



TEXAS CLEAN RIVERS PROGRAM
BASIN HIGHLIGHTS REPORT
OF THE
RED RIVER BASIN
APRIL 1998



As the Texas Clean Rivers Program (CRP) completes its seventh year, the Red River Authority of Texas reaffirms its commitment to the program and provides this summary report of the goals accomplished during the past year ending in March 1998. The rules were developed by the Texas Natural Resource Conservation Commission (TNRCC) for the CRP and are utilized by river authorities and other agencies to conduct regional assessments of water quality throughout each river basin in the state. Biennial assessment reports for each of the 23 major rivers in the state were submitted in 1992, 1994, and 1996 to the Governor's Office, the TNRCC, and other agencies. The vital data included in these reports together with new data obtained during this period have been utilized in the presentation of this 1998 Basin Highlights Report. The intent of this report is to inform the public, stakeholders, and other interested parties of the strides being made to reach a better understanding of the local watersheds for improved management and protection of our water resources.

THE RIVER

The Red River originates in eastern New Mexico and flows across the Texas Panhandle where it becomes the Texas-Oklahoma boundary, then continues its course into southwest Arkansas to Louisiana and the Mississippi River. The Red River has a total drainage area of 94,450 square miles and 1,616 stream miles. The diversity of the basin is evidenced by parts of six major ecoregions: the Western High Plains, Southwestern Tablelands, Central Great Plains, Central Oklahoma-Texas Plains, Texas Blackland Prairies, and South Central Plains. Legal jurisdiction of the Authority includes 43 Texas Counties or 40,266 square miles; whereas the Red Basin in Texas involves 40 counties and 24,463 square miles. This excludes the parts of the Red River that flow through Oklahoma, Louisiana, and Arkansas. The elevation from west to east ranges from 4,835 feet to 495 feet above sea level, with rainfall averaging 15 inches per year to 55 inches at the Texas-Arkansas border. There are 32 major reservoirs in Texas which provide an abundance of water uses to more than one million people.



GOALS OF THE PROGRAM

In contemplation of the immense geographical area to assess, the Basin Advisory Committee recommended that the Authority divide the basin into more manageable areas or sub-basins to make better use of the available resources. The basin was divided into five geographical basin reaches. Each basin reach was further divided into subwatersheds consistent with established hydrological unit areas (HUA) to facilitate improved planning, monitoring, geographical analysis, and dissemination of information. Major strides have been made since the four principal goals were established to successfully evaluate the water quality of the Red River Basin, as well as the specific objectives set to achieve these goals. The four principal goals include:

Identifying Water Quality Conditions of the Red River Basin

The thrust of the CRP for this year has been identification of water quality conditions which exhibit concerns within the Red River Basin. Under the Authority's approved Basinwide Monitoring Plan (BMP) and Quality Assurance Project Plan (QAPP), 15 new stations have been established throughout the basin for the collection of chemical, physical, and biological data. The focus has been directed toward accurately identifying the water quality concerns that came out of the 1996 Assessments of Water Quality for the basin. The BMP was designed and implemented by basin reach in an effort to converge available resources in the most beneficial areas. As a result, 197 sampling events have occurred and 4,230 chemical, physical, and/or biological parameters were analyzed to provide sufficient data to form conclusions based on good science for the

development of future action plans that will ultimately provide improved management of our water resources. The data obtained have proven useful to the local communities facing more stringent discharge permit requirements to help offset some of the pressures of unfunded mandates. The data will also be beneficial in addressing the stream segments designated by the TNRCC for Total Maximum Daily Loads (TMDL) analysis to be performed. These segments and the parameters of concern are found in the basin reach descriptions.

In cooperation with local entities, TNRCC district offices, the Texas Parks and Wildlife Department and/or cities, four Receiving Water Assessments (RWA) were conducted and 26 Rapid Bioassessments (RBA) were performed. This information has greatly expanded our knowledge of the water resources (i.e. biological health) and enabled us to identify more accurately the impact of point and nonpoint sources of pollution within the watershed. Additionally, this information supplements the Texas Surface Water Quality Management database (SWQM), in which trend analysis were recently performed. Detected trends are also delineated in the basin reach descriptions in this report. The analysis of the data also demonstrates that the basin as a whole supports fishing, swimming, and other permitted uses with only a few exceptions in some stream segments. For more details on the monitoring results, access our website at www.rra.dst.tx.us/CRP. Additionally, a USGS Fact Sheet (insert to this report) was published jointly by the U.S. Geological Survey and the Red River Authority of Texas which show complete monitoring coverages during the FY 1997 period. Improved water resource management, protection, and conservation are becoming more prevalent as a direct result of the public's awareness and the dissemination of more accurate information with which to make informed decisions.

Involving the Public through Education

In accordance with the Authority's approved Public Participation Plan, several public events were held within the basin involving at least 10,000 people from municipal, industrial, agricultural, educational, and private sectors, all of whom demonstrated a vested interest in the Clean Rivers Program (CRP) and its outcome. This was accomplished through the distribution of printed materials published through the CRP, the world wide web, and public meetings and forums conducted during this reporting period. With the assistance of audio/visual presentations depicting current trends in environmental conditions and water quality concerns identified throughout the course of this year's assessment, a broad cross section of society has been reached which ranged from the educational sector (K-12 and college level) with programs like the Think Earth Environmental Education Program, Major Rivers, and the Texas Rivers Volunteer Environmental Monitoring Project, to the public and professional sectors through events such as the Basin Advisory Committee, the Wichita Falls Regional Water Resource Conference, Earth Day, the Ecology Institute, Civic Clubs, and individual inquiries. Probably the two most outstanding initiatives that gained the greatest level of success were the Clean Rivers Program World Wide Web Home Page and the Texas Rivers Volunteer Environmental Monitoring Project. Both are utilized regularly by people from all walks of life who demonstrate their determination toward learning about and protecting our water and land resources. We have seen a growing level of interest and participation in both, leading to a greater personal involvement on the part of the general public.

Finding Feasible Solutions for Controlling Pollution

The assessment process evaluated existing pollution control and abatement programs with regard to identified water quality concerns. While regional activities impact the local watersheds, site specific problems tend to be intensified by the larger scale influences of naturally occurring and anthropogenic pollution to receiving waters. Elevated levels of chloride originating from natural springs in the western parts of the basin and

historical disposal practices from the oil industry continue to be the leading regional concern of the Red River Basin. Therefore, an intensive study within the Red Basin Reach II, the Wichita River Basin, was conducted to determine if the present chloride control plan should be continued; if it could be considered actually effective from a technical, economical, and environmental standpoint, and will it be beneficial to the public in terms of reclaiming Lake Kemp for municipal, industrial, and agricultural uses without adversely affecting the environment. The conclusion was yes, it clearly demonstrates that the control plan is working. A complete copy of the report can be viewed and downloaded from the CRP Home Page at www.rra.dst.tx.us/Publications/CRP. The study also revealed some interesting characteristics of the Wichita River Basin and identified other influences of chloride loading to the watershed. Water quality monitoring will be continued at key stations to address these findings.

The coordinated collection, management and analysis of water quality data are key elements in determining reasonable scientific solutions for maintaining and improving the quality and availability of natural resources. The CRP is accomplishing these tasks and represents the combined efforts and determination of the stakeholders through participation in Receiving Water Assessments (RWA), Rapid Bioassessments (RBA), and other targeted monitoring activities within the local watersheds. Municipal and industrial wastewater dischargers have long since been considered a point source of pollution to the receiving waters. However, conscientious maintenance and continued monitoring coupled with the application of improved technologies demonstrate that most discharges actually provide a means of support to the ecosystem and contribute to needed streamflows during drought conditions. Monitoring conducted during this period gives evidence of these findings and provides valuable data for the administrators of a discharge permit to aid in planning, permitting, and preventative maintenance. These combined efforts of the regulated communities and the regulators alike exemplify how the CRP has been able to achieve a cooperative spirit to insure that the impact to receiving waters of our watersheds remain compatible with the ecosystem

and in balance with natural habitats. Watershed runoff from urban and agricultural activities can be major contributors of pollution without effective control programs in place to reduce or prevent adverse impacts resulting from agricultural and livestock practices. Nutrient and bacteriological data have been and continue to be a key part in the Authority's monitoring plan to address the extent of nonpoint pollution in all areas of the basin. This information will enable the creation of a nonpoint source pollution study to be performed in those areas most affected. Hopefully, this will lead to best management practices, which will aid in alleviating the problems that nonpoint source pollution poses. One such study is the Terra Blanca Creek Watershed located in Reach IV of the Red River Basin and includes portions of Deaf Smith, Randall, Parmer, and Castro Counties. In March 1995, the watershed was placed on the State of Texas 319 Nonpoint Source Assessment List as a concern due to agricultural practices. In 1996, the Texas Agricultural Extension Service (TAEX), the Texas Agricultural Experiment Station (TAES), and the Texas A&M University System (TAMU) received 319(h) funding from the Texas Soil and Water Conservation Board to conduct a three year study project to demonstrate, evaluate, and educate producers on cost effective best management practices for water quality management from selected types of nonpoint sources. The project consists of the installation of field demonstration plots to include various best management practices on both cropland and livestock operations. Several more field demonstration plots were designed and are currently being evaluated. Several field demonstration plots are planned for 1998. For more information on the study contact Lanny A. McDonald, Extension Associate - Water Quality, P. O. Drawer 10, Bushland, Texas 79012.

Providing Administrative and Technical Assistance to Local Entities

The CRP was designed and is continuously critiqued by the stakeholders to provide local benefits and assistance to municipal, industrial, and agricultural sectors with waste load evaluations, receiving waters assessments and nonpoint source pollution control strategies through the establishment of localized stream standards.

Coordination of permitting and providing quality assured data enables both the regulator and the regulated community to work together in finding reasonable solutions toward improving management practices that result in protecting our water resources. One such example is the development of a common QAPP with which any entity desiring to participate in the water quality monitoring effort can combine resources to advance the common goals of watershed protection. Surveys of the local entities have been conducted which identified and prioritized local water quality issues and needs for implementation of the strategic water quality monitoring, which will result in the establishment of realistic water quality stream standards. The assimilated data are growing in popularity for use in local planning and water resource management due to its accuracy and ready access. Being able to find the information needed to make informed decisions regarding water resource management, along with other related data, enable the local communities to combat many of the unfunded mandates being imposed by the federal government without regard to local considerations. The central clearinghouse for current inventories of water quality, water resource, and socio-economic data related geographically is rapidly becoming a dependable resource for everyone due to its ready access and continuous expansion as the needs dictate for benefit of the public. Visit our website often and provide your comments and suggestions for improvement. Access can be through the Internet at www.rra.dst.tx.us/CRP or directly through an arranged connection. Links are also provided to other environmental and natural resource websites for your convenience.

For More Information:

Red River Authority of Texas

900 8th Street, Suite 520

Hamilton Building

Wichita Falls, Texas 76301-6894

Administration: (940) 723-0855

Laboratory: (940) 723-8697

Internet: www.rra.dst.tx.us

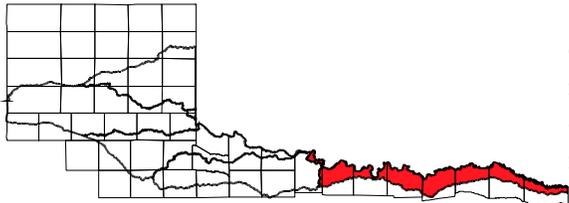
E-mail: info@rra.dst.tx.us

FIVE REACHES OF THE RED RIVER BASIN

For the Clean Rivers Program to be comprehensive in nature and useful as a resource management tool, a priority watershed approach was followed to properly identify and isolate individual factors or elements having an influence on the quality of the water resources obtained from large geographical areas. Each primary area of study was hydrologically divided into five basin reaches containing approximately 7,000 square miles each. The five basin reaches were prioritized according to the degree of concern and further subdivided into smaller subwatersheds to facilitate water quality monitoring, point and nonpoint source identification, and conduct a trend analysis on selected parameters of concern. The subwatershed areas are being further divided into intensive study areas (ISA) for use in prioritized biological assessments, intensive monitoring surveys, receiving water assessments, stream segment classification and in determining accurate cause and effect relationships of pollution impacting the watersheds.

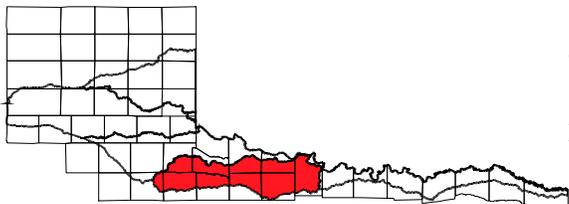
Four types of water quality monitoring were determined to be useful components for inclusion in the Basinwide Monitoring Plan to accomplish the state's monitoring objectives. The four types of monitoring components are fixed station monitoring, systematic watershed monitoring, targeted monitoring and volunteer environmental monitoring. The Authority is employing each of these types in its basinwide monitoring program.

Reach I - The Red River main stem watershed from the Texas-Arkansas state-line upstream to the confluence of Cache Creek and Red River. (Bowie County to Montague County)



There are five subwatersheds in this reach totaling 7,698 square miles of contributing drainage area in Texas, Arkansas, and Oklahoma, 3,600 square miles in Texas, and 46 registered water quality monitoring stations. Median streamflow of the main stem measures 13,180 cubic feet per second. There are 53 permitted municipal and industrial discharges, 15 permitted solid waste disposal sites, and 123 water rights permits issued in this reach. Estimated population was reported to be 313,500 in 1995. The Authority conducted 68 monitoring events during this period and 2,756 parameters were screened and analyzed, which revealed the general quality of the water to be suitable to support fishing, swimming, and high aquatic life. Of the constituents screened*, concerns were identified in parameters of nutrients, metals, bacteriological, and total dissolved solids. Trend analysis for constituents of concern at stations located in the reach showed a decreasing trend for conductivity in Segments 201, 225, and 203, an increasing trend for lead (d) in Segment 202, a decreasing trend for o-phosphate in Segment 204, and a decreasing trend for dissolved oxygen in Segment 209 and 225.

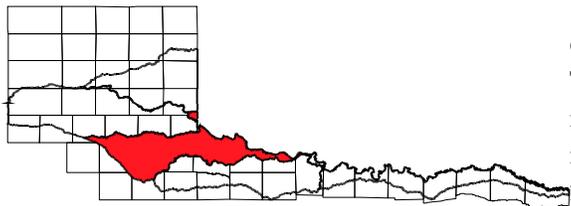
Reach II - Wichita River and Little Wichita River watersheds, from the confluence with the Red River to their headwaters. (Clay County to Cottle/King/Dickens Counties)



Reach II also contains five subwatersheds with 4,951 square miles of contributing drainage in Texas and 72 registered water quality monitoring stations. Streamflow of the main stem measured 377 cubic feet per second. There are 37 permitted municipal and industrial discharges, 25 permitted solid waste disposal sites and 53 water rights permits issued in this reach. Estimated population in 1995 was reported at 104,000. The Authority conducted 124 monitoring events during this period and 1,760 parameters were screened and analyzed, revealing the general quality of the water to be suitable to support fishing, swimming, and high aquatic life. Of the constituents screened*, concerns were identified in parameters of nutrients, bacteriological, and total dissolved solids. Trend analysis for constituents of concern at stations located in this reach showed a decreasing trend for fecal coliform in Segment 204 and a decreasing trend for total kjeldahl nitrogen in Segment 214.

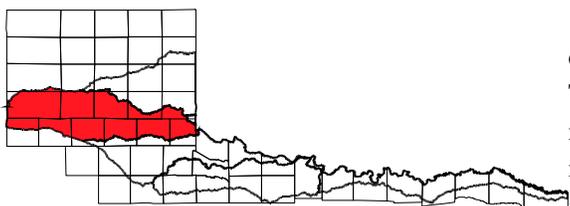
* All Parameters screened utilized the State's Surface Water Quality Monitoring Standards, and, as such, do not reflect drinking water standards.

Reach III - Pease River watershed from the confluence with the Red River to its headwaters including the Red River main stem from the confluence of Cache Creek upstream to the confluence of Buck Creek and Red River. (Wichita County to Swisher/Briscoe/Floyd Counties)



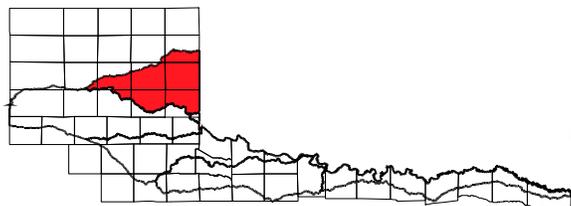
The five subwatersheds contained in Reach III have 5,734 square miles of contributing drainage in Texas and Oklahoma with 4,845 square miles in Texas and 14 registered water quality monitoring stations. Streamflow of the main stem measured 64.1 cubic feet per second. There are 19 permitted municipal and industrial discharges, 14 permitted solid waste disposal sites, and 28 water rights permits issued in this reach. In 1995 estimated population was 100,000. The Authority conducted one monitoring event during this period and ten parameters were screened and analyzed, which revealed the general quality of the water to be suitable to support fishing, swimming, and high aquatic life. Of the constituents screened*, concerns were identified in parameters of nutrients, metals, and total dissolved solids. Trend analysis for constituents of concern in this reach showed a decreasing trend for total and ortho- phosphorus at Station 10096 (Wildhorse Creek). This reach has two segments that are on the State's 303d list for a TMDL study to be conducted. Segment 205 is listed for elevated levels of fecal coliform and cadmium. Segment 221 is listed for elevated levels of chloride, sulfate, and total dissolved solids.

Reach IV - Prairie Dog Town Fork Red River from the confluence of Buck Creek and Red River upstream to the Texas-New Mexico state-line. (Childress/Collingsworth Counties to Deaf Smith/Parmer Counties)



Reach IV also contains five subwatersheds with 7,626 square miles of contributing drainage in Texas and Oklahoma with 7,084 square miles in Texas and 33 registered water quality monitoring stations. Streamflow of the main stem measured 286 cubic feet per second. There are 84 permitted municipal and industrial discharges, 17 permitted solid waste disposal sites, and 55 water rights permits issued in this reach. Estimated population was reported to be 155,000 in 1995. The Authority conducted 12 monitoring events during this period and 226 parameters were screened and analyzed, revealing the general quality of the water to be suitable to support fishing, swimming, and high aquatic life. Of the constituents screened*, concerns were identified in parameters of nutrients, metals, and total dissolved solids. Trend analysis for constituents of concern from stations located in this reach showed an increasing trend for conductivity in Stream Segments 228 and 229, and an increasing trend for sulfate in Segment 229. This reach has three segments listed on the State's 303d list for a TMDL study to be conducted. Segment 207 is listed for elevated levels of fecal coliforms. Segment 228 is listed for elevated levels of total dissolved solids and Segment 229 for elevated levels of sulfate and depressed dissolved oxygen levels.

Reach V - North Fork Red River from the Texas-Oklahoma state-line upstream to the headwaters of McClellan Creek, including the headwaters of the Salt Fork Red, Red River, Elm Fork of Red River and the Washita River. (Collingsworth/Wheeler/ Hemphill Counties to Potter County)



Reach V includes six subwatersheds with 7,580 square miles of contributing drainage in Texas and Oklahoma with 4,124 square miles in Texas and 24 registered water quality monitoring stations. Streamflow of the main stem measured 30 cubic feet per second. There are 29 permitted municipal and industrial discharges, 15 permitted solid waste disposal sites, and 39 water rights permits issued in this reach. The 1995 estimated population was reported at 77,000. The general quality of the water is suitable to support fishing, swimming, and high aquatic life. No trends were detected in this reach. Segment 222 is listed on the State's 303d list for a TMDL study concerning elevated levels of fecal coliform.

* All Parameters screened utilized the State's Surface Water Quality Monitoring Standards and, as such, do not reflect drinking water standards.