Oklahoma's NPS Annual Report

FY 2005

Oklahoma Conservation Commission

OKLAHOMA'S NONPOINT

Oklahoma's Nonpoint Source (NPS) pollution program is a combination of federal, state, and local agency programs. The Oklahoma Conservation Commission (OCC) is the technical lead agency and the Office of the Secretary of Environment (OSE) is the administrative lead agency for the program.

The Program's vision statement, ***"Responsible Care for Oklahoma's Natural Resources"*** allows for the protection and utilization of natural resources. Responsible care implies that sound management techniques will be followed and that continual maintenance is required to insure protection of our resources for future generations.

The vision is further refined to address water resources. Although NPS pollution may directly influence soil and air quality, all NPS pollution ultimately affects water quality. The program's mission statement further delineates the program's vision:

"Conserve and Improve Water Resources through Assessment, Planning, Education, and Implementation"

The mission statement guides the activities of the NPS Program by developing a foundation for conservation, improvement, and restoration of water resources.

Oklahoma Conservation Commission's Responsibilities

The OCCs goal is to provide for the conservation of the state's natural resources through a voluntary approach.

The OCC has statutory jurisdiction over:

- monitoring, evaluation, and assessment of the state's waters to determine the extent of NPS pollution;
- soil conservation and erosion control;
- wetland protection and conservation strategy; and
- assessment and conservation plan development and implementation.

The OCC works in collaboration with the 88 Conservation Districts to accomplish the above goals. Through this partnership, the OCC has contact with landowners and local leaders through which water quality programs are implemented.

The two OCC divisions that play a critical role in the NPS Management Program are the Conservation Programs Division and the Water Quality Division (OCCWQ). The Conservation Programs division provides technical assistance to conservation districts in three major program areas: upstream flood control, conservation cost-share, and conservation education. The division assists districts in the new construction, rehabilitation, operation, and maintenance of upstream flood control structures. These structures help reduce flooding and sediment delivery, which may also reduce downstream bank erosion.

The Conservation Programs division administers the Locally-led Cost-Share Program. This program, funded through the State legislature, provides monies to districts to install best management practices to reduce erosion and improve water quality. These monies are available on a cost-share basis with at least 40% match required from the landowner. Through this program, NPS pollution reduction activities are implemented statewide.

The Conservation Education Program involves teacher training, technical assistance to districts, outdoor classroom development, and cooperative projects with other agencies and higher education entities. Conservation Programs coordinates the agency's role as cosponsors of three education curricula – Project WET, Project WILD and Project Learning Tree. The Division also handles the Commission's statutory responsibility to coordinate environmental and natural resources education for the state through the Oklahoma Environmental Education Coordinating Committee chaired by the Commission.

As the State's technical lead for NPS pollution and the §319 Program, the OCCWQ works with Conservation Districts, Universities, and other agencies to implement the State's NPS Management Program. We chair the NPS

SOURCE PROGRAM

Working Group, composed of state and federal agencies, tribes, nonprofit organizations, and other groups with NPS interests in the State. OCC represents the NPS program in various working groups, meetings, planning sessions, and program reviews related to water quality efforts in the State.

The goals of OCC require the collection of consistent, accurate, and complete water quality data. OCCWQ works towards these goals by strictly following quality assurance protocols to generate outputs and reports. We assess the quality of aquatic systems by collecting fish, macroinvertebrates, habitat, physical, and chemical data. This information is an invaluable resource for controlling and preventing NPS pollution. Without background and diagnostic information, demonstration projects designed to restore or avoid pollution impacts would be less effective.

Oklahoma Conservation Commission Water Quality Division.

OCCWQ is home to the Blue Thumb Program, a NPS water quality education program that utilizes volunteers to spread its messages. Blue Thumb partners with Conservation Districts and other groups to teach citizens about the importance of protecting their water quality. Blue Thumb also provides opportunities for citizens to implement the lessons they have learned with activities designed to reduce NPS pollution like curb-marking, stream clean-ups, household pollutant collection events, and workshops.

As the primary recipient of § 319 (h) funding in the State, the OCCWQ division oversees the implementation of numerous projects designed to demonstrate practices to reduce NPS pollution. These projects range from Statewide or regional programs to watershed wide implementation efforts, designed to reduce NPS pollution by a specific amount. Implementation efforts occur on a cost-share basis and are targeted towards the entities producing the greatest pollutant loads.

Overall, the OCCWQ is committed to protecting and restoring watershed quality throughout the state. We accomplish this work with a staff of dedicated individuals, committed to improving water quality and creating a healthier environment. This qualified staff consists of various Associate's, Bachelor's,

Goal	Progress in 2005	% of goal completed in 2005	%/year needed to meet goal	% of goal completed since 2000
1	Expanded Implementation began in 2 top ten priority watersheds	20%	10%	50%
2	Data collection is completed for the first four cycles of Rotating Basin Monitoring Program	10%	7%	80%
3	Added 5 new Blue Thumb Programs	6%	10%	55%
4	1 Watershed Based Plan was drafted.	10%	10%	50%
5	Continued State-funded cost-share programs in priority watersheds and statewide.	NA	NA	NA

Master's, and Doctoral degrees. This is a diverse team of biologists, environmental scientists, ecologists, foresters, planners, education specialists, and more with over 350 years of cumulative experience in water quality and related fields.

Oklahoma's Nonpoint Source Management Program FY 2005 Progress

Oklahoma's Nonpoint Source Management Program defines the State's goals for addressing NPS pollution through 2015. Oklahoma identified long-term goals of establishing and implementing programs to attain and maintain beneficial use support in the State's waters. To further these goals, the State set five short-term goals: 1) implement NPS control programs in priority watersheds; 2) identify sources in watersheds threatened or impaired by NPS pollution; 3) increase the number of water quality-enhanced education programs across the State to 100% of the Conservation Districts; 4) draft Watershed Restoration Action Strategies to address priority watersheds; and 5) identify additional sources of funding to address NPS concerns.

Oklahoma is making significant progress towards our NPS Management Program short-term goals through assessment, planning, education, and implementation.

The State has ongoing or completed programs in five of the top ten priority watersheds. A project began in October 2003 to expand an existing priority watershed project to new parts of the watershed and programs expanded in one of those watersheds in response to a TMDL in October 2004.

Projects to collect Statewide data to delineate reference streams are complete and data analysis on a Statewide level will be complete in February 2006. Once reference streams have been delineated statewide, comparison of stream water quality will help identify streams with potential water quality problems. Comparison of landuse and other data between reference stream watersheds and the watershed of the stream in question should help identify potential sources of NPS pollution. Data collection is complete for the first four cycles of the Rotating Basin Monitoring Program.

Forty-two Counties now have active Blue Thumb (BT) programs. This is an increase of five districts since 2004. The program has completed more than forty percent of its ultimate goal to have BT programs in every conservation district. An additional five groups should begin programs in FY 2006.

Watershed Restoration Action Strategies (WRASs) or Watershed-based Plans have been drafted for five of the top ten watersheds. Two additional Watershed-based Plans will be drafted in FY 2006.

Alternative sources of funding have been difficult to locate with State budget shortfalls. The State legislature funded a cost-share program to address water quality and soil erosion concerns. OCC also worked in 2005 to identify and quantify sources of nonfederal matching funds that had previously not been summarized. This included accounting for volunteer time devoted to NPS activities and utilizing more private funds as match. Also in 2005, the OCC devoted significant effort towards garnering State support for a Conservation Reserve Enhancement Program (CREP) in 3 of the top ten priority Watersheds. Nonfederal match is anticipated to be allocated through the City of Tulsa, Scenic Rivers Commission, and State Legislature in 2006. The State anticipates a $65,000,000 CREP program to protect riparian areas

and reduce NPS pollution in the Eucha/Spavinaw, Illinois River, Fort Cobb Reservoir, and Sugar Creek Watersheds.

Cooperative State Efforts to Address NPS Pollution

Oklahoma's environmental agencies continued to collaborate in 2005 to advance and integrate water quality programs. These efforts included Integration of Surface water and Superfund Program Planning in the Grand Lake Watershed, Use Support Assessment Protocols (USAPs), Probabilistic Monitoring Programs, Scenic Rivers Monitoring Proposals, and Water Quality Standards.

Led by ODEQ, Oklahoma Agencies began to participate in an EPA Region VII-led effort to develop a Superfund-focused Watershed Based Plan for the Tri-State Mining Area in the Grand Lake Watershed. As a result of a series of meetings beginning in March 2005 in Joplin, MO., the Superfund program agreed to allow review of their monitoring program to better meet the needs of and coordinate with ongoing surface water programs in the watershed. In addition, ODEQ agreed to compile a database of research that had been completed in the Tri-State Mining Area and to host a calendar of events.

The main NPS-related topics for the 2005 OWRB Water Quality Standards revision process included a Sediment Use Support Assessment Protocol (USAP), Nutrient Criteria for Select Classes of Lakes, newly designated Nutrient Limited Watersheds, and clarification of the definition of a Watershed. Several meetings were held in August and September of 2005. Additional meetings were held in October and November and this process will culminate in a formal hearing in January 2006.

The OCC worked closely with the OWRB to evaluate data under a proposed Sediment USAP which would initially focus on streams currently listed on the Integrated Report as being impaired based on poor fish collections. The USAP would allow the use of habitat data to determine whether the biological impairment was related to sedimentation.

The OWRB proposed nutrient-related criteria of 10 µg/l chlorophyll-a for lakes designated as sensitive waters supplies (approximately 65 lakes). Adoption of this criteria would lead to listing of approximately 18 of these lakes on the 2006 Integrated Report's 303 (d) list. In addition, OWRB listed Thunderbird and Tenkiller Lakes as Nutrient Limited Watersheds.

The OWRB continued beneficial use support assessment monitoring of approximately 180 river and stream sites 10 times per year and quarterly monitoring of approximately 60 state lakes through the Beneficial Use Monitoring Program (BUMP). The OWRB monitoring initiative also includes coordination of a volunteer water quality monitoring program. Resulting information will be compiled into the 2005 BUMP Report.

Other monitoring programs included OCC monitoring efforts, Oklahoma Department of Agriculture pesticide and groundwater sampling, ODEQ sampling including biological sampling for fish flesh analysis, and Oklahoma Department of Wildlife Conservation investigations of fish kills and sampling associated with their aquatic programs.

Considerable water quality monitoring programs are also ongoing, conducted by Federal partners including the Army Corps of Engineers, the U.S. Geological Survey, U.S. Fish and Wildlife, the Bureau of Reclamation, and the Environmental Protection Agency. This data is used in all stages of the NPS Program.

Education is a major tool the State uses to address NPS pollution. Numerous agencies work together to provide water quality education opportunities across the State. Agencies including OCC, OWRB, Oklahoma Cooperative Extension Service, and ODEQ have education programs that include Nonpoint Source Education. Education between agencies is also an important part of successful State programs. In 2005, OCC again offered a fish identification course to interested State, Tribal, and local partners. The fish ID course serves as an annual QA session, insuring accuracy and consistency among fish identification and collection methods among agencies. In addition, the OCC shares the considerable knowledge about fish identification and collection methods with other entities.

The Office of the Secretary of Environment coordinated an course titled "In-depth Data Analysis and Interpretation for Tribes" March 22-25th, 2005, as part of their tribal training series. The training offered a means for State Agency personnel to explain the types of statistical analyses currently used to summarize commonly-collected water quality data.

The U.S. Army Corps of Engineers Tulsa District Office began work with the State of Kansas, the City of Tulsa, and other partners to draft Watershed Based Plans for Lake Oolagah and the Eucha/Spavinaw Watersheds.

The ODEQ continued to work on TMDLs for the State, notably completing the first entirely NPS-based TMDL, the Fort Cobb Reservoir TMDL, discussed later in this report. In addition, ODEQ completed nine other TMDLs during FY 2005. ODEQ continues to improve access to and visibility of the State's Water Quality Data through their online data viewer and GIS map, available at http://maps.scigis.com/deq%5Fwq/.

MONITORING

2005 OCC Monitoring Efforts

The NPS Assessment Program is the basis for identifying the location and extent of NPS-related water quality problems. Assessment also helps focus NPS program planning, education, and implementation efforts in areas where they can be most effective.

The goal of assessment varies with the projects' objectives, but assessment activities are generally geared towards one or more of the following: 1) cataloguing natural conditions or identifying streams being impacted by human activities; 2) identifying the sources of water quality problems; and 3) determining the success of corrective or protective measures.

The OCC assessment program provides a comprehensive and statistically sound evaluation of the state's waters every five years. This dynamic system can be annually updated when impacts are identified to allow Oklahoma to respond to newly identified NPS threats. During 2005, monitoring was conducted at more than 190 sites through the Rotating Basin Monitoring Program (RBMP), Blue Thumb Volunteer Monitoring Programs, Lake Eucha Priority Watershed Implementation Projects, and Peacheater Creek National Monitoring Program.

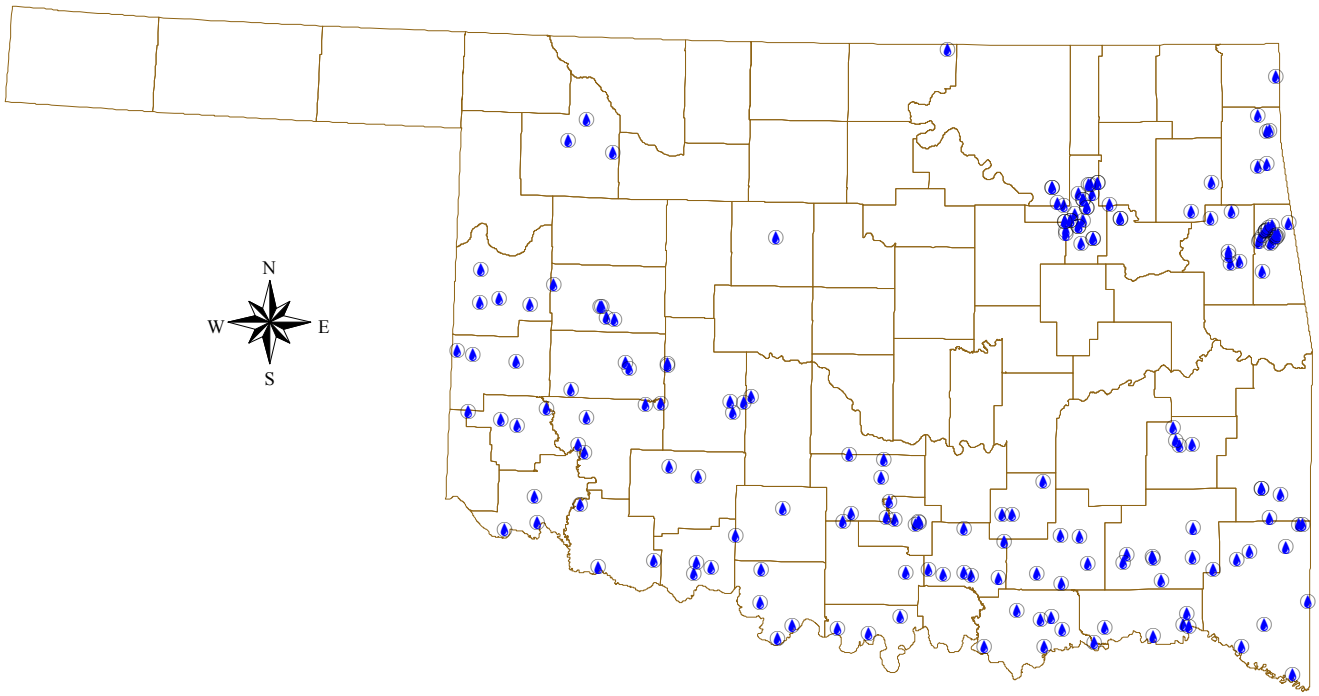
OCC routinely monitored approximately 115 sites through the Rotating Basin Monitoring Program (RBMP) in the Upper North Canadian, Cimarron, Upper Arkansas, Lower North Canadian, Lower Canadian, Lower Arkansas, Washita, and Upper Red Basins. Chemical and physical samples were collected monthly, macroinvertebrates were collected twice a year (winter and summer), and fish were surveyed once a year at each site. Objectives of this monitoring include: 1) beneficial use support status at HUC 11-digit watershed outlet, 2) verification or removal of 303(d) listed streams, 3) categorical and geographical identification of causes and sources of impairment, and 4) to gather necessary data for planning restoration strategies.

Field staff also assisted with fish collections at Blue Thumb volunteer monitoring sites. Fish communities are assessed at Blue Thumb sites once every three years. Blue Thumb volunteers collected water quality, habitat, and biological data at more than 60 stream sites across the State.

Post-implementation monitoring continued on the Peacheater Creek National Monitoring Program Project. Nine sites in Peacheater and Tyner Creek watersheds are monitored intensively in a program mimicking the pre-implementation monitoring. This monitoring will continue for at least 2 years. Additional monitoring was conducted for the Beaty Creek Watershed Implementation Project.

2005 marked the beginning of the OCC effort to implement a bacterial source tracking monitor-

2005 OCC Monitoring Sites



ing program in the Eucha/ Spavinaw watershed to clarify significant sources of fecal bacteria in that watershed. The Oklahoma Department of Agriculture, Food, and Forestry Laboratory has partnered with OCC to complete this effort.

Also in 2005, the OCC cooperated with the Oklahoma Water Resources Board in the early stages of a probabilistic monitoring program for the State. 2005 probabilistic sampling included collection at approximately 23 sites in the Grand-Neosho River Basin and approximately 44 sites in the Lower Red River Basin. The two agencies, along with other partners, will continue to expand a probabilistic program to cover the entire state.

OCC completed flow monitoring in the Turkey Creek watershed to assist ODEQ with development of the TMDL for Turkey Creek. In 2003, analysis of available data for TMDL completion revealed that previous monitoring programs by the OCC and USGS were sufficient for TMDL estimation with the exception of an annual hydrograph for the watershed. Therefore, OCC installed a stage recorder near the watershed outlet and measured flow for more than a year. The data was utilized by ODEQ for the TMDL.

OCC continued to implement its quality assurance program in 2005 with quarterly calibration sessions among field staff, annual field audits, and annual fish identification training to insure that the various field collection staff continue to implement methods true to the Standard Operating Procedures and that variability between individuals is low.

Assessment activity will continue to evolve in 2006 as we return to the original basins with the RBMP program, beginning its second cycle, and address the State's changing needs. We look forward to expanded monitoring partnerships with peer agencies. Particularly important will be the continuation of collaborative efforts with the OWRB to develop and implement a probabilistic monitoring program. OCC will also incorporate a probabilistic component into its RBMP Program.

Blue Thumb Volunteer Monitors Collect Stream Stage Information.

OCC Water Quality Specialists Seine During Fish Collections as Part of the Rotating Basin Monitoring Program.

PLANNING

Financial Report

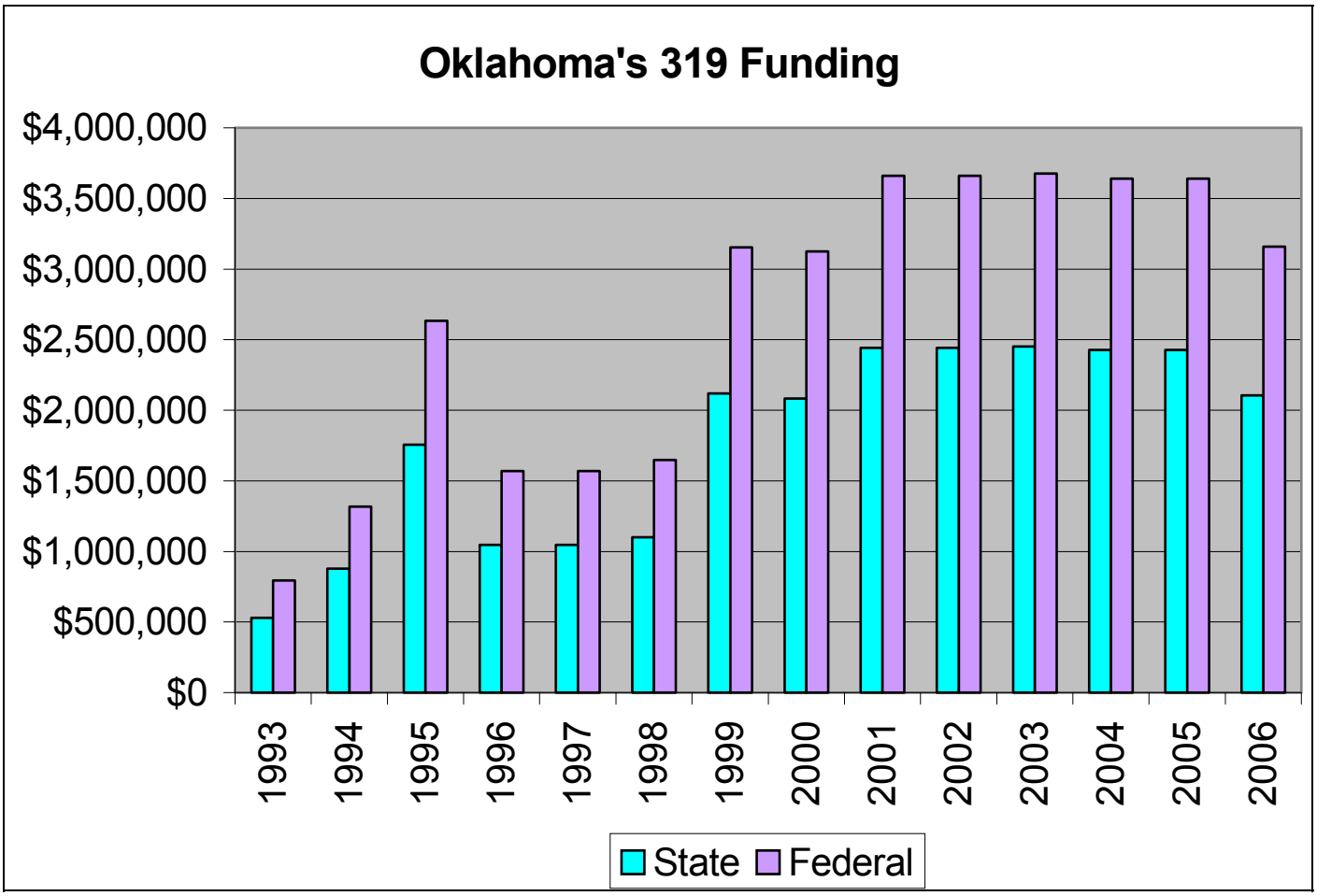
The NPS Program has shown remarkable growth over the past decade. The Federal budget for the Oklahoma Program has grown from the FY 1993 319(h) grant of $793,000 to the $3.15 million grant currently planned for the FY 2006 program.

The recent federal budget crisis has led to a substantial reduction in the program. Federal cuts amounting to more than 13% between 2004 and 2006 of $481,600 have resulted in a total program reduction of $802,666. This reduction translates to implementation of fewer NPS load reduction activities. In addition, the forty-percent match requirement of the program, which Oklahoma meets mostly with hard match, translates to a much larger program reduction.

State resources spent on NPS control have also grown. Between 1993 and 1998, only $65,000 of state funds were annually budgeted for demonstration of nonpoint source controls. However, in 1999 the State substantially increased efforts towards NPS implementation with the State Cost-Share Program. State funding for a statewide nonpoint source control effort grew substantially with the introduction of the State Cost Share Program. In the year 2000, the state dedicated $500,000 to help farmers implement practices that protect water quality. Since then, between $250,000 and $1,500,000 per year has been available for farmers to implement best management practices. With the FY 2001— 2005 319(h) budget matched forty percent by state and local funds, the overall program ranges between five and six million dollars per year.

These increases in state monies are critical to future success of the program. Hard match, as opposed to soft match such as inkind services, enables significantly more best management practices to be put on the ground and therefore greater protection of our natural resources. The lean State budgets of the past few years have resulted in a shortfall in State cost-share funds which has limited the number of best management practices that can be implemented. Recent upswings in the State budget should help reverse this trend.

Local participation is necessary



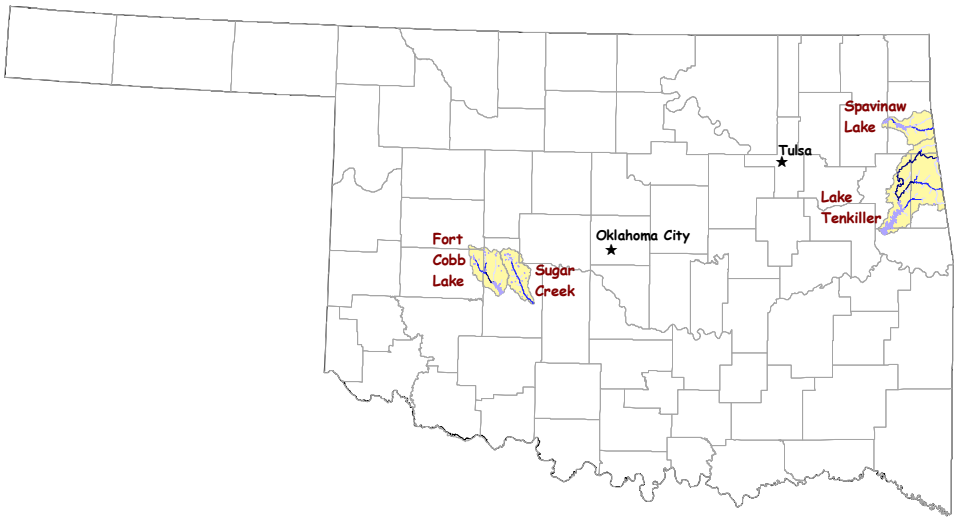
to insure success of federal programs so that the programs are more likely to affect continued behavioral change, rather than temporary practices to qualify for subsidies.

Conservation Reserve Enhancement Program

Although the 319 Program has been very successful at demonstrating practices and programs to address nonpoint source pollution, it was never intended to be a stand-alone solution to water quality problems. The OCC has been working with conservation districts, the Oklahoma Association of Conservation Districts (OACD), NRCS, Farm Services Agency (FSA) and other partners to find programs to extend the success of 319 programs, both in duration and extent. One of the most promising of these programs is the Conservation Reserve Enhancement Program or CREP.

CREP is an off-shoot of the continuous sign-up Conservation Reserve Program (CRP). CREP differs from CRP in that States are allowed to "enhance" the program to meet the State's specific needs and the encourage more extensive sign-up in the program. NRCS and FSA in Oklahoma had long believed that Oklahomans were mostly unwilling to participate in riparian programs because of their limited success in enrolling landowners willing to implement riparian BMPs. However, OCC and Conservation Districts have enrolled more than 130 landowners in riparian protection programs through priority watershed projects, suggesting Oklahoma landowners are willing to implement riparian BMPs.

Riparian Protection is the foundation of the CREP program in Oklahoma..



Oklahoma CREP Watersheds include Fort Cobb and Sugar Creek in Caddo County, and Spavinaw and Tenkiller Lake Watersheds in eastern Oklahoma.

Based on landowner concerns raised after implementing riparian areas through 319 programs, the CREP enhancements will include higher cost-share rates on fencing, expansion of potential riparian widths to up to 30% of the flood plain to reduce likelihood of fence wash-outs, fescue and Bermuda as additional alternatives for the grassed zone of the buffer, winter feeding facilities, and expansion of the distance from the riparian zone for placement of alternative water sources to encourage use of upland areas for pasture and lowland areas for haying.

The Oklahoma CREP will attempt to install approximately 24,000 acres of riparian area in the Illinois River, Fort Cobb, Eucha/Spavinaw, and Sugar Creek Watersheds. The program will invest approximately $67,000,000 of Federal, State, and other partner dollars.

Working with OACD, the OCC has expanded its usual program partners beyond EPA, OSE, Conservation Districts, and USDA to include the City of Tulsa, The Scenic Rivers Commission, The Nature Conservancy, and potentially the

The Oklahoma CREP will offer Winter Feeding Facilities to encourage cattlemen to reduce cattle grazing and feeding near streams or other water ways.

Pastures such as this will be targeted by CREP to protect the riparian area. Establishing a natural buffer between pastures and streams will reduce nutrient, sediment, and bacteria loading to streams and stabilize eroding banks.

Cherokee Nation and American Electric Power (AEP). These new partners will invest monies in permanent easements, streambank stabilization, riparian protection, water quality monitoring, and tree planting for carbon credits. These investments will be matched 80% by federal dollars to increase the amount of riparian area that can be protected through the program.

The CREP Program is anticipated to begin in 2006.

Soil and Water Assessment Tool (SWAT)-Based Water Quality Targeting

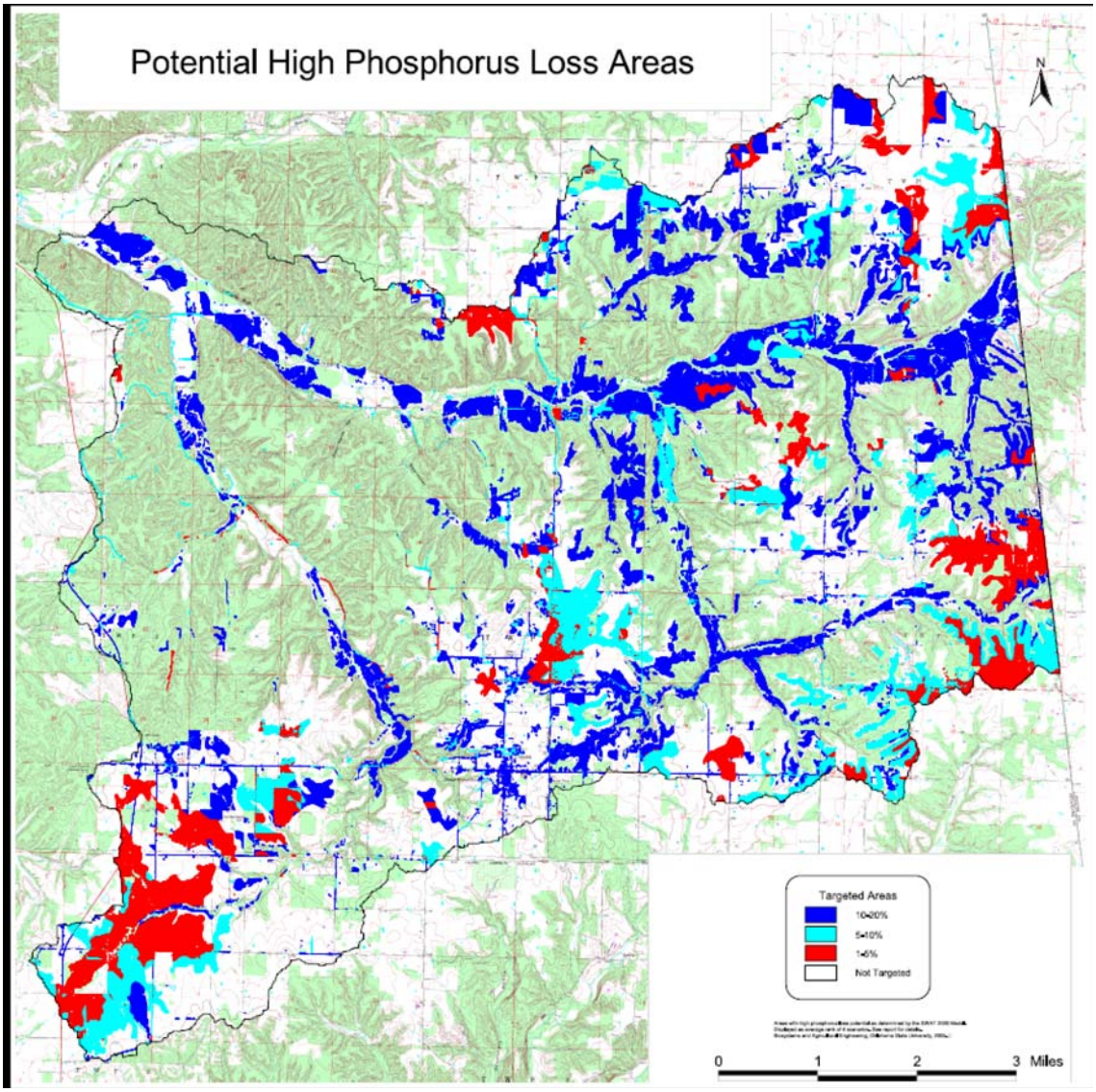
Recent reductions in the 319 program have increased the importance of efficient utilization of remaining monies.

Oklahoma's program has sought to direct as much of its program dollars as possible into implementation of load-reducing best management practices (BMPs), redirecting excess dollars from personnel, supplies, and similar categories into implementation dollars whenever possible. In addition, with the support of EPA Region VI and Oklahoma State University Department of Biosystems and Agricultural Engineering, OCC continues to develop more precise methods of targeting the landowners that should be eligible for our programs based on whether their land is likely a significant contributor to loading in the watershed.

The 319 program primarily utilizes the SWAT model as the backbone of its targeting efforts. SWAT is the

primary model the ODEQ utilizes to develop the NPS portion of Total Maximum Daily Loads (TMDLs). Utilization of the same model insures that BMPs will be targeted towards the same locations in the watershed the TMDL estimates as significant contributors, further insuring that the NPS program will be working to address TMDL recommendations as possible.

During 2005, targeting was completed for the Spavinaw Creek Watershed as part of a 2003 319 Project, and the Turkey Creek Watershed, as part of a 2002 Project. The Spavinaw targeting results were shared with NRCS and the City of Tulsa. The City of Tulsa will utilize the targeting results to help direct their planned program to establish permanent easements in the Eucha/Spavinaw Watershed.



Spavinaw Creek Phosphorus Targeting results predict areas of the watershed that contribute most significantly to phosphorus loading.

The OCC will utilize the targeting results to determine which landowners qualify to participate in the 2003 program. In addition, the OCC will contact each landowner in the targeted area to explain the program and the benefits it offers landowners and the environment.

During 2006, the OCC will work with partners to complete targeting in the Oklahoma portion of the Grand Lake Watershed and Honey Creek watershed in Missouri and Arkansas. These results will guide implementation in a 2006 project in the Honey Creek watershed, and in future Grand lake efforts.

Development of Guidelines for TMDLs with Nonpoint Source Components using SWAT

The most frequently used model to analyze NPS loading in Oklahoma is the SWAT model. Much of this watershed modeling has been completed by Oklahoma State University Biosystems and Agricultural Engineering Department Professor Dr. Dan Storm.

Dr. Storm has provided training to Oklahoma State Agencies on the use of the SWAT model for NPS TMDL development. In addition, under a 1999 319 project, he developed a guidance manual detailing the process involved in data collection and analysis to develop the model for particular watershed, along with the necessary quality assurance required for model runs.

The manual also discussed the strengths and weaknesses of the SWAT model, particularly as it pertained to situations where it might not be the appropriate model for estimating NPS loading in a watershed.

The manual has been supplied to ODEQ for use in their TMDL program and will be provided to any subcontractor that OCC works with to complete watershed targeting using the SWAT model.

EDUCATION

Blue Thumb Programs

The Blue Thumb (BT) Programs are designed to develop ongoing environmental volunteer education programs through a "train-the-trainers" concept. A community-based organization is developed that has resources to address local problems. Community changes come from within rather than from outside. This imparts an air of responsibility and community control that is often lost by mandated activities. Grassroots involvement is a proven agent of change and is an essential component to a proactive and dynamic NPS program.

Forty-two counties now have active Blue Thumb programs. This is an increase of five new programs since 2004. The program has now completed 55 percent of its ultimate goal to have BT programs in every conservation district. Blue Thumb staff kept busy with recruiting, trainings, orientations, quality assurance sessions, monitoring, and general presentations.

The Blue Thumb Program adapts to meet the needs of its volunteers. Some volunteer groups focus on education events such as Earth Day and environmental cleanups. Others are concerned about groundwater used as a drinking water source. For others, Blue Thumb is a volunteer monitoring program.

Volunteer monitoring is an important part of most BT programs. During 2005, BT volunteers monitored 83 stream sites for dissolved oxygen, temperature, chloride, nitratenitrogen, ortho-phosphate, pH, ammonia nitrogen, and

A large group of McCurtain County residents attended a Blue Thumb volunteer training in Idabel in Spring 2005. The volunteer monitoring program is just one important aspect of Blue Thumb's education efforts.

physical characteristics including relative stage, water clarity, and visual observations such as trash, foam, or other debris. Volunteers monitor water quality at their sites once a month and forward the data to the BT Quality Assurance Officer. Volunteers also participate in benthic macroinvertebrate collections and fish collections at their sites. During 2005, volunteers collected benthic samples at 83 sites and fish collections at 21 sites. Blue Thumb held 3 groundwater screenings in 2005 to help homeowners identify potential concerns with their well water.

Blue Thumb requires a substantial commitment from its volunteers including monthly sampling and quarterly quality assurance (QA) checks. These QA sessions are held across the state and help assure both the volunteers and BT staff that the data collected is of acceptable quality. The QA sessions also provide volunteers an opportunity to ask questions and to restock their monitoring kits with necessary supplies. Over 15 QA sessions were conducted during 2005.

Blue Thumb Programs had many successes in 2005. These include:

The No-till seminar in Fort Cobb Watershed was attended by more than twice as many area farmers as expected. High fuel costs have made less intensive management options such as no-till more popular than ever.

- The Fort Cobb Project Blue Thumb Program in the West Caddo, Deer Creek, North Caddo, and Mountain View Conservation Districts held a No-Till Seminar on August 15, 2005 to discuss the merits of no-till farming. Sponsored by the OCC, Noble Foundation, Southern Plains Ag Resource Coalition, and Great Plains Resource Conservation and Development Council, the seminar attracted 152 farmers from the Fort Cobb area, more than double the expected attendees. Adoption of no-till management is one of the BMPs suggested by the 2004 Fort Cobb Draft TMDL, and the focus of a 2005 319 Priority Watershed Project.

Brandon Faulkenberry, Project Coordinator for the Wister Watershed Project, leads a group of college students and local landowners on a best management practice tour to discuss pasture management.

The Wister Lake Priority Watershed Project wrapped its five year program to demonstrate methods to address NPS pollution in the Wister Watershed. The Wister Lake Watershed 319 Education Program utilized youth and adult education programs to increase awareness about the water quality problems in the watershed and to offer potential solutions to the problems. These events included Natural Resource Days, Land and Forestry Contests, Environmental Teacher Workshops, Poultry Education Meetings, Tours of BMPs, logging workshops, and informational articles for local newspapers. The program attempted to develop

The Blue Thumb stream team from Gage High School includes (from left, front row) Tori Long, Alisa Yeomans, and Katheryn Moyer. Back row from left are Fletcher Mackey, Desire Deviney, Lacy Hutson, Blue Thumb's Kim Shaw, Jenni Griffith, Jared Clark, and Aaron Long. The team is standing on the banks of Wolf Creek in Ellis County. They have just completed a fish collection.

an education program that would continue beyond the length of the 319 project, supported by the conservation districts, local schools, and the local college. Through the program, outdoor classrooms were constructed for LeFlore and Latimer County Conservation Districts, five sites were monitored by Blue Thumb volunteers, and 80 local citizens participated as blue thumb volunteers.

Blue Thumb volunteers monitored Little Deep Fork Creek in Creek County to help elevate public awareness about local water quality issues. Blue Thumb data suggested that although water quality at the BT site was generally good, the stream habitat was affected by bank erosion and riparian degradation, leading to a pollution tolerant fish community, although the macroinvertebrate community appeared to be healthy.

Tulsa County Conservation District's Blue Thumb Program was highlighted in a story on the National Association of Conservation Districts Web page in August, discussing the history and current focus and activities of the program.

Tribal Partnerships

Blue Thumb and other OCC programs continue to work to expand the partnership between Oklahoma Tribes and the OCC education programs. Beginning in 2003, BT began working with the Groundwater Foundation of Lincoln, Nebraska, to plan a workshop for tribes entitled "Protecting Our Water Resources." Rather than offer one workshop, two workshops were offered close to tribal headquarters in different areas of the state.

The workshops covered source water protection and assessment, source water protection strategies and program implementations, source water protection case studies, identification of healthy streams, and Blue Thumb information. Twenty-one tribes attended the workshops. Participants not only benefited from the presentations, but also left with information on protecting their local water resources.

During the course of this project, several Blue Thumb training sessions for new volunteers were held. Eight tribes attended training sessions. Five tribes came aboard as Blue Thumb volunteers. Representatives from these tribes monitor monthly, attend quality assurance sessions, help collect macroinvertebrates, and perform macroinvertebrate subsampling.

Additional outreach to tribes has included demonstration of fish seining for a Tribe Youth Awareness Day, exhibits at Inter-Tribal Conferences, Tribal Celebrations, and Tribal Pow-Wows, and school development classes for tribal elementary students, high school students, and teachers.

It is now estimated that approximately eighteen percent of Blue Thumb volunteers have a tribal affiliation.

Blue Thumb Wetlands

The OCC Wetland Program is also working to expand tribal partnerships. The Experiential Learning Opportunities for Tribal Residents of Oklahoma Project provided an opportunity for tribes in Oklahoma and Region VI to learn about wetlands in a field setting. Tribes often seek out training opportunities to further their environmental programs, and it is important to develop partnerships among the various tribes and government agencies in order to have comprehensive wetlands protection. The goal of the project was to provide tribal members with experiential learning opportunities on the functions and values of wetland resources, diversity of wetland types found in Oklahoma, and wetland restoration opportunities. The objective was to provide this experience for tribal members to increase their participation in EPA-funded wetlands programs. We advertised the field opportunities to all of the tribes in the state, and we had 18 participants from 11 tribes.

The information provided to the participants included field experience to view different wetland features and understand how they

are related to wetland functions and values. The participants were also exposed to a range of different wetlands types across the state that were both natural and created. In addition, wetland educational tools, such as wetland curricula and outdoor classrooms were presented. Many agencies were on hand to provide information on all of the different wetland programs, with tours of several of the projects.

From discussions with the tour participants, it appears that each of these individuals learned a great deal on the tour and will increase their efforts to protect and conserve wetlands on their tribal property.

One of the most effective aspects of the NPS Program is the demonstration of pollution prevention and abatement techniques. Using Clean Water Act Section 319 funds, the OCC and partners transfer knowledge and practical information to address priority areas. At the end of 2005, the OCCWQ program had over thirty active projects including 319 and 104(b)(3) grants. One goal of the NPS Program is to implement NPS pollution reduction activities in the top ten priority watersheds for the next ten years.

Karen Pope, a Tulsa County BT Volunteer, stands on the banks of Mooser Creek, in Tulsa County.

Dennis Wilson, OSU Forestry Resource Center, talks with new volunteer Bill Ballard on the banks of Buffalo Creek in McCurtain County. BT is new in this county, and the OSU Forestry Resource Center has taken a leadership role. The program is also monitoring Yashau, Bluff, and Push Creeks.

Oklahoma Annual Water Conference

OSU's Water Resources Research Institute held its annual conference September 27-28, 2005 on its Tulsa, OK campus. Approximately 110 people attended the program's six sessions covering issues related to the Arbuckle Simpson Aquifer, Nutrient Water Issues, Conservation Environmental Assessment Program, Urban River Corridors, Emerging Issues, and Oklahoma Water Research Priorities Panel.

IMPLEMENTATION

Oklahoma Conservation Cost-Share Program

Oklahoma's water and soil resources are an important foundation of the state's economy. Climatic events and human activities impact these natural resources. Our task as stewards is to minimize these impacts to the land and waters of the State.

To accomplish this goal, the OCC established the Conservation Cost-Share Program. The program provides cost-share funding to the State's 88 Conservation Districts to promote protection of water resources and prevent soil erosion and provides match for Federal funds allocated to implementation programs in priority watersheds.

Practices and funding rates are approved by the Conservation Commissioners and practices which specifically address water quality, have been approved by EPA as match for the State's 319 Program. The maximum rate of locally-led cost-share is 60%, although the landowners frequently provide more than the required 40% match to implement practices.

The program has grown in many ways including the number of practices offered, the amount of funding available, and the contribution from the landowner. Practices funded in Year 1 of the Program included pond cleanout and pond building as a response to the severe drought conditions that year. Year 1 funded the cleanout or building of over 900 ponds. $566,270 of State funds were matched by $959,077 of landowner funds.

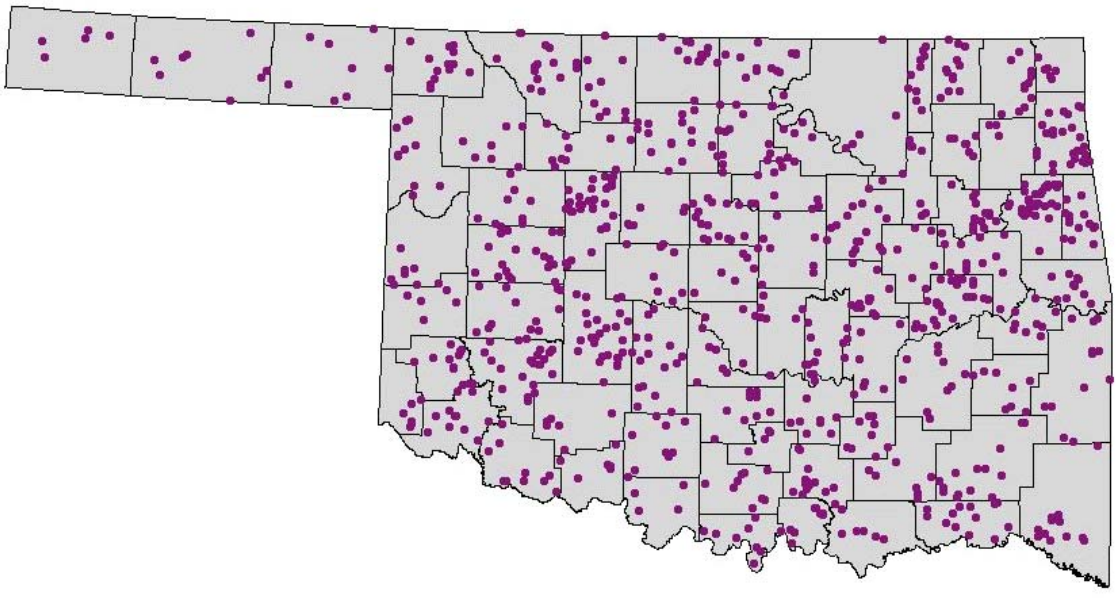
Thirteen types of practices were eligible for funding in Year 2 and 787 practices were installed. These included 37 critical area plantings, 26 diversions, fourteen fencings, eleven grade stabilizations, 68 grassed waterways, 281 pasture and hayland plantings, 62 pest management practices, 182 pond installations, one range seeding, 53 terraces, 48 water tanks, three well decommissionings, and one windbreak or shelterbelt establishment. These practices were funded by $430,323 of cost-share funds and $799,370 of landowner contributions.

No new practices were added to the suite for year 3, but 873 practices were funded by $453,595 of cost-share funds and $920,753 of landowner funds. Funding for Year 4 increased to $1,165,000. Three new practices were available Statewide- trickle irrigation systems, nutrient management, and installation of pipelines for conveying water for livestock.

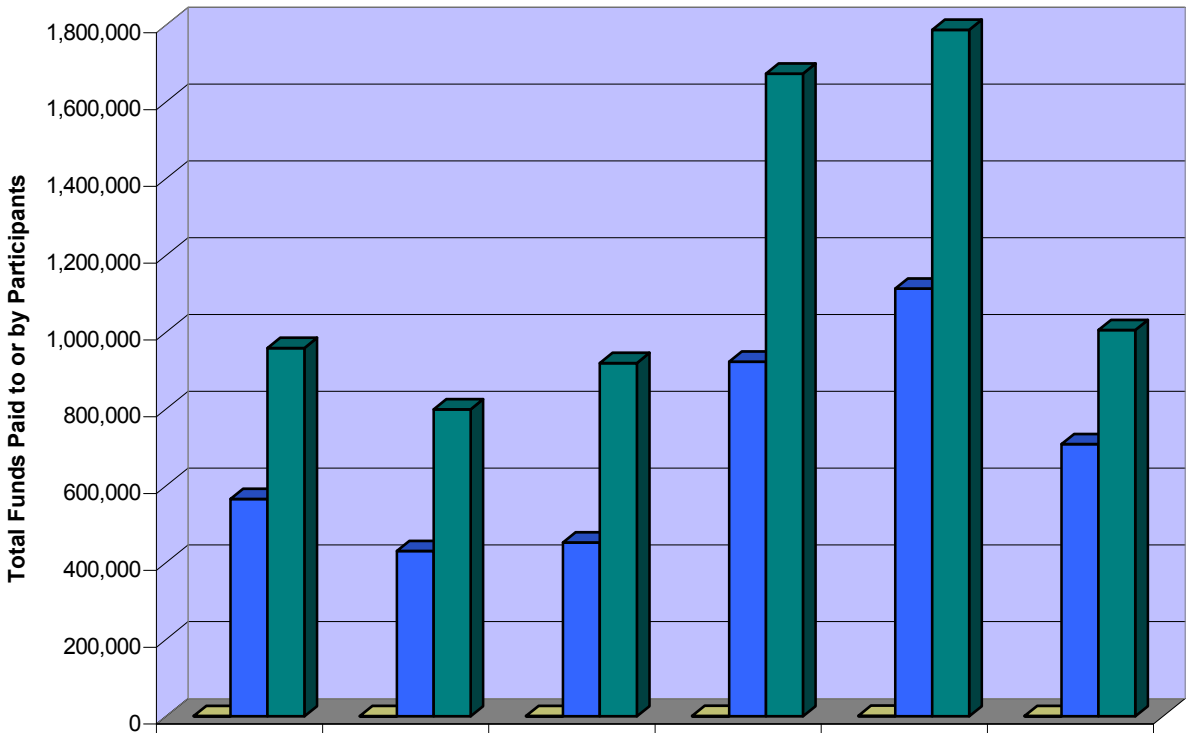
During year 4, 1197 practices were installed, funded by $923,506 of cost-share funds and $1,673,480 of landowner funds.

Funding for Year 5 increased to $1,500,000. Practices such as buffer strips, field borders, filter strips, irrigation systems for windbreaks and shelterbelts, and well construction were now eligible. 1,414 practices were installed with a total of $1,113,906.55 paid by cost-share funds matched by $1,787,926.02 paid by participants for a total of 2,901,832.57.

Funding for year 6 included an appropriation of $1,000,000. 967 practices were implemented including 69 brush managements, 27 critical area plantings, 13 diversions, 15 fencings, 9 grade stabilization structures, 33 grassed water-



Location of Cooperators in Locally-Led Cost Share Program Year 6.



	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Practices Installed	903	787	872	1,197	1414	967
Total amount paid to participants	$566,270	$430,323	$452,845	$923,506	$1,113,907	$708,835
Total amount paid by participants	$959,077	$799,370	$920,003	$1,673,480	$1,787,926	$1,005,689

Locally-Led Cost-Share Program Funding Levels.

ways, 43 nutrient managements, 267 pasture and hayland plantings, 88 pest managements, 17 pipelines, 305 ponds, 9 range seedings, 12 terraces, 30 watering facilities, and 20 wells.

State Budget cutbacks reduced funding for year 7 to $500,000. No new practices were added to the suite for either year 6, 7, or 8. Funding for year 8 was even lower, with a total of $250,000 allocated to the program.

The scale of the program and number of practices implemented each year make it difficult to estimate potential loading reductions due to the program. However, use of the STEP L program estimates that a typical year of the Statewide cost-share program could result in the following NPS load reductions: 534 tons of sediment, 2,621 lbs of phosphorus, and 9,617 lbs. of nitrogen statewide per year.

FY 1999 Illinois River and Baron Fork Watershed Implementation Project

The Illinois River and Baron Fork Priority watershed program was completed in FY 2005, although efforts continue through other avenues. The Illinois River Watershed is one of the State's top priority watersheds. A State Scenic River, the Illinois River supports an important tourism industry based on its water quality, and the river and downstream Lake Tenkiller serve as an important water supply for surrounding communities.

Like many watersheds in eastern Oklahoma, the Illinois River watershed also supports a poultry and cattle industry that are critical to the local economy.

However, the growth of the poultry industry in the watershed has coincided with a decline in water quality in the Illinois River and Lake Tenkiller, primarily associated with excess nutrients. The River, Lake Tenkiller, and several tributaries in the watershed are listed on the 2002 303(d) list for phosphorus impairments. Additional causes of impairment include low dissolved oxygen, fecal bacteria, turbidity, nitrate, and poor fish communities.

The purpose of the Illinois River Project was to demonstrate practices to reduce nutrient loading in the watershed, to promote the reestablishment of buffer zones and riparian areas, to provide technical and educational assistance to producers, and to coordinate the activities of various agencies and groups working in the watershed.

In order to accomplish this goal, the OCC partnered with the Cherokee and Adair County Conservation Districts and established

An important grazing industry is supported in the Illinois River watershed through the use of poultry litter as fertilizer.

a Watershed Advisory Group (WAG). The purpose of the WAG was to recommend practices and cost-share rates to be offered through the program, then to promote the program to insure its success.

The program focused in the Oklahoma portion of the watershed, and enrolled 177 cooperators. Cooperators received cost-share for installation of BMPs at rates of 60—80%, depending on the effectiveness of the practice to reduce NPS pollution.

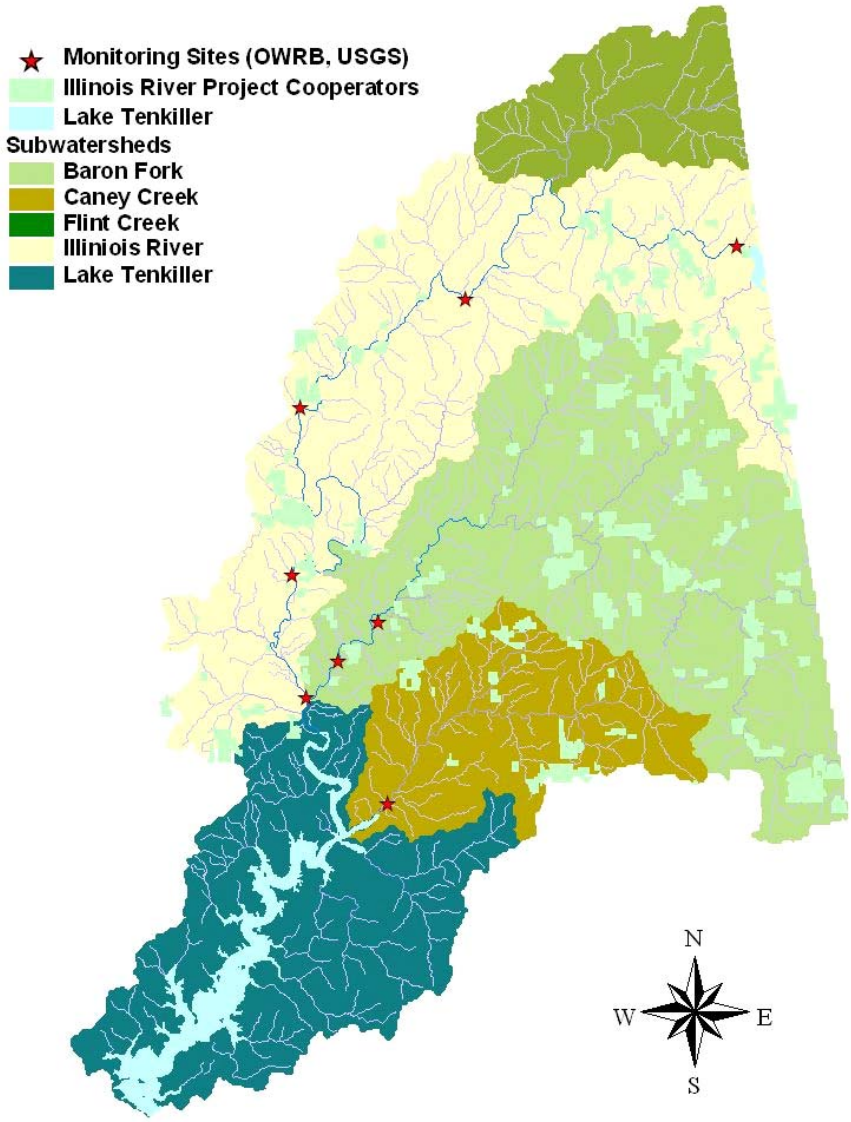
The top priority for the program was protection of riparian area. Through the diligence of the conservation districts and project personnel, the program enrolled 1,343.1 acres of riparian area, the equivalent of 50 miles of riparian buffer on either side of the stream. To replace the stream as a water source and protect the stream from livestock access, the program installed 17 ponds, three freeze-proof tanks, and 4 access lanes to the stream.

The second priority for the program was improved animal and human waste management. The program installed 28 winter feeding facilities, 10 heavy use areas, cleaned out 11 lagoons, installed 3 new lagoons, and 6 poultry litter cakeout or cleanout storage buildings. The program also upgraded 22 septic systems through new tanks and/or lateral line installations.

Prescribed Grazing Systems were the third priority for the program. The program installed 56 miles of cross fencing, 61 ponds, 120 freeze-proof tanks, and 10.25 miles of PVC pipeline to improve pasture management and the quantity and quality of pasture cover in the watershed.

Although water quality improvements associated with the program were not detected with a comparison of water quality data during the project period, the Oklahoma Water Resources Board reported that water quality in the river appears to be improving over the last few years. This improvement is likely due to a combination of improved waste water treatment, implementation of BMPs through this program, Arkansas, and USDA programs, and increased awareness of water quality issues in the watershed.

In addition, potential load re-



Cooperators in the Illinois River Project.

duction estimates using the EPA STEPL model suggested that when fully mature, practices implemented through the program could result in as much as a 29% reduction in NPS phosphorus loading.

Other program successes included 197 landowners in the watershed had updated conservation plans, detailing practices needed for water quality protection; at least 90% of the poultry producers comply with State requirements related to Animal Waste Plans; and a greater degree of riparian protection than predicted.

Efforts will continue in the watershed to increase the installation of practices through USDA programs such as EQIP and potentially a CREP program. In addition, the Oklahoma Scenic Rivers Commission (OSRC) is planning streambank restoration efforts, and OSU Extension, OSRC, Conservation Districts, Blue Thumb, and additional partners will continue education efforts in the watershed.

Mitigation of NPS Impact to Littoral Zone of Lake Thunderbird– Cleveland County, Oklahoma

Lake Thunderbird is listed on the State's 303(d) as being impaired by suspended solids. Suspended solids, whether washed in from the drainage basin or resuspended in the reservoir, serve to prevent or eliminate the establishment of an aquatic plant community in the littoral zone. Littoral plants are essential to a healthy functioning reservoir ecosystem because they divert nutrients from algae production and provide direct food and aquatic structural habitat for fish. The loss of an aquatic plant community also accelerates the physical process of shoreline erosion. Once physical processes such as shoreline erosion have begun in Oklahoma reservoirs it often takes human intervention to stabilize the shoreline long enough to establish the littoral zone as a functioning community. Bioengineering methods have been developed that halt the erosive processes long enough to allow for the establishment of a healthy aquatic plant community. This results in low-cost long-term erosion control.

The Oklahoma Water Resources Board (OWRB) worked with lake managers at the Central Oklahoma Master Conservancy District to demonstrate methods of shoreline erosion control at Lake Thunderbird using bioengineering methods.

The project developed a shoreline erosion control plan for Lake Thunderbird, implemented techniques at a demonstration site to address the problems, and then monitored to document success of the practices.

Approximately 415' of branchbox and coir geotextile rolls (CGR) breakwater was installed along the main body of the lake. Behind the breakwater, a 30' to 40' strip of emergent aquatic vegetation was planted at and above the waterline. Plantings included rushes, sedges, spikerush, bulrush, water willow and horsetail. Plantings included transplants from different areas of the lake and nursery sources. Success of nursery plugs versus transplanted plugs was compared.

The project determined that although branchboxes and CGRs were effective breakwaters, additional methods should be considered for Lake Thunderbird. In addition, over 150' of effective breakwater was established at the lake including mostly branchbox breakwater and a softstem bulrush, common bulrush, and water willow community. It is believed that the vegetation will slowly spread from behind the breakwater, barring extreme drought or herbivory.

Although the branchboxes fared better than the CGR rolls, they were very labor intensive to install. A floating breakwater that could be deployed in deeper water to allow for a wider range of plant elevations and species should be considered.

Fine sediment filled in the originally rocky shore following installation of the breakwater branch boxes. This sediment will support the establishment of dense vegetation to support shoreline stabilization.

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The Oklahoma Conservation Commission

The Oklahoma Conservation Commission (OCC) has the responsibility of providing assistance to the 88 conservation districts in Oklahoma to foster a sense of care, wise use and best management of Oklahoma's renewable natural resources. This assistance is provided through each division of the Oklahoma Conservation Commission.

These divisions include Administrative Services, Financial Management, Information and Technology, District Services, Conservation Programs, Abandoned Mine Land Reclamation, and Water Quality.

This document has been prepared as a requirement for the Clean Water Act Section 319 Program. The OCC, as authorized by Executive Director Mike Thralls, issues this publication, printed by the OCC, with funding through a grant from the Environmental Protection Agency. Twenty copies were printed at a cost of approximately $X.XX each. Copies have been deposited with the Publications Clearinghouse of the Oklahoma State Department of Libraries. All programs and services of the OCC and the Oklahoma Conservation Districts are offered on a nondiscriminatory basis without regard to race, color, national origin, gender, marital status, or disability.

NPS Activities in FY 2006

The focus and direction of the NPS program in Oklahoma must continually adapt and evolve to meet dynamic challenges. The OCC's Water Quality Program will continue to use a multifaceted approach to address NPS pollution concerns. This includes monitoring, education, implementation, and demonstration.

The monitoring program will continue to expand and evolve in 2006 in order to provide essential baseline information for developing effective restoration and preventative efforts. The rotating basin program will expand to new basins and cover approximately 70 sites during the year. Also planned is a statewide analysis of water quality, habitat, biological, landuse, and other pertinent data to develop a statewide list of reference streams. Also in 2006, OCC will continue bacterial source identification monitoring in priority watersheds.

In 2006, we look forward to the completion of additional Watershed Based Plans to allow implementation programs to move into new watersheds. Potential watersheds include the Illinois River, North Canadian River, and Thunderbird Lake Watersheds. In addition, ODEQ will likely begin developing a Watershed Based Plan for the Wister Watershed to either serve as the substitute for, or at least a precursor to a TMDL.

In 2006, we look forward to maintaining and expanding the partnerships with other federal, state, local, and tribal organizations. These relationships provide the Conservation Commission, other agencies, and organizations much more leverage with funding sources. This process is an essential part of our future projects to maximize results and secure different sources of funding. The future of water quality is the responsibility of everyone. We must strive to educate others on the effects or potential effects that each of us have on our environment. The Blue Thumb Programs will continue to focus on getting the information to the public and will continue to expand into new counties.

Large scale multi-agency projects will be the focus in 2006. Implementation activities will wrap up in the Wister Lake Watershed as that project reaches its completion. Activities will continue in the Fort Cobb, Stillwater Creek, Spavinaw Creek, and Grand Lake Watersheds. We will also begin implementation in the Honey Creek subwatershed of Grand Lake to reduce NPS pollution and protect the water, based on the new UWA.

State agencies will also cooperate with the OWRB to improve our Water Quality Standards, Use Support Assessment Protocols, and to insure that quality data is used in our reporting and decision-making processes.

None of the OCC's planned activities would be successful without the cooperation of our partners in the NPS Working Group. We plan to focus on increasing participation in the working group during 2006.