

SABINE RIVER BASIN

HIGHLIGHTS

THE TEXAS CLEAN RIVERS PROGRAM

March 1999 to February 2000

Sabine River Watershed Management Program

The Sabine River Authority (SRA) is using an integrated approach to address water quality issues. This comprehensive program includes the following components:

Public Participation and Basin Steering Committee;

Data Collection, Management and Analysis;

Targeted Monitoring;

Subwatershed Screening;

Subwatershed Inventory;

Quality Assurance Project Plan (QAPP);

Geographic Information System;

And the World Wide Web Project.

This integrated approach to water quality management provides for the best use of limited resources. This is accomplished through the subwatershed inventory, data analysis, and screening studies, which identify areas of water quality concerns or possible concerns, and focuses additional monitoring on problem areas. The coordination of state, regional, and local entities reduces duplication of effort in addressing water quality issues. Encouraging public participation increases the awareness of the impact of human activities on water quality.

PUBLIC PARTICIPATION AND BASIN STEERING COMMITTEE

The Sabine Basin Steering Committee allows stakeholders to have an active role in addressing water quality issues in the Sabine Basin. The Basin Steering Committee Meetings are held in three locations to encourage participation from all of the stakeholders in the Basin. With an emphasis on stakeholder involvement, the SRA invites water supply corporations, permitted dischargers, council of governments, city, and county officials to become steering committee members. Private citizens and environmental organizations are also urged to join the committee. Interested parties should contact the SRA to be added to the contact list. Membership in the committee has grown from 65 to 133 members since 1991. Subcommittees were formed in the upper and lower Basin to address the special studies in those areas.

The SRA has completed a Comprehensive Sabine Watershed Management Study to address water supply as well as water quality in the Sabine Basin. This plan was performed in conjunction with the Texas Water Development Board. The purpose of this plan is to update the 1985 *Update of the Master Plan for the Sabine River*. Significant changes have taken place since 1985 that necessitated an update of SRA's overall plan for the Basin. This plan takes an overall look at Basin development including such issues as

water need, water supply, the environment, conservation, economic development, and natural resources among others. The goal of this planning is to implement a program to satisfy the water needs of the Sabine Basin in a timely and cost-effective manner. The combination of this study with the Texas Clean Rivers Program (TCRP) represents a holistic approach to water management.

TEXAS WATCH CITIZEN MONITORING

Texas Watch training has continued in the upper Sabine Basin with continued support for students at Jarvis Christian College with ten sites in the Hawkins area, Kilgore College with a site near their campus, and the City of Longview with several sites in the Longview area. Texas Watch data from the Longview watershed will be utilized with other professional data collected by the SRA during a year 2000 special study of Grace Creek and its major tributaries. In the lower Sabine Basin, training has also continued with the help of area schools. Students at Little Cypress-Mauriceville High School are monitoring two sites near their school, which will also be monitored by SRA as a part of a year 2000 special study. Students in the Orange area are also learning about monitoring from the Nature Classroom, which is a part of the West Orange Cove School District, located on Adams Bayou. Personnel for these two districts also aided SRA in the collection of data for the Adams Bayou Special Study in 1998/99.

Groups or individuals interested in citizen monitoring should contact SRA for additional details. Additional information on citizen monitoring can be found at the Texas Watch website. The site is hosted by Southwest Texas State University and can be found at www.texaswatch.geo.swt.edu.

DATA COLLECTION BY OTHER ENTITIES

Water quality data collected by the City of Kilgore, and Eastman Chemical has been included in the SRA QAPP. Kilgore has been documenting water quality and flow in Bighead and Rabbit Creeks to determine the aquatic life use of the two streams. Eastman collects quarterly samples at six Sabine River sites and at their point of discharge to provide additional metals data for stream Segment 0505. Water quality monitoring programs of the City of Longview and East Texas Saltwater Disposal are expected to be added to the SRA QAPP soon. This will allow the data to be used by the TNRCC in updating surface water standards and wastewater permit criteria.

DATA COLLECTION, MANAGEMENT AND ANALYSIS

The collection, management, and analysis of water quality data is accomplished through an integrated program that includes a Data Management Plan, a comprehensive monitoring program, and statistical analyses of historical and current data. The Data Management Plan was updated in September 1999 and is reviewed on an annual basis. The data collection program is discussed below. Data analyses are conducted according to guidelines set forth by the Clean Rivers Program.

SECTION 303(D) OF THE CLEAN WATER ACT

The Clean Water Act in Section 303(d), requires that water bodies not meeting established water quality standards be listed as impaired and reported to the Environmental Protection Agency (EPA). The Program Guidance for the Texas Clean Rivers Program requires the Planning Partners to analyze the results of the data screening in conjunction with other factors affecting water quality to identify and describe the reason for the concern. The SRA provided comments to the TNRCC on the Draft 2000 303(d) list; however the final list has not been determined at this time. Water bodies of concern are addressed in the Summary of Sabine Basin Water Quality section of this report.

THE SRA WATER QUALITY MONITORING PROGRAM

The SRA Water Quality Monitoring Program (WQMP) for 1999 included 39 stations on the mainstem and reservoirs. The intensive efforts on Toledo Bend will continue as an in-kind service to the Texas Clean Rivers Program (TCRP). The stations are sampled monthly. Active stations for WQMP were selected on the basis of relative position (upstream or downstream) to point source discharges, water supply intakes, proximity to industrialized areas of the basin, areal coverage of reservoirs, and other land use activities that have the potential to impact water quality.

SRA TCRP SUBWATERSHED SCREENING PROGRAM

The SRA TCRP Subwatershed Screening Program utilizes biological screening studies in combination with routine physical and chemical parameters to provide data on the health of aquatic life and long range water quality protection. The screening studies provide information on the health of aquatic life and provide toxics information to protect human health. The focus of these tests is in subwatershed areas where this information is lacking. The biological tests include ambient toxicity tests (AT), and rapid bioassessments (RBA) with macroinvertebrate and fish collections. Water quality samples are also collected for physicochemical parameters to aid in determining long term trends in water quality for the routine water quality parameters. This additional monitoring program complements the existing WQMP by providing information on the many subwatersheds not covered by WQMP. The Subwatershed Screening Program also includes field investigations to provide data on subwatersheds that have never been sampled.

The location of sampling sites is reviewed each year and adjusted as needed. The Subwatershed Screening Program in 1999 focused on Reaches 1 and 7 with additional monitoring in problem areas identified by screening in previous years. Subwatershed sampling locations were selected using a subwatershed ranking system that included previous bioscreening results, historical data, and the subwatershed inventory of all known factors which could influence water quality. Screening studies in 2000 are focused in Reach 4.

TARGETED MONITORING

SRA field personnel have participated in hands-on Receiving Water Assessment (RWA) refresher seminars with the TNRCC, and RWA's have been completed for the Cities of Quinlan, Edgewood, Lindale, and the Smith Co. WCID #1. These assessments allow permits to be based on current scientific data that provides protection for the receiving stream and does not burden the discharger with unnecessary permit restrictions. Permittees are contacted prior to the RWA to provide them the opportunity to participate in the assessment.

SPECIAL STUDIES

The SRA 1996 Assessment of Water Quality identified the Adams Bayou, Cow Bayou, and Cowleech Fork subwatersheds as areas of concern. Due to extensive use of these, and other surrounding water bodies, intensive studies were conducted in 1998 to identify the sources of water quality impairments. Since 1998 was an unusually dry year, the study was extended into 1999. Quarterly and rainfall event sampling was conducted to study possible non-compliance with the Texas Surface Water Quality Standards. Subcommittees were formed from the SRA Steering Committee to include public, industry, and local, state, and federal agencies to develop and recommend plans to eliminate impairments. Special reports were issued in August 1999, identifying causes of the impairments, sources of the impairments, and recommendations for actions to alleviate these impairments. The impairments in Adams and Cow Bayou appear to be from a combination of both point and non-point sources. Toxicity in the Cowleech Fork Subwatershed was not as severe as initial tests indicated. While point sources did appear to have some impact in the Cowleech Fork Subwatershed, most of the impact came from non-point sources. Copies of these studies are available upon request from SRA.

The herbicide, atrazine has recently come under a lot of scrutiny in the Lake Tawakoni watershed after the reservoir was placed on the 303(d) list as a possible threat to future water use. Although levels found have not exceeded allowable limits, in water supply samples, SRA will be sampling for atrazine in Lake Tawakoni beginning in the year 2000. This is a cooperative effort with the TNRCC in an effort to resolve the atrazine concerns.

Summary of Sabine Basin Water Quality

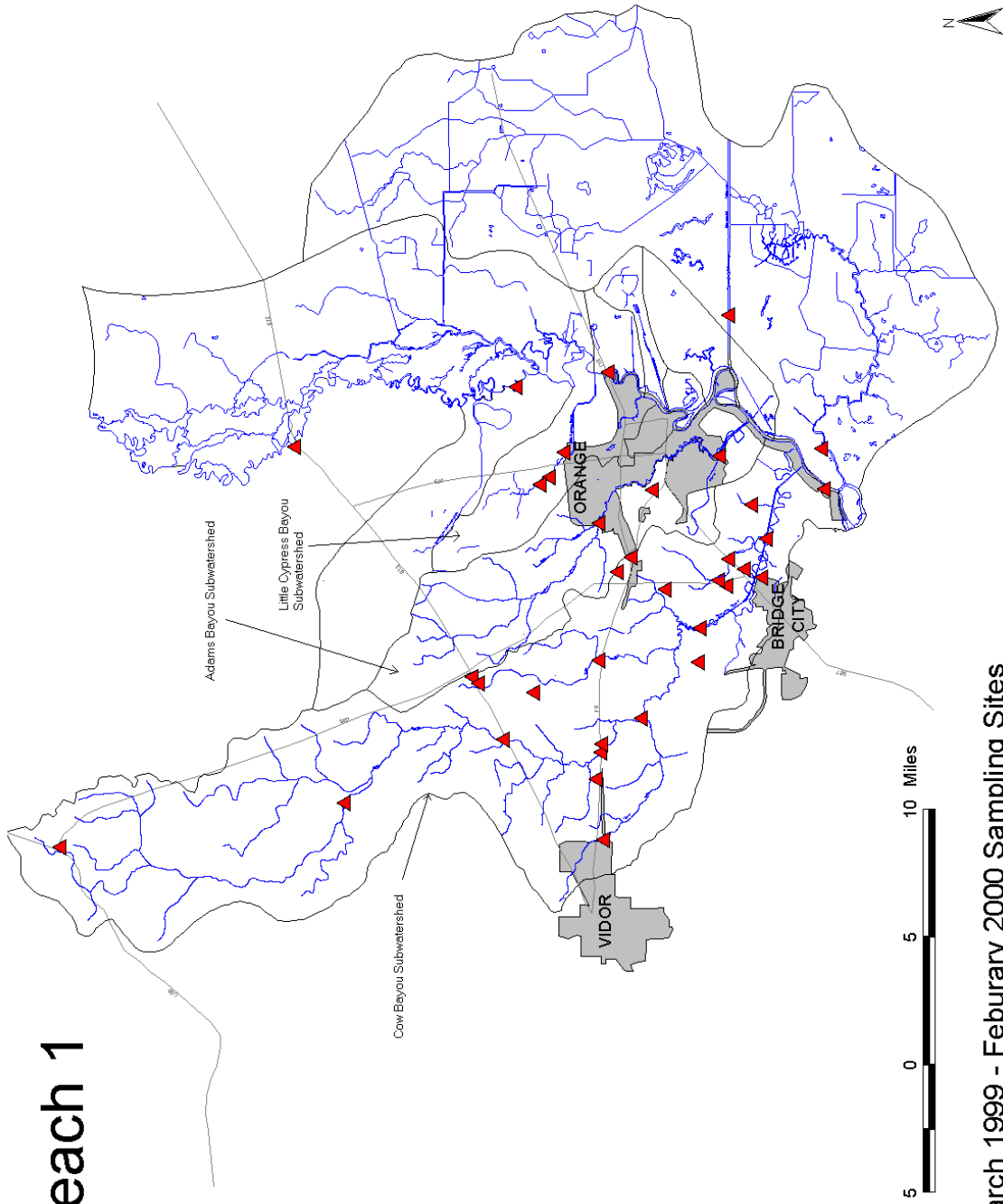
REACH 1

Description: Sabine River and its drainage from Sabine River Confluence into Sabine Lake (river mile 0) to Morgans Bluff (river mile 25.1) in Orange County. This Reach is divided into 14 subwatersheds and covers 348.48 square miles. Eighty-six percent of the reach is in Texas and 14% is in Louisiana. This reach includes Segments 0501 (Sabine River Tidal), 0508 (Adams Bayou Tidal), and 0511 (Cow Bayou Tidal). Although some areas are quite rural, much of this reach is dominated by two cities with populations greater than 5000.

Water Quality: Data analyses have indicated water quality problems in three subwatersheds. The Adams and Cow Bayou Subwatersheds are impaired due to low dissolved oxygen, high fecal coliforms, and high nutrients. The special studies indicated the impairments were due to both point and non-point sources. The non-point sources include large populated areas using inadequate on-site systems. The Little Cypress Bayou Subwatershed was shown to have a concern due to biological impairment. Members of the Sabine Basin Steering Committee expressed concerns for zinc and copper requirements in wastewater permits. SRA will continue to collect additional data on zinc and copper to aid in determining appropriate permit limits.

Monitoring: The 1999 WQMP included five sites in Reach 1. The 1998/99 Special Study included 24 sites in the Cow Bayou Subwatershed that were monitored into 1999. The 2000 WQMP includes 9 monitoring sites in Reach 1 and three sites in a special study in Little Cypress Bayou. Monitoring is also being conducted quarterly at four sites as a follow up to the special studies conducted in the Adams and Cow Bayou Subwatersheds.

Reach 1



March 1999 - February 2000 Sampling Sites

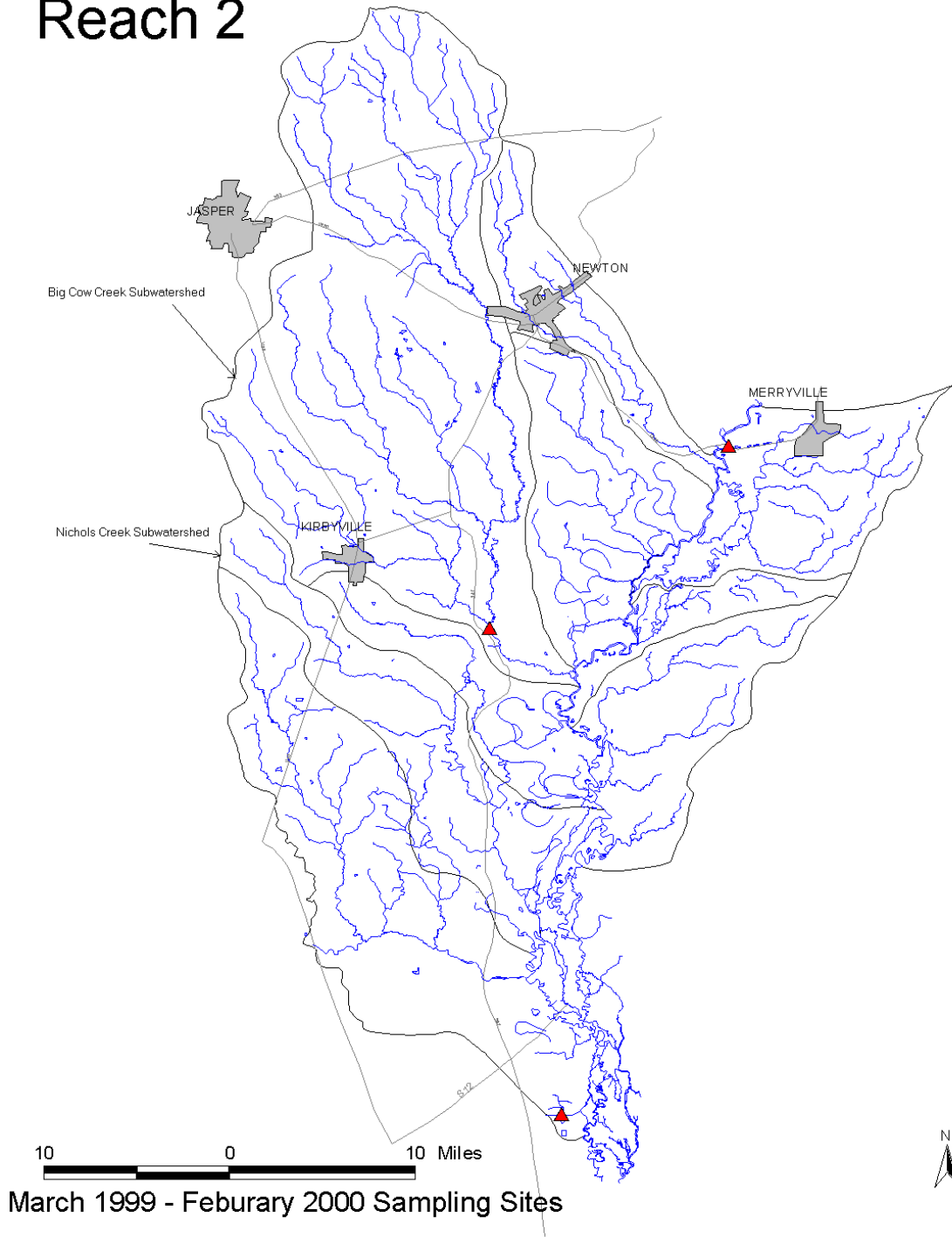
REACH 2

Description: Sabine River and its drainage from Morgans Bluff (river mile 25.1) to a point which includes Caney Creek (river mile 95.24) in Newton County. This Reach is divided into 9 subwatersheds and covers 1103.15 square miles. Three-quarters of the reach is in Texas and 25% is in Louisiana. Reach 2 includes the lower portion of Segment 0503 (the Sabine River below Toledo Bend) and Segment 0513 (Big Cow Creek). This is largely a rural area with no major industries or cities.

Water Quality: Data analyses have shown water quality problems in two subwatersheds in Reach 2. The Nichols Creek Subwatershed was added to the draft 303(d) list due to low dissolved oxygen and high fecal coliform bacteria levels. The conditions in Nichols Creek appear to be due to ambient conditions and no biological impairments have been observed. There are no permitted discharges in this sparsely populated Subwatershed. The 303(d) list also included the Big Cow Creek Subwatershed (Segment 0513) due to elevated levels of dissolved aluminum and high levels of fecal coliform bacteria. This Subwatershed contains only one municipal wastewater discharge and no other densely populated areas. Non-point sources include large areas of pastureland.

Monitoring: The SRA WQMP includes two sites in Reach 2 for 2000. One subwatershed is being monitored this year through the SRA TCRP Subwatershed Screening Program. The WQMP includes one site in the Big Cow Creek Subwatershed and in addition to the routine parameters, the sampling includes aluminum.

Reach 2



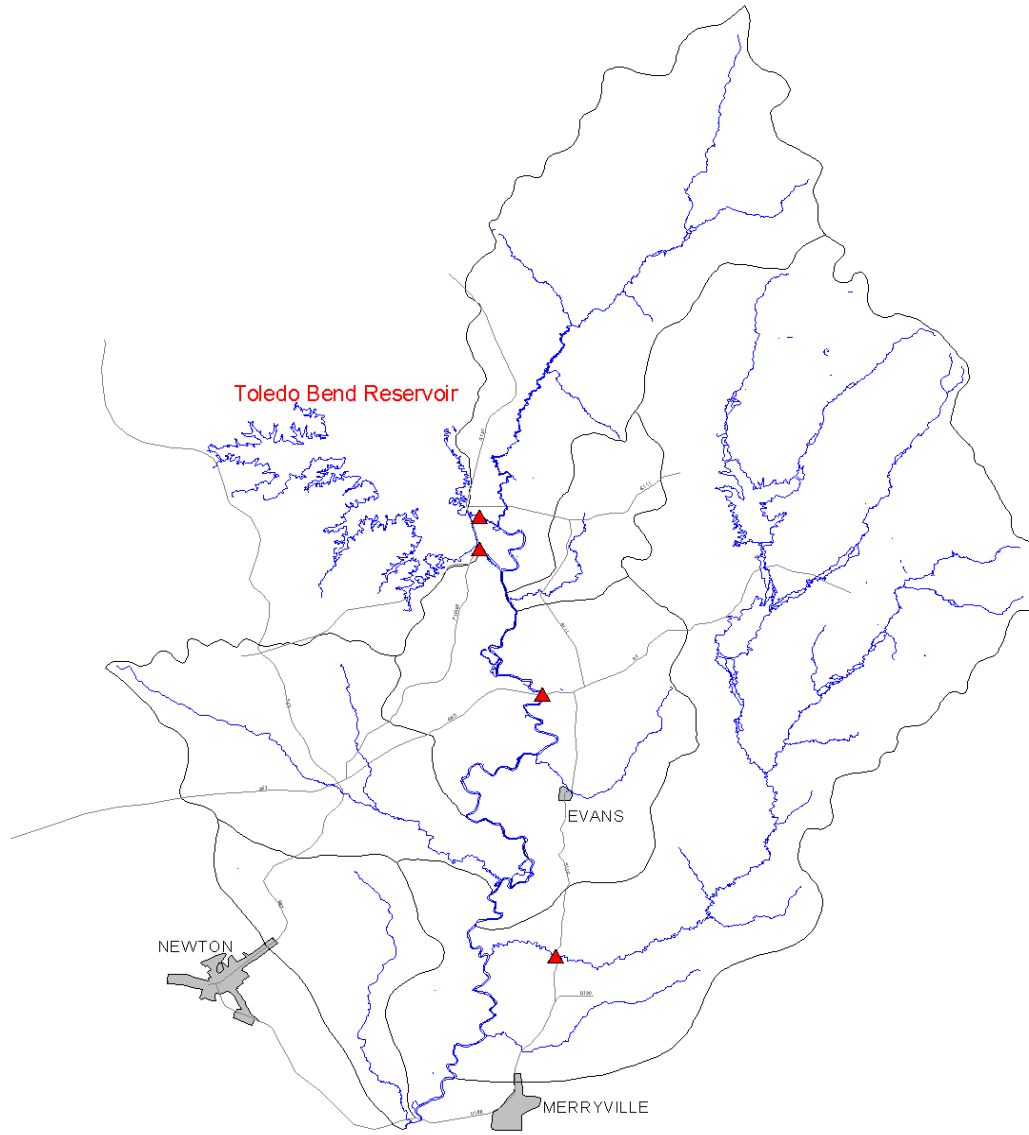
REACH 3

Description: Sabine River and its drainage from above the Caney Creek Confluence (river mile 95.24) to Toledo Bend Dam (river mile 156.45). This Reach is divided into 8 subwatersheds and covers 364.28 square miles. Seventy-seven percent of the reach is in Texas 23% is in Louisiana. Reach 3 includes the upper portion of Segment 0503 (the Sabine River below Toledo Bend). This is largely a rural area with no major cities or industries.

Water Quality: The data analyses indicate water quality problems in only one subwatershed in Reach 3. The Bayou Anacoco Subwatershed, located in Louisiana, has been shown to have concerns or possible concerns due to fecal coliforms and nutrients. All of the subwatersheds in this reach have low priorities according to the Subwatershed Ranking performed in 1999. Segment 0503 was included on the 303(d) due to elevated levels of lead, but is being de-listed since additional sampling for lead indicates no elevated levels are present in this Reach.

Monitoring: The SRA WQMP in Reach 3 includes four sites. Four of the Subwatersheds in this Reach are located in Louisiana and additional monitoring will need to be coordinated with the Louisiana Department of Environmental Quality.

Reach 3



March 1999 - February 2000 Sampling Sites

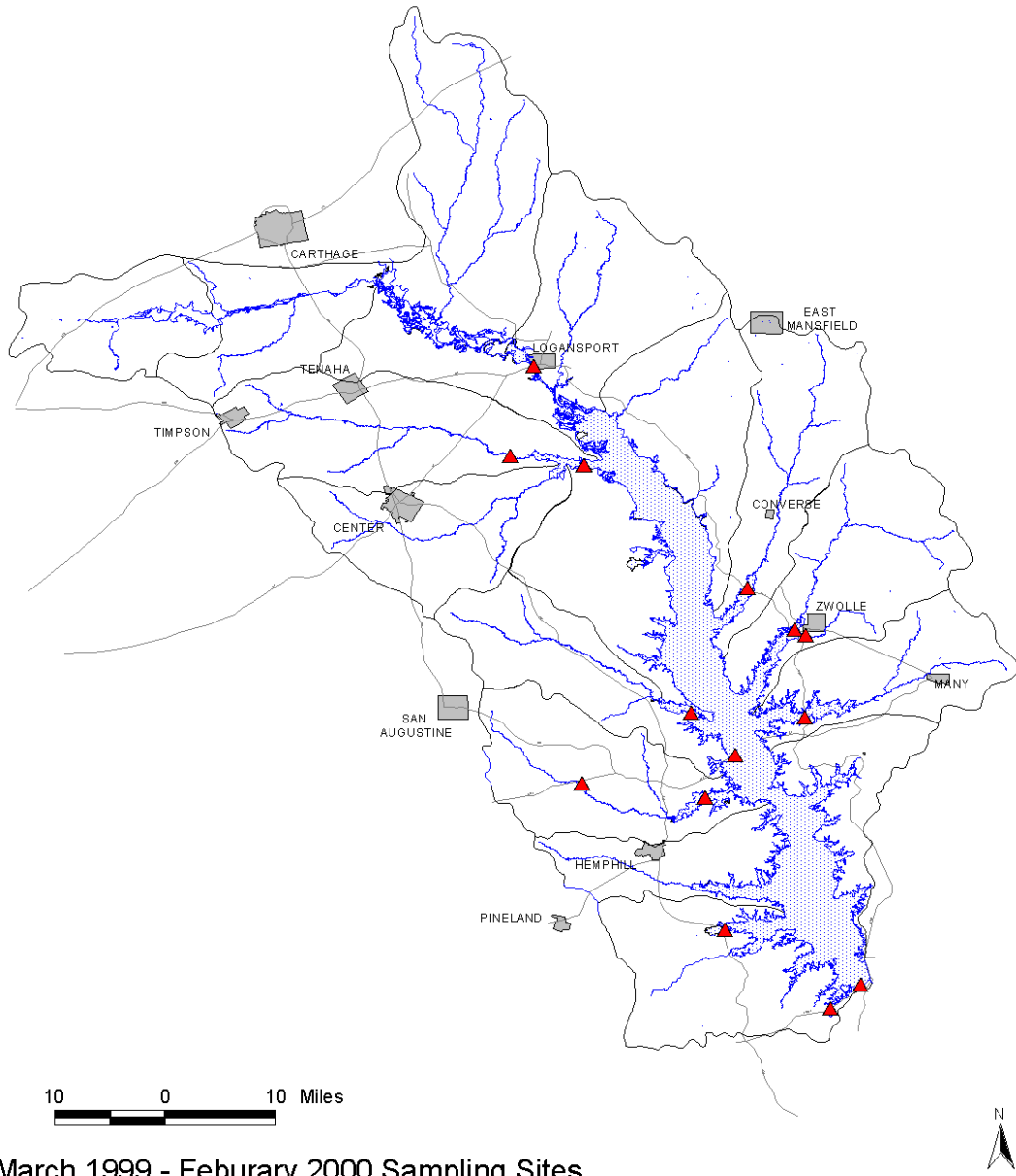
REACH 4

Description: Sabine River from Toledo Bend Dam (river mile 156.45) in Newton County to a point which includes Murvaul Creek Confluence (river mile 291.2) in Panola County. This Reach is divided into 21 subwatersheds and covers 2932.82 square miles. Sixty-eight percent of the reach is in Texas with 32% in Louisiana. Reach 4 includes Segment 0504 (Toledo Bend Reservoir) and Segment 0509 (Lake Murvaul) both of which are classified for water supply. This reach is dominated by Toledo Bend Reservoir and has no major cities or industries.

Water Quality: Concerns have been identified in two Subwatersheds in this Reach. Water quality problems in the San Miguel Bayou Subwatershed, located in Louisiana, include low dissolved oxygen, high fecal coliform levels and high levels of nutrients. The Toledo Bend reservoir was included on the 303(d) list for pH, dissolved oxygen, and mercury in fish tissue. The pH in some areas of the Toledo Bend Reservoir was occasionally outside the range established in stream standards, however the exceedances were observed in less than 10% of the samples. In the Tenaha Creek Arm of the reservoir, low dissolved oxygen levels were observed in the summer months, but the low values appear to be due to ambient conditions and no biological impairments were observed. A fish consumption advisory is still in effect for largemouth bass at Toledo Bend Reservoir due to elevated levels of mercury.

Monitoring: The SRA WQMP includes 11 sites in Reach 4. Three sites are being monitored through the SRA TCRP Screening Program.

Reach 4



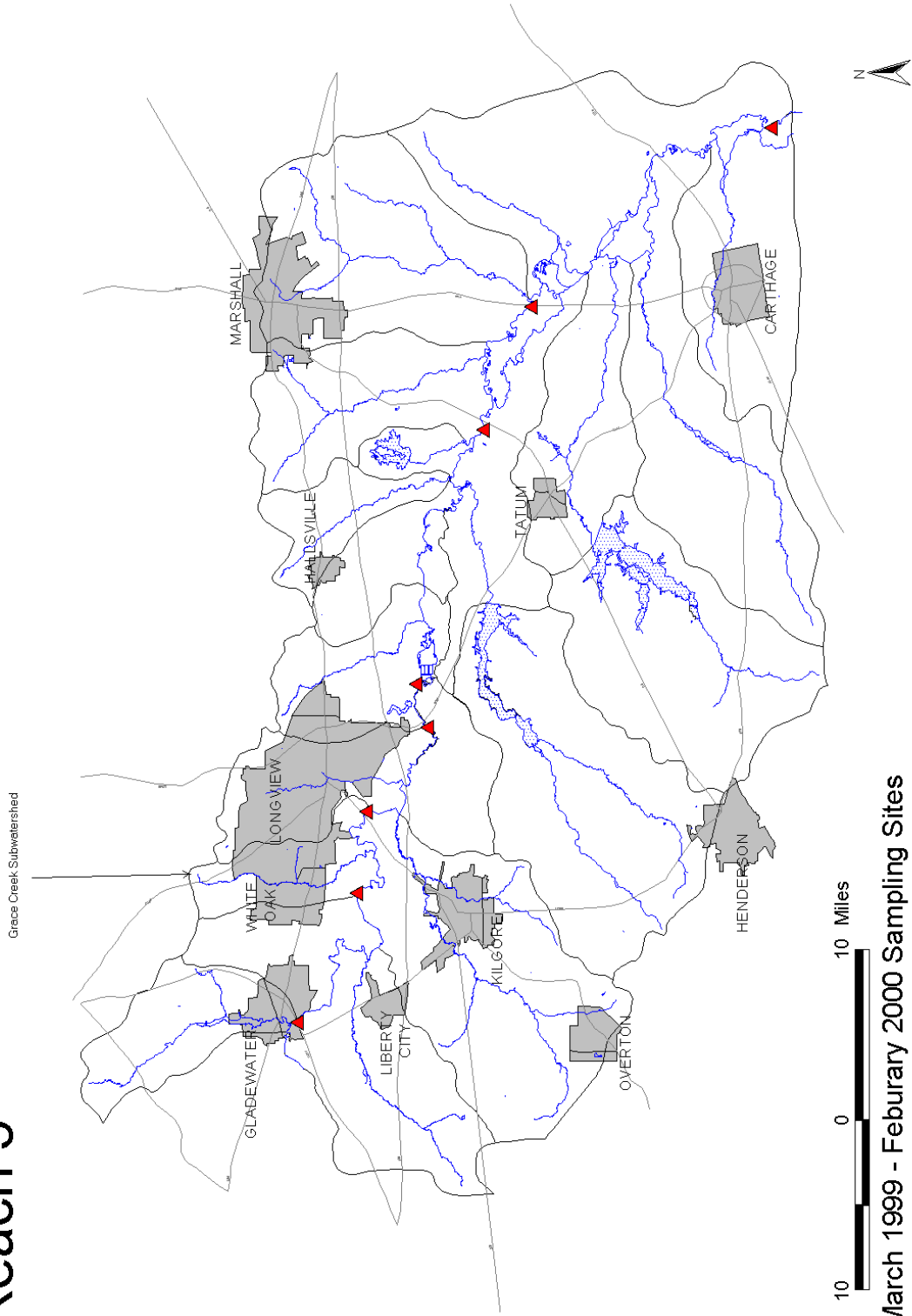
REACH 5

Description: Sabine River and its drainage from above Murvaul Creek Confluence (river mile 291.2) in Panola County to a point which includes Glade Creek Confluence (river mile 397.95) in Gregg County. This Reach is divided into 24 subwatersheds and covers 1629.18 square miles. Segment 0510 (Lake Cherokee, a water supply reservoir) is included in Reach 5. Also included is Segment 0505 (Main-stem of the Sabine River) which is used extensively for water supply. Reach 5 has the highest concentration of population in the Sabine Basin. There are numerous industries in this reach as well as six cities with populations above 5000.

Water Quality: Water quality concerns have been identified in five Subwatersheds in this Reach. The concerns and possible concerns in Reach 5 include biological impairments, low dissolved oxygen, and high fecal coliform bacteria. The biological impairments in three of the subwatersheds caused these subwatersheds to receive a high priority in the SRA subwatershed ranking and these watersheds have been scheduled for special studies to begin in 2000. Segment 0505 was included on the 303(d) list due to high levels of lead, but additional sampling results indicate no elevated levels of metals in this Reach and it is to be de-listed.

Monitoring: The SRA WQMP includes seven main-stem river sites in Reach 5. A non-point study is being conducted in the Grace Creek Subwatershed to delineate concerns identified in the 1999 assessment. Additional sampling will be conducted in two other Subwatersheds next year. Eastman Chemical personnel are monitoring an additional site in Reach 5. SRA has trained Eastman Chemical field personnel in the TNRCC metals sampling protocol and Eastman is now collecting additional samples for several metals under the umbrella of the SRA QAPP.

Reach 5



March 1999 - February 2000 Sampling Sites

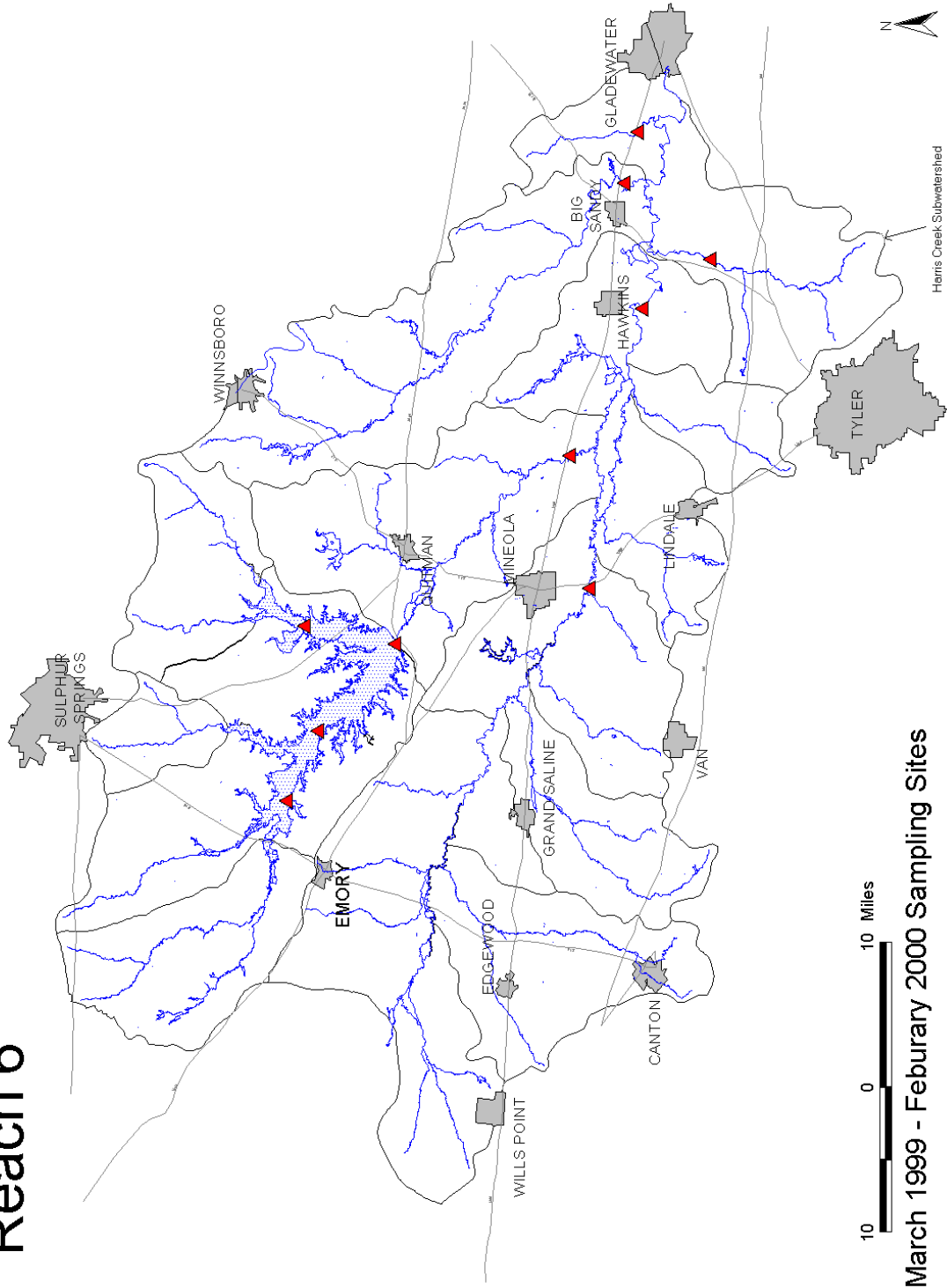
REACH 6

Description: Sabine River below Lake Tawakoni, From above Glade Creek Confluence (river mile 397.95) in Gregg County to Iron Bridge Dam (river mile 514.5). This reach is divided into 27 subwatersheds and covers 1977.13 square miles. This reach includes Lake Fork Reservoir (Segment 0512) which is a public water supply reservoir. This reach also includes Segments 0506, 0514, and 0515. This is largely a rural area, but has numerous dairies primarily on Segment 0512.

Water Quality: Water quality concerns and possible concerns have been identified in six of the Reach 6 Subwatersheds, but only one Subwatershed has been placed on the 303(d) list. The water quality impairments included low dissolved oxygen, dissolved solids, total phosphate, fecal coliforms, and biological impairments. The Harris Creek Subwatershed was placed on the 303(d) list due to low dissolved oxygen, but the water quality problems are not severe, do not impact aquatic life, and may be due to ambient conditions. One monthly site and two quarterly sites in this subwatershed were added to the 2000 WQMP.

Monitoring: The SRA WQMP includes nine sites in Reach 6, including three sites in Lake Fork Reservoir. TNRCC personnel are monitoring an additional site in Lake Fork Reservoir.

Reach 6



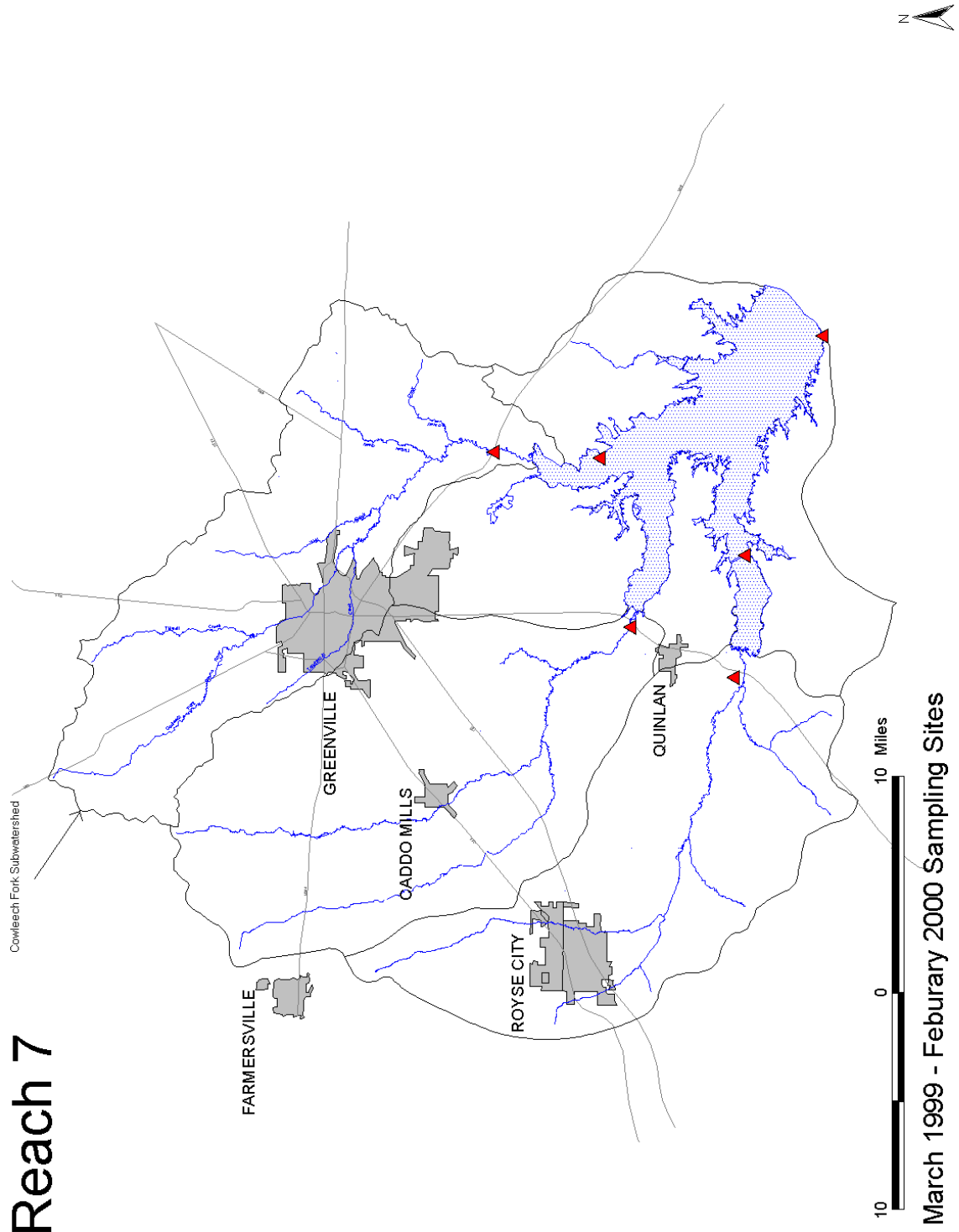
REACH 7

Description: From Iron Bridge Dam (Lake Tawakoni, river mile 514.5) to Sabine River (Cowleech Fork, river mile 579.4) Watershed Divide Near Celeste (headwaters of the Sabine River). This reach is divided into seven Subwatersheds and covers 774.72 square miles. All of the Subwatersheds drain into Lake Tawakoni (Segment 0507) which is a public water supply reservoir. Although much of this reach is rural, it contains one of the four largest cities in the Sabine Basin.

Water Quality: Previous studies have identified concerns and possible concerns mainly from fecal coliform and nutrients. The Subwatershed ranking performed in 1996 listed Subwatershed 7.07 as a high priority for additional study. This study performed during 1998-99, indicated impairments were not as severe as was first thought and appear to come from non-point sources in the mostly-rural watershed. SRA has recommended the development of a source water protection plan for Lake Tawakoni and its watershed. The 1998 draft 303(d) list of waterbodies not meeting the designated use has included Lake Tawakoni as threatened due to atrazine (an herbicide) contamination in finished water supplies. Lake Tawakoni has also been included on the 303(d) list for high pH levels and low dissolved oxygen. The pH levels have been shown to be due to ambient conditions and the proposed revisions to the standards include a change to the pH range for Lake Tawakoni. The low dissolved oxygen levels were observed at one location in the summer months and appear to be due to ambient conditions.

Monitoring: The SRA 2000 WQMP includes three sites in Reach 7 monitored monthly. SRA is conducting a joint study with the TNRCC to examine atrazine levels in Lake Tawakoni. In 1999, three sites were sampled in this Reach as part of the Cowleech Fork Special Study.

Reach 7



SUBWATERSHED INVENTORY

Inventories are being maintained by SRA of all factors that can impact water quality for the Sabine Basin and placed into the GIS as layers. Subwatersheds can then be analyzed based on the specific factors within the subwatershed. Data sets for the inventories have been received from a number of sources including municipalities, government agencies (local, state, and federal), and universities. Data sets that include water quality analyses must first be reviewed to determine the quality assurance associated with the data meets the criteria stated in the SRA QAPP. Other data sets are also reviewed in accordance with the SRA Data Management Plan. In addition to layers for hydrology and highways the data sets include:

Water Quality Data

Population

Septic Tanks

Solid Waste Sites

Land Use

Permitted Discharges

Storm Water Permits

USGS Flow Stations

Superfund Sites

As other data sets become available to SRA they will be assimilated into the Subwatershed Inventory.

QUALITY ASSURANCE PROJECT PLAN

The Quality Assurance Project Plan (QAPP) was updated in September 1999. This document includes all of the details about the SRA monitoring programs, the project definition and background, and all of the quality assurance requirements to ensure the data collected are accurate. The QAPP also ensures that the data collected are representative of the water body being sampled.

GEOGRAPHIC INFORMATION SYSTEM

The SRA Geographic Information System (GIS) provides the means to examine all of the factors which influence water quality. The SRA GIS is a graphical representation of spatial and descriptive data within a database. This allows the relationships of several data sets to be analyzed or viewed in a discerning format. Many layers of information are available through the Internet for use by stakeholders and other interested entities. The following summarizes the recent developments in the SRA GIS:

Digitized reaches and subwatersheds located in the Louisiana portion of the Sabine River Basin. The boundaries were derived from Louisiana TIGER hydrology and USGS topographic maps. With the completion of the associated descriptive tables, the boundaries will be provided on the SRA WEB site for Internet access.

Line drawings provided by the Texas Water Development Board representing Regional Water Planning Areas were converted into GIS polygon coverages. These coverages were applied towards SRA's organizing an Upper Sabine Basin Water Alliance. These coverages are available on the SRA WEB site for Internet access.

SRA has continued with efforts to procure digital orthophoto quarter quadrangles (DOQQ's) for the counties located in the Sabine River Basin. The following counties have ordered the DOQQ's: Collin,

Kaufman, Van Zandt, Hunt, Gregg, Smith, Orange, and Newton. SRA is continuing to network with entities for cost sharing arrangements and is focused on Jasper, Sabine, and San Augustine counties.

WORLD WIDE WEB PROJECT

SRA's World Wide Web site, <http://www.sra.dst.tx.us/>, provides TCRP stakeholders with on-demand access to information and data regarding water resource issues within the Sabine River Basin.

Information and data services provided include the following:

- ◆ The TCRP home page, <http://www.sra.dst.tx.us/srwmp/tecp/>, provides information regarding Senate Bill 818, a current events Bulletin Board, slide presentations concerning TCRP activities in the Sabine River Basin given at professional meetings, and links to the TNRCC and other TCRP partners' web sites.
- ◆ The Water Quality and Supply Data home page, <http://www.sra.dst.tx.us/srwmp/swi/webdata/data.htm>, provides access to USGS flow data, water quality data, permitted landfill data, daily river and reservoir readings, and permitted outfalls. These data can be viewed on a subwatershed basis in the Subwatershed Inventory at <http://www.sra.dst.tx.us/srwmp/swi/webdata/index.htm>.
- ◆ The Sabine Basin GIS Clearinghouse, <http://www.sra.dst.tx.us/pub/sra/srwmp/swi/gis/WEBGIS.HTM>, allows users to view and download water-related GIS data sets. SRA recently became a node on the National Geospatial Data Clearinghouse, <http://fgdclearhs.er.usgs.gov/>, which makes these data available through the searching capabilities provided by the Clearinghouse.
- ◆ Sabine Basin Web Maps, <http://www.sra.dst.tx.us/srwmp/swi/webmaps/>, provides access to the GIS data sets in an on-line mapping system.
- ◆ The *Texas Orthoimagery Program Data for the Sabine River Basin* page, <http://www.sra.dst.tx.us/pub/sra/srwmp/swi/gis/top.htm>, allows visitors to our Web site to preview and download over 2,400 re-sampled DOQQ's (digital ortho quarterquads).