

SABINE RIVER BASIN HIGHLIGHTS

THE TEXAS CLEAN RIVERS PROGRAM

March 1998

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

Through the expansion of the Basin Steering Committee, more stakeholders have an active role in addressing water quality issues in the Sabine Basin. The Basin Steering Committee Meetings are now held in three locations to encourage participation from all of the stakeholders in the Basin. With an emphasis on stakeholder involvement, the SRA invited water supply corporations, permitted dischargers, council of governments, city, and county officials to become steering committee members. Membership in the committee has grown from 65 to 133 members.

The SRA is also preparing a Comprehensive Sabine Watershed Management Study to address water supply as well as water quality in the Sabine Basin. The study will encompass all of the

Sabine River Basin in Texas and is critically important in meeting the goals of providing for adequate supplies of good quality water to meet the present and future needs in the Basin. 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.

WASTE LOAD EVALUATION FOR SEGMENT 0505

The Waste Load Evaluation (WLE) was performed in September of 1996 through the TCRP of the Texas Natural Resource Conservation Commission (TNRCC), as part of the contract between TNRCC and SRA. This investigation was a coordinated effort supported by the SRA, TNRCC, Texas Parks and Wildlife Dept. (TPWD), the United States Geological Survey (USGS), the City of Longview, the City of Kilgore and Eastman Chemical Company. Others involved in the study were the Cities of Hallsville, Marshall, White Oak, Gladewater, and Stroth's Brewery. The "Study Design Report" for this investigation as well as assistance with the overall coordination of the sampling effort was performed by Alan Plummer Associates, Inc. under contract to the City of Longview.

The WLE allowed modelers with the TNRCC to more accurately determine the impact of wastewater discharges under current conditions on the Sabine River in Segment 0505. Basing permits on scientific data provides for better protection of the water resource without burdening the area communities with unnecessary and costly new treatment facilities.

TEXAS WATCH CITIZEN MONITORING

Texas Watch training has continued in the upper Sabine Basin with a demonstration for a class at Quitman High School and a three phase training session for students at Jarvis Christian College. The high school class has adopted two sites in the Sabine Basin that will be monitored on a monthly basis. The college has committed to monitor ten sites in the Hawkins area. Texas Watch activities have also continued in the lower Sabine Basin with two area schools and other individuals committing to sampling the Adam's Bayou Subwatershed for the SRA Special Study.

DATA COLLECTION BY OTHER ENTITIES

Water quality data collected by the City of Kilgore has been included in the SRA QAPP. This will allow the data to be used by the TNRCC in updating the city's 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 February 1998 and is reviewed on an annual basis. The data collection program is discussed below. Statistical analyses of the data are conducted according to guidelines set forth by the Clean Rivers Program.

THE SRA WATER QUALITY MONITORING PROGRAM

The SRA Water Quality Monitoring Program (WQMP) for 1998 includes 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). 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.

In the 1998 calendar year the Subwatershed Screening Program will focus on Reaches 2 and 6. 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.

TARGETED MONITORING

Receiving Water Assessments (RWA's) have been conducted for the City of Liberty WSC and the City of Grand Saline to be used for permit renewals. 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. RWA's scheduled for 1998 will include the Cities of Henderson, Quinlan, Edgewood, Smith Co. WCID #1, and the City of Lindale. Permittees will be contacted prior to the RWA to provide them the opportunity to participate in the assessment.

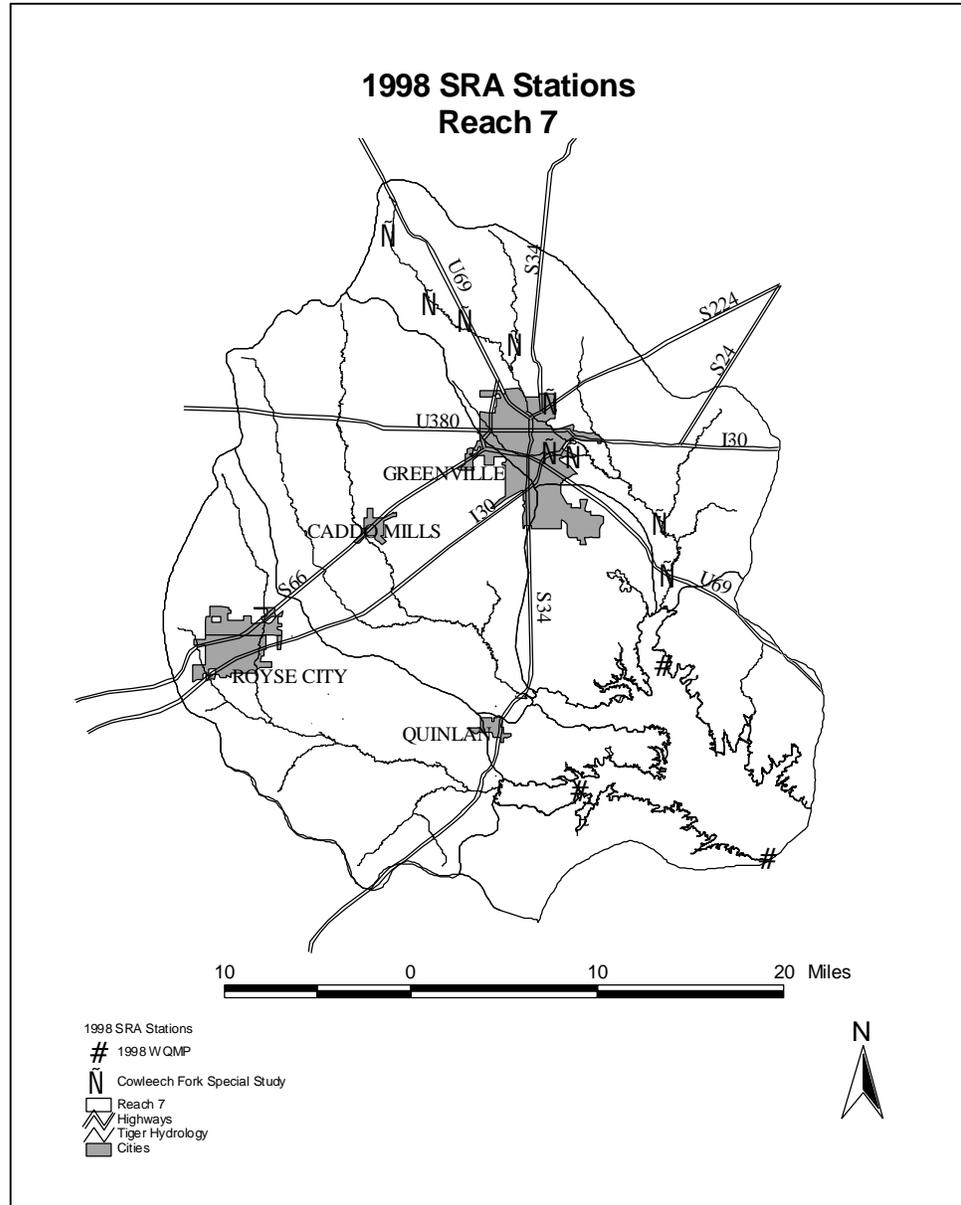
SPECIAL STUDIES

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 will be conducted to identify the sources of water quality impairments. Frequent sampling will be conducted to substantiate non-compliance with the Texas Surface Water Quality Standards. Subcommittees have been formed from the SRA Steering Committee to include public, industry, and local, state, and federal agencies to develop and recommend plans to eliminate the excessive impairments. Quarterly progress reports will summarize the sampling events in the subwatershed, and give the preliminary results. A special report will be issued in August 1999, and will include identification of the causes of the impairments, sources of the impairments, and recommendations for actions to alleviate these impairments.

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 7 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 two subwatersheds with concerns and possible concerns mainly from fecal coliform and nutrients. The subwatershed ranking performed in 1997 listed Subwatershed

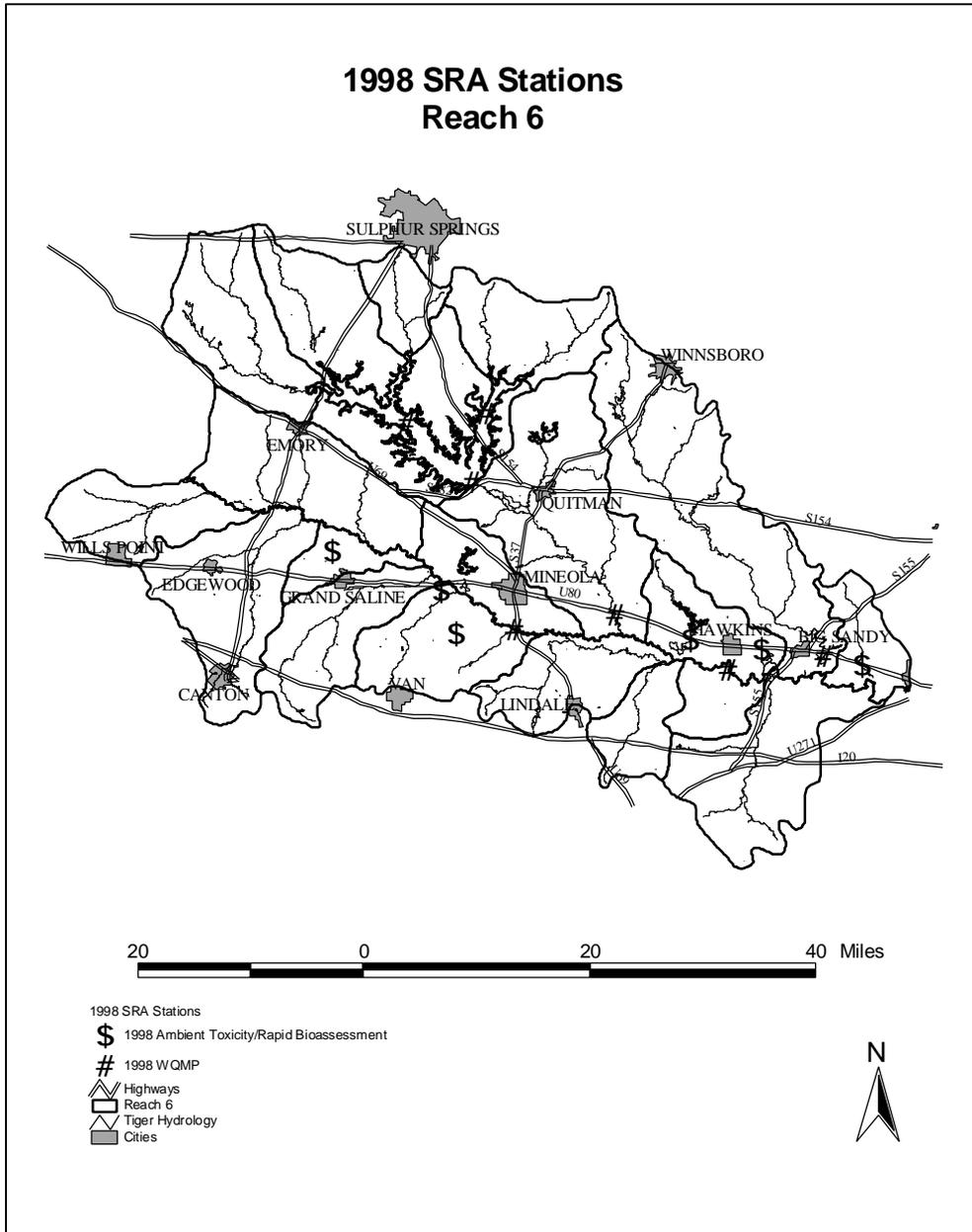


7.07 as a high priority for additional study. The 1998 draft 303d list of waterbodies not meeting the designated use has included Lake Tawakoni as threatened due to atrazine (an herbicide) contamination in finished water supplies.

Monitoring: The SRA WQMP includes three sites in Reach 7 monitored monthly. All seven of the subwatersheds have been monitored through the SRA TCRP Subwatershed Screening Program. The Cowleech Fork Subwatershed will be targeted for a special study to determine the cause(s) for water quality impairments.

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. The water quality impairments included low dissolved oxygen, dissolved solids, total phosphate, fecal coliforms, and biological impairments. One subwatershed was shown to be a high priority from the 1997 subwatershed ranking.

Monitoring: The SRA WQMP includes seven sites in Reach 6 including three sites in Lake Fork Reservoir. The 1998 SRA

TCRP Subwatershed Screening Program includes six sites in five subwatersheds of Reach 6. A total of 5 sites have been sampled through the SRA TCRP Subwatershed Screening Program.

REACH 5

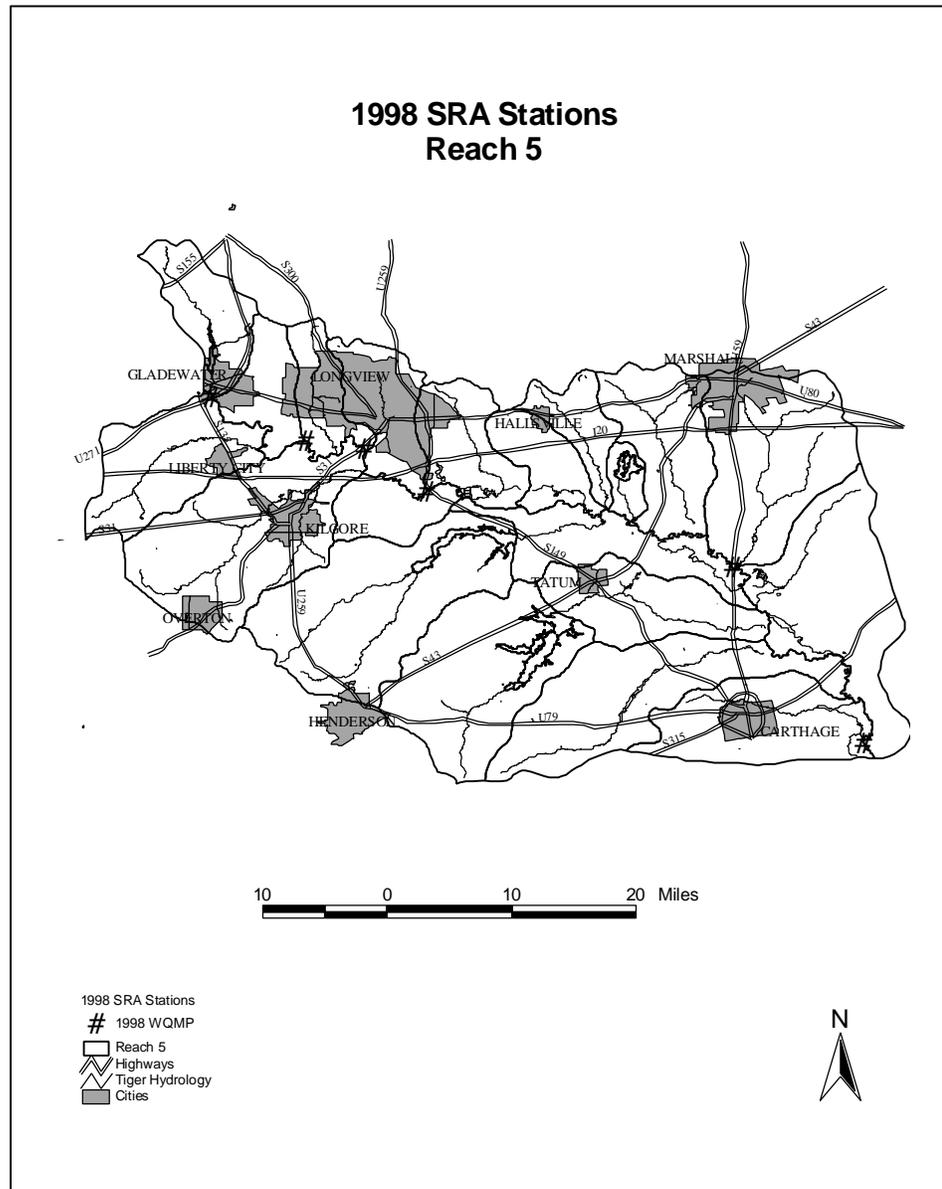
Description: Sabine River and its drainage from above Murvaul Creek Confluence (river mile 291.2) in Panola County to a point which includes Glade Creek Confluence (river mile 397.95) in Gregg County. This Reach is divided into 24 subwatersheds and covers 1629.18 square miles. Segment 0510 (Lake Cherokee, 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 and possible concerns for Reach 5 include biological impairments, low dissolved oxygen, and high nutrients. A possible concern was indicated for some dissolved metals, however most of the analyses for metals were below the

detection limit. The biological impairments in three of the subwatersheds caused these subwatersheds to receive a high priority in the subwatershed ranking. Segment 0505 has been included on the 303d list due to high levels of lead. SRA is planning to work with Eastman Chemical to perform additional sampling and analyses of lead and cadmium.

Monitoring: A total of six sites are included in the SRA WQMP Reach 5. Nine sites have been monitored through the SRA TCRP Screening Program. Additional subwatershed sampling will be conducted in the near future.



REACH 3

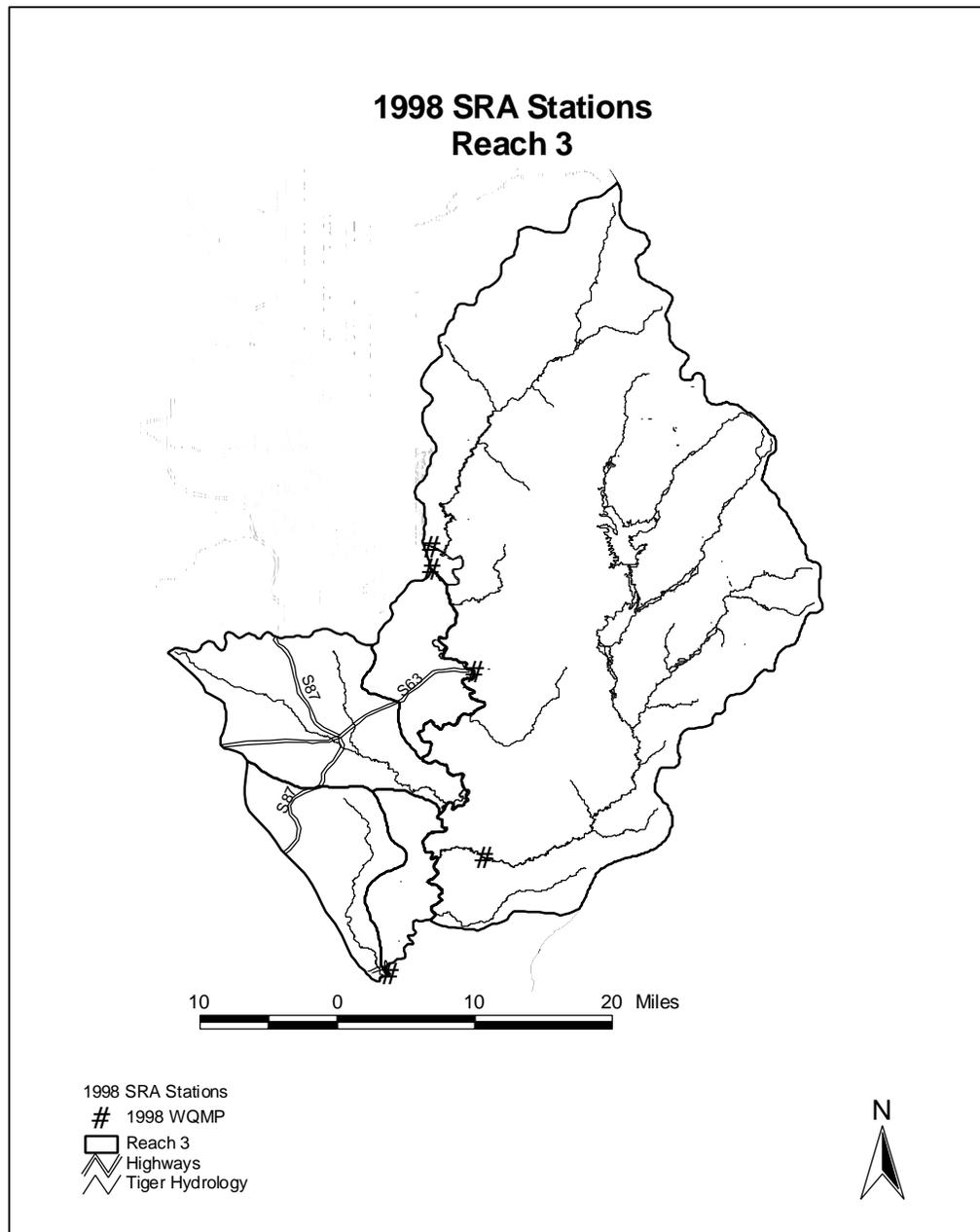
Description: Sabine River and its drainage from above the Caney Creek Confluence (river mile 95.24) to Toledo Bend Dam (river mile 156.45). This Reach is divided into 8 subwatersheds and covers 364.28 square miles. Seventy-seven percent of the reach is in Texas 23% is in Louisiana. Reach 3 includes the 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:

Only one subwatershed in Reach 3 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 1997. The 303d list includes Segment 0503 due to elevated levels of lead in the upper portion. Additional sampling will be conducted for lead in this Reach.

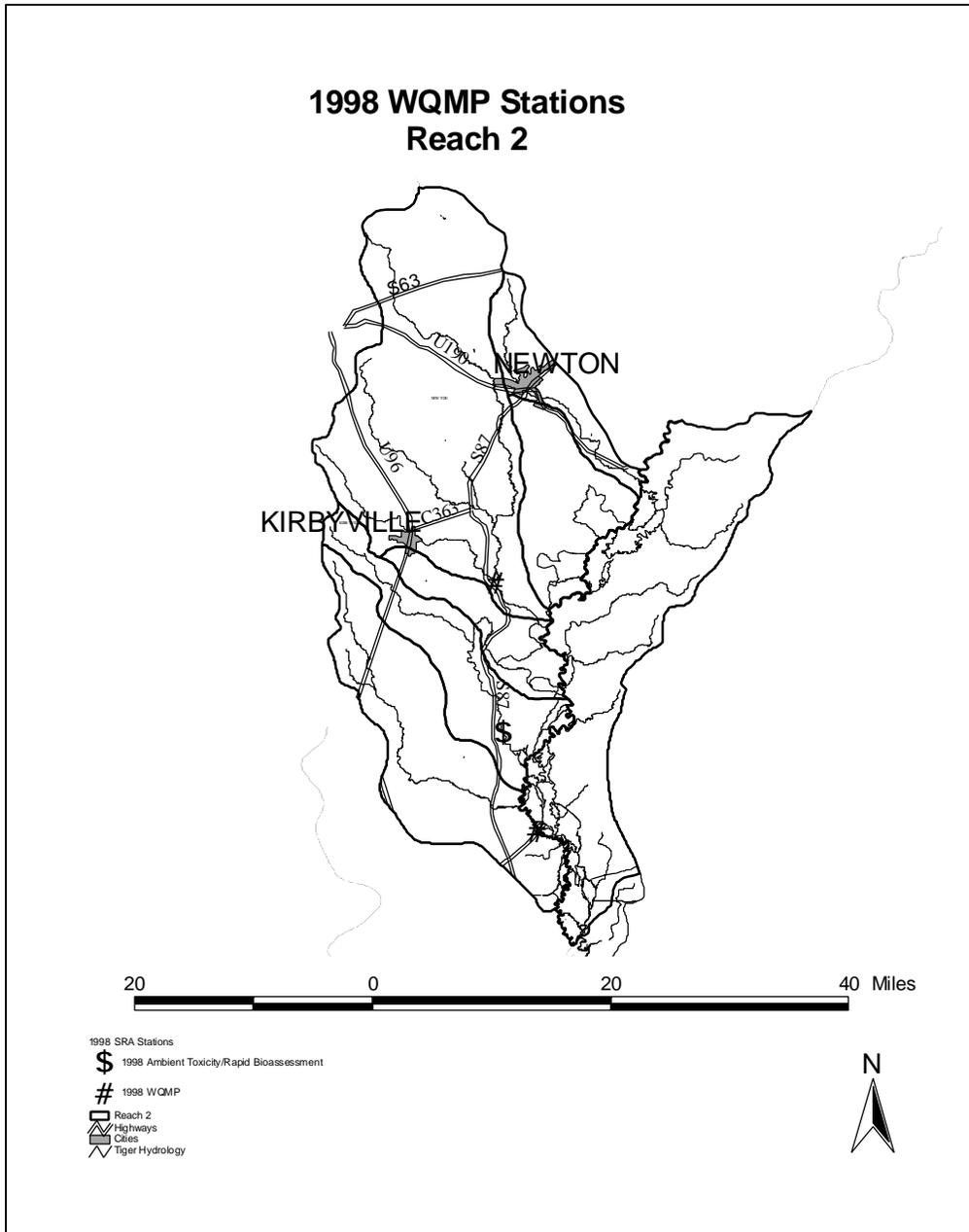
Monitoring: A total of four sites are included in the SRA WQMP in Reach 3. One site in this reach

has been monitored through the SRA TCRP Screening Program.



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:

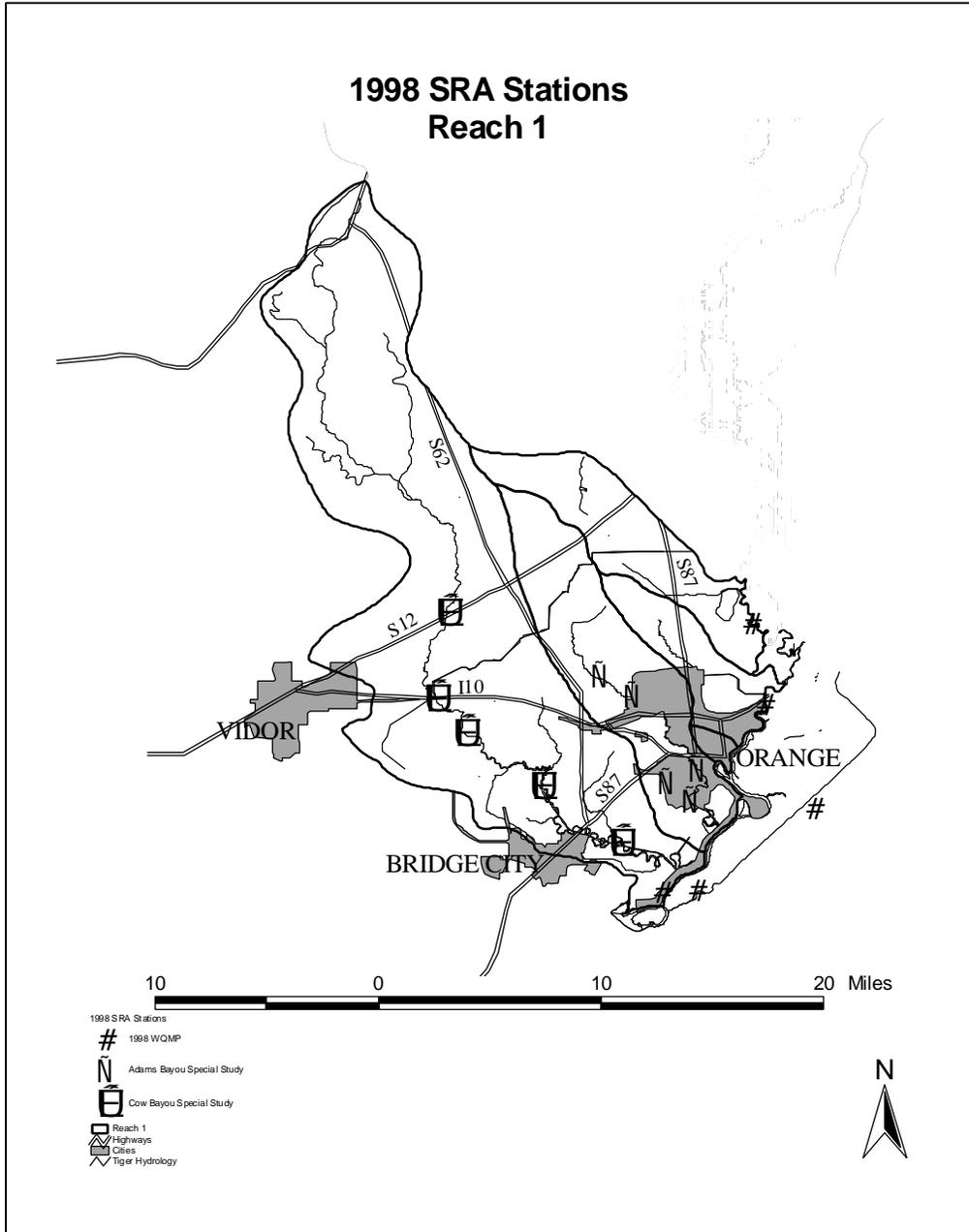
Data analyses have shown one subwatershed in Reach 2 to have a possible concern due to biological impairment. One other subwatershed has a possible concern due to elevated levels of fecal coliforms. The 303d list included Segment 0513 due to elevated levels of dissolved aluminum. The lower portion of Segment 0503 is on the 303d list due to elevated fecal coliform levels. Additional sampling of aluminum will be conducted in Segment 0513.

Monitoring:

The SRA WQMP includes three sites in Reach 2 for 1998. A total of five sites have been monitored through the SRA TCRP Screening Program. One subwatershed is being monitored this year through the SRA TCRP Subwatershed Screening Program.

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 two of the subwatersheds have concerns and possible concerns due to low dissolved oxygen, high fecal coliforms, and high nutrients. One 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 collect additional data on zinc and copper to aid in determining appropriate permit limits.

Monitoring: The 1998 WQMP includes five sites in Reach 1. The Adams Bayou Subwatershed and the Cow Bayou Subwatershed are being included in the SRA Special Studies to determine the cause(s) for water quality impairments.

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 January 1998. 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/tcrp/>, 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 U.S.G.S. 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. It will also provide digital orthoimagery data for selected regions of the Basin as this imagery becomes available through the Texas orthoimagery Program, http://www.tnris.state.tx.us/top_hp.html.
- Presentations given include "GIS on the Web: an accessible management tool" presented at the North American Lake Management Society Houston '97 International Symposium. Slides for this presentation are available at <http://www.sra.dst.tx.us/presentations.htm>.