CHAPTER 5

WATER QUALITY PARTNERSHIPS IN THE RED RIVER WATERSHED

5.1. BACKGROUND. The Watershed Approach relies on participation at the federal, state, local and nongovernmental levels to be successful. Two types of partnerships are critical to ensure success:

- Partnerships between agencies
- Partnerships between agencies and landowners

This chapter describes both types of partnerships in the Red River Watershed. The information presented is provided by the agencies and organizations described.

5.2. FEDERAL PARTNERSHIPS.

5.2.A. Natural Resources Conservation Service. The Natural Resources Conservation Service (NRCS), an agency of the U.S. Department of Agriculture, provides technical assistance, information, and advice to citizens in their efforts to conserve soil, water, plant, animal, and air resources on private lands.

Performance Results System (PRS) is a Web-based database application providing USDA Natural Resources Conservation Service, conservation partners, and the public fast and easy access to accomplishments and progress toward strategies and performance. The PRS may be viewed at http://prms.nrcs.usda.gov/prs. From the opening menu, select "Reports" in the top tool bar. You will select the time period that you are interested in and the conservation treatment of interest on the page that comes up. Depending on the time period of interest, you will have various report options to choose from, such as location, reporting period and program involved in the reporting. You may be required to "refresh" the page in order to get the current report to come up.

The data can be used to determine broad distribution trends in service provided to customers by NRCS conservation partnerships. These data do not show sufficient detail to enable evaluation of site-specific conditions (e.g., privately-owned farms and ranches) and are intended to reflect general trends.

Conservation Practice	Feet	Acres	Number
Conservation Buffers	410,364	94	
Erosion Control		31,609	
Nutrient Management		36,960	
Comprehensive Nutrient Management Plans			1
Pest Management		35,300	63
Grazing / Forages	37,039	13,993	
Tree and Shrub Practices		2,713	
Tillage and Cropping		29,091	
Waste Management Systems			1
Wildlife Habitat Management		3,622	
Water Supply	7,451		14

Table 5-1. Landowner Conservation Practices in Partnership with NRCS in the Tennessee Portion of the Red River Watershed. *Data are from PRMS for October 1, 2001 through September 30, 2005 reporting period. More information is provided in Appendix V.*

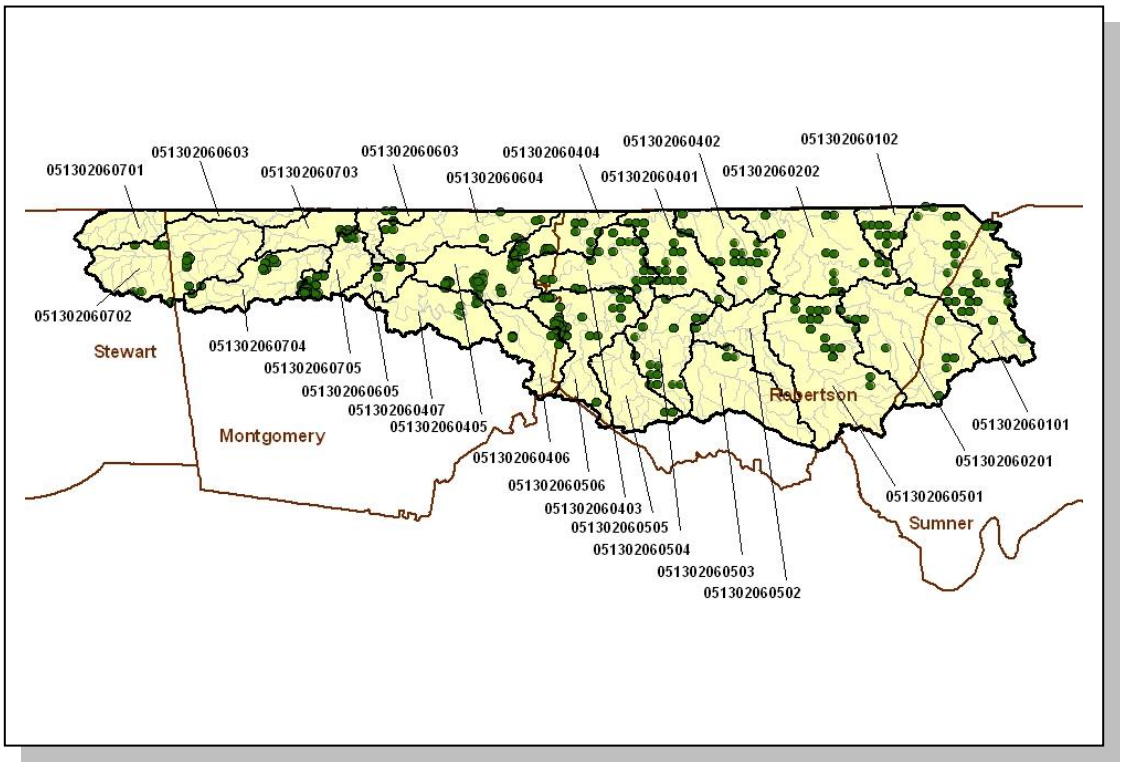

Figure 5-1. BMPs Installed by NRCS in the Red River Watershed in 2006 and 2007. Information was provided as part of Conservation Technical Assistance Grant 060701T47. *Best Management Practices applied in the watershed may be found in Appendix V.*

5.2.B. United States Geological Survey – Tennessee Water Science Center Programs. The United States Geological Survey (USGS) provides relevant and objective scientific information and data for public use in evaluation of the quantity, quality, and use of the Nation's water resources. National USGS water resource assessments include the National Streamflow Information Program (http://water.usgs.gov/nsip/), National Atmospheric Deposition Network (http://bqs.usgs.gov/acidrain/), the National Stream Quality Accounting Network (http://water.usgs.gov/nasqan/), and the National Water-Quality Assessment Program (http://water.usgs.gov/nawqa). For a national overview of USGS water resources programs, please visit http://water.usgs.gov. Specific information on the Upper and Lower Tennessee River NAWQA study units can be found at http://tn.water.usgs.gov/lten/tenn.html .

In addition to National assessments, the USGS also conducts hydrologic investigations and data collection in cooperation with numerous Federal, State, and local agencies to address issues of National, regional, and local concern. Hydrologic investigations conducted by the USGS Tennessee Water Science Center address scientific questions pertaining to five general thematic topics:

1. Water Use and Availability,
2. Landforms and Ecology,
3. Watersheds and Land Use,
4. Occurrence, Fate, and Transport of Contaminants, and
5. Floods and Droughts.

In support of these investigations, the USGS Tennessee Water Science Center records streamflow continuously at more than 100 gaging stations, makes instantaneous measurements of streamflow at numerous other locations as needed or requested, monitors ground-water levels Statewide, and analyzes the physical, chemical, and biologic characteristics of surface and ground waters. In addition, the Water Science Center compiles annual water-use records for the State of Tennessee and collects a variety of data in support of National USGS baseline and other networks. More information pertaining to USGS activities in Tennessee can be accessed at http://tn.water.usgs.gov .

USGS Water Resources Information on the Internet. Real-time and historical streamflow, water-level, and water-quality data at sites operated by the USGS Tennessee Water Science Center can be accessed on-line at http://waterdata.usgs.gov/tn/nwis/nwis. Data can be retrieved by county, hydrologic unit code, or major river basin using drop-down menus on the web page. For specific information or questions about USGS streamflow data, contact Donna Flohr at (615) 837-4730 or dfflohr@usgs.gov. Recent USGS Tennessee Water Science Center publications can be accessed by visiting http://tn.water.usgs.gov/pubpg.html. A searchable bibliographic database is also provided for locating other USGS reports and products addressing specific scientific topics.

5.2.C. U.S. Fish and Wildlife Service. The mission of the U.S. Fish and Wildlife Service is working with others to conserve, protect, and enhance fish, wildlife, and plants and their habitats for the continuing benefit of the American people. Sustaining our nation's fish and wildlife resources is a task that can be accomplished only through the combined efforts of governments, businesses, and private citizens. The U.S. Fish and Wildlife Service (Service) works with State and Federal agencies and Tribal governments, helps corporate and private landowners conserve habitat, and cooperates with other nations to halt illegal wildlife trade. The Service also administers a Federal Aid program that distributes funds annually to States for fish and wildlife restoration, boating access, hunter education, and related projects across America. The funds come from Federal excise taxes on fishing, hunting, and boating equipment.

Endangered Species Program

Through the Endangered Species Program, the Service consults with other federal agencies concerning their program activities and their effects on endangered and threatened species. Other Service activities under the Endangered Species Program include the listing of rare species under the Endangered Species Act (ESA) of 1973 (87 Stat. 884, as amended: 16 U.S.C. 1531 et seq.) and the recovery of listed species. Once listed, a species is afforded the full range of protections available under the ESA, including prohibitions on killing, harming or otherwise taking a species. In some instances, species listing can be avoided by the development of Candidate Conservation Agreements, which may remove threats facing the candidate species, and funding efforts such as the Private Stewardship Grant Program. The federally endangered gray bat (*Myotis grisescens*) occurs in the Red River Watershed. For a complete listing of endangered and threatened species in Tennessee, please visit the Service's website at http://*cookeville.fws.gov*.

Recovery is the process by which the decline of an endangered or threatened species is stopped and reversed, and threats to the species' survival are eliminated, so that long-term survival in nature can be ensured. The goal of the recovery process is to restore listed species to a point where they are secure and self-sustaining in the wild and can be removed from the endangered species list. Under the ESA, the Service and National Marine Fisheries Service were delegated the responsibility of carrying out the recovery program for all listed species.

In a partnership with the Tennessee Chapter of The Nature Conservancy (TNC), Tennessee Wildlife Resources Agency (TWRA), and Tennessee Department of Environment and Conservation (TDEC) Division of Natural Heritage, the Service developed a State Conservation Agreement for Cave Dependent Species in Tennessee (SCA). The SCA targets unlisted but rare species and protects these species through a suite of proactive conservation agreements. The goal is to preclude the need to list these species under the ESA. This agreement covers middle and eastern Tennessee and will benefit water quality in many watersheds within the State.

In an effort to preclude the listing of a rare species, the Service engages in proactive conservation efforts for unlisted species. The program covers not only formal candidates but other rare species that are under threat. Early intervention preserves management options and minimizes the cost of recovery.

Partners for Fish and Wildlife Program

The U.S. Fish and Wildlife Service established the Partners for Fish and Wildlife Program to restore historic habitat types which benefit native fishes and wildlife. The program adheres to the concept that restoring or enhancing habitats such as wetlands or other unique habitat types will substantially benefit federal trust species on private lands by providing food and cover or other essential needs. Federal trust species include threatened and endangered species, as well as migratory birds (e.g. waterfowl, wading birds, shorebirds, neotropical migratory songbirds).

Participation is voluntary and various types of projects are available. Projects include livestock exclusion fencing, alternate water supply construction, streambank stabilization, restoration of native vegetation, wetland restoration/enhancement, riparian zone reforestation, and restoration of in-stream aquatic habitats.

HOW TO PARTICIPATE ...

- Interested landowners contact a Partners for Fish and Wildlife Biologist to discuss the proposed project and establish a site visit.
- A visit to the site is then used to determine which activities the landowner desires and how those activities will enhance habitat for trust resources. Technical advice on proposed activities is provided by the Service, as appropriate.
- Proposed cost estimates are discussed by the Service and landowner.
- A detailed proposal which describes the proposed activities is developed by the Service biologist and the landowner. Funds are competitive, therefore the proposal is submitted to the Service's Ecosystem team for ranking and then to the Regional Office for funding.
- After funding is approved, the landowner and the Service co-sign a Wildlife Extension Agreement (minimum 10-year duration).
- Project installation begins.
- When the project is completed, the Service reimburses the landowner after receipts and other documentation are submitted according to the Wildlife Extension Agreement.

For more information regarding the Endangered Species and Partners for Fish and Wildlife programs, please contact the Cookeville Ecological Services Field Office at 931/528-6481 or visit their website at http://*cookeville.fws.gov*.

5.2.D. United States Army Corps of Engineers-Nashville District. The Nashville District, U.S. Army Corps of Engineers is one of seven districts in the Lakes and Rivers Division. The district's area is determined by the Cumberland River and the Tennessee River's watersheds and encompasses 59,000 square miles in portions of seven states. This geographic area is represented by 14 senators and 20 Congressional representatives. The Nashville District's missions include providing flood protection, recreation, hydropower, and navigation. The District also provides environmental stewardship through our Regulatory and Civil Works programs, conducts emergency response to disasters, and to performs other authorized Civil Works projects.

Within the 18,000 square mile Cumberland River Basin, overall responsibilities for the Nashville District include operation and maintenance of 10 reservoir projects. Each of these is operated for some or all of the following purposes: hydropower production, flood control, navigation, water supply, water quality, fish and wildlife, and recreation.

Within the much larger, 41,000 square mile Tennessee River Basin the Nashville District operates a series of navigation locks and has regulatory permit authority over dredge and fill activities under the Clean Water Act and the Rivers and Harbors Act.

As of 2005, the District's flood control projects have prevented more than $1.96 billion in flood damages. The District also provides flood prevention planning assistance to the states and local governments.

Lakes in the Nashville District are the most popular in the nation. More than 36 million people visited our 10 lakes last year. These recreation users had an economic impact on the region of nearly $877 million dollars. Five Nashville District lakes rank among the top 25 in Corps-wide visitation. In 2000, the District's 70 commercial concessionaires produced $1.3 million in profit, and returned more than $300,000 to the U.S. Treasury in rent payments for leases.

The Nashville District has the capacity to produce more than 914 megawatts of clean electricity, enough to power the needs of a city the size of Nashville, at nine different hydropower generations plants in the Cumberland River Basin. The District generates about $44 million in revenue from the sale of this power annually. This revenue is returned to the U.S. Treasury.

The Nashville District operates and maintains 1,175 commercially navigable river miles; almost 10% of the total within the U.S. Army Corps of Engineers. The district operates and maintains 14 navigation lock projects; nine on the Tennessee River, four on the Cumberland River, and one on the Clinch River. There are more than 40,000 commercial and recreational lockages annually. More than 74 million tons of commodities passed through these 14 locks during 2005. Wilson Lock in Alabama has the highest single lift east of the Rocky Mountains, between 93 and 100 feet, depending on the current river water level.

Regulatory Program

The U.S. Army Corps of Engineers has been involved in regulating certain activities in the nation's water since 1890. Prior to 1968, the primary thrust for the regulatory program was the protection of navigation. As a result of new laws and judicial decisions, the program has evolved to one that considers the full public interest by balancing the favorable impacts against detrimental impacts. The Nashville District annually handles more than 3,000 regulatory actions, 97% of which were evaluated in less than 60 days.

Section 10 of the Rivers and Harbors Act of 1899 **-** requires approval prior to the accomplishment of any work in or over navigable waters of the United States, or which affects the course, location, condition or capacity of such waters. Typical activities requiring Section 10 permits are:

•Construction of piers, wharves, bulkheads, dolphins, marinas, ramps, and cable/pipeline crossings.
• Dredging and excavation

Section 404 of the Clean Water Act **-** requires approval prior to discharging dredged or fill material into the waters of the United States. Typical activities requiring Section 404 permits are:
• Depositing of fill or dredged material in waters of the U.S. or adjacent wetlands.
• Site development fill for residential, commercial, or recreational developments.
• Construction of revetments, groins, breakwaters, levees, dams, dikes, and weirs.
• Placement of riprap and road fills.

Civil Works Program

The Corps' ongoing Civil Works responsibilities date back to the early 1800's when Congress authorized the removal of navigation hazards and obstacles. Over the years, succeeding Administrations and Congresses have expanded the Corps' missions to include most all water-related planning, development, and construction areas where a Federal interest is involved. Funds for Congressionally Authorized Projects are provided through Energy and Water Appropriations Acts and through contributions from non-Federal entities for specific projects.

Civil Works projects may also be funded under the Continuing Authorities Program (CAP). Congress has provided the Corps with standing authorities to study and build specific water resources projects for specific purposes and with specified spending limits. CAP projects are usually implemented in a faster time frame, are limited in complexity, have Federal cost limits, are approved by the Division Commander, and do not need Congressional authorization.

Nashville District Corps of Engineers Water Quality Program

The Nashville District Corps of Engineers collects a significant volume of physical, chemical, and biological water quality data every year. These data are collected at representative points both within all ten Nashville District lakes, on various major and/or

representative inflow streams, and in the tailwaters. Where there are known water quality problems, such as seasonal low DO in certain turbine releases, monitoring is significantly intensified to track and quantify a particular problem. This information is used to make informed decisions about how a project's powerplant should operate. Baseline, continuous recording, multiparameter water quality monitors keep track of conditions at critical points on the main stem of the Cumberland River from the mouth of the Obey River near Celina, Tennessee to the tailwater of Lake Barkley in western Kentucky. The monitor at the Old Hickory Dam tailwater, in particular, provides key information, since water discharged from Old Hickory must be able to absorb inputs from Nashville which is just downstream.

The data collected by the Nashville District are used to help determine watershed water quality trends and to provide for better management of the comprehensive reservoir system. The data are essential for running predictive water quality models, a growing trend in Corps' water management practice.

Additional information concerning projects, programs, and activities of the Nashville District Corps of Engineers can be obtained on the World Wide Web at http://www.orn.usace.army.mil/

Environmental Education

Environmental education opportunities are provided to area school age children by the Nashville District Corps of Engineers. Water Quality personnel have participated in environmental awareness programs for the past several years at the majority of Nashville District lakes. These programs are organized by the local lake Resource Management staff and involve various area schools. The programs provided allow students to have a "hands on" experience in water quality surveillance techniques. Typically the programs include an interactive discussion of overall water quality issues. This is supplemented with demonstrations of sophisticated water quality instrumentation, collection and analysis of biological specimens from local aquatic environments, and viewing of reference materials and preserved specimens. The value of such environmental education is enormous, because it reaches young people early in their lives and exposes them to a scientific learning experience that is impossible to duplicate in a formal classroom. This experience hopefully contributes to a greater lifelong awareness by the individual of the importance of conserving and improving water quality and wise use of water resources.

Additional Information

To obtain additional information about the District, please refer to the home page at: http://www.lrn.usace.army.mil/, or contact the following offices:

Public Affairs Office (General Information): (615) 736-7161
Regulatory Branch: (615) 369-7500

5.3. STATE PARTNERSHIPS.

5.3.A. TDEC Division of Water Supply. The Source Water Protection Program, authorized by the 1996 Amendments to the Safe Drinking Water Act, outline a comprehensive plan to achieve maximum public health protection. According to the plan, it is essential that every community take these six steps:

1) Delineate the drinking water source protection area
2) Inventory known and potential sources of contamination within these areas
3) Determine the susceptibility of the water supply system to these contaminants
4) Notify and involve the public about threats identified in the contaminant source inventory and what they mean to their public water system
5) Implement management measures to prevent, reduce or eliminate threats
6) Develop contingency planning strategies to deal with water supply contamination or service interruption emergencies (including natural disaster or terrorist activities).

Source water protection has a simple objective: to prevent the pollution of the lakes, rivers, streams, and ground water (wells and springs) that serve as sources of drinking water before they become contaminated. This objective requires locating and addressing potential sources of contamination to these water supplies. There is a growing recognition that effective drinking water system management includes addressing the quality and protection of the water sources.

Source Water Protection has a significant link with the Watershed Management Program goals, objectives and management strategies. Watershed Management looks at the health of the watershed as a whole in areas of discharge permitting, monitoring and protection. That same protection is important to protecting drinking water as well. Communication and coordination with a multitude of agencies is the most critical factor in the success of both Watershed Management and Source Water Protection.

Watershed management plays a role in the protection of both ground water and surface water systems. Watershed Management is particularly important in areas with karst (limestone characterized by solution features such as caves and sinkholes as well as disappearing streams and spring), since the differentiation between ground water and surface water is sometimes nearly impossible. What is surface water can become ground water in the distance of a few feet and vice versa.

Source water protection is not a new concept, but an expansion of existing wellhead protection measures for public water systems relying on ground water to now include surface water. This approach became a national priority, backed by federal funding, when the Safe Drinking Water Act amendments (SDWA) of 1996 were enacted. Under this Act, every public drinking water system in the country is scheduled to receive an assessment of both the sources of potential contamination to its water source of the threat these sources may pose by the year 2003 (extensions were available until 2004). The assessments are intended to enhance the protection of drinking water supplies within existing programs at the federal, state and local levels. Source water assessments were mandated and funded by Congress. Source water protection will be

left up to the individual states and local governments without additional authority from Congress for that progression.

Tennessee's Wellhead Protection Rules were revised as of October 29, 2005 to include requirements for similar protection for public water systems using surface water sources under the heading of Drinking Water Source Protection Rule (1200-5-1-.34) in addition to the previous requirements for wellhead protection for public water systems using ground water sources. The rule addresses surface or ground water withdrawals in the vicinity of public water sources as well as potential contaminant sources threatening public water sources to reflect the amended prohibitions in the 2002 Amendments to the Tennessee Safe Drinking Water Act, TCA 68-221-771. There are additional reporting requirements of potential contaminant source inventories and emergency response for the public water systems as well. The Division of Water Supply will be able to use the Drinking Water Source Protection Rule to work in complimentary fashion with the Division of Water Pollution Control and other Departmental agencies in activities to protect public water sources.

As a part of the Source Water Assessment Program, public water systems are evaluated for their susceptibility to contamination. These individual source water assessments with susceptibility analyses are available to the public at http://www.state.tn.us/environment/dws as well as other information regarding the Source Water Assessment Program and public water systems.

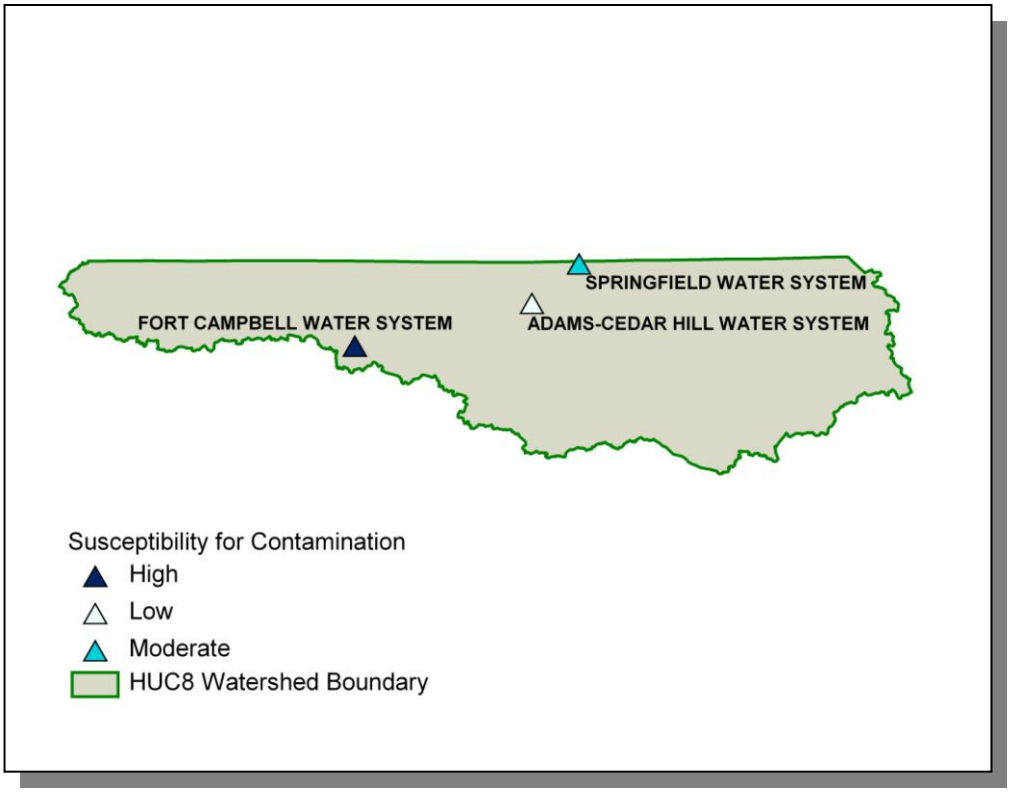

Figure 5-2. Susceptibility for Contamination in the Red River Watershed.

For further discussion on ground water issues in Tennessee, the reader is referred to the Ground Water Section of the 305(b) Water Quality Report at http://www.tdec.net/water.shtml.

5.3.B. State Revolving Fund. TDEC administers the state's Clean Water State Revolving Fund Program. Amendment of the Federal Clean Water Act in 1987 created the Clean Water State Revolving Fund (SRF) Program to provide low-interest loans to cities, counties, and utility districts for the planning, design, and construction of wastewater facilities. The U.S. Environmental Protection Agency awards annual capitalization grants to fund the program and the State of Tennessee provides a twenty-percent funding match. TDEC has awarded loans totaling approximately $550 million since the creation of the SRF Program. SRF loan repayments are returned to the program and used to fund future SRF loans.

SRF loans are available for planning, design, and construction of wastewater facilities, or any combination thereof. Eligible projects include new construction or upgrading/expansion of existing facilities, including wastewater treatment plants, pump stations, force mains, collector sewers, interceptors, elimination of combined sewer overflows, and nonpoint source pollution remedies.

SRF loan applicants must pledge security for loan repayment, agree to adjust user rates as needed to cover debt service and fund depreciation, and maintain financial records that follow governmental accounting standards. SRF loan interest rates range from zero percent to market rate, depending on the community's per-capita income, taxable sales, and taxable property values. Most SRF loan recipients qualify for interest rates between 2 and 4 percent. Interest rates are fixed for the life of the term of the loan. The maximum loan term is 20 years or the design life of the proposed wastewater facility, whichever is shorter.

TDEC maintains a Priority Ranking System and Priority List for funding the planning, design, and construction of wastewater facilities. The Priority Ranking List forms the basis for funding eligibility determinations and allocation of Clean Water SRF loans. Each project's priority rank is generated from specific priority ranking criteria and the proposed project is then placed on the Project Priority List. Only projects identified on the Project Priority List may be eligible for SRF loans. The process of being placed on the Project Priority List must be initiated by a written request from the potential SRF loan recipient or their engineering consultant. SRF loans are awarded to the highest priority projects that have met SRF technical, financial, and administrative requirements and are ready to proceed.

Since SRF loans include federal funds, each project requires development of a Facilities Plan, an environmental review, opportunities for minority and women business participation, a State-approved sewer use ordinance and Plan of Operation, and interim construction inspections.

For further information about Tennessee's Clean Water SRF Loan Program, call (615) 532-0445 or visit their Web site at http://www.tdec.net/srf.

5.3.C. Tennessee Department of Agriculture. The Tennessee Department of Agriculture's Water Resources Section consists of the federal Section 319 Nonpoint Source Program and the Agricultural Resources Conservation Fund Program. Both of these are grant programs which award funds to various agencies, non-profit organizations, and universities that undertake projects to improve the quality of Tennessee's waters and/or educate citizens about the many problems and solutions to water pollution. Both programs fund projects associated with what is commonly known as "nonpoint source pollution."

The Tennessee Department of Agriculture's Nonpoint Source Program (TDA-NPS) has the responsibility for management of the federal Nonpoint Source Program, funded by the US Environmental Protection Agency through the authority of Section 319 of the Clean Water Act. This program was created in 1987 as part of the reauthorization of the Clean Water Act, and it established funding for states, territories and Indian tribes to address NPS pollution. Nonpoint source funding is used for installing Best Management Practices (BMPs) to stop known sources of NPS pollution, training, education, demonstrations and water quality monitoring. The TDA-NPS Program is a non-regulatory program, promoting voluntary, incentive-based solutions to NPS problems. The TDA-NPS Program basically funds three types of programs:

- BMP Implementation Projects. These projects aid in the improvement of an impaired waterbody, or prevent a non-impaired water from becoming listed on the 303(d) List.

- Monitoring Projects. Up to 20% of the available grant funds are used to assist the water quality monitoring efforts in Tennessee streams, both in the state's 5-year watershed monitoring program, and also in performing before-and-after BMP installation, so that water quality improvements can be verified. Some monitoring in the Red River Watershed was funded under an agreement with the Tennessee Department of Agriculture, Nonpoint Source Program (U.S. Environmental Protection Agency Assistance Agreement C99944674-04-0).

- Educational Projects. The intent of educational projects funded through TDA-NPS is to raise the awareness of landowners and other citizens about practical actions that can be taken to eliminate nonpoint sources of pollution to the waters of Tennessee.

The Tennessee Department of Agriculture Agricultural Resources Conservation Fund Program (TDA-ARCF) provides cost-share assistance to landowners across Tennessee to install BMPs that eliminate agricultural nonpoint source pollution. This assistance is provided through Soil Conservation Districts, Resource Conservation and Development Districts, Watershed Districts, universities, and other groups. Additionally, a portion of the TDA-ARCF is used to implement information and education projects statewide, with the focus on landowners, producers, and managers of Tennessee farms and forests.

Participating contractors in the program are encouraged to develop a watershed emphasis for their individual areas of responsibility, focusing on waters listed on the Tennessee 303(d) List as being impaired by agriculture. Current guidelines for the TDA-ARCF are available. Landowners can receive up to 75% of the cost of the BMP as a reimbursement.

Since January of 1999, the Department of Agriculture and the Department of Environment and Conservation have had a Memorandum of Agreement whereby complaints received by TDEC concerning agriculture or silviculture projects would be forwarded to TDA for investigation and possible correction. Should TDA be unable to obtain correction, they would assist TDEC in the enforcement against the violator. More information forestry BMPs is available at:

http://www.state.tn.us/agriculture/forestry/bmpmanual.html

The complaint form is available at:

http://www.state.tn.us/environment/wpc/forms/wqlogging_cn1274.doc

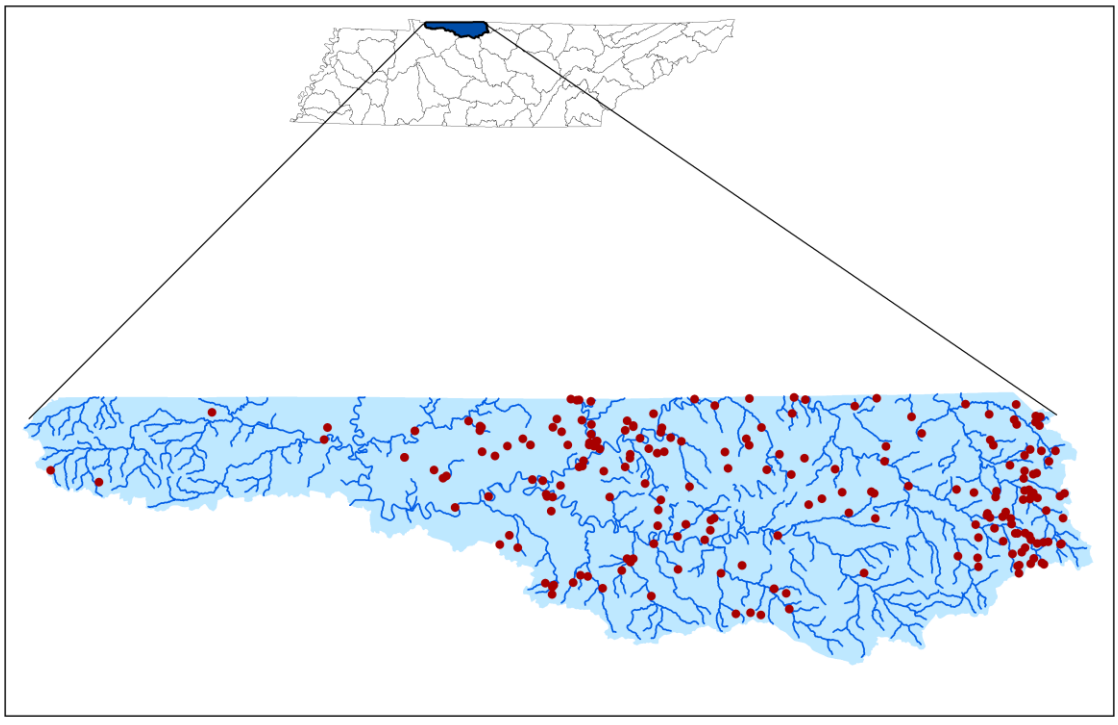

Figure 5-3. Location of BMPs installed from 1999 through 2005 in the Tennessee Portion of the Red River Watershed with Financial Assistance from the Tennessee Department of Agriculture's Nonpoint Source and Agricultural Resources Conservation Fund Grant Programs. *More information is provided in Appendix V.*

5.3.D. Kentucky Division of Water – Kentucky Watershed Management Framework. The Kentucky Watershed Management Framework is a dynamic, flexible structure for coordinating watershed management across the Commonwealth of Kentucky.

The Watershed Management Framework is not a new program, but rather a way of coordinating existing programs and building new partnerships that will result in more effective and efficient management of the state's land and water resources. Inherent in the design of the Framework is the belief that many stakeholder groups and individuals must have ongoing opportunities to participate in the process of managing the abundant natural resources that characterize Kentucky's watersheds.

Benefits to the people of Kentucky include:

- Better information for decision making
- Increased ability to resolve complex water resource problems
- Improved coordination among governmental agencies
- More opportunities for citizens to get involved
- Increased ability to demonstrate results and benefits of environmental management
- More cost-effective use of public and private funds

Each major river basin in Kentucky is staffed with a Basin Coordinator. Basin Coordinators are staff assigned to serve as a liaison in a given basin management unit among the agencies, the local interests, and the resources concerns. Their job is to specialize in their watershed, to know what resources might be available to address the concerns, and facilitate the watershed process to implement plans that address the problems.

For more information about the KY Watershed Management Framework visit our website at http://www.watersheds.ky.gov/

Watershed Framework activities in Red River Watershed are coordinated through the Four Rivers Basin Team. The Four River Basin Team is a multi-agency task force that meets regularly to help in development of monitoring strategies, education and outreach, prioritization of issues and watersheds within the basin, planning, and networking among technical staff and local leaders to apply agency resources to implement fixes. For more info about the Four Rivers Basin Team contact Bob Wise, Four Rivers Basin Coordinator at (270) 442-3343 or via email at robert.wise@jpf.org. The web address is http://www.watersheds.ky.gov/basins/four_rivers/

Red River Watershed

Summers Branch (05130206030)
Sulphur Spring Creek (05130206060)
Red River, below Prices Mill (05130206050)
Red River, below Adairville (05130206070)
Little Whippoorwill Creek (05130206080)
Red River, at Oakville (05130206090)
South Fork of Red River (05130206140)
Red River, below Keysburg (05130206160)
Whippoorwill Creek (05130206150)
Elk Fork, below Bradshaw (05130206180)
Elk Fork, below Allensville (05130206190)
Spring Creek (05130206250)
West Fork of the Red River (05130206230)
Little West Fork (05130206300)
Noahs Spring Creek (05130206280)

Geography. The Red River Watershed in Kentucky is comprised of about 700 square miles. In the south the watershed terrain is typical of the Western Pennyrile region with narrow stream valleys rising gradually to ridges and rolling hills. Elevations vary only 100-175 feet between valleys and ridge tops. The region is underlain by Mississippian limestone rock resulting in widespread karst topography. The extensive karst topography causes creeks to disappear into sinkholes and reappear at lower elevations at springs and glades. There are a number of swamps or wetlands that remain in the watershed.

Along the northern perimeter of the watershed is much more rugged with features like Rainbow Rock Knob, Luckett Knob and Buzzard Knob rising to more than 800 feet in elevation. This change is due to the Dripping Springs Escarpment that forms a boundary between the Western Pennyrile and the Western Coal Field regions. The escarpment is a line of hills formed by isolated Pennsylvanian- and Mississippian-age sandstones capping more erodible Mississippian-age shales and limestones.

Waterways. There are more than 700 miles of streams in the KY portion of the watershed. Primary tributaries to the Red River are Sulphur Spring Creek, Whippoorwill Creek, Little Whippoorwill Creek, South Fork of the Red River, Pleasant Grove Creek, Elk Fork, & West Fork of the Red River.

Due to the karst topography many tributaries disappear underground and reappear at lower elevations as springs or glades.

The upper 44.6 miles of the main stem of Whippoorwill Creek are Outstanding Resource Water due to the presence of littlewing pearlymussel (*Pegias fabula).*

Land cover/land use. The watershed is dominated by row crop agriculture. along with some livestock, swine, poultry and dairy production. Wetland areas and a few small areas along streams remain forested. Most of the forest areas remain on the rugged knobs and ridges along the escarpment in the northern part of the watershed. There are some residential areas in the near the communities of Adairville, Russellville, Pembroke, Trenton, Elkton and especially around Oak Grove and the Fort Campbell Military Reservation.

Agency Data Assessment. During the 2000 water quality assessment the stream reaches in the Red River Watershed were assessed.

- Lower 6.6 miles of Sulphur Spring Creek were assessed for fish and were judged fully supporting for aquatic life.
- A 7.0-mile segment of the main stem of the Red River, from the state line downstream to the mouth of Sulphur Spring Creek, was assessed for fish. This segment was judged partially supporting for aquatic life.
- A 4.2-mile segment of Little Whippoorwill Creek, from the mouth to Pleasant Run Creek, was assessed for fish. This segment was judged fully supporting for aquatic life.
- A 1.2-mile segment of the South Fork of the Red River was assessed for drinking water parameters and was judged fully supporting as a drinking water supply. A 5.3-mile segment of the main stem from the mouth to the Adairville Wastewater Treatment Plant was assessed for fish, but the data was judged to be inconclusive for support of aquatic life.
- The entire 2.2 miles of Pleasant Grove Creek were assessed for macroinvertebrates and fecal coliform bacteria. The stream was judged partially supporting for aquatic life and not supporting for primary contact recreation.
- An 8.7-mile segment of the main stem of the Red River, from the South Fork to Little Whippoorwill Creek, was assessed for fish, macroinvertebrates, algae, and fish tissue consumption. The segment was judged fully supporting for aquatic life and fish tissue consumption. An aquatic and riparian habitat survey conducted on this segment yielded a score in the fully supporting range. An additional 2.1-mile segment from Whippoorwill Creek to the South Fork of the Red River was assessed for fish, but the data was judged to be inconclusive for support of aquatic life.
- A 3.1-mile segment of the main stem of the Red River, from the mouth of Whippoorwill Creek downstream to the state line, was assessed for fish, macroinvertebrates, algae, water quality and fecal coliform bacteria. The segment was judged fully supporting for primary contact recreation but only partially supporting for aquatic life.
- The lower 13.0 miles of Whippoorwill Creek were assessed for fish, macroinvertebrates, algae, water quality and fecal coliform bacteria. The segment was judged fully supporting for both aquatic life and primary contact recreation.
- A 7.0-mile segment of the Elk Fork, from Dry Branch upstream to the city of Elkton, was assessed for fish and was judged not supporting for aquatic life.
- A 14.4-mile segment of the Elk Fork, from Dry Branch downstream to the Tennessee state line, was assessed for fish, macroinvertebrates and algae. This segment was judged fully supporting for aquatic life.

- An 11.9-mile segment of the West Fork of the Red River was assessed for fish, macroinvertebrates, algae, water quality and fecal coliform bacteria. The segment was judged fully supporting for aquatic life and primary contact recreation.
- A 0.8-mile segment of Dry Fork Creek was assessed for macroinvertebrates and was judged not supporting for aquatic life.

Watershed Efforts in the Red River. The Red River, at Oakville was one of three HUC 11 watersheds identified by the Four River's Basin Team as a priority watershed for watershed planning in the first cycle of the KY Watershed Management Framework. The Basin Team has worked with the Red River Watershed Association (RRWA), which has been the driving force behind activities within the watershed.

The primary area of focus has been on Pleasant Grove Creek, an impaired tributary to the Red River. Previously EPA funded projects from the 1990's have identified numerous sources of impairments to Pleasant Grove Creek. Dealing with the impairments is complicated due to the extensive karst topography in the watershed. More recent projects in the subwatershed include:

- EPA 319(h) funding to the RRWA to focus on sinkhole education and restoration in this subwatershed.
- Additional EPA funding has been allocated to the Cumberland River Compact to focus on innovative approaches to sustainable agriculture in this subwatershed.

In addition, the Red River Watershed was identified as a priority by the Joint Kentucky/Tennessee Water Quality Project. Both states will work together to identify sources of impairment using groundwater and surface water sampling.

5.4. LOCAL INITIATIVES.

5.4.A. The Cumberland River Compact. The mission of the Cumberland River Compact is to enhance the water quality of the Cumberland River and its tributaries through education and by promoting cooperation among citizens, businesses, and agencies in Kentucky and Tennessee.

We are a unique non-profit group that believes we can have both a strong economy and a healthy environment. The Compact is made up of businesses, individuals, community organizations and agencies working in the Cumberland River watershed. Over 2 million people share this watershed. Compact members work with all interested organizations and individuals to help ensure that our rivers and streams continue to provide us with clean water,bountiful crops, healthy fisheries and abundant recreational opportunities.

Since 1997, the Compact has set out to create a Watershed Outreach Program in each of the 14 watersheds that make up the Cumberland Basin. Members and staff of the Compact work with local communities to develop watershed forums where citizens can come together to learn more about their watershed and participate in developing a shared vision for the future. We welcome your interest and participation in this challenging project.

For more information about the Cumberland River Compact and to learn more about your local watershed, contact us at info@cumberlandrivercompact.org, 615-837-1151 or join us on the web at http://www.cumberlandrivercompact.org.

5.4.B. The Red River Watershed Association. The Red River Watershed Association (RRWA) is a community-based organization made up of Kentucky and Tennessee residents, stakeholders in the watershed dedicated to preserving and restoring the ecological health of the Red River. The mission of the Red River Watershed Association is “To enhance and protect the quality and quantity of the creeks, streams and springs of our area through activities that educate, promote community cooperation, and encourage responsible stewardship.” Through this mission, the RRWA addresses a wide range of challenges facing the Red River Watershed. Though non-confrontational in style, the RRWA actively seeks solutions to problems affecting water quality and quantity by seeking to understand all perspectives and working collaboratively with a wide range of interests to yield long lasting and practical results.

The RRWA's work is made possible by the scientific and technical training and experience of its staff and advisors and the participation of a diverse corps of volunteers who are crucial to its programs. The organization conducts field projects and monitoring studies to get a more detailed understanding of the threats and priorities in the watershed. Education and outreach efforts include sponsorship of public meetings and special events, training workshops, water quality education programs, canoe trips, stream clean-ups, streambank restoration and habitat improvement projects, and the publishing of literature on key issues/topics affecting the watershed. The RRWA has positive relationships and strong working partnerships with key environmental agencies, community groups, and academic institutions.

Initiated by the Cumberland River Compact in 2000, the RRWA held its first solo meeting in 2001. As a 501(c)(3) non-profit membership organization since 2002, the RRWA relies on the support of its members and generous individuals and corporations to provide critical funding that supports scientific and technical staff, gives flexibility to program work, and to leverage funding from government grants to put money to work in the watershed.

RRWA successes to date include:

- Annual canoe float trips on the Red River
- Multi-site stream clean-ups on the mainstem and tributaries to the Red River
- Public education meetings throughout the watershed focusing on key issues affecting water quality and quantity
- Sediment and bacteria monitoring studies
- A "Green Agricultural Practices For Watershed Management Exposition"
- Stream enhancement/restoration demonstration projects
- Conduct visual stream assessments of impaired creeks and streams in the watershed to establish protection priorities
- Strategic partnerships and collaborative work with landowners and agencies including Tennessee Department of Environment & Conservation's Division of Water Pollution Control, Tennessee Department of Agriculture's Non-point Source Program, Tennessee Wildlife Resources Agency, Kentucky Division of Water, local Natural Resources Conservation Service offices, organizations like the Cumberland River Compact, World Wildlife Fund, Four Rivers Basin team, Austin Peay State University's Center For Field Biology, and more

For more information contact:

RRWA
P.O. Box 1185
Springfield, TN 37172
Phone: 615-384-5622
Email: info@redriverwatershed.org
Web address: http://www.redriverwatershed.org

5.4.C. The Nature Conservancy (TNC). The Tennessee State Wildlife Action Plan (SWAP), formerly known as the Comprehensive Wildlife Conservation Strategy (CWCS), was developed by the Tennessee Wildlife Resources Agency with assistance from The Nature Conservancy in 2005. Congress mandated that each state and territory in the United States develop a SWAP as a requirement for continued receipt of federal State Wildlife Grant funding. These plans require the completion of 8 key elements of wildlife planning: 1) a list of animal species of greatest conservation need, 2) information about the distribution and abundance of species targets, 3) locations and relative conditions of key habitats, 4) descriptions of problems affecting target species and their habitats, 5) descriptions of conservation actions and priorities for conserving target species and habitats, 6) details for monitoring target species, conservation actions, and adaptive management, 7) discussion of plans to review the SWAP at specific intervals, and 8) information about coordination and implementation of the SWAP with major stakeholders. In Tennessee, the SWAP was integrated into a spatial model using Geographic Information Systems (GIS) and other database technology.

Priority aquatic, terrestrial, and subterranean areas for conservation were identified across the state. Priorities were determined in the GIS model based upon relative differences in species rarity, population viability, and potential mobility of species across habitat units. Priority problems affecting species and needed conservation actions are detailed across each region of the state For complete information about the Tennessee SWAP, please visit:
http://www.state.tn.us/twra/cwcs/cwcsindex.html to read or download the full report.

Contact:
Chris Bullington
State Conservation Planning Manager
The Nature Conservancy, TN Chapter
2021 21st Avenue South; Suite C-400
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5.4.D. The Five Rivers Resource Conservation and Development Council (RC&D).

Red River Watershed BMP work in Five Rivers RC&D Area

Five Rivers RC&D Council – The mission of the Five Rivers RC&D Council is to promote activities that will enhance the quality of life, conserve natural resources, and promote economic development in the council area.

The Five Rivers RC&D Council covers seven (7) counties in Middle Tennessee. Named for the 5 major rivers following through the area, the council serves Cheatham, Dickson, Houston, Humphreys, Montgomery, Robertson and Stewart Counties. With the natural resources and community activities being diverse in geography, the Council responds to the needs of their local communities, both for conservation issues and for economic and rural development. The collaboration of its numerous partners makes the Five Rivers RC&D Council area distinctive.

The Five Rivers RC&D Council assists in administering the USDA Resource Conservation and Development Program, which is a unique combination of private enterprise and federal assistance that encourages economic growth through development, conservation, and planned utilization of natural resources across the council area and Tennessee. Just a few services the RC&D Program is providing in our community are Conservation Education, Farmland Protection, providing Technical Assistance, ensuring Community Services, establishing Sustainable Development, encouraging Natural Resource Protection, and Communicating Local Issues.

The Five Rivers RC&D Council has worked with landowners along the Red River in Montgomery and Robertson Counties to demonstrate solutions to sedimentation and non-point source pollution loading by installing Best Management Practices along sensitive stream segments. Assisting the Natural Resources Conservation Service and the Red River Watershed Association in developing conservation plans to include new techniques for stream crossing and watering livestock animals has proven to be critical to influencing adjacent landowners.

The environmental problems addressed within the watershed were caused by severe streambank erosion from changes in the stream channels, livestock accessibility to these streams, a lack of buffer and riparian zones, and some improper farming techniques that have impaired the stream systems.

Some of the management practices include solar ram pumps for watering troughs to provide fresh clean water supplies for cattle and fences to exclude livestock from access to ponds or adjacent stream. The landowners used geo-textile fabrics and bioengineering to restore streambanks and to provide protection against future river swells. The stabilization of the slopes allowed the landowners to establish a stream crossing for farm and heavy equipment to gain access to secluded portions of their property. Landowners reduced sedimentation by improving their pasture lands and providing intensive rotational grazing systems to adequately feed forages and maintain healthy open lands. The improved varieties of grass were better suited for Middle Tennessee's drier conditions. The opportunity to establish some native warm season grass plots for wildlife habitat was made possible through some USDA farm programs.

The project installations totaled over $12,000 in addition to improving the water quality along the Red River. The aquatic habitat remains intact and the rare native plants have a better environment to flourish. The knowledge carried on by these landowners speaks to their neighbors, ensuring the rest of the farming community grasped these conservation concepts for their own benefit and for the benefit of generations to come. These conservation measures are also being used in Kentucky within the Red River Watershed, for cross state improvements.

For more information on the Five Rivers RC&D Council and its programs, contact Chandra Berry-Owens, NRCS-RC&D Coordinator at 931-368-0252 ext. 5 or visit the web site http://www.FiveRiversRCD.org.