16, 2006 by the Texas Water Development Board (TWDB). This action

(Continued on page 3)

(Continued from page 2)

Sulphur River Basin Highlights cont.

clears the way for the TWDB to prepare the State Water Plan. After three years of data analysis and public comments, the Northeast Texas (Region D) planning group has decided to exclude the proposed Marvin Nichols Reservoir from the approved plan. This was due in part to the negative impact of the reservoir project on the timber industry, including the destruction of tens of thousands of acres of bottomland hardwood forests. Texas regional water plans are mandated by law to protect the state's agricultural, natural, and water resources. Region D is now researching additional ways to supply water to other regions of the state that will not include the huge economic impact of building a new dam. One possible alternative studied by the United States Corps of Engineers is to increase the yield of Wright Patman Reservoir within the Sulphur River Basin.

Monitoring in the Sulphur River Basin during FY2006:

Systematic monitoring sites on which biological sampling occurred in 2006 include sites which are reasonably close together and the addition of several new stations. Texarkana College personnel and students collected samples from Rice Creek, Anderson Creek, Bee Creek, and Caney Creek for biological and habitat monitoring during the last fiscal year. Madtom catfish were found in Bee Creek, and Western Starhead Topminnows were found in Anderson Creek. Both of these species are considered intolerant or less tolerant of pesticides and chemicals than most species of fishes, therefore their presence indicates a moderately healthy environment. Rice Creek contained a lower number of fish species than the other creeks sampled.



Early Morning Fishing at Cooper Lake

New View of Cooper Lake:

TCEQ Region 5 staff member Rob Cook is responsible for conducting routine monitoring in the Sulphur River Basin. During the July Steering Committee Meeting he detailed the impairments and drought related changes taking place at Cooper Lake near Sulphur Springs. Water quality impairments in Texas are required to be assessed every two years, and as of 2004, Cooper Lake was listed as having two impairments. These impairments included depressed dissolved oxygen levels and high pH. Although the pH level of waters within the region containing Cooper Lake are expected to range between 6 and 8.5, those in Cooper Lake have been recorded at higher values. However this higher pH level may actually be the normal condition for this body of water. A map of Northeast Texas detailing its ecological regions shows Cooper Lake to be in a different ecological region than it is currently listed. A change in the designated ecological region for Cooper Lake would adjust the common lake pH value to 9. If the EPA accepts the proposal of a Cooper Lake ecological region relocation, pH will no longer be considered an impairment in this water body.

Water Quality Monitoring

Monitoring, data collection, and analysis are the basis for maintaining good water quality within the Sulphur River Basin. These activities are an integral part of the Clean Rivers Program (CRP), a cooperative program administered by the Texas Commission on Environmental Quality (TCEQ), and directed by the Sulphur River Basin Authority (SRBA). Other entities participating in monitoring within the Sulphur River Basin include the Clean Rivers Program Steering Committee members, Texarkana College, HDR Engineering, Inc., and the United States Geological Survey (USGS).

There are five basic types of monitoring which occur in our basin: 1) **Routine**, 2) **Systematic**, 3) **Flow**, 4) **Diel**, and 5) **Special Study**. Each type of monitoring includes specific sets of parameters or measurements that are recorded or analyzed.

Routine monitoring is used to expand and maintain the water quality database. Its focus is to improve our ability to follow trends and to identify water quality changes in the major watersheds.

Systematic monitoring is used to investigate known concerns and detect potential concerns. Systematic monitoring stations are typically placed on the smaller, unclassified streams that would not normally be evaluated during routine monitoring. Biological monitoring is a key factor used in the selection of systematic sampling sites.

Flow monitoring is utilized to support permitted discharger actions.

Diel sampling involves multiple field measurements conducted over a 24 hour period, using an electronic multiparameter probe. This type of sampling usually records dissolved oxygen, temperature, conductivity, and pH measurements. Diel sampling is frequently scheduled for areas where dissolved oxygen levels are a concern.

Special studies are additional water monitoring projects designed to address a specific concern or to provide additional information as a result of a previous monitoring effort or a current issue. The focus of these studies has been the improvement of water quality within the Basin, and documentation of both current and historical watershed conditions.

In addition to the standard station monitoring, Biological and Habitat Evaluations are performed twice a year at specific stream stations. These measurements are used to evaluate the stream's aquatic community composition, integrity, and appropriate aquatic life use.

Water Quality Parameters by Group

Field Parameters generally include: dissolved oxygen, conductivity, pH, temperature, stream flow, flow severity, secchi disc depth, and field observations.

(Continued on page 5)

(Continued from page 4)

Water Quality Monitoring Concluded

These measurements provide information about the physical and chemical water quality characteristics at the sample site.

Dissolved Oxygen (DO) is usually sampled individually. This value indicates the amount of oxygen available in the water body. Factors such as higher water temperatures and the presence of organic materials can reduce the DO level. All aquatic life has certain minimum concentrations that are necessary for its support.

Conventional Parameters are chemical and biological components found in water that typically require laboratory analysis. These parameters generally include several forms of nitrogen, phosphorus, bacteria, chlorophyll-a, total dissolved solids, and total suspended solids. Within this grouping high chlorophyll *a* levels, nitrite+nitrate, orthophosphate, and total phosphorus are considered as nutrient values. High levels of nutrients can cause excessive plant growth, which can lead to lower levels of dissolved oxygen in the water body and reduce the ability of aquatic organisms to survive. At higher levels nutrients are a threat to human health and can result in taste and odor problems in drinking water.

Metal Parameters generally include: aluminum, arsenic, chromium, copper, nickel, silver, zinc, barium, molybdenum, calcium, selenium, iron, and manganese. These are measured to evaluate the potential for exposure to toxic concentrations of metals.



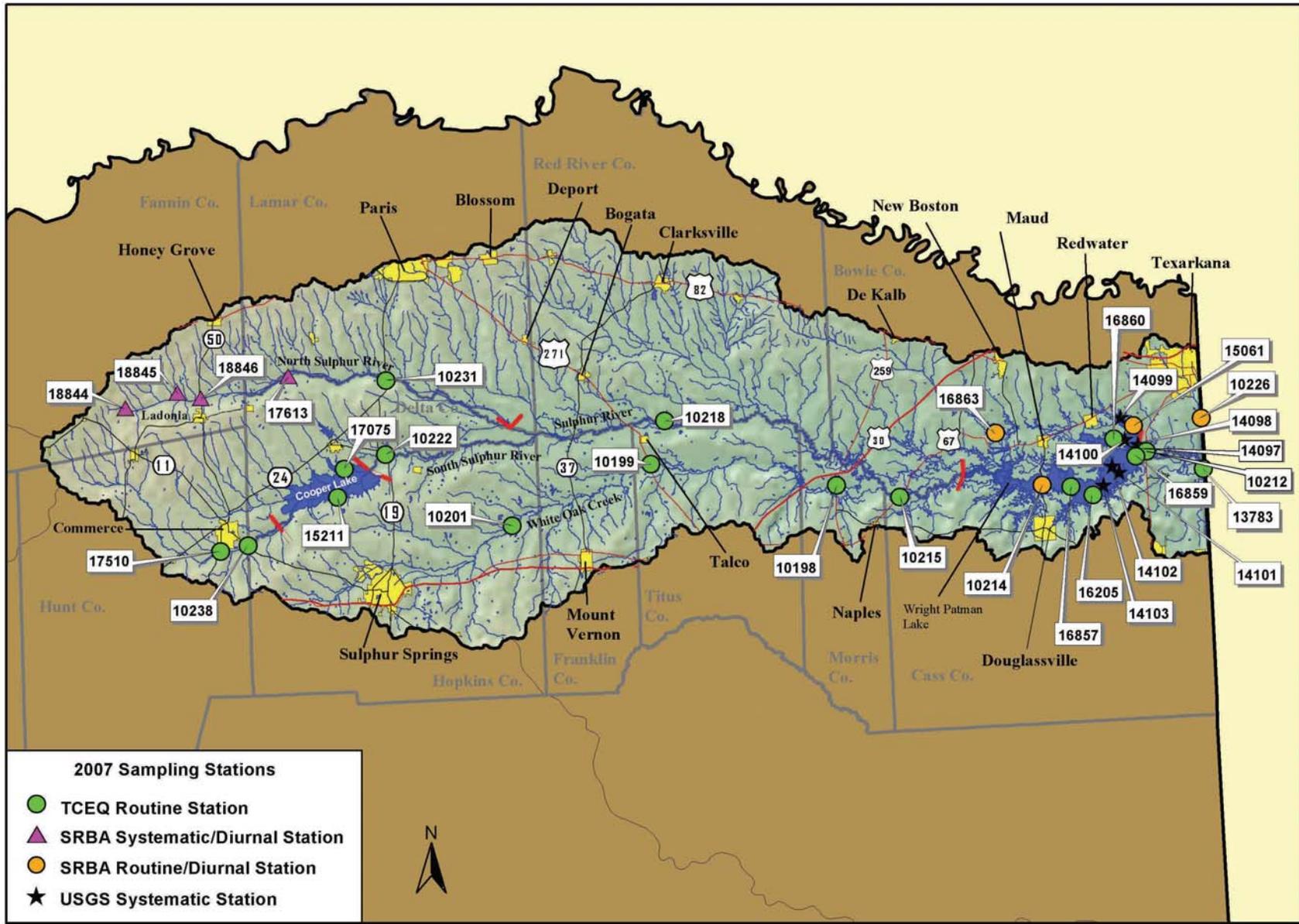
CRP Coordinated Monitoring in FY2006

Coordinated monitoring meetings are held once a year to bring all the monitoring agencies and entities together to discuss streamlining and coordinating monitoring efforts within the basin. These meetings are one of the key events of the Clean Rivers Program.

On April 19, 2006, a meeting was held to discuss and develop a coordinated basin-wide monitoring schedule for the Sulphur River Basin Fiscal Year 2007 Clean Rivers Program. Held at the Northeast Texas Municipal Water District Executive Offices in Hughes Springs, Texas, participants included TCEQ, SRBA, HDR, Inc., and USGS. Issues detailed in the report *Monitoring Priorities for Concerns and Non Supporting Parameters Based on the DRAFT 2004 Texas Water Quality Inventory*, produced by the TCEQ, were used as a guide for addressing sampling and water quality issues in the Basin.

A detailed monitoring schedule planned for the Sulphur River Basin in fiscal year 2007 is available at <http://cms.lcra.org/schedule.asp?basin=3&FY=2007>, as part of the interactive database for statewide coordinated monitoring schedules. A link to this schedule can be found on the SRBA website at <http://www.sulphurr.org>. A map showing the location and type of all scheduled FY2007 sampling stations is presented on page 6 of this report.

Possible ferry wreck in the Sulphur River exposed by recent low water levels. This site is being examined by the Texas Historical Commission.



Sulphur River Basin-Clean Rivers Program
Monitoring Stations FY2007

Sulphur River Basin Water Quality Conditions

The following discussion is an overview of the current water quality in the Sulphur River Basin. Where water quality problems occur, recommendations are proposed to address the identified issues. Water quality monitoring and data analysis is organized by watershed or areas of landscape that all drain into a common stream, river, or lake. The Sulphur River Basin is divided into six watersheds or drainage basin areas: North Sulphur River Watershed, South Sulphur River Watershed, Sulphur River Watershed, Lower Sulphur River Watershed, White Oak Creek Watershed, and Wright Patman Lake Watershed. A map showing the location of each of the Sulphur River Basin watersheds is located on page 8 of this report. Within the basin watersheds are grouped to reflect major changes in habitat and water quality.

Every two years, the state must assess the quality of their water and submit a report to the Environmental Protection Agency (EPA) detailing the extent to which each water body in the state meets water quality standards. The TCEQ publishes this assessment as the *Texas Water Quality Inventory and §303(d) List*. This document essentially has two main parts: the *Texas Water Quality Inventory*, which gives the status of all the waters in the state, and the *§303(d) List*, which identifies waters that do not meet one or more of the standards set for their use.

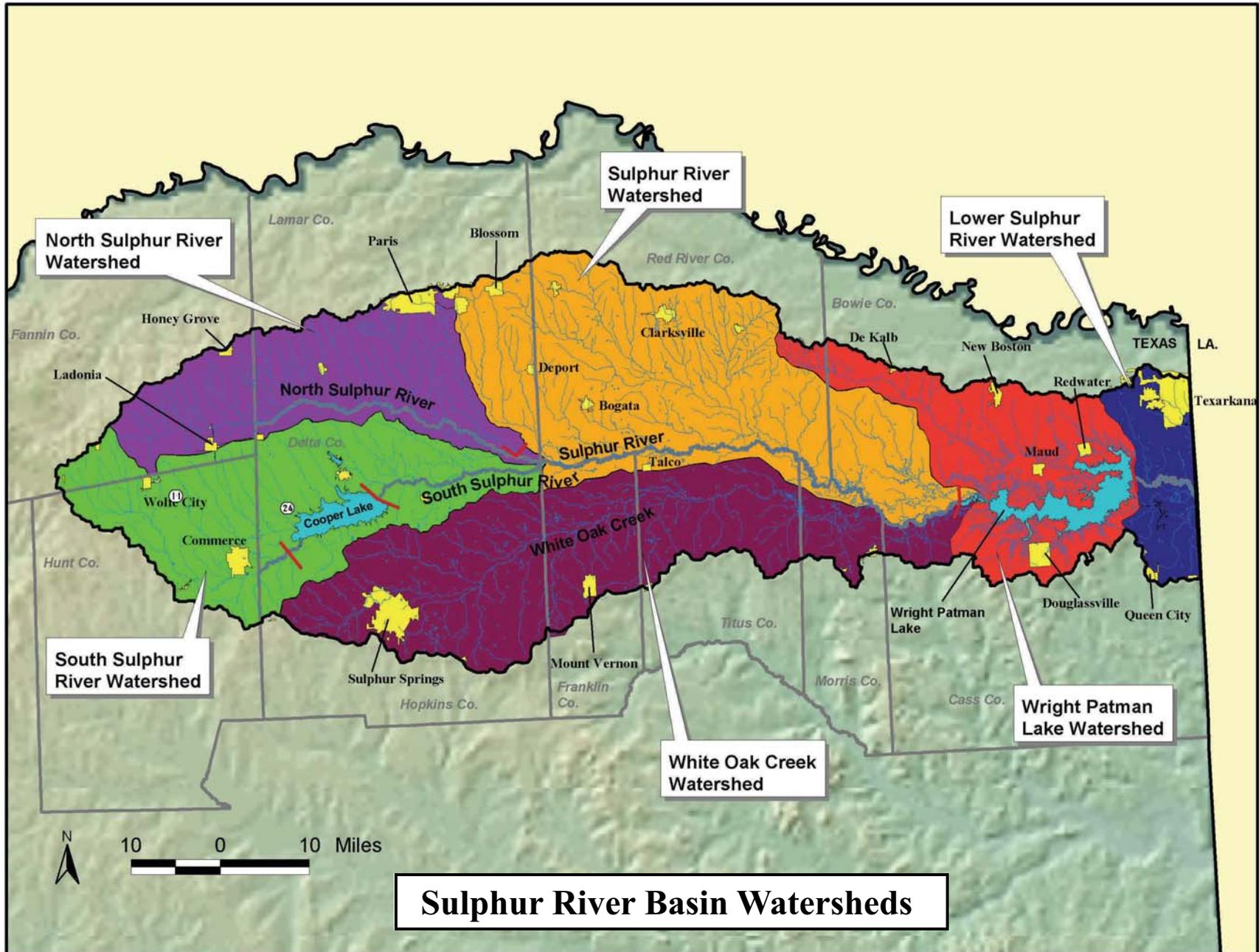


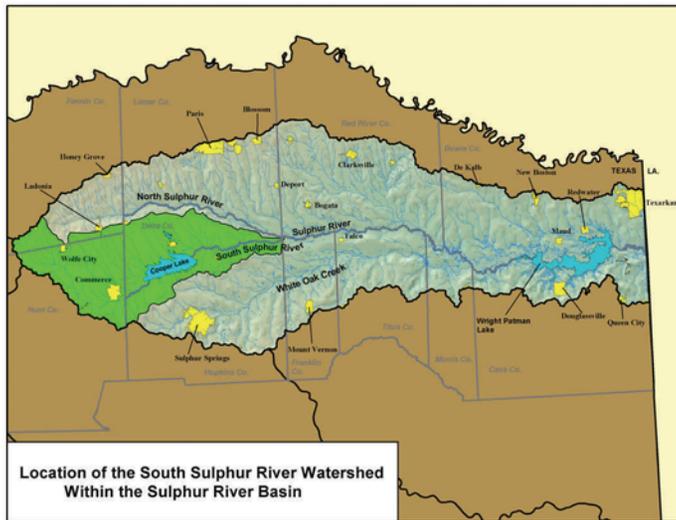
Large woody debris in the Sulphur River disrupts flow and navigability of the river.

Four bodies of water are currently listed on the *2004 Texas §303(d) List* (May 13, 2005) in the Sulphur River Basin for non-support of dissolved oxygen and/or pH standards.

These segments include:

- **Wright Patman Lake (Segment 0302)**
- **White Oak Creek (Segment 0303B)**
- **Upper South Sulphur River (Segment 0306)**
- **Cooper Lake (Segment 0307)**





South Sulphur River Watershed

The 661 square mile South Sulphur River Watershed is located in the extreme western portion of the Basin between the North Sulphur River Watershed and the White Oak Creek Watershed. The western upland half of this watershed is drained by the Middle and South Sulphur Rivers, which meet in Cooper Lake. The remaining areas are drained by the South Sulphur River. This watershed includes two sections of the South Sulphur River, the reaches above (Segment 0306), and below Cooper Lake (upper reaches of Segment 0303), and Cooper Lake itself (Segment 0307). Three USGS streamflow gages are found in this watershed. They include (USGS 07342500), located on the South Sulphur River near the City of Cooper below Cooper Lake; (USGS 07342465), on the South Sulphur River south of the City of Commerce; and (USGS 07343480), on the Middle Sulphur River north of the City of Commerce.

The South Sulphur River Watershed is located in the northern reaches of the Texas Blackland Prairies Ecoregion. The vegetation of this watershed is generally marked by extensive agricultural clearing.

The areas surrounding the South Sulphur River contain stands of water oak; elm and hackberry, while the south shore of Cooper lake is composed primarily of post oak forest.

Segments: 0303—Sulphur/South Sulphur River, 0303A—Big Creek Lake (unclassified water body), 0306—Upper South Sulphur River, 0307—Cooper Lake, and 0307A—Middle Sulphur River (unclassified water body).

Water Bodies: Cooper Lake and Big Creek Lake.

Cities: Commerce (pop. 7,669), Cooper (pop. 2,150), Wolfe City (pop. 1,566), and Ladonia (Pop. 667).

Counties: Portions of Fannin, Hunt, Delta, and Hopkins Counties.

Land Use: Land use in the South Sulphur River Watershed is dominated by agricultural lands that occupy the majority of the watershed. Agriculture in this watershed is focused on cattle, rangeland, and crops. There are limited areas surrounding the South Sulphur River and the south shore of Cooper Lake which contain remnants of the original riparian forests of this area.

Soils: Soils of the South Sulphur River floodplain are primarily clayey Trinity, Kaufman and Tinn soils. Soils adjacent to the Sulphur River floodplain are typically loamy Wilson and Crockett soils. Upland soils of the watershed are usually clayey Houston Black and Leson soils.

Permitted Discharges: There are eight municipal wastewater treatment facilities in this watershed.

(Continued from page 9)

South Sulphur River Watershed cont.

Water Quality Issues:

Segment 0303—South Sulphur River below Cooper Lake

The South Sulphur River generally exhibits a slightly alkaline pH. Conductivity and dissolved solids levels are generally moderate in this segment. Tributaries of the South Sulphur River below Cooper Lake (upper reaches of Segment 0303) include Big Creek, Brushy Creek and Lake Creek. Big Creek Reservoir is the only water body of significant size in this segment. There are no permitted dischargers in this segment.

Segment 0306—Upper South Sulphur River above Cooper Lake

The water quality problems identified in this segment are consistent with the development of excessive levels of photosynthesis and respiration initiated by large nutrient loads. Permitted dischargers in this segment include four municipal waste dischargers.

Segment 0307—Cooper Lake

Cooper Lake (Segment 0307) is the largest body of water in the South Sulphur River Watershed. The lake covers about 19,000 acres and is surrounded by thousands of acres devoted to parks and wildlife management. The South Sulphur River, the Middle Sulphur River, and Pecan Creek among others flow directly into Cooper Lake. The water of Cooper Lake is typically alkaline and of average conductivity, with moderate dissolved solids concentrations, including alkalinity, total dissolved solids (TDS), chloride and sulfate. The Middle Sulphur River (Segment 0307A) exhibits similar pH, conductivity, and dissolved solids levels. This segment includes three permitted municipal waste dischargers.

The Upper South Sulphur River (Segment 0306) and Cooper Lake (Segment 0307) are included on the 2004 Texas §303(d) List as a result of depressed dissolved oxygen and high pH. In addition, the 2004 Water Quality Inventory lists Segment 0303 with concerns for aquatic life use in the lower 25 miles due to depressed dissolved oxygen, and Segment 0306 as partially supporting its general use due to high pH. There are also nutrient enrichment concerns for Segment 0306 in the 25 miles above SH11. Cooper Lake (Segment 0307) is listed for non-support or partial support of the general use standards due to high pH, whereas the aquatic life use was found to be partially supporting due to depressed dissolved oxygen.

Sampling within this basin during fiscal year 2006 included five routine stations monitored by TCEQ.

