

Nonpoint Source Pollution Management Program



Arkansas 2006 Annual Report

Prepared Pursuant to Section 319(h) of the Federal Clean Water Act

Arkansas Natural Resources Commission

January 31, 2007



The Arkansas Natural Resources Commission (ANRC) is proud to provide this 2006 Nonpoint Source Pollution Management Program Annual Report highlighting examples of the wide-ranging activities Arkansas is doing to prevent, manage and reduce nonpoint source pollution. FFY 2006 was a productive year for the NPS Management Program.

- This is the first year operating under Arkansas' new 2006-2010 NPS Management Program Update with eight priority watersheds.
- Working with partners across the state, Arkansas increased estimated load reductions substantially from last year, not surprising given that Arkansas increased funding for implementation projects from 41% of 319 funds to 76% of 319 funds.
- Project partners and agency partners came together for the first time to review ongoing projects as a group. This annual process will enable us to learn from each other and improve the effectiveness of projects over time.
- Arkansas has so many effective projects that it was difficult to choose which ones to highlight this year. In addition to those highlighted, we hope readers will pay special attention to the Urban Low Impact Development Project, the Information Clearinghouse Project and so many others.
- The Arkansas NPS Program and its partners have focused more attention on analyzing long-term monitoring results to identify trends, especially in areas where the NPS Program has made significant effort over time. This report includes examples of stream segments where water quality improvements can be seen. It is not practical, however, to determine to what extent NPS best management practices contributed to those improvements. So for now, we must assume that widespread adoption of best management practices to reduce NPS runoff plays an important role in water quality improvements in the watersheds where our investments have been substantial.

The NPS Management Program is truly a partnership. ANRC works closely with its agency partners, including USDA Natural Resources Conservation Service, the Arkansas Department of Environmental Quality, the Arkansas Forestry Commission, the Arkansas Game & Fish Commission, the University of Arkansas Division of Agriculture as well as our project partners across the state who work at the local level to design and implement effective projects. This level of interagency cooperation is one of the major strengths of Arkansas' program and a testament to Arkansas' commitment to improve the state's water quality.

Your dedication and ongoing participation in the NPS program is deeply appreciated.

Sincerely,

A handwritten signature in black ink, appearing to read "J. Randy Young".

J. Randy Young, P.E.
Executive Director

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2006 Highlights

Four successful initiatives illustrate Arkansas' commitment to preventing, reducing and managing nonpoint source (NPS) pollution through its Nonpoint Source Pollution Management Program.

- **Arkansas NPS Program establishes task force, implements new management plan and launches innovative project review**
- **The Illinois River Watershed Partnership brings together diverse allies and conducts baseline surveys to plan and later evaluate the effectiveness of urban outreach and education**
- **Farmers choose to voluntarily fence cattle out of streams in the Spring River watershed**
- **Significant progress has been made in the second year of implementing new requirements in nutrient surplus areas**

These initiatives were selected because they illustrate what can be achieved through targeted investment of limited resources when there is enthusiastic partnerships, effective leadership and a sound approach.

NPS Task Force and Project Review Promotes Innovation

In 2006, the Arkansas NPS Program embarked on an ambitious initiative to meaningfully engage stakeholders at all levels in planning and evaluating how to improve Arkansas' water quality through coordinated efforts to prevent, reduce and manage nonpoint source pollution. Over the course of FFY 2006, more than 140 persons representing 79 different organizations participated in the development of Arkansas' 2006-2010 Nonpoint Source Pollution Management Program Update. This was accomplished through four meetings of the Nonpoint Source Task Force and more than 27 individual consultations with agencies, nonprofit organizations and watershed groups that have programs to reduce or manage nonpoint source pollution. The University of Arkansas conducted a statistically valid evaluation of this process available at www.ArkansasWater.org. The results of this evaluation were presented at a national meeting of the American Water Resources Association in June 2006.

The task force met for its first follow up meeting in September 2006 in conjunction with Arkansas' first Peer Project Review. The task force assessed progress toward 2006-2007 short-term milestones in the 2006-2010 Management Program Update and recommended short-term milestones for 2007-2008. Appendix A shows progress toward 2006-2007 milestones and revised milestones for 2007-2008. The University of Arkansas Department of Biological and Agricultural Engineering, working in conjunction with its partner, ComMetrics, Inc., provide ongoing support for the task force **(05-1200)**. The NPS Program will use this adaptive management approach to monitor progress and make adjustments on a timely basis throughout the life of this update.

In 2006, the Arkansas NPS Program took another significant step to strengthen the Program, engaging 319 project partners and other stakeholders in a peer review of projects aimed at preventing, managing and reducing nonpoint source pollution (**06-130**). More than 60 project partners and stakeholders participated. Twenty project presentations were made. All project partners participated in the entire 2-day review so lessons learned could be shared effectively. PowerPoint presentations from the 2006 Project Review can be found at www.ArkansasWater.org. These efforts are already paying significant dividends in:

- Effective sharing of lessons learned across the state
- More creative partnerships that bring together enthusiastic local groups with highly-skilled technical partners
- Increased quantitative analysis of project impact on water quality
- More focused criteria for selection of 319 projects for funding (see the section *Looking Ahead*)
- Timely review and revision of NPS milestones

Based on this initial experience, the Arkansas NPS Management Program will conduct a project review annually in combination with the annual task force review of milestones.

While resources do not exist to undertake research that shows improved water quality and controls for other sources of improvement, the NPS Management Program and its partners intensified its analysis of monitoring data in FFY 2006, evaluating long-term trends and seeking measurable improvements in water quality at existing monitoring stations below project areas. ANRC increased the percentage of 319(h) project funds spent on implementation projects from 41% in FFY 2005 to 76% in FFY 2006. No measurable improvements in overall water quality were expected in FFY 2006 as a direct result of this increased investment, however, ANRC has set a goal to increase the share of funds invested in implementation projects even more in FFY 2007. See *Lessons Learned* and *Looking Ahead* sections.

A New Watershed Group Works With Cooperative Extension Service on Urban Education

In a bold move towards unity, farmers, poultry processors, real estate developers, local governments, and environmental groups from The Nature Conservancy to the Sierra Club worked together to organize the Illinois River Watershed Partnership (IRWP) in 2006 (**05-190**).

As a starting point, the IRWP partnered with the University of Arkansas Cooperative Extension Service to launch the **Illinois River Watershed Urban NPS Outreach and Education (02-1900)**. IRWP and Extension have planned 12 workshops and six volunteer projects. To measure the effectiveness of the training and outreach to be offered, the Survey Research Center (SRC) at the University of Arkansas is conducting pre- and post-outreach surveys in urban areas of both the Illinois River Watershed (the target group) and in Faulkner County (the control group). The pre- and post-outreach surveys inquire about residents' knowledge about water quality and their behavior that may affect water quality. Change in knowledge and behavior will be measured by comparing Illinois River Watershed and Faulkner County residents before and after the urban



outreach efforts. This scientific approach to education will provide an exciting model for effective efforts to change behavior in other parts of the state. Its results also can provide valuable information for other groups developing water quality education and outreach. A summary of results of the pre-survey can be found in Appendix B.

Farmers Are Voluntarily Investing Their Own Resources To Improve Water Quality

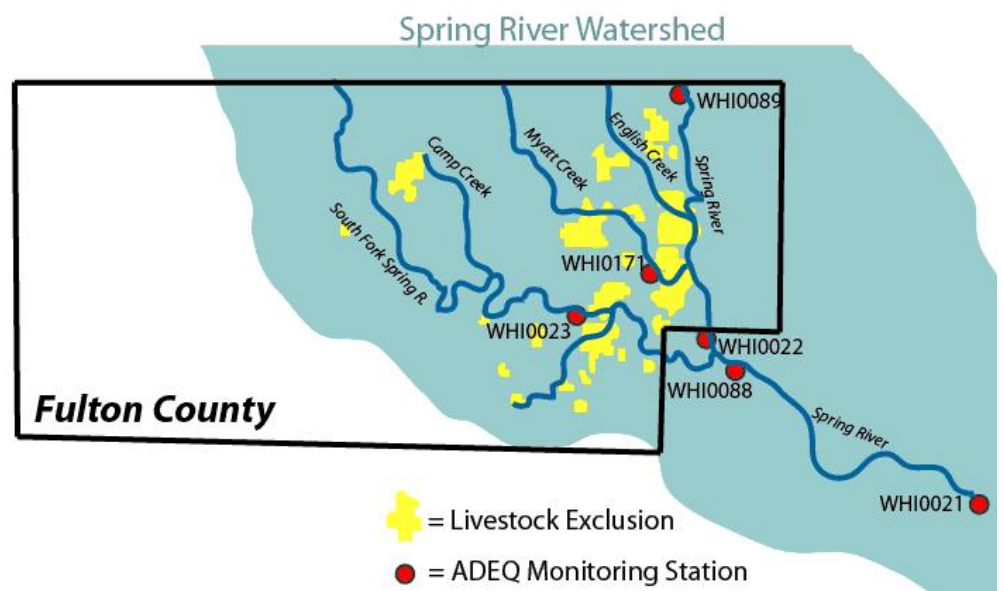
When designing projects, it is easy to assume what farmers will and will not do. Farmers in Fulton County are proving that many farmers will voluntarily fence cattle out of streams given the right circumstances (**04-500**). Landowners in Lee and St. Francis County are proving that farmers will voluntarily tax themselves to pay for critical conservation practices (**05-600**). Together, these two projects show that we can and should question our project design assumptions.

Among other implementation objectives for the **Spring River Watershed BMP Implementation Project (04-500)**, the Conservation District and its partners set a short-term goal of restricting cattle access from 6.5 miles of streams (34,320 ft) in the Spring River watershed.

Not only has the Conservation District and its partners met that short-term goal, they surpassed it more than ten-fold. Since the beginning of the project, farmers have fenced cattle out of 68.2 miles (360,332 ft) of streams that flow into the Spring River. In addition, data from ADEQ monitoring stations shows improved water quality for some parameters since farmers began fencing cattle out of streams and began implementing other BMPs (see Appendix C).

The Spring River project is also remarkable in other ways. By forging effective working partnerships, the partners have been able to tap a wide range of funding sources, which has enabled them to hire staff and maximize financial assistance to landowners. The partners in the Spring River Project are the first to say, however, that it isn't staffing or financial assistance that has generated the remarkable response from farmers, rather it is more intangible things like taking the time to develop trust, integration of staff across institutional boundaries, having a shared vision, and believing the goals are important.

The Spring River achievements are so remarkable that the Arkansas Association of Conservation Districts plans to interview farmers, the Conservation District board of directors, NRCS and Conservation District staff to better understand how trust was established with landowners in a way that changed fundamental attitudes about livestock-stream interactions. Results of these interviews will be compiled in a case study and presented at workshops for Conservation Districts across the state in 2007.



Farmers in St. Francis and Lee Counties have banded together to form a drainage district in order to tax themselves to raise money needed to restore the hydrologic function of a critical drainage corridor and reduce sedimentation in the main channel of Larkin Creek, a large tributary and the primary drain for most of the agricultural land west of the L'Angeuille River.



A number of laterals drain into the main channel of Larkin Creek. Farmers rely on these laterals to transport water from cropland. Several of the laterals have become clogged with sediment and contribute a large amount of sediment to the river. The landowners and farm operators have battled the clogged drainage channel for years. They came to the Conservation District seeking assistance to restore the channel as a proper drain and manage the surrounding cropped areas to maintain its function. As the channel filled with sediment, water began to encroach onto cropland and timber. Several landowners have experienced frequent loss of crops resulting in a loss of income. By working together, there is hope for addressing the underlying problem. In addition to voting to create a tax improvement district, the farmers working with the Conservation Districts submitted a request for 319(h) funds, **Larkin Creek Project (05-600)**, and are seeking engineering assistance from USDA-NRCS.

The experiences in Fulton, Lee and St. Francis County are an important reminder that farmers always have and will continue to invest wisely based on a wide range of complex factors. Their willingness to implement best management practices and invest their own resources beyond what is typically expected reminds us once again that land managers are most responsive to best management practices, technical assistance and incentives that take into account their complex needs and objectives presented from their unique point of view in a climate of trust.

Update On Second Year Implementation of New Requirements For Poultry Feeding Operations

In 2003, the Arkansas General Assembly enacted new laws to define nutrient surplus areas and reduce nutrient runoff into waterbodies. To implement these new laws, the Arkansas Natural Resources Commission (ANRC) drafted Titles 19, 20, 21, and 22, which went into effect last year.

- Title 19 requires statewide registration of poultry feeding operations with more than 2,500 birds
- Title 20 authorizes the nutrient management planner's certification program
- Title 21 authorizes a nutrient applicator certification program
- Title 22 defines nutrient surplus areas and specifies nutrient management requirements for nutrient surplus areas and non-surplus areas of the state

Training of planners and applicators began in FFY 2005. Statewide registration took effect in 2005, while the remaining new requirements went into effect January 1, 2006. As the numbers below show, significant progress has been made.

Progress in Implementation of Poultry Feeding Operation (PFO) Rules	
Statewide PFO Registration	
Poultry feeding operations (PFO) registered in 2006	3,778
Poultry feeding operations registered in 2005	3,955
Statewide Certification of Planners & Applicators	
Number of certified nutrient applicators	1,832
Number of certified nutrient planners	134
Nutrient Surplus Area	
Number of Water Quality Technicians Writing Plans	13
Number of nutrient management plans written in Nutrient Surplus Areas in 2006	875
Number of nutrient management plans written in 2005	2,018
Total nutrient management plans developed since implementation of Title 22	2,893

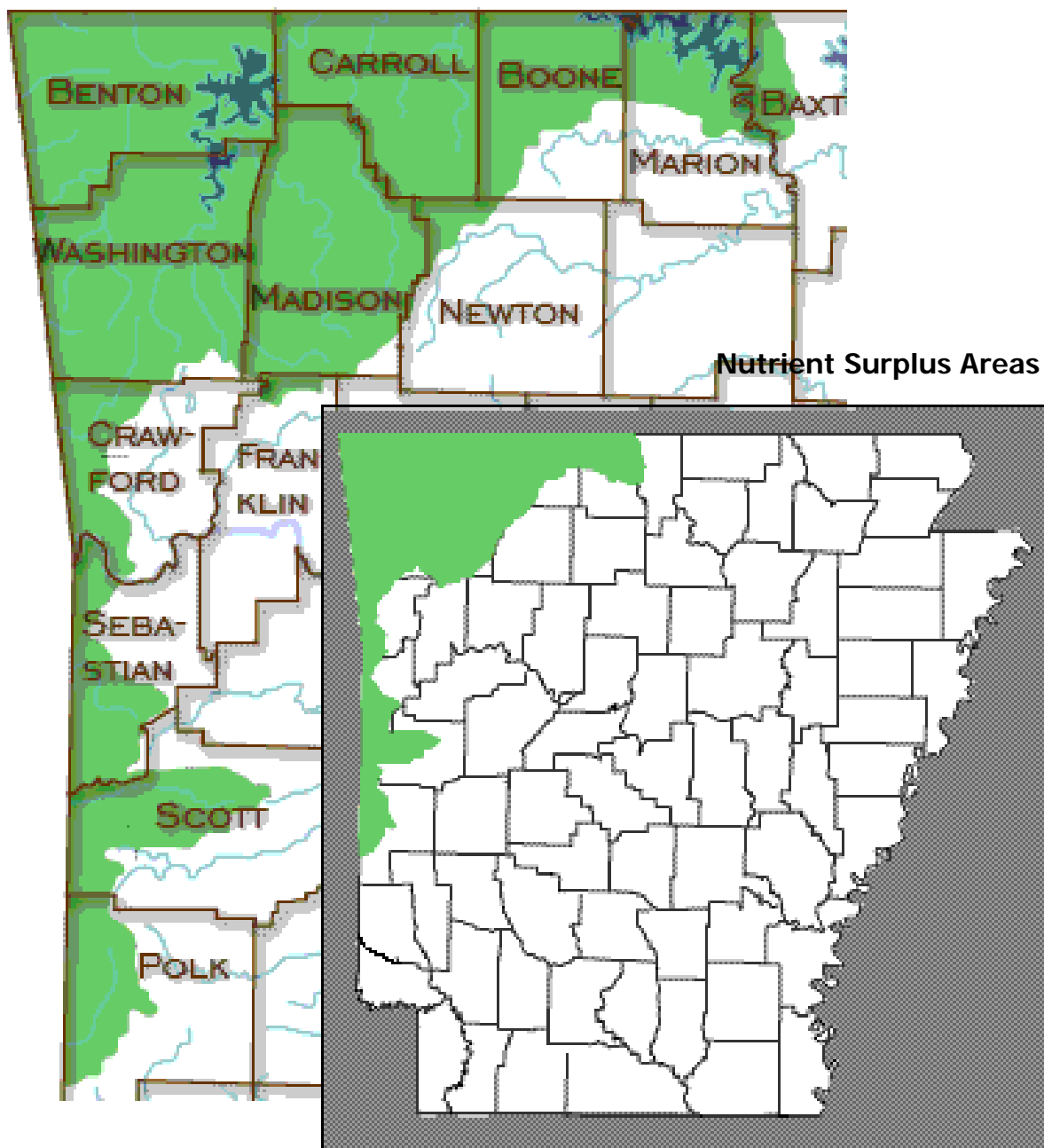
Information gathered in the registration process is being aggregated into a database which will soon provide a new source of information to improve watershed models and more effectively focus resources to generate measurable results. Required information includes the number of birds, type of operation, location, litter management system, type of litter storage system and amount, acreage used for land application, land application practices and amount, amount of litter transferred or used, and processor(s) in which the operator contracts.

Guidelines for certifying planners and applicators and training programs compiled in the *Arkansas Nutrient Management Planner's Guide* were developed under the **Arkansas Excess Nutrient Management Project (03-700)** and adopted by all state and federal agency partners involved. The *Arkansas Nutrient Applicator's Guide* also has been adopted by all of the partner agencies.

The Cooperative Extension Service developed a four-day training for nutrient planners based on the *Arkansas Nutrient Management Planner's Guide*. To date, seven training sessions have been delivered. Some 134 planners have completed the training. All future plans written in Arkansas will be developed according to the protocol laid out in the guide, which will result in improved management of nutrients on thousands of acres across nutrient sensitive watersheds in the state. In addition, the Cooperative Extension Service developed a 2.5 hour training session for both private and commercial nutrient applicators. To date, Extension has conducted 43 training workshops attended by more than 2,500 private and commercial applicators. The Cooperative Extension Service has been granted a no cost extension through December 31, 2007 to complete all planned training.

Poultry operations and nutrient application sites located in watersheds designated as nutrient surplus areas must now develop a Nutrient Management Plan or apply at a protective rate of application. In 2006, 875 farms developed nutrient management plans in the nutrient surplus areas. Nutrient Management Plans include periodic nutrient content analysis and describe how litter will be used, such as land application at a rate specified in the plan or at the protective rate

acceptable to the ANRC. Poultry operators in nutrient surplus areas must use a certified nutrient planner to develop all plans for dry litter and nutrient land application. Poultry operators must become a certified applicator or work under the supervision of a certified applicator to apply litter or designated nutrients.





Lessons Learned

Over the course of FFY 2006, ANRC was in dialogue with its partners to identify lessons learned, assess progress toward milestones and evaluate the effectiveness of its 319(h) funded projects. Discussions were held with EPA, project partners during our first annual project review and stakeholders at our annual task force meeting. Based on this dialogue, a number of lessons have been identified.

Strengthening Local Capacity

- Funding given to fledgling watershed groups should be designated for tangible projects rather than salaries and organizational development to generate early success
- Local investment of funding and in-kind contributions of time and materials are essential from the outset to promote long-term sustainability

Project Design

- Priority should be given to funding best management practices that will be implemented closest to the waterway
- Focused projects aimed at targeted problems in a relatively small geographic area have the greatest chance of impacting water quality in the short-run
- Projects that bring together innovative working partnerships, local leadership, enthusiasm, strong technical skills and the resources of local, state and federal agencies have the greatest opportunity to achieve their goals
- Projects that bring together multiple funding sources are more likely to sustain funding over time and achieve tangible results in the long run

Monitoring

- Project partners and agencies should give strong consideration to coordinating water quality monitoring locations, sample collection methodologies and parameters tested to improve the quantity and quality of water quality monitoring data
- Project-specific monitoring is critical, not only to evaluate effectiveness in improving water quality, but as an education tool to encourage more land managers to implement BMPs

Education/Outreach

- Survey results in Northwest Arkansas and Faulkner County show that many residents do not know where stormwater and wastewater goes. Effective education programs are critical to changing behaviors. However, pre- and post-testing is needed to ensure the cost-effectiveness of education and outreach methods
- Education messages and outreach efforts are more likely to result in behavior change when there is trust and mutual respect

Cooperation/Communication

- Both at the project level and the state level there can never be enough collaboration or communication - both can always be improved both in quantity and quality



Looking Ahead

NPS Program Changes

Based on lessons learned in the Project Review and Task Force meetings, ANRC made some changes in the 319 grants program criteria that will be implemented in FFY 2007 aimed at generating measurable results as quickly as possible. Priority will be given to projects that:

- Implement BMPs that have a direct impact on reducing nonpoint source pollution in the state's eight priority watersheds (*see Program Overview* section) and/or in a stream segment in which a nonpoint source TMDL (excluding Mercury) has been established or will be established (see Appendix D)
- Focus on a 12-digit Hydrologic Unit Code (HUC)
- Address land adjacent to a nonpoint source-related 303(d) listed waterbody
- Include a monitoring component

Demonstration projects should include a technology transfer element that will result in extensive implementation of conservation practices or best management practices. Stand-alone education and outreach projects will not be considered as a priority for FY 2007 grant projects.

Continued Emphasis on Cooperation and Communication

The NPS Management Program has decided to make the Annual Project Review a regular part of its program. New and ongoing projects as well as selected completed projects will be asked to make presentations to their peers and to stakeholders who participate.

When the NPS Management Program Task Force was formed, it was planned the group would meet every other year. Based on recommendations of the task force in September 2006, it has been decided that the task force will meet annually in conjunction with the Annual Project Review to review progress toward short-term milestones and recommend revisions, additions and deletions as appropriate.

To further promote cooperation and communication, www.ArkansasWater.org went online in January 2007 **(02-1800)**. With support from the Arkansas Association of Conservation Districts, this information clearinghouse organizes information by watershed and land use and provides links to Arkansas-specific water quality information.

Legislative Issues

The 86th Legislative Session began January 8, 2007 with an \$800 million surplus. While the primary focus of this session is expected to be K-12 education, Medicaid and how to use the surplus, there are at least two water quality issues that will likely come under discussion: source water protection and extraordinary resource waters.

Program Overview

Priority Watersheds

The 2006-2010 NPS Management Program Update includes eight 8-digit HUC watersheds designated as priority watersheds. To identify priority watersheds for the 2006-2010 Update, the NPS Management Program employed a qualitative risk assessment matrix to prioritize 8-digit watersheds eligible for incremental funds. As a starting point for the assessment, a literature review of impaired water bodies was conducted. Watersheds with reaches on the state's 303(d) inventory of impaired waters were given the most weight. The NPS Management Program Task Force identified additional parameters to be considered and a scoring system for each parameter. Parameters considered included: 1) Water Body Impairment; 2) Human Health Impacts; 3) Population; 4) Land Use; 5) Land Use Change; 6) Biotic Impacts; 7) Potential Human Exposure; 8) Concentration of Livestock; 9) Cropland; 10) Construction; 11) Density of Unpaved Roads; and 12) Priority of a Bordering State.

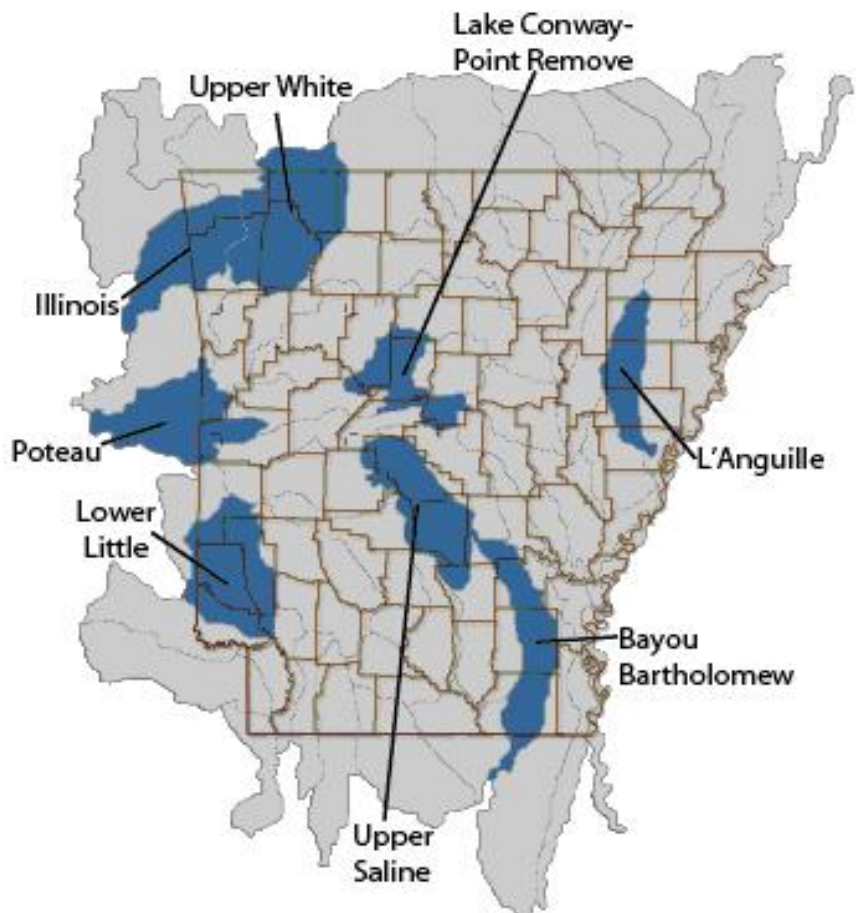
Based on the resulting scores, watersheds were grouped into quintiles. ANRC designated eight priority 8-digit HUC watersheds from the top quintile as priority watersheds. The accompanying map shows the location of these priority watersheds.

- Bayou Bartholomew
- Illinois River
- L'Anguille River
- Lake Conway-Point Remove
- Lower Little River
- Poteau River
- Upper Saline River
- Upper White River (Beaver Reservoir)

NPS-Related TMDLs

All stream reaches with an approved NPS-related Total Maximum Daily Load (TMDL) (excluding mercury) are considered priority waterbodies. Reaches with an approved NPS-related TMDL become eligible for 319 incremental funding two years after the TMDL is approved, unless the stream segment is already within an 8-digit HUC priority watershed. If the TMDL is for a stream segment that is not in an 8-digit HUC priority watershed, only the reach with the approved TMDL will be considered a priority for

Priority Watersheds



incremental funds. See Appendix D for NPS-related TMDLs by pollutant with TMDLs established during or prior to FFY 2006.

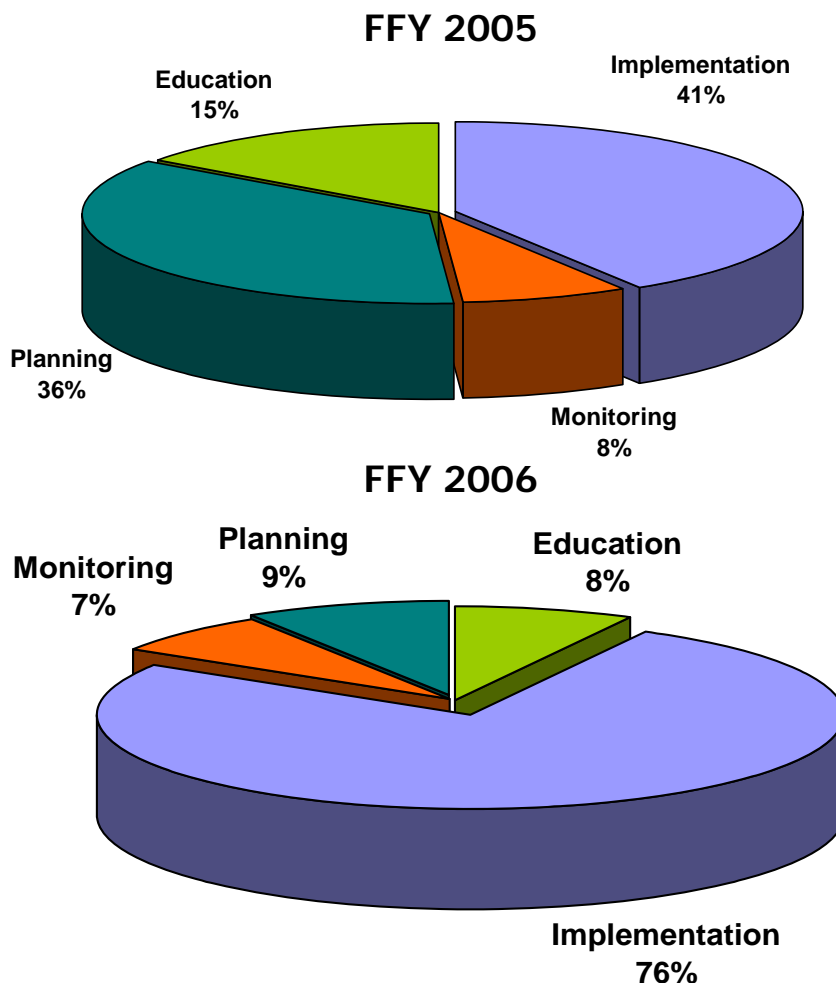
FFY 2006 Expenditures of CWA 319 Funds

Clean Water Act 319(h) funds allocated to Arkansas for nonpoint source pollution prevention, reduction and management are administered through projects. FFY 2006 projects were selected based on the 2006-2010 program update. The agencies and nonprofit organizations that carry out projects provide all non-federal match for federal funds.

In FFY 2006, ANRC and its project partners spent \$8.2 million dollars to reduce and prevent nonpoint source pollution in Arkansas. This included \$4.5 million in federal Clean Water Act Section 319 funds which were matched by \$3.7 million in non-federal funds from state and local sources. Federal and non-federal expenditures by month can be found in Appendix E. Funds spent by other agencies to reduce and manage nonpoint source pollution are not available as agencies account for funds by funding source and line item in the state budget.

The pie charts below show how federal funds disbursed for projects were allocated among planning, monitoring, education and implementation. Implementation funds increased from 41% of federal funds spent in FFY 2005 to 76% of federal funds spent in FFY 2006, which resulted in increased estimated load reductions. A list of projects, their status, and primary goal can be found in Appendix F, Project Status.

FFY 2005 and FFY 2006 Project Expenditures of 319(h) Funds By Function



Financial Assistance (Cost Share), BMP Implementation and Estimated Load Reductions

Ten projects included a cost share element in FFY 2006. Financial assistance is offered to landowners and land users to implement and maintain carefully targeted best management practices (BMPs) for demonstration purposes. This table shows 319 funds paid to landowners as cost share and the landowner reported investments by project in FFY 2006.

Project #	Project	County	Federal	Match	Total
01-510	Lower L'Anguille	St. Francis	\$7,063	\$11,681	\$18,744
02-400	Upper Little Red	Stone	\$30,131	\$45,203	\$75,334
04-200	Upper White	Boone, Carroll & Madison	\$114,740	\$209,224	\$323,964
04-300	Upper White	Benton	\$60,149	\$103,157	\$163,306
04-500	Spring River	Fulton	\$218,953	\$323,993	\$542,946
05-500	Middle White	Izard	\$23,929	\$44,047	\$67,976
05-700	Lower L'Anguille	St. Francis	\$53,714	\$83,519	\$137,233
05-800	Strawberry River	Sharp	\$16,900	\$26,005	\$42,905
Totals			\$525,579	\$846,829	\$1,372,408

Implementation of these BMPs resulted in estimated load reductions shown below. Data were collected for all implemented BMPs for each project using a standardized BMP reporting form (see Appendix G). The BMP type and affected land area were entered in either the Region 5 or STEPL load estimation models. Depending on the model used and the type of BMP, several additional parameters (e.g. cover management factor, land use data, and animal population) may be required to complete the calculation. The output of the models is nitrogen, phosphorus and sediment that the BMPs are predicted to have reduced.

Project #	Project Name	Life of Project Reduction			FFY 2006 Reduction		
		N lbs/yr	P lbs/yr	Sediment tons/yr	N lbs/yr	P lbs/yr	Sediment tons/yr
00-151	Point Remove Phase I	40,212	19,009	5,991	40,212	19,009	5,991
00-152	Benton Co. Pasture Establishment	157	78	87	157	78	87
00-153	Sharp Co. Pasture Management	86	43	43	86	43	43
00-155	Washington Co. Erosion Control	5	3	3	5	3	3
01-140	Arkansas Co. CD Special Funding I	15,100	7,886	855	15,100	7,886	855
01-142	Point Remove Wetlands Reclamation Phase II	40,212	19,009	5,991	40,212	19,009	5,991

Project #	Project Name	Life of Project Reduction			FFY 2006 Reduction		
		N lbs/yr	P lbs/yr	Sediment tons/yr	N lbs/yr	P lbs/yr	Sediment tons/yr
01-143	Arkansas Co. CD Special Funding II	16,655	8,698	943	16,655	8,698	943
02-1000	Buffalo Island Drainage District	62,127	39,311	5,375	12,504	3,132	1,451
03-150	Boone Co. Mini-Grant	905	452	605	218	109	148
03-151	Lawrence Co. Mini-Grant	7,201	823	143	5,133	587	102
03-154	Logan Co. Mini-Grant	912	457	559	543	272	331
03-155	Lonoke Co. Mini-Grant	17,465	4,448	276	6,537	1,665	103
03-156	Phillips Co. Mini-Grant	6,682	1,535	66	2,278	428	30
03-157	Polk Co. Mini-Grant	4,993	412	101	1,596	132	32
03-160	Newton Co. Mini-Grant	2,495	275	117	1,897	209	89
03-161	Prairie Co. Mini-Grant	3,391	661	83	1,760	343	43
03-300	Upper Little Red River Project	3,797	969	857	113	57	61
04-101	Benton Co Mini-grant	546	272	297	385	192	207
04-103	Cross Co Mini-grant	2,664	558	153	280	140	111
04-104	Faulkner Co Mini-grant	3,571	443	252	236	118	119
04-105	Lonoke Co Mini-grant	521	260	223	358	179	145
04-106	Marion Co Mini-grant	1,339	699	873	501	250	313
04-107	Miller Co Mini-grant	226	113	100	114	57	50
04-109	Perry Co Mini-grant	421	211	203	231	116	104
04-112	Woodruff Co Mini-grant	171	85	73	123	61	50
04-113	Yell Co Mini-grant	3,705	387	157	303	152	132
04-200	Upper White Cost Share	25,015	7,389	6,855	13,836	4,556	4,206
04-300	Benton Co. Cost Share	27,038	3,921	1,119	398	149	134
04-500	Spring River Watershed Project	7,368	3,818	3,968	1,774	887	956
05-101	Franklin Co. Mini-grant	325	163	164	325	163	164
05-102	Newton Co. Mini-grant	371	185	221	371	185	221
05-103	Point Remove Mini-grant	187	94	89	187	94	89
05-104	Randolph Co. Mini-grant	332	166	169	332	166	169
05-151	Mountainburg Streambank	49	25	25	49	25	25
05-500	Middle White Cost Share	13,072	6,531	7,876	13,072	6,531	7,876

Project #	Project Name	Life of Project Reduction			FFY 2006 Reduction		
		N lbs/yr	P lbs/yr	Sediment tons/yr	N lbs/yr	P lbs/yr	Sediment tons/yr
05-700	L'Anguille Cost Share II	4,265	2,090	934	4,265	2,090	934
05-800	Strawberry River Cost Share III	628	314	306	628	314	306
Total		314,209	131,793	46,152	182,774	78,085	32,614

In addition, nitrogen and phosphorus were removed from the Nutrient Sensitive Areas through the **Litter Transport Project (03-1100)**. It is estimated that 2,593,842 pounds of nitrogen and 2,821,372 pounds of phosphorus have been removed from Nutrient Sensitive Areas in northwest Arkansas since the project began in 2003. These load reduction estimates were calculated using an average N content of 57 lbs/T and a P content of 62 lbs/T and multiplying by tons of litter hauled. Litter removed from Nutrient Sensitive Areas is not included in the load reduction estimates above.



Planning & Modeling

NPS Management Program Planning

The NPS Management Program Task Force developed short-term milestones for FY2006-2007 through its planning process in 2005. In order to avoid the need to do major updates of the program, an adaptive management process was included in the 2006-2010 NPS Program Update. As part of this adaptive management process, the task force meets annually to review progress toward the short-term milestones and then revises, adds or deletes milestones on a rolling basis. The task force met September 29, 2006 to review the FFY 2006-2007 milestones and to update milestones for FFY 2007-2008. These milestones and progress toward achieving them can be found in Appendix A.

Modeling Priority Watersheds

For each of the priority watersheds identified in the 2006-2010 NPS Management Program Update, the Biological and Agricultural Engineering Department at the University of Arkansas developed and tested the Soil and Water Assessment Tool (SWAT) models. These models identify the relative contribution to watershed discharge and loading of sediment, phosphorus, and nitrogen for sub-watersheds within the 8-digit HUC watershed. The sub-watersheds are then divided into quintiles by the relative load and this analysis is used to assist in prioritizing sub-watersheds for emphasis as nine element plans are put into place. Models for the Upper White River (Beaver Reservoir) watershed and Lake Conway-Point Remove watershed are not available at this time.

These models were developed through a multi-phase approach by the University of Arkansas, Department of Biological and Agricultural Engineering. Models for the Upper White River and Illinois River have been calibrated and are in the process of being validated -- **SWAT Modeling of the Illinois River Watershed (02-1400)** and **Development of a Decision Support System and Data Needs for the Beaver Lake Watershed (02-1200)**. Models for other priority watersheds are in the initial stages of development, **GIS Database Development and Watershed Modeling in the Arkansas Priority Watersheds (04-120)**. See Appendix H for SWAT modeling results to date.

Watershed Planning in Priority Watersheds

Where possible, nine element plans are developed in a cooperative effort between ANRC and local watershed groups. Some local watershed groups have developed Watershed Restoration Action Plans (WRAS) that do not include all of the elements of a nine element plan. The following nine element plans have been submitted to EPA and comments have been received: Bayou Bartholomew, Illinois River, L'Anguille River, Upper Saline River and Upper White River. The following groups have a local WRAS: Lake Fayetteville Watershed Partnership, Lower Little River Watershed Coalition, Kings River Watershed Partnership and West Fork of the White River Group.



Monitoring and Evaluation

ADEQ Monitoring and Reporting

Monitoring is an important part of Arkansas' NPS management program. ADEQ has sole responsibility for assessing the waters of the state. ADEQ uses monitoring data to assess the waters of the state "to the extent that appropriate information is available" and issues two major reports on a roughly biennial basis: the *Water Quality Inventory Report* required by Section 305(b) of the Clean Water Act and the *Inventory of Impaired Water Bodies* required by Section 303(d) of the Clean Water Act. ADEQ issued the draft *2004 Inventory of Impaired Water Bodies* in February 2005. There are 59 stream segments totaling 1,009.9 stream miles listed in Category 5a; those stream segments are truly impaired and require TMDL development.

ADEQ maintains a downloadable database of water quality monitoring data collected since the last quarter of 1990, including data from the ambient network, the roving network, the Buffalo River National Park Service Stations, and other water quality monitoring stations that have data generated more than just once or twice and use sampling methods certified by ADEQ. Water quality data may be downloaded at:

http://www.adeq.state.ar.us/techsvs/water_quality/monitors.asp. Maps showing locations of ADEQ monitoring stations are available on the ADEQ website at:

http://www.adeq.state.ar.us/water/branch_planning/pdfs/WQ05-07-01.pdf.

Supplemental Monitoring

ANRC maintains a limited long term supplemental monitoring program in selected watersheds. ANRC monitoring supplements but does not duplicate ADEQ monitoring. In 2006, ANRC monitored the following:

- Bayou Bartholomew **(06-111)**
- Kings River **(06-112)**
- L'Anguille River **(06-113)**
- West Fork – White River **(06-114)**
- White River **(06-115)**
- Upper Saline River **(06-116)**
- Lee Creek **(04-800)**
- Lake Conway Point Remove (Stone Dam Creek) **(02-1700)**

ANRC monitoring data will be made available at www.ArkansasWater.org sometime in FFY 2007. The U.S. Geological Survey, U.S. Army Corps of Engineers, some water districts, and other entities also maintain monitoring stations in selected water bodies across the state.

Assessment Projects

The ADEQ Water Division initiated a project in July 2004 to assess the physical, chemical, and biological health of the Middle Fork of the Little Red River Watershed **(02-1500)**. Based on data collected from October 1998 to September 2003, the Arkansas' 2004 Integrated Water Quality Monitoring and Assessment Report (305(b)) identified two stream segments in the Middle Fork Little Red River as only partially supporting the aquatic life use because of low dissolved oxygen concentrations. In addition, these two segments were assessed as not supporting the primary contact recreation use because of high fecal coliform bacteria

concentrations. The data generated from this special project indicate that the Middle Fork of the Little Red River is fully attaining all water quality standards and fully supporting all its designated uses. However, low dissolved oxygen concentrations do exist in some areas during periods of low-flow and summer-time ambient temperatures. There are also some areas of concern related to the point source discharges in the watershed, the elevated turbidity concentrations during periods of high runoff caused by the large, spring-time storm events, and the damage to in-stream habitat caused by short-term gravel removal activities. The complete report is available at: www.ArkansasWater.org.

The Cache River/Bayou DeView watershed has undergone tremendous alteration in the past 50 years due to wholesale landscape conversion from forested wetlands to agriculture cropland and altered hydrologic regime. Decline in water quality has been attributed to sediment and turbidity. The goal of the **Sediment Assessment: The Cache River Watershed of Arkansas (06-400)** project is to identify, rank, and prioritize critical streambank erosion sites by an on-the-ground assessment and from data collected from continuous monitoring stations.

Phase I of the project (**01-610**) generated baseline data of sediment and nutrient fluxes and development of a watershed framework assessment. However, due to the short length of the study, no flow regime or water quality trends could be established for statistical predictions. There was an immediate need to produce a priority ranking of sub-watersheds ranked by severity of contribution of sediment from critical streambank erosion sites to the Cache River mainstream. This project uses existing baseline data and new data obtained from the continuous monitoring stations. The main contributors of sediment from critical streambank areas within the sub-watersheds will be evaluated as well as the determination of relationships between total suspended sediment fluxes at various hydrologic flows. The monitoring is being conducted for a three-year period to establish relationships and trends.

The **Middle Fork of the White River Nonpoint Source Assessment of Watershed (05-200)** is compiling an assessment database for the Middle Fork White River (MFWR). These data should prove useful to identify and prioritize nonpoint sources of pollution. Water quality sampling has begun, and a location for an automated stormwater sampler was selected. Existing water quality and flow data have been compiled and organized. Stream bank evaluation has been completed, and efforts to confirm land use data are nearing completion. Cleanup has begun around the river, including the removal of many defunct chicken houses. Photo documentation and erosion inventory have begun.

Monitoring as a Component of Projects

Monitoring is included as a component of some implementation projects, such as **Demonstration of Greenway Development to Protect Ecological Services in Urban Streams (02-900)**, **AGFC Blossom Way Phase II/Osage Creek (05-400)** and **Urban Low Impact Development (05-1100)**. To the extent practical, all implementation projects that begin in FFY 2007 will either include monitoring in the project design or as a separate component.

BMP Monitoring

Several projects and agencies are involved in monitoring implementation of BMPs:

- **Forestry.** The Arkansas Forestry Commission (AFC) monitors implementation of silviculture BMPs. Arkansas Forestry Commission and the forestry industry developed voluntary best management practices for silviculture available at: www.ArkansasWater.org. AFC monitors implementation of BMPs at clear cut sites and reports its results every other year. The

challenge has always been identifying the universe of clear cut sites from which to draw statistically valid samples. AFC requested funds to identify clear cut sites using aerial reconnaissance **(05-300)**. All forestlands in Arkansas have been flown over at two-mile intervals and sites have been randomly assessed. Using aerial reconnaissance, AFC identified nearly twice as many clear cut sites as it has in previous projects. Results of the current BMP monitoring project will be published by physiographic region in FFY 2007.

- **Farm Bill Funded BMPs.** Conservation Districts work with NRCS and FSA to monitor implementation of BMPs installed with federal funding made available through Farm Bill Programs. Due to confidentiality provisions in the Farm Bill, these BMPs are not made public. However, NRCS does provide to the public limited data by county on acres with cropland and grazing land management plans written, acres with BMPs installed, and estimates of soil loss reductions. These data are provided in Appendix I.
- **319(h) Funded BMPs.** Finally, 319(h) project partners are required to maintain records on BMPs installed and ANRC estimates load reductions for nitrogen, phosphorous and sediment. These data are provided in this report by project and watershed in Appendix J.

Development and Evaluation of BMPs

Three projects exemplify the importance of evaluating the effectiveness of BMPs:

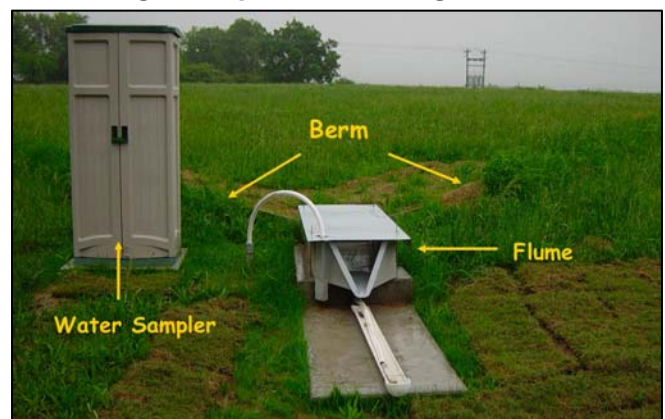
The Effectiveness of Best Management Practices in Reducing Non Point Source Pollution from Prescribed Fire (04-900)

studied the effects of various methods of prescribed fire on the headwaters of the Ouachita River to identify BMPs to minimize or prevent nonpoint source pollution. Prescribed burns were carried out on private industrial forestland in western Hot Spring County. The project tested levels of 23 water quality parameters following storms that occurred after burns and storms that did not occur after burns. The project concluded that prescribed fires in watersheds less than 250 acres have no great impact on water quality but that streamside management zones (SMZs) clearly reduce the effect of burning.



Edge of field water quality monitoring from various forage and pasture management practices in the Ozark Highlands (05-1300)

is identifying the most effective BMPs and is gaining a better understanding of how they impact overall water quality. Selected BMPs are being examined in 16 fields ranging from 0.5 to 2.0 acres. Runoff water from these sites is being collected and tested based on statistically valid sampling procedures. Samples are analyzed for phosphorus content and selected metals. The project will focus on evaluating and dealing with contaminants found in swine effluent and poultry litter, and also the effects of forage management and Soil Test P (STP) levels on in-stream phosphorus loads.





The Cooperative Extension Service is **Demonstrating the impact on water use and runoff water quality of BMP implementation for a rice rotation in the L'Anguille River watershed (04-400)**. There is a critical need to demonstrate the link between the water quality implications of row crop agriculture and water conservation on a farm scale. By working with the local Conservation District and area media outlets, many producers are seeing first hand how to select the appropriate BMPs and irrigation water management techniques for different situations and to implement them to improve water quality, reduce water usage and reduce production costs.

The project is demonstrating two best management practices -- flash board risers and multiple inlet rice irrigation -- compared to traditional methods of rice cropping. Innovative irrigation water management techniques, such as border irrigation for soybeans and multiple-inlet rice irrigation, have proven effective in reducing irrigation requirements, thereby reducing tail-water and thus carrying less sediment from the fields. The reduction of runoff water also reduces flow volume in ditches and streams where streambank erosion can occur. The project includes edge of field monitoring on four fields on two farms in St. Francis County near Palestine and extensive education and outreach through field days, a website, video documentation, local media, fact sheets, etc.

Before installing and monitoring BMPs, STEPL was used to estimate the annual reduction in pollutant load at the edge of the field with and without the BMPs. Based on pre-installation assumptions, the calculated load was 151.6 tons/year without the BMP and 37.9 tons/year with the BMP implemented for a reduction of 113.7 tons / year or 1.1 tons/acre/year. Preliminary data show TSS levels in runoff not only much lower with multiple inlet rice irrigation and flashboard risers compared to conventional methods but also TSS levels go down much more quickly with the demonstrated BMPs. Presentation of preliminary data available at www.ArkansasWater.org as the load reduction estimates predicted.





Education and Outreach

Photos: Courtesy of AGFC

In Arkansas, education about how to reduce and prevent nonpoint source pollution is a cooperative effort that includes government, universities, local government and nonprofit organizations. This section provides a few examples of the education that is taking place.

319 Funded Education and Outreach Projects

The NPS program completed two education and outreach projects in FFY 2006: The **Sebastian County Conservation Education Project (04-600)** and **Pulaski County Conservation District Special Funding (01-141)**. The Sebastian County project created hands-on curriculum for middle school students and trained 135 teachers in 41 school districts across 16 counties to effectively use the materials. As a result, an estimated 17,000 students received environmental education in one year. The Pulaski County project supported WaterFest 2006, a water education event involving students, teachers, parents, agencies, companies, and community leaders in the use of backyard conservation practices to help keep our waters SAFE: Swim-able, Available, Fishable and Especially drinkable for 600 students from Mabelvale Magnet Middle School.

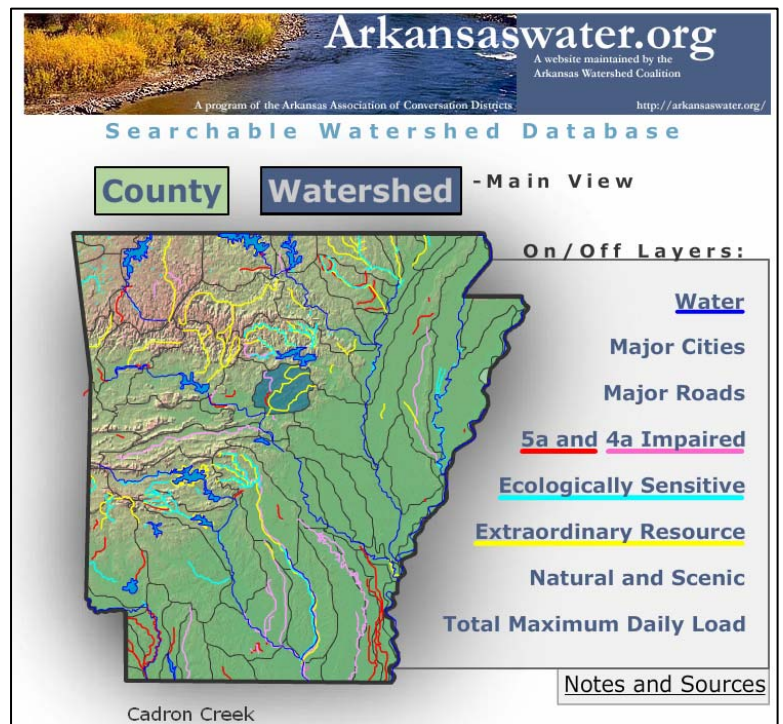


Westwood Elementary summer camp

The project **Urban NPS Hispanic Outreach and Education (05-1000)** targets the Hispanic population, which is increasing throughout Arkansas, but especially in Northwest Arkansas where they make up 12% of the population in Washington and Benton counties. The project is translating existing educational materials and promoting awareness of current water quality conditions through youth and adult education. The program has conducted more than 25 events and outreach meetings, worked with the Jones Center for Families to reach Hispanic youth, and displayed posters in high traffic areas, such as the Cinco de Mayo Festival.

The need for a central repository for resources to better equip local groups to undertake effective projects that generate measurable results was a recurring theme in a survey recently conducted by the Arkansas Association of Conservation Districts. At the same time, ComMetrics, Inc. had collected a large library of research and monitoring reports, data, maps, website links, education materials, 319 and other project reports and other resources, which would be useful to local groups developing watershed projects across the state. **Arkansas.Water.org Information Clearinghouse (02-1800)** marries these two efforts, bringing together people who can use information to improve project effectiveness with those who have relevant, timely information.

ArkansasWater.org is developing a searchable, content-rich website that will serve as an information clearinghouse, including NPS project documents dating back to FFY 2000 searchable by project number, project name, watershed, county, project type, and pollutant. The site also makes available links to data, education materials, research reports, and other resources that will improve project results in Arkansas. Information is organized by interactive maps that overlay watersheds, counties, and land use making the website user friendly even for first time users of the internet. The project also includes activities to draw users into the website, including an e-newsletter, demonstrations, workshops, etc.



In addition to these standalone outreach and education projects, demonstration projects include a substantial outreach and education component. The **Urban Low Impact Development Project (05-1100)** is a good example. The project includes three basic components:

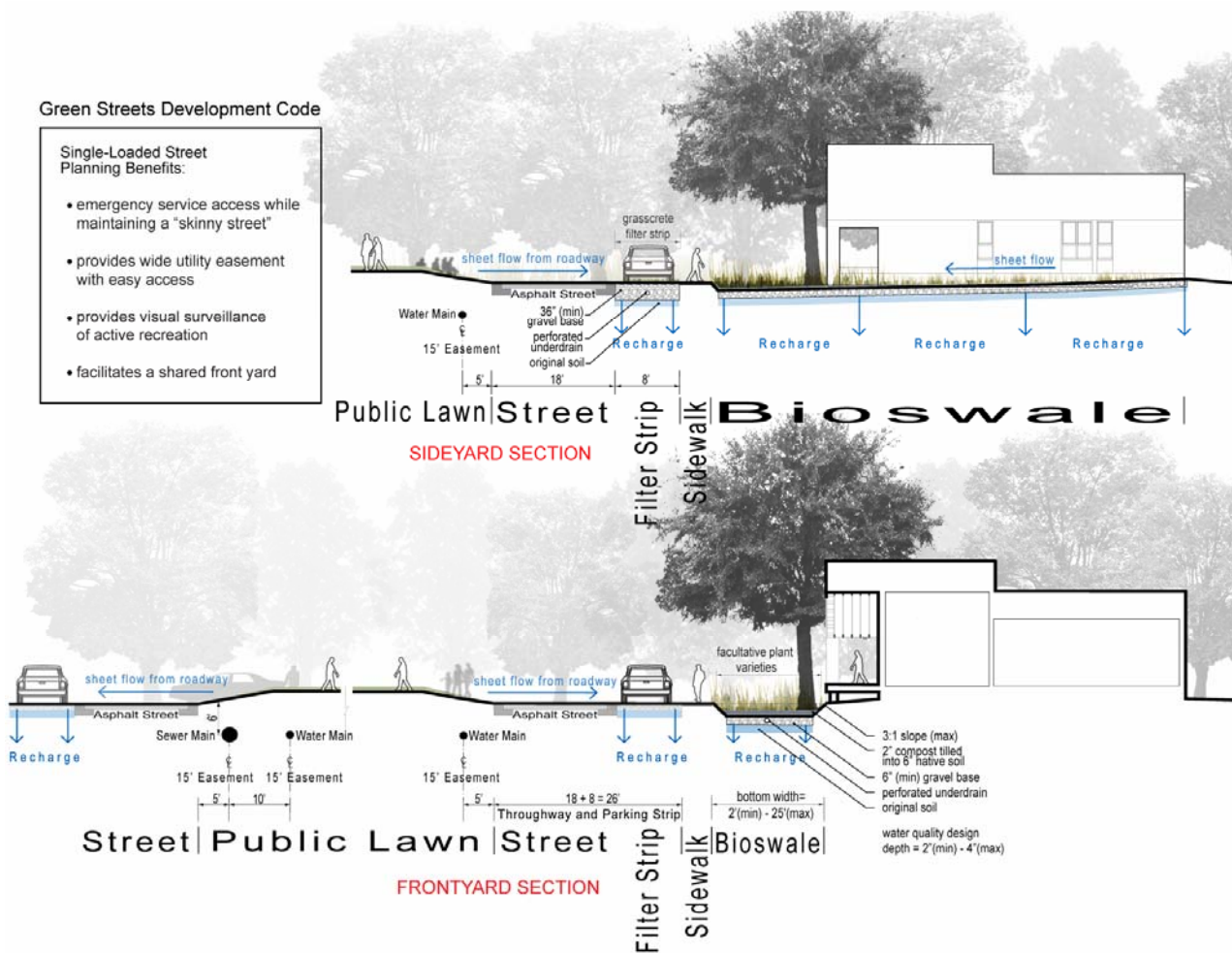
- An assessment of the condition of urban streams in Northwest Arkansas
- Broad-based education on Low Impact Development for community leaders, professional architects, landscape architects, engineers and developers, city officials and students
- Demonstration of LID practices in a Habitat for Humanity development in Rogers, Arkansas of 12 housing units, called Habitat Trails

The project has received three national awards that have raised the visibility of Low Impact Development among professional architects, landscape architects and developers who are in a position to promote these best management practices widely. The project's awards include:

- 2006 American Institute of Architects (AIA) Education Honors Awards and project presentation at AIA national conference in Los Angeles
- 2006 Environmental Design Research Association (EDRA) Places Awards for Place Design, Planning, and Research
- 2006 American Society of Landscape Architects' (ASLA) Planning and Design Honor Award

The project has brought together city leaders to approve variances to ordinances, architects, landscape architects and environmental engineers to integrate design work, and Habitat for Humanity that mobilized hundreds of volunteers in the development of the project. The 319(h) grant leveraged several millions of dollars in additional investment to pull together this nationally recognized award-winning demonstration project. The demonstration-effect of this project is already generating substantial interest among developers in throughout Northwest Arkansas.

Habitat Trails Low Impact Design



So many other agencies, local governments and nonprofit groups are involved in education and outreach that it would be impossible to catalog them all. However, it is important to illustrate the breadth of their reach so key examples of their efforts are listed below.

ADEQ Watershed Outreach and Education

ADEQ provides technical support to many state and local education and outreach efforts. Some examples of ADEQ's FFY 2005 education and outreach include:

- The Arkansas Water Advisory Group (AWAG) organized the *2006 Building Livable Communities through Watershed Protection*, attended by 195 individuals. The conference included two pre-conference workshops, tours of local BMP projects, 8 CEU credits on conservation education for teachers, and an emphasis on how to help communities use the Clean Water Act to improve water quality. All participants received a copy of the River Network book, *Clean Water Act: Owner's Manual* by Gayle Killam, who also was keynote speaker **(01-144)**
- Conducted 34 WET, WILD and PLT workshops for 577 individuals across the state
- The AWAG newsletter highlights a different watershed group each quarter

- Maintains the AWAG listserv that keeps watershed groups and individuals interested in watershed issues informed of fundraising, training and other opportunities
- Facilitate the Beaver Lake Scientific Work Group, a voluntary group of researchers and analysts who share information
- Conducted seven workshops on macroinvertebrates and four School Yard Habitat workshops as well as other school-based activities with more than 337 participants
- Consulted onsite with watershed groups six times over the year and numerous telephone consultations
- Participated in or led Natural State Expo (1400 participants), Watersheds 101 at Petit Jean State Park (37 participants), Wonders of the Watershed at Little Rock Zoo (322 participants), ADEQ Field Inspector Training (28 participants), Ozark Society meeting on ERW issues (28 participants), Conservation Day at the Jones Center (600 participants), and Arkansas Parks & Recreation Association Conference (38 participants)

University of Arkansas Cooperative Extension Service

The University of Arkansas Cooperative Extension Service conducts extensive water quality education and outreach on an ongoing basis.

- Training for nutrient planners (see earlier discussion in 2006 Highlights **(03-700)**)
- Training for nutrient applicators (see earlier discussion in 2006 Highlights **(03-700)**)
- More 4000 individuals were trained in the effective and environmentally sound use of agricultural pesticides, including 2039 Private Pesticide Applicators and 2,053 Commercial Applicators in cooperation with the Arkansas State Plant Board. This training is required for continuing licensure for both private and commercial applicators. The training programs include a strong emphasis in water quality protection through the use of best management practices. Nearly half of the Private Applicators reported the adoption of new BMPs for environmental protection as a result of this training.
- Annual refresher training required by ADEQ's Liquid Animal Waste Management System Regulation No. 5, which applies to livestock and poultry operations regardless of size that utilize water as a part of their manure management system. In the spring of 2006 there were 409 permitted farms (310 swine, 79, dairy, 17 poultry, and 3 other). This year 10 meetings were held in March, April, and May to provide this refresher training.
- Conduct regular equipment calibration training programs for fertilizer, animal manure and pesticide application users to help operators understand both the economics and environmental effects of nutrient and pesticide management.
- Urban*A*Syst, Farm*A*Syst and Home*A*Syst programs online
- More than 60 nutrient management fact sheets online
- Educational and outreach support to Regional Planning Commissions on stormwater management in Northwest Arkansas and the Pine Bluff area (see *Interagency Cooperation* discussion on stormwater education activities in northwest Arkansas **(02-1900)**). Similar training is being conducted in Jefferson County
- Various demonstration projects, such as **Edge of Field Monitoring on Forage and Pasture Land (05-1300)** in northwest Arkansas and **L'Anguille River Rice Rotation BMP Demonstration (04-400)** in eastern Arkansas include substantial education and

outreach components. These projects were discussed in the *Monitoring and Evaluation* section of this report.

Arkansas Game & Fish Commission Stream Teams

Stream teams are a critical component of water quality education in Arkansas. More than 500 stream teams have been formed with sponsors ranging from Ducks Unlimited to local school teachers to state agencies. To promote learning-by-doing, AGFC gave 245 stream team mini-grants from 1999-2006, totaling more than \$800,000. Grants ranged in size from \$100 to \$10,000. These mini-grants leveraged some \$2.7 million from partner organizations including ANRC, NRCS, and local partners.

In FFY 2006, local stream teams conducted activities, including: water quality monitoring, volunteer training workshops, litter clean up, classroom presentations, storm drain stenciling, streambank stabilization, streamside tree plantings, and improvement of fish and wildlife habitat. The stream team program also holds a well-attended conference every other year and recognizes individuals and organizations making a difference in conserving Arkansas' water resources. The next stream team conference will be held in FY 2007.

Arkansas Forestry Commission and Partners

Working with a wide range of industry partners, the Arkansas Forestry Commission (AFC) provides leadership for education on best management practices for water quality. AFC and the Arkansas Timber Purchasers Association conducted 20 workshops for loggers attended by 550 loggers and others. In addition, AFC hosted several BMP workshops for private non-industrial forest landowners. In addition, AFC wrote 187 Forest Stewardship plans covering 36,963 acres. Forest Stewardship certifications and re-certifications totaled to 140 farms covering 38,027 acres in FFY 2006.

WCRC Mid-South Watershed Training Program

The Watershed Conservation Resource Center (WCRC) is a nonprofit organization. With funding from EPA, the Watershed Training Program provides education and technical tools for environmental professionals and others. Courses offered in FFY 2006 included:

Basic Field Techniques to Determine Stream Morphology with Lee Chavez, Clear Water Hydrology, 3 days

Essential Elements for Successful Watershed Planning with Barry Tanning, Tetra Tech and Stuart Lehman, US EPA, 4.5 days

Low Impact Development Workshop with Larry Coffman, Low Impact Development Center, 2 days

Applied Fluvial Geomorphology with Dave Rosgen, Wildland Hydrology, 4.5 days

River Morphology and Applications with Dave Rosgen, Wildland Hydrology, 4.5 days

Cooperating Partners

Arkansas relies on the cooperation of many public and nonprofit entities at the federal, state and local levels in order to manage NPS pollution. While these cooperative efforts are too numerous to present in this report, notable examples are described below.

Coordination With NRCS

NRCS and ANRC continued discussions started in FFY 2005 to increase coordination of funding between EQIP and 319(h) funds. A working agreement was reached to set aside special EQIP funds for the L'Anguille River watershed to partner with 319 funding on projects that help achieve Total Maximum Daily Loads (TMDL). Discussions also continued on how to maintain farmers' privacy required in the 2002 Farm Bill while making available data needed to more effectively evaluate progress toward statewide NPS objectives. With anticipated budget cuts in the NRCS program, the two agencies are discussing how to ensure farmers who need technical assistance will get the engineering help they need to make apply for financial assistance. Appendix I reports NRCS conservation plans written by county, number of farms where BMPs were installed and estimated load reductions.



City employees learn stormwater BMPs

Productive Urban Partnerships

In July 2004, cities in Benton and Washington counties, and the University of Arkansas embarked on a collaborative partnership. Faced with EPA's 2003 federally mandated stormwater management regulations, the fifteen jurisdictions in Northwest Arkansas' "urbanized area" capitalized on the University of Arkansas Cooperative Extension Service's water quality education experience. A diverse group of 23 individuals representing the participating entities serve on the steering committee, providing guidance on educational program planning, implementation and evaluation. To date:

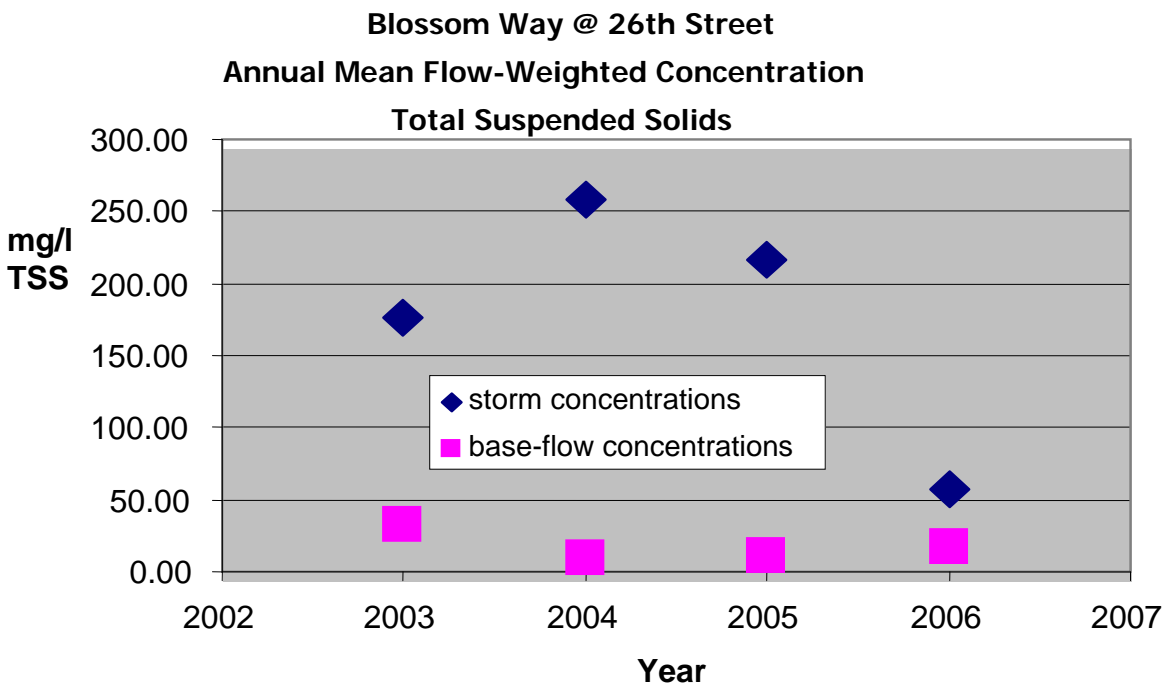
- More than 300 employees have been trained in Bentonville, Fayetteville, Springdale, Rogers and Washington County
- Nearly 140 developers, contractors, engineers, consultants and municipal staff participated in the "ABC's of BMPs" construction stormwater management workshop on October 11, 2006 at the NWA Convention Center in Springdale,
- Over the past two years, more than 40 programs have been conducted with nearly 3,000 school, 4-H and scouting programs



Blossom Way – One Thing Leads To Another

In the FFY 2005 Annual NPS Report, Arkansas highlighted the Blossom Way project to demonstrate a greenway approach to managing threatened urban streams, **Demonstration of Greenway Development to Protect Ecological Services in Urban Streams (02-900)**. At that time, the Blossom Way had more than achieved its goals and was gaining national recognition after presentations at nine national meetings and being highlighted in the *Public Works* magazine in November 2005 at www.pwmag.com. Now the project is showing improved water quality as well.

Despite aggressive urbanization upstream of this project, a comparison of annual loadings showed a 7% decrease in the amount of sediment being transported in FFY 2005 and the stream appeared to be adjusting from ephemeral to intermittent with the presence of more consistent and stable stream flow. There were also signs of healthy stream invertebrates such as caddisflies and stoneflies. In FFY 2006, the annual mean flow weighted concentration of total suspended solids dropped even more. As Phase II becomes a reality, we will continue to report on more partnerships, more BMPs implemented and improved water quality.



Following on the successes of the Blossom Way project, the partners moved forward with the next phase **Best Management Practices for Streambank Protection (05-400)**. Land use analysis has helped the project team map land use around streams to best determine what steps can be taken to prevent erosion. The project completed a land use analysis of the Blossom Way watershed project area by conducting a head-up digitization of geo-rectified aerial photography collected in February 2005. This process resulted in 756 individual features which were assigned land use classifications. Land use classifications were assigned to digitized features. The features were defined using the Anderson Land Use/Land Classification system as a basis. The most general or Level I land uses in the Project Area and corresponding percentages are shown in the table. The total Project Area was 7.28 mi² or 4,661 acres.

Streambank inventories have been collected on Osage Creek and its tributaries, with 400 individual stream banks evaluated. Actions taken to stabilize stream banks are described in Appendix A, Short-Term Milestone 06/07-15.

The plans for the construction of a new channel, along with new BMPs, will help to reduce erosion and sediment pollution in the creek. Monitoring will continue throughout the project to determine what BMPs are best suited for the project and how they can be used most effectively. Educational presentations will help inform the community about changes in their surroundings and should also help develop public interest in water quality management and upkeep.

Level I Land Use Description	Area		% of total
	(mi ²)	(acres)	
Urban or Built-Up Land	4.18	2675	57.4%
Agricultural Land	2.11	1351	29.0%
Forest Land	0.36	230	4.9%
Water	0.08	52	1.1%
Barren Land	0.55	353	7.6%
Total	7.28	4661	100.0%



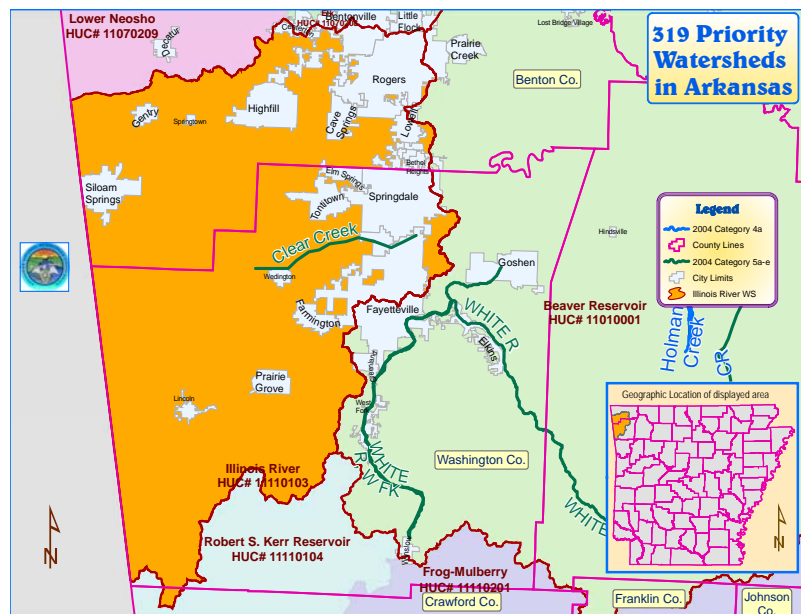
Implementation Projects

Priority Watersheds

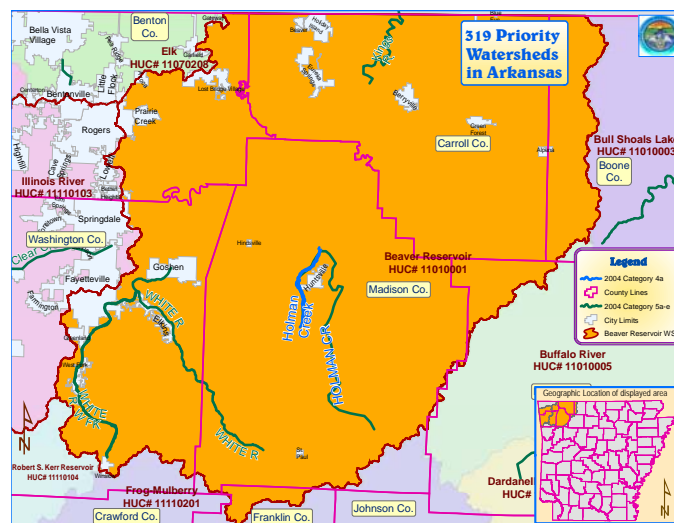
A number of projects address water quality issues in both the Illinois River and Upper White River (Beaver Reservoir) watershed due to similar topography and land uses (e.g., poultry production and rapid urbanization). Several projects targeted at these watersheds have been discussed earlier in this report. Below are descriptions of additional projects that exemplify the work that is being done in these watersheds.

Illinois River

The Illinois River Watershed contains approximately 1.1 million acres of which approximately 493,500 acres (46%) are in Arkansas and approximately 576,000 acres (54%) are in Oklahoma. The Arkansas portion of the Illinois River watershed (HUC 11110103) occupies the northwestern corner of Arkansas and covers part of Benton County, a large part of Washington County and a small section of Crawford County. This ADEQ planning segment includes the Illinois River and its tributaries within Arkansas. The main tributaries in Arkansas are Osage Creek, Flint Creek and Spring Creek.



Upper White River (Beaver Reservoir)



The Upper White River watershed (HUC 11010001) consists of portions of Washington, Benton, Madison, and Carroll Counties in Northwest Arkansas. This watershed encompasses Beaver Reservoir, a 66-mile reach of the White River and its tributaries, and an 85-mile reach of the Kings River and its tributaries. It also includes Long Creek and Yocum Creek.

Examples of Implementation Projects in the Illinois and Upper White River Watersheds

Since large-scale poultry production began in the 1970's, large volumes of litter have been land applied to fields in northwest Arkansas and northeast Oklahoma yearly. While the litter has proven fertilizer value, its application in localized areas is impacting surface water quality. Application rates have been calculated to meet the nitrogen nutrient needs of the vegetation, mainly grasses, receiving the litter. While the plant's nitrogen requirements are met, the litter contains more phosphorous than can be utilized during the plant's growing cycle. Excess phosphorous can be eroded from the soil and washed into nearby waterways. Several projects focus on this issue.



Poultry Litter Transport from Nutrient Surplus Watersheds in Northwest Arkansas (03-1100)

facilitates removal of the surplus litter from northwest Arkansas and transports it to areas where the litter will be utilized as a plant fertilizer and a soil amendment.

The project goal for FFY 2007 is to improve the efficiency of the system to allow continued increases in the quantities of litter exported from the watershed. Since the program began, 58,435 tons had been exported through the end of calendar year 2006 at an average cost of \$7.78 per ton. In FFY 2006, 45,506 tons were exported. The project is developing a model that can be used anywhere in the country for exporting poultry litter.

Arkansas Excess Nutrient Management Project (03-700). See *2006 Highlights* section.

The **Benton County Illinois River Watershed Cost-Share Project (04-300)** provides technical and financial assistance, develops CNMPs and educates the community about the project. A total of 84 cost-share contracts have been established between Benton County farmers and the Conservation District. The project has helped farmers develop 110 CNMPs and install BMPs that improved some 5,200 acres of farmland. More than 200 farmers have benefited from the project. A variety of BMPs have been implemented, including watering facilities, heavy use areas, waste storage facilities, ponds, fences, alum treatment of poultry litter, and pasture planting areas, all of which help reduce nutrient runoff into the Illinois River.



While water quality for some parameters in the Illinois River has improved over time (see Appendix K), it is not practical to determine how much of that improvement comes from point and nonpoint sources without long-term cost-prohibitive research. Given this reality, the Illinois River Watershed Partnership calls for continued efforts by all land users to implement proactive measures to reduce pollutants reaching the river.

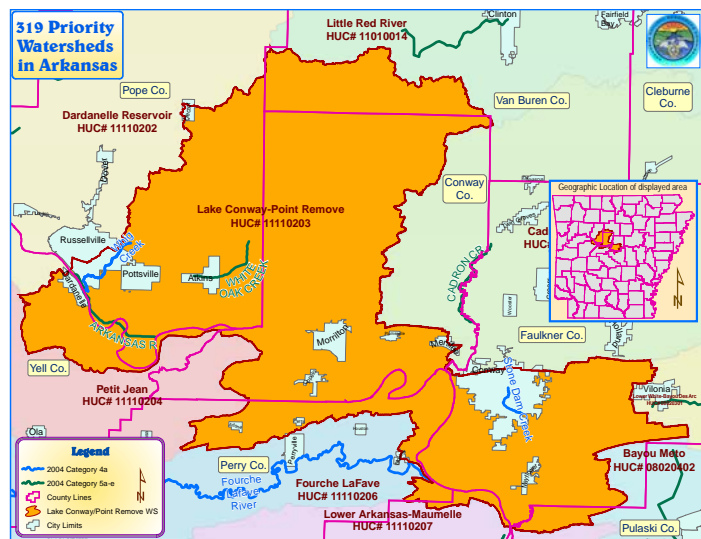
The **Upper White River Cost Share Project (04-200)** takes action that will reduce the sediment drainage and nutrient loss in pastures surrounding the White River. BMPs have been implemented on 256 farms throughout the project area in FFY 2006. The project focuses on providing technical and financial assistance for BMPs that keep nutrients on site and reduce soil erosion.

Lake Conway-Point Remove

The Lake Conway Point Remove watershed (HUC 1110203) is located in central Arkansas and covers parts of Faulkner, Conway, Perry, Pope and Van Buren counties. The watershed includes East and West Forks of Point Remove Creek, Overcup Creek, Gum Log Creek, Palarm Creek and Galla Creek. This watershed includes 310.8 stream miles as well as Lake Conway, Overcup and other lakes.

Water Quality Monitoring and Public Outreach for Lake Conway-Point Remove Project (02-1700)

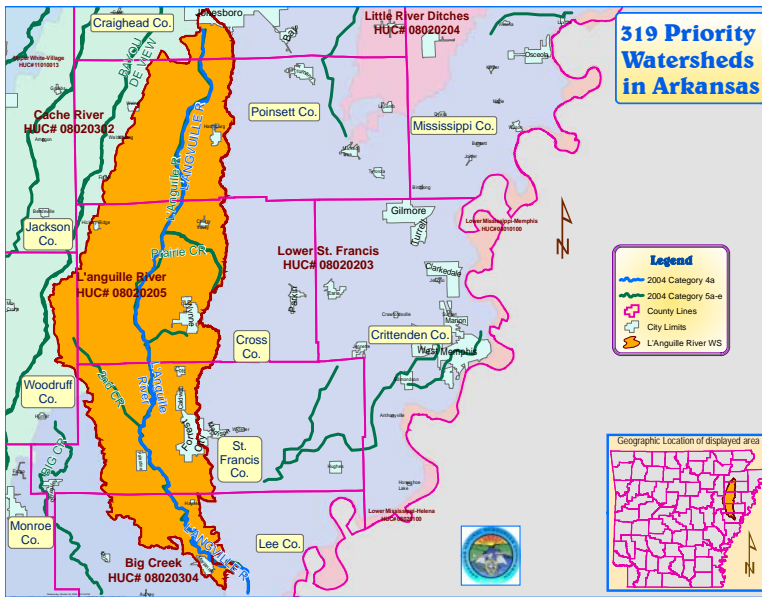
collected data for one year using three methodologies; grab sampling, automatic sampling devices, and multi-parameter sensory devices. This project also conducted a public outreach campaign to increase public awareness on water quality and nonpoint source issues in the watershed. The gathered information will be used in the future to establish a management plan for the watershed.



The **Point Remove Wetlands Reclamation and Irrigation District Phase 2 Special Funding (01-142)** Some 15 farmers within the Point Remove Wetlands Reclamation & Irrigation District with 20,000+ acres participated in this project to help reduce erosion and enhance water quality by installing drop pipes and water control structures and underground pipe lines for water conveyance.

L'Anguille River

The L'Anguille River watershed is located in northeast Arkansas and covers parts of Craighead, Poinsett, Cross, Woodruff, St. Francis and Lee counties. The L'Anguille River begins south of Jonesboro, Arkansas, and flows generally southward to its confluence with the St. Francis River near Marianna, Arkansas. This watershed includes the entire 98-mile length of the L'Anguille River. The total drainage area of the L'Anguille River is approximately 963 square miles. The principal tributaries are Brushy Creek, First Creek, Second Creek and Larkin Creek. Second Creek, a tributary of the L'Anguille, has been designated as an extraordinary resource water (ERW).



The entire length of the L'Anguille River is listed as impaired for aquatic life (ADEQ, 2004). Excess sediment originating primarily from row crop agriculture was identified as the source of impairment, resulting in development of a TMDL for this watershed for total suspended solids (TSS). Several projects work with landowners on reducing sediment through the use of BMPs.

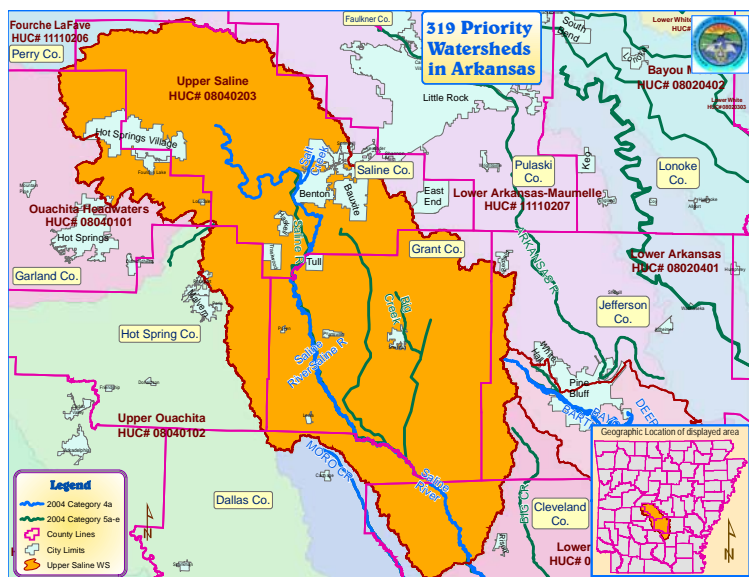
St. Francis & Lee County Larkin Creek Sediment Prevention Demonstration Project (05-600). See *2006 Highlights* section.

Two outreach meetings were held to let farm owners and operators know how the **Lower L'Anguille River Watershed Cost-Share Project – Phase II (05-700)** could help them install conservation practices that would improve water quality. Approximately 100 attendees learned about the condition of the river and the actions needed to improve conditions in the watershed. In addition, the project was publicized through a brochure, mail outs, newsletters, newspaper articles, radio spots, and a "Watershed Awareness" exhibit. All identified land users in the watershed area received periodic mailings and invitations to all outreach meetings.

During the first year, 43 applications were determined eligible. Twenty-eight of those applications are complete with BMPs installed, including fifty-two drop pipes, approximately 5,000 acres of crops converted to no-till, and over six thousand feet of irrigation water conveyance. Applications were also received to install ponds and establish pasture.

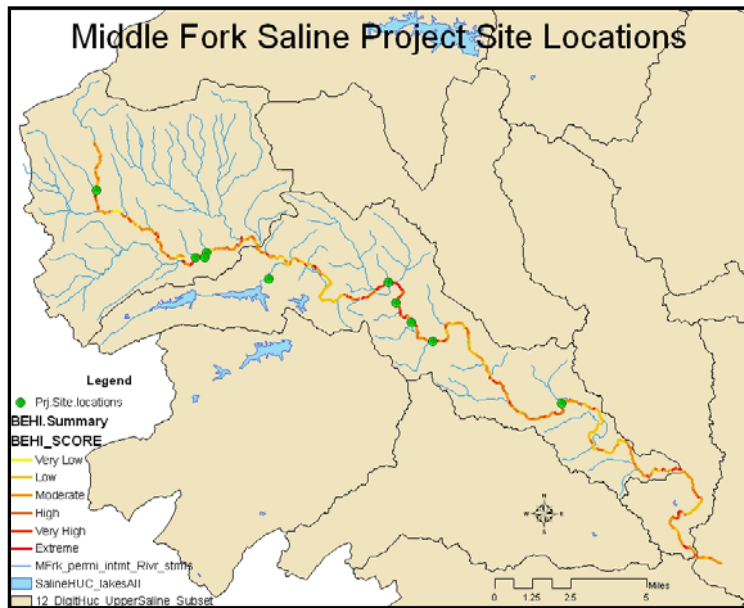
Upper Saline River

The Upper Saline River watershed consists of portions of Grant, Saline, Garland, Perry, Hot Springs, Jefferson, Cleveland, Dallas and Pulaski counties and has a total drainage area of approximately 1,716 square miles. This watershed encompasses the main stem of the Saline River and its tributaries and includes the North, South, Middle, and Alum Forks.

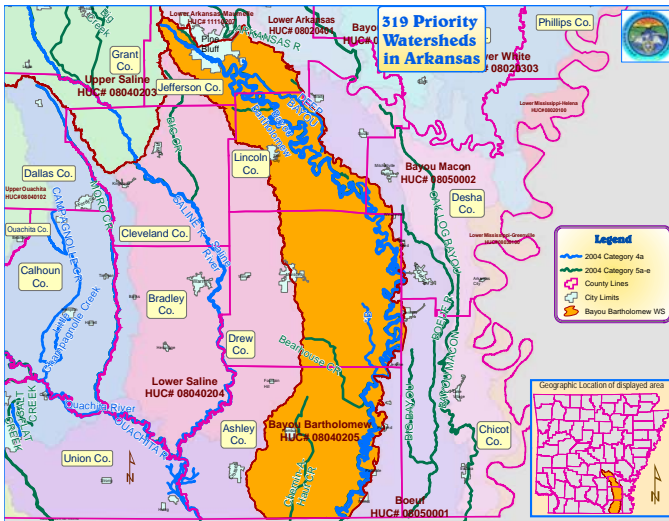


Assessing Sediment Sources for the Middle Fork Saline River (05-900) is assessing individual sites of bank erosion to identify and prioritize future restoration sites. The map below shows the sites assessed where load estimates were calculated.

Each site is surveyed twice. The first survey was completed in FFY 2006. The second will be carried out in FFY 2007. The survey looks at variables such as bank height and angle, root depth and density, and surface protection, etc.



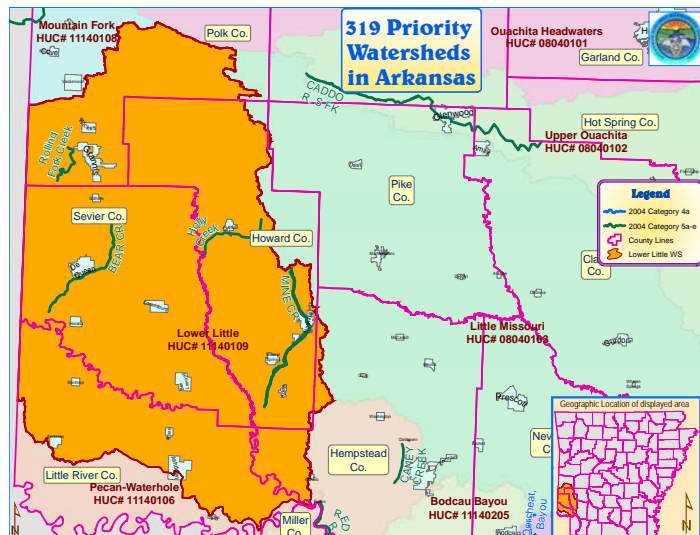
Bayou Bartholomew

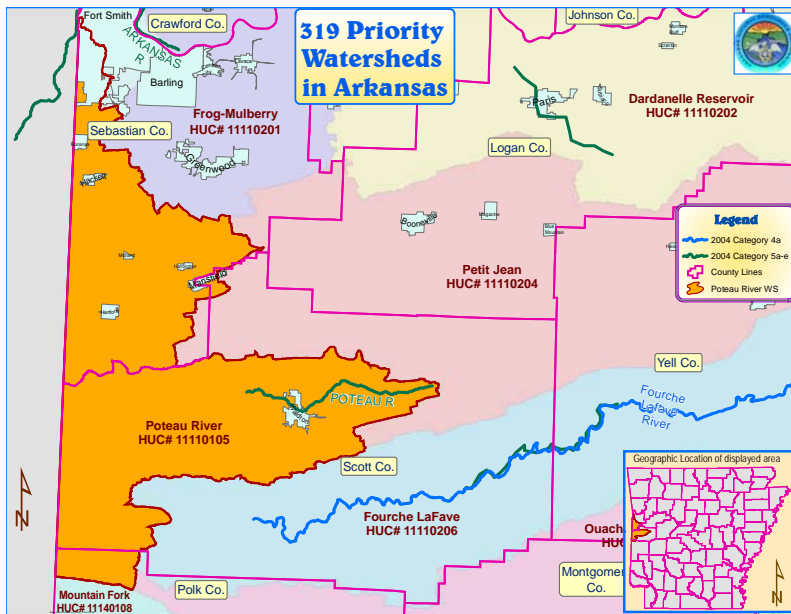


Bayou Bartholomew begins near Pine Bluff, Arkansas and flows generally southward towards its confluence with the Ouachita River west of Bastrop, Louisiana. The Arkansas portion of the watershed encompasses nearly one million acres in a seven county area of southeast Arkansas, including parts of Jefferson, Cleveland, Drew, Chicot, Lincoln, Desha and Ashley counties. The main tributaries in Arkansas are Deep Bayou, Ables Creek, Cutoff Creek, Bearhouse Creek, Overflow Creek, and Chemin-A-Haut Creek. No projects were funded in the Bayou Bartholomew watershed in FFY 2006.

Lower Little River

The Little River Basin flows from Oklahoma into southwest Arkansas. The Little River has a total length of 217 miles of which 130 miles are in Oklahoma and the remaining 87 miles (called the Lower Little River) are in Arkansas, including all of Sevier County and parts of Polk, Howard, Hempstead and Little River counties. No projects were funded in the Lower Little River watershed in FFY 2006.





Poteau River

The Poteau River watershed is located on the western edge of Arkansas, just south of the Arkansas River. The Arkansas portion of the Poteau River watershed includes large portions of Scott and Sebastian Counties and a small part of northwestern Polk County, covering an area of 1,889 square miles. Major tributaries in Arkansas include Jones Creek and James Fork. The largest share of the watershed is located in Oklahoma. No projects were funded in the Poteau River watershed in FFY 2006.

Agriculture Statewide Program

Silt and sedimentation from erosion and agricultural activities is a common focus of nonpoint source pollution abatement projects in watersheds across the state. Several projects work with farmers and landowners on implementing a variety of BMPs.

The **Buffalo Island Drainage District #9 Sediment Prevention Project (02-1000)**. As of September 30, 2006, 449 pipe drops had been installed in Buffalo Island Drainage District ditches. These pipe drops have reduced 6,826 tons of sediment from entering the headwaters of the Cache River.

The **Upper Little Red River Watershed BMP Implementation Project (03-300)** has minimized the impact of nonpoint source pollution by providing pasture and nutrient management, pasture establishment, animal waste utilization plans, and demonstrations. The equipment, a fertilizer spreader, boom sprayers and Bermuda sprigger and digger the district owns continues to be put to good use by the land users in the county. A Rotational Grazing/Forage Management Workshop was held November 2, 2006 in conjunction with the County Extension Service. The district plans more training sessions and field days in the coming year to make the land users aware of the possibilities of rotational grazing. The steady implementation of BMPs (an additional 36 farms in FY06) shows that farmers are receptive to these new conservation practices.





Spring River Watershed Project (04-500).
See *2006 Highlights* section.

The White River below Bull Shoals Dam is well known as one of the premiere trout streams in the United States and brings in many tourist dollars to the county. This stream is important to sportsmen, paddlers, and landowners along the river. Much of the pasture and hay land in the watershed has been reduced to minimal stands due to years of summer droughts, increased weed and woody vegetation pressure, and over grazing. The pasture in this area is very steep with majority of the slopes in excess of 20%. It is important to have adequate stands of vegetation to reduce soil and nutrient movement into streams and waterways. The goal of the **Middle White River, South IZard County 319(h) Project (05-500)** project is to initiate use of farm planning to achieve BMPs on pasture and hay land within the Middle White River watershed in south IZard County.

Farm plans will be developed to help land users operate land efficiently and substantially reduce the amount of sediment and pollution that enters the White River. The project area covers approximately 100,100 acres with 27% of the project area being pasture and hay land. The project will treat 10,000 acres within this area by providing technical assistance to producers with on-farm advice and guidance, and also making equipment available at reasonable rental rates, and providing cost-share assistance for BMP implementation. Interest in the project is strong to date, with BMPs planned for 303 farms and completed for 126 farms.

The **White River, Stone County Project (06-800)** was modeled on Project 05-500 Middle White River, South IZard County Project, with a focus on landowners in Stone County. The project area covers approximately 318,000 acres with 25% of the project area in pasture and hay land. The project goal is to treat 18,000 acres within this area by providing technical assistance and financial assistance to producers, and also making equipment available at reasonable rental rates. A total of at least 75 farm plans will be written that cover pasture and hay land needs.

The Strawberry River, located in the Ozark Highland eco-region of north central Arkansas, serves as an excellent recreational stream for Arkansans. Sediment entrance into the stream from agricultural regions and other streams such as the North Big Creek has caused much concern over the health of aquatic life in the river. The North Big Creek is a major contributor to the problem due to the years of drought and poor farm management of areas along the creek. The **Strawberry River Agricultural Watershed Project - Reach III (North Big Creek) (05-800)** has begun cleanup



and treatment of the North Big Creek in order to improve the condition of the Strawberry River. Soil erosion, turbidity, and bacteria are current issues that contribute to water quality problems in the Strawberry River. The majority of farmers and landowners in the areas cannot afford the equipment to establish BMPs to reduce these issues, so the project makes equipment available to those who agree to implement conservation plans. The object of the project is to implement 162 conservation plans throughout the area, improving the pasture condition of 21,600 acres and thus eliminating 46% of harmful erosion. Educational material will be provided in the form of a quarterly project newsletter, which will feature articles on grazing management and the implementation of conservation practices.

To this date, the project has hired a Grassland Specialist to evaluate the farms, created plans for 5,577 acres, planned and completed BMPs on 27 farms, provided assistance to farmers, and completed four newsletters. As a result of this project, BMPs will be established throughout the area that will reduce the amount of sediment entering the North Big Creek by 2 tons per acre, in effect greatly reducing the amount of soil that pollutes the North Big Creek and the Strawberry River.

The Lower Norfork Dam Watershed, a sub-watershed of the White River Watershed Basin, is located in Fulton County in north central Arkansas. The **Lower Norfork Dam BMP Project (06-200)** aims to control runoff of sediment, bacteria, and nutrients into the Lower Norfork Dam Watershed by implementing BMPs.

This project continues to build on the momentum of previous projects to bring about a fundamental change in the attitudes of livestock producers towards livestock operations and water quality, especially in regards to utilization of streams as a primary source of water for livestock. The project will provide equipment for better land management, including no-till drills and sprayers. The goal is to implement 50 conservation plans per year on 39,225 acres of pastureland (30% of the watershed) and 6.5 miles of stream bank protection. Project information will be incorporated into newsletters, field days, presentations, public meetings and other outreach efforts. The environmental effect of the project will be evaluated through follow up inventory of practices installed through out the watershed, their effectiveness and acceptability as well as comparison to the pre-project inventory currently being conducted.

Arkansas County Conservation District Sediment Retention Project Phase I and II (01-140 and 01-143) is reducing sediment due to run-off from agricultural fields. Phase I of the project provided assistance to install 3,558 feet of pipe and 88 drops, flashboards, drain structures and frames covering 6,825 acres. Phase II implement 26,170 feet of pipe and 48 drops, flashboards, drain structures and frames, covering an additional 7,500 acres in Arkansas County. By installing this pipe in key areas of their land, the 84 participating farmers will reduce substantial erosion and sedimentation by controlling the volume and flow rate of runoff water, keep soil in place, and reduce soil transport. It is estimated that reduction in soil loss provided by this program should result in over 29,000 tons of soil saved per year. This should also benefit field access, irrigation water management, and reduce fertilizer needs in the future.

Forestry Statewide Program

One of the fastest growing recreational uses is the expansion of off highway vehicles (OHVs). Depending on specific site characteristics, unmanaged OHV use can damage wetlands and riparian areas, produce severe soil erosion, and spread invasive weeds. On the Lee Creek Subdivision of the Boston Mountain Ranger District in the Ozark-St. Francis National Forest, user-defined trails have been created and exploited by OHV enthusiasts, resulting in increased soil erosion which threatens water quality. To add to the body of information that existed with

regards to multi-use trail system and OHV recreation uses, the **Assessment of OHV Trails in the Cove Creek Watershed; Identifying soil resource impacts and effective BMP/Restoration measures (06-700)** was implemented.

The Forest Service is developing existing trails into a designated trail system to meet the demands for motorized recreation opportunities, while protecting the natural resources. By providing an acceptable alternative to the current "renegade" use, the environmental impacts are expected to become limited and restricted in their extent and magnitude. Concurrent with the trail development, this project will complete an assessment of the project area to provide information to identify restoration opportunities, recommend BMPs, select water quality monitoring locations, and identify locations for stream bank and riparian restoration. Once completed, this inventory will guide other project activities such as the design and installation of stream crossings, establishment of erosion control measures for stream banks, restoration of the native vegetation within the riparian areas, assessment of current impacts, and monitoring the results of these activities. This project can serve as a model for practices that should be employed in similar areas and future projects.

