



ARKANSAS 2008 ANNUAL REPORT

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



Arkansas Natural Resources Commission
January 31, 2009

NOTES FROM THE DIRECTOR

The Arkansas Natural Resources Commission (ANRC) is proud to provide this 2008 Annual Report for the Arkansas Nonpoint Source Management Program. Unfortunately, many will remember 2008 as a turbulent year, to say the least. Arkansas was hit several times with severe weather events throughout the year. In addition to the impacts the weather brought locally, the nation has been experiencing major economic challenges that reach from Wall Street to Main Street. Amidst these two realities, the Commission still aimed to carry out its purpose of managing and protecting our water and land resources for the health, safety, and economic benefit of the State of Arkansas.



Items to keep in mind while reviewing this report:

- ◆ There were no nonpoint source-related streams added to the 2008 list of impaired water bodies compared to the 2006 list.
- ◆ The weather events of 2008 have adversely affected the lives of many Arkansans, thus creating further hurdles for those trying to implement conservation and water quality programs that rely on the participation of local landowners.
- ◆ From cleaning up after natural disasters to declines in financial markets to skyrocketing prices in materials, the capacity for local match towards 319 projects is substantially less than it ever has been.
- ◆ Financial assistance to transport poultry litter from the nutrient surplus area now includes State funds.
- ◆ Arkansas continues to incorporate a monitoring component into implementation projects.

As you know, the NPS Management Program is a continually growing partnership. In addition to its agency partners, ANRC works closely with nonprofit organizations and local watershed groups as well as our local Conservation Districts across the state that are responsible for engaging landowners to make projects effective. These partnerships, not ANRC, are the strength of this program and without the commitment from every entity to improve water quality we would not be able to provide reports such as this. Your dedication to and ongoing participation in the NPS program is deeply appreciated.

Sincerely,

A handwritten signature in black ink, appearing to read "J. Randy Young". The signature is fluid and cursive, written over a light blue horizontal line.

J. Randy Young, P.E.
Executive Director

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SPECIAL SECTION: 2008 WEATHER EVENTS AND THE NPS MANAGEMENT PROGRAM



Tornado, near Atkins



Black River, north of Newport¹

Weather plays an important role in many areas of our lives. From the way we dress, to planning weekend activities, to how we feel. Even our attitude can be dependent on whether the sun is shining or not. How does the weather relate to this report and the NPS Management Program? The following pages of this report are dedicated to answering that question and illustrating the perspective of this program.

Tornadoes

Arkansas rang in the New Year with six tornadoes on the 7th and 8th days of January. Subsequent storm events produced over thirty more tornadoes during February, April, and May. Small, short-lived tornadoes were present during September, when tropical storms were moving through the State. Overall, eighty tornadoes were counted between January and November 2008. That is over 200% above the yearly average of twenty-six. The table below lists the dates and locations of select areas affected by the tornadoes.

Town(s)	Date
Moreland, Appleton, Jerusalem, Beverage	January 7
Osceola	January 8
Atkins, Clinton, Mountain View, Highland, Rea Valley, Gassville	February 5
Benton, Bryant	April 3
Birdtown, Damascus, Greers Ferry, Hensley, Woodson, Carlisle, Sheridan, Cross Roads	May 2
Augusta, Stuttgart	May 10
Cabot, Glen Rose, Hot Springs	September 13

Table 1. Dates and locations of select areas affected by tornadoes during 2008.

In most cases, tornadoes alter landscapes to varying degrees. One drastic example is the result of a storm on February 5th that spawned a tornado, which was on the ground for 122 miles. This large swath of land sustained many changes to its landscape; root systems were disturbed and ground cover and canopy cover were removed. These alterations increase the potential for soil loss and movement. Heavy rains are particularly hazardous for grounds vulnerable to soil loss. When heavy rains lead to flooding events, the pollution potential exponentially increases.

¹ National Weather Service, <http://www.srh.noaa.gov/lzk/html/events2008.htm>

Snow, Rain, and Flooding

Tornadoes created grounds that were vulnerable to any precipitation and then the deluge began. In March, a blanket of snow covered a large portion of the State. There were accumulations of 4-8 inches across a large portion of northern and western Arkansas and in some locations over a foot. The snowmelt left the ground saturated, creating a dangerous environment for future precipitation.

Heavy spring rains led to major flooding events statewide. The National Weather Service reported that rains during the week of March 17 often exceeded 6 inches in a 24-hour period across northern and central Arkansas. Floods at most sites had recurrence intervals of between 25 and 100 years. The more extreme floods occurred in north-central and east-central Arkansas. Water levels increased at some locations by as much as 10 to 42 feet. According to Jaysson Funkhouser, USGS Arkansas Water Science Center surface-water specialist, "The flooding . . . is the most extensive and severe flooding to strike Arkansas since 1982."² During a flood, not only is soil moved and lost from undeveloped land, but also from construction sites, stream bank failures and roads washing out.

The summer was pleasantly mild with timely rains to keep the ground saturated, but not overly soaked. In August, a low-pressure system stalled over Arkansas for several days. With crops still in the field and more than sufficient rainfall, Arkansas' saturated soils then felt the brunt of Tropical Storms Gustav and Ike during the month of September. There were several 72-hour precipitation totals over 10 inches in parts of the State during Gustav. Ike did bring a dose of rain (1-3 inches common in the west with less than an inch in the east), but the nine tornadoes it produced were responsible for most of its impact. The table below outlines each of the major weather events in 2008.

Date	Event
January 7-8	Tornadoes
January 29	High winds
February 5	Tornadoes
March 6-7	Heavy snow
March 17-19	Flooding rain
April 3-4	Heavy rain/tornadoes
April 8-10	Flooding rain
May 2	Tornadoes
May 10	Tornadoes
June 1	Wind damage
August 9-12	Heavy rain
September 1-4	Flooding rain/wind
September 13-14	Isolated tornadoes/wind

Table 2. Dates of major weather events in Arkansas during 2008.³

The following three figures show the locations of flood events and precipitation comparisons for eight weather stations.

² United States Geological Survey, <http://ar.water.usgs.gov/NEWS/08-flood.pdf>

³ National Weather Service, <http://www.srh.noaa.gov/lzk/html/events2008.htm>

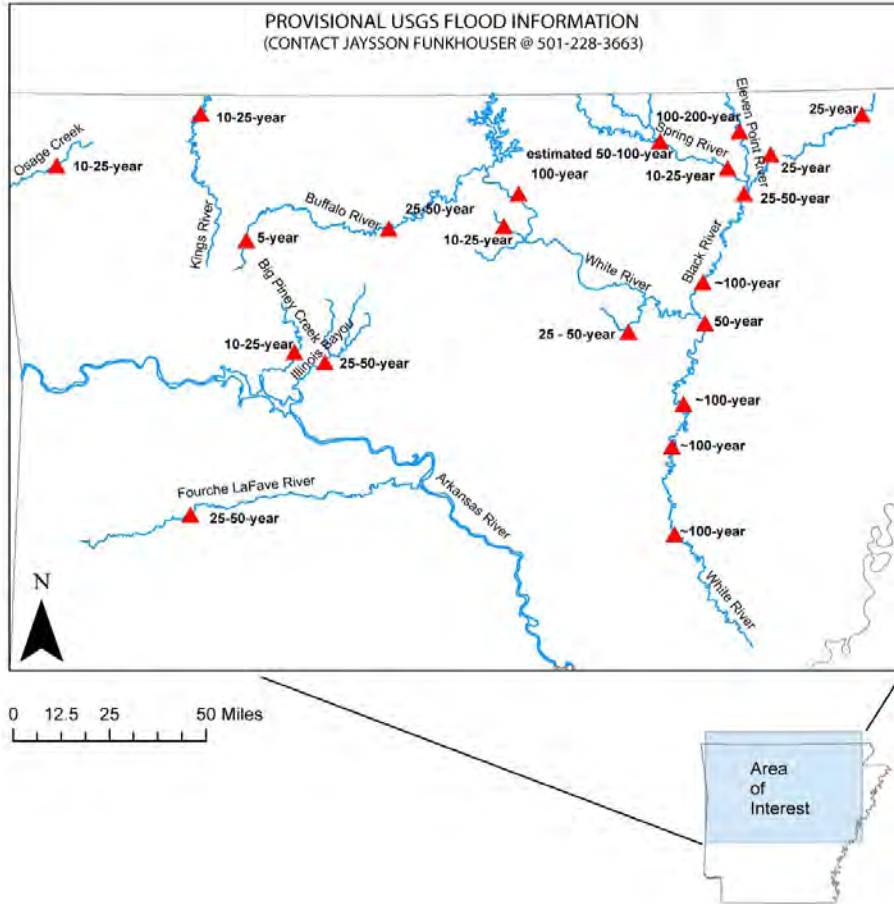


Figure 1. USGS Map locating the major flood events of 2008.

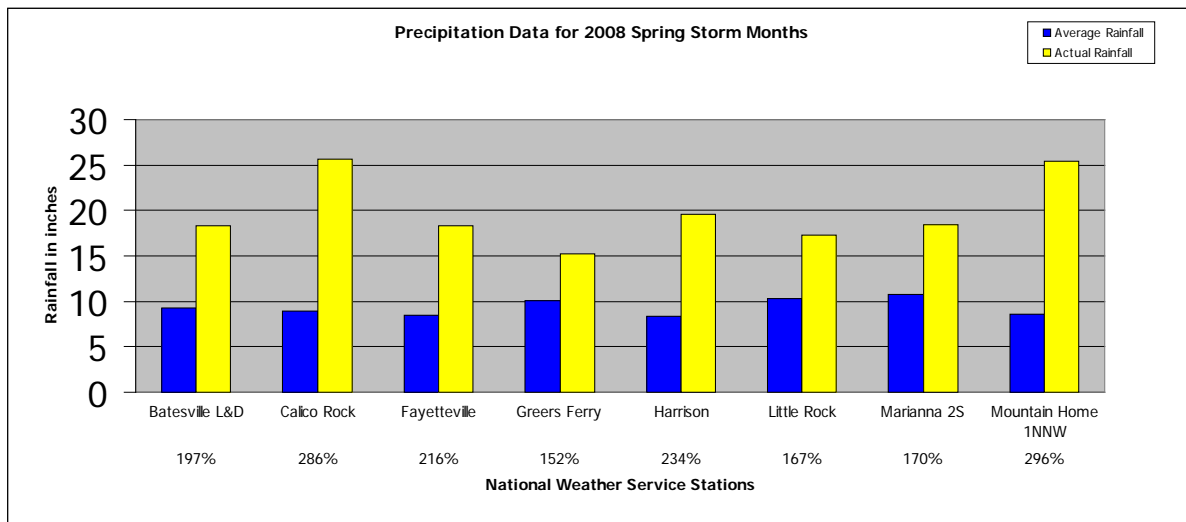


Figure 2. March and April 2008 rainfall totals and averages at select NWS stations in Arkansas. Percentages indicate departure from average.

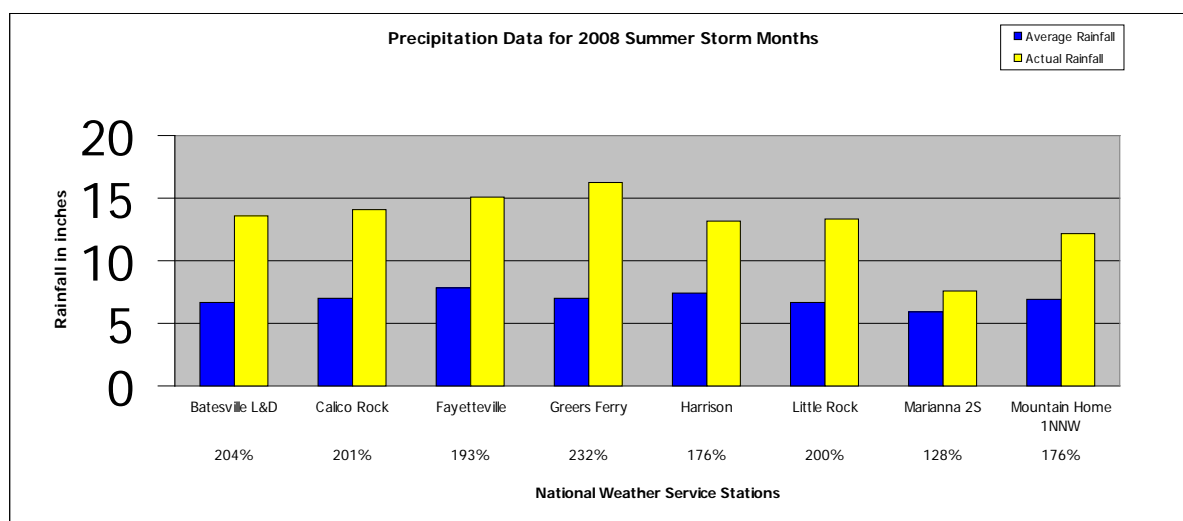


Figure 3. August and September 2008 rainfall totals and averages at select NWS stations in Arkansas. Percentages indicate departure from average.

Increased runoff from impervious surfaces cannot be ignored in any storm event, especially a flood. In addition to the movement of soil during flood events, large debris is agitated and carried away in floodwaters. This scenario transpired more than once across a large portion of Arkansas.

ANRC is the lead agency responsible for the statewide agriculture program within the NPS Management Program. Agriculture producers across the board, row-crop and animal, were affected by the weather events of 2008. Floodwaters washed away pasture soil and fences. Crops planted late had a late harvest. Moreover, lives and property were lost this year and that is enough of a burden. To implement and maintain a conservation practice after waking up to hardships after a natural disaster is, in most cases, too much to endure. Improving water quality cannot compare to picking up the pieces of a family's livelihood and trying to move on. In addition to the losses suffered by landowners, some of our water quality monitoring stations saw damage or were destroyed during storm events.

ANRC will continue to encourage the implementation of not only ecologically sustainable, but also economically viable conservation practices to improve water quality. Given the weather events this past year, a reduction in impaired water bodies is not likely even though the NPS program is working toward control and reduction of NPS. In fact, more water bodies could become impaired due to these weather events.

2008 Program Highlights

Arkansas' NPS Management Program met the challenges presented during 2008 to expand Arkansas' capacity to manage and reduce NPS pollution. Changes are coming to fruition in the NPS Management Program; they will help mold project design and validate project effectiveness. A few of the program highlights are described below.

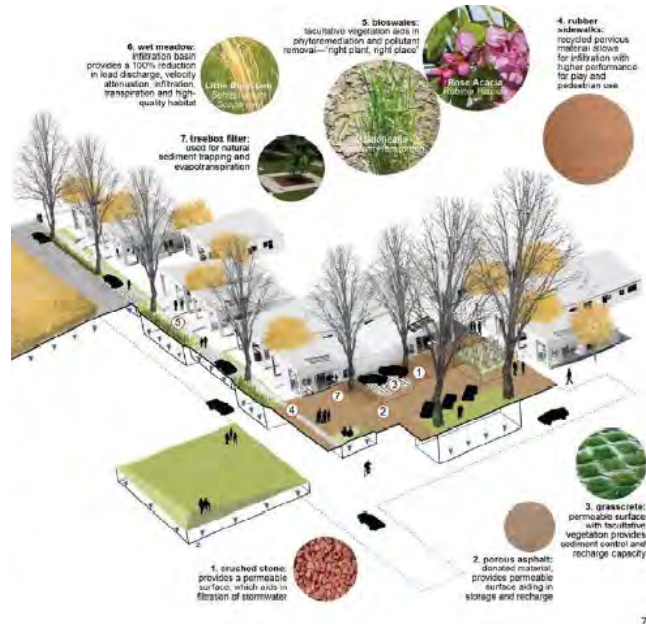


- ◆ **SWAT Modeling Capability on a 12-Digit Watershed Scale.** The Soil and Water Assessment Tool (SWAT) models are being refined to mimic watershed processes to the 12-digit Hydrologic Unit Code (HUC) level. The model incorporates "ground truthing," meaning the model is calibrated using observed and regionalized data. The model processes become validated when the model adequately represents the system by comparing model predictions to independent, observed data. This allows a greater amount of validity and confidence utilizing the models when running different implementation scenarios. Modeling at the 12-digit level will help identify priority sub-watersheds allowing funds to be directly targeted in areas to enable significant results toward the goal of improved water quality.
- ◆ **Priority Watersheds to be Updated.** The Arkansas NPS Management Program continues to update the way it selects priority watersheds. In September, ANRC held a meeting of the NPS Management Task Force to gather input from a wide range of interested persons to refine the management program and lay the groundwork for more implementation projects. As a result, the use of the new 12-digit SWAT modeling, 2006 Land Use/Land Cover data and a more "balanced" matrix will be utilized along with: Arkansas Department of Environmental Quality's (ADEQ) updated list of impaired streams, a working definition of likely NPS-related impairment, identified locations of NPS-related impaired streams, improved soil maps, and other factors. The new matrix developed enhances the previous matrix with the ability to identify likely NPS-related impaired streams in Arkansas. The matrix will continue to be refined using input from knowledgeable partners, data updates, and other factors on an annual basis. These new tools will allow the state to add or remove priority watersheds based on updated information.
- ◆ **Arkansas: A Leader in Low Impact Development.** Arkansas has become a leader in low impact development (LID) with the dawn of a project partially funded by the U.S. Environmental Protection Agency (EPA) and ANRC and designed by the University of Arkansas Community Design Center and the Ecological Engineering Group. The *Porchscapes* project is a 43-unit Habitat for Humanity residential demonstration whose objective is to design a pilot LID-Neighborhood Development that combines affordability with best management practices. The residential area is located on a 10-acre parcel of land that drains to a highly impacted, impaired watershed. Approximately one-third of the land will be left in conservation. A wet meadow, rainwater gardens, bioswales, and pervious parking and street surfaces will absorb and treat storm water on site, a key goal in low-impact development. The project will function on a "parks not pipes" network of treatment landscapes. The rainwater gardens, bioswales, infiltration trenches, sediment filter strips, tree box filters, and wet meadows will clean water using biological processes. This is critical since the first hour

of urban storm water runoff has a greater pollution index than raw sewage. The neighborhood sectors are developed as sub-watersheds.

Porchscapes has been recognized recently by receiving the following awards:

- **2008 Citation Award** from the Arkansas Chapter of the American Institute of Architects
- Third Place – **2008 GB Gunlogson Student Environmental Design Competition** (Ecological Engineering Group & University of Arkansas Community Design Center) from the American Society of Agricultural and Biological Engineers.
- 2008 Arkansas Planning Association **Achievement in Urban Design Award**
- 2008 American Society of Landscape Architects **Honor Award for Analysis and Planning**



2008 Illustrative Projects

This section describes projects that illustrate the Arkansas NPS Programs' efforts to seek projects that demonstrate thinking "outside the box" and addressing water quality problems in areas that require somewhat of a different approach.

Linking Other Natural Resource Concerns with Water Quality

Erosion is a natural process that can be accelerated by certain land use practices. Excess sediment in streams has an adverse effect on aquatic life. Sediment plumes the water, making it impossible for submerged aquatic vegetation to receive enough sunlight to grow. This vegetation is critical habitat for many aquatic animals including young fish. Sediment also smothers fish eggs and covers gravel bottoms where fish spawn and aquatic insects live. It does not break down or dissolve, thus with each storm event is stirred up again. In addition, sediment contaminated with pesticides can prove toxic to aquatic life.



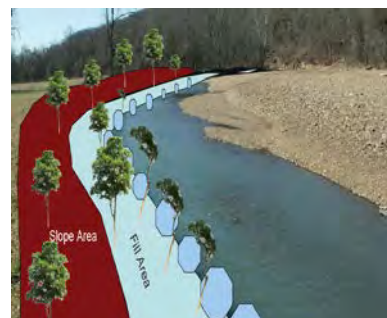
Aquatic Habitat Improvement Program



Stream bank erosion before

(07-800) The Arkansas Game and Fish Commission embarked upon a project to protect stream banks in three North Arkansas streams where storm events are eroding stream banks and dumping tons of sediment into the streams each year. This project seeks to stabilize stream banks, improve water quality, improve fish habitat, and improve economic benefits.

Stabilization at the sites included installing rock veins in the stream and using the Longitudinal Peak Stone Toe Protection (LPSTP) technique. The LPSTP is the placement of a windrow of stone in a peak ridge along the toe of an eroding bank and built up to about two thirds of the bank height. This method is effective when the upper bank is fairly stable and the erosion is due to cutting away at the toe of the bank. The LPSTP protects the toe while allowing the upper bank to stabilize on its own. Once the LPSTP is in place, the area is filled to construct a floodplain bench and the bank is sloped at 3:1. The filled area is



Plan for Restoration



LFSTP Technique

then vegetated using trees and native grasses.

The Aquatic Habitat Improvement Project will apply this stream bank stabilization method to a 1000-foot stretch of eroded riverbank in the Upper White near Brashears, a 450-foot stretch of eroded bank in the Lower Norfolk at Norfolk and a 1400-foot stretch of eroded bank of the White River at the mouth of Crooked Creek.

Abandoned Pesticides Project – L'Anguille River Watershed

(05-1400) After the realization that old and abandoned pesticides were being stored on farms throughout the watershed, this situation was clearly an unexpected threat to water quality in the event of a disaster. This project strived to educate producers about the dangers and risks of old and abandoned pesticides, while cultivating their trust to persuade them to participate in collection events that would remove the pesticides from the watershed. Producers were invited to complete a self-assessment that ensured the privacy of the individual but provided a comprehensive list of the types, amounts, and packaging conditions of abandoned pesticides that were being stored.

An extensive outreach campaign introduced the project to potential participants through posters, news articles, letters, media scripts, public displays, and presentations at community meetings.

Collection events were planned each year in each of the six counties in the watershed. Farm Bureau was selected as a neutral aggregator to collect the self-assessments. Personal information was removed from each form to protect the identity of participants. Information about the chemical such as chemical name, type, amount, and condition of container was provided to officials at each collection site.

The project put the infrastructure in place for local planning committees made up of County Judges, Emergency Services personnel, Farm Bureau, County Extension Agents, Conservation Districts, government agencies, and farmers to provide removal of these pesticides utilizing the Abandoned Agricultural Pesticide and Plant Regulator Disposal Trust Fund of the Arkansas State Plant Board.

Project leaders gauged the success of the educational program by the number of pounds of chemicals collected.



County	2006	2007
Craighead	6/3 4,986 lbs.	3/14 8,705 lbs.
Woodruff	6/28 4,602 lbs.	3/13 6,311 lbs.
Poinsett	9/28 27,298 lbs.	3/28 10,569 lbs.
Lee	10/10 10,898 lbs.	11/7 11,785 lbs.
St. Francis	10/11 1,018 lbs.	11/8 15,925 lbs.
Cross	10/12 10,259 lbs.	11/9 19,471 lbs.
Total	131,827 lbs	59,061 lbs. 72,766 lbs.

Figure 4. Dates and amounts of pesticides collected in 2006 and 2007.

Arkansas Silviculture NPS Project

The Arkansas Forestry Commission's commitment to maintain the reputation that forests generate clean water brought about the **Silviculture Statewide Assessment Project (05-300)** to conduct a statewide assessment of forest Best Management Practices and provide educational materials and training for landowners, loggers, and foresters.



The project used existing Arkansas Forestry District divisions to set the base for potential sites to be located and then statistically selected for monitoring of the use of forest BMPs to protect water quality. A total of 3,478 logging operations were identified and 267 of those sites were chosen for assessment. The ownership of the selected sites varied with 14 sites federally owned, 174 sites industry owned, 78 sites privately owned and

6 sites with state ownership. The major BMP categories assessed were roads, harvesting, regeneration, and streamside management zones. The assessment data illustrated the BMP implementation scores from each site and results confirm that streamside management zones score significantly lower, and sites privately owned generally score lower than sites under other types of ownership. Despite obstacles with personnel change, equipment malfunctions, sample size issues in some districts, and landowner issues, the project provided an enlightening assessment of water quality issues in the forestry industry and provided needed education and training.

In response to the information provided by the assessment, the project initiated training for foresters, loggers, landowners, and "in-house" training for all county rangers and county foresters. As a result 1,348 loggers were trained in 43 BMP programs, 1,062 private landowners were trained in 12 programs, and all county rangers and county foresters received training.



Restoring Urban Streams

Urban streams face sudden and severe impacts from storm events. The increasing areas covered by impervious surfaces decrease the natural buffers and remove the roots of trees and plants that hold the soil in place. Urban streams need BMPs that will protect the stream bank and improve the aesthetics of the area.

Demonstration of Best Management Practices for Stream Bank Protection

The Arkansas Game and Fish Commission, the Arkansas Watershed Conservation Center, the Arkansas Water Resources Center, the University of Arkansas Biological and Agricultural Engineering Department, and the City of Rogers collaborated to demonstrate BMPs for stream bank protection in the Blossom Way Watershed (05-400). A little over 57% of the



watershed is in urban or built up land use. The project included extensive water sampling, stream evaluations (to characterize the rate of stream bank erosion), an analysis of stabilization practices, a land use analysis of the watershed, design and installation of best management stabilization practices.

Over four hundred individual stream banks were evaluated. An inventory and assessment of bank erosion potential was conducted for thirty miles of stream including Blossom Way Branch and Osage Creek in Rogers, Arkansas.

The Arkansas Game and Fish Commission and the University of Arkansas Biological and Agricultural Engineering Department completed designs for the stream bank demonstrations. The demonstration of BMPs project reintroduces the floodplain by

enlarging the channel and stabilizing the stream banks with the use of native vegetation and various other techniques.



The photo to the left shows the newly dug floodplain and flagged new channel.

Project leaders use lessons learned from this project to increase the understanding and awareness among regional planners of the ecological and economical viability of stream stabilization. Public meetings were held to present eco-friendly practices and techniques not normally used in urban planning to regional planners and decision makers. Hopefully this will lead to a coordination of principles and practices between municipal jurisdictions and will foster improved regional planning efforts to develop a regional strategy to address sediment transport and stream bank erosion.

Demonstration of a Natural Channel Design to Restore a Stream Reach Draining an Urbanized Sub-Watershed of Hamstring Creek

Streams in urban areas have seen an increase in channel instability and enlargement due to the increase in magnitude of storm events producing runoff from large impervious areas. These conditions result in a stream network that no longer has a sustainable balance between the discharge of the stream and the sediment that must be transported to maintain stable channel dimensions.



Eroded Urban Stream Bank

Traditional methods of addressing enlarged channels in urban areas included recreation of a channel and lining it with concrete, use of riprap, and enclosure of the stream into a culvert system. The methods addressed the concerns somewhat but proved to be very expensive, do not improve aesthetics, decrease biodiversity, and generally move the problem to downstream property owners. The City of Fayetteville collaborated with the Watershed Conservation Resource Center to implement a natural channel design demonstration project. The project naturalized the stream corridor in areas that were cleared of vegetation, reduced the enlargement of the stream channel, and prevented contraction of the stream network. It also created potential to increase aquatic habitat in the watershed, improve aesthetics of the stream, and promote the use of alternatives to traditional channel modifications by hosting a field day for local developers and city planners in Northwest Arkansas.



Lessons Learned

Again, in FFY 2008, project holders and NPS partners met to review projects and discuss lessons learned. The project review is a valuable tool for project holders to present lessons learned and discover benefits from each other's experiences. As project leaders interact with other project participants, project partners and agencies, as well as stakeholders, they learn valuable lessons involving how weather, economic conditions, and human nature can alter the course of a project. The lessons learned section is presented to give advice to entities who want to submit new workplans, in project guidelines, and in program communications.

Smaller Scale Projects Limit Potential for

Participation

The **Polk County Water Quality Improvement Demonstration Project (06-1100)** selected two small watersheds for demonstration sites to serve as an educational showcase demonstrating to landowners the value and importance of protecting and improving water quality by adoption of BMPs. This involved recruiting two landowners willing to work with the project committee to implement BMPs on a cost share basis and use the whole farm as a demonstration farm. Information from the sites will be in field days, public meetings, tours, and newsletters.

Project leaders identified economic conditions as an "opportunity to overcome" as it was difficult for farmers to spend the money required to match the cost share. They also felt that it would be better to drop the "whole farm" approach and go with implementing individual practices on a number of farms in the watershed to reach more producers.

A similar project, **Implementing Best Management Practices on the West Fork of the White River (07-500)**, sought to provide a demonstration educational site, write nutrient management plans to minimize risk of NPS pollution, and cost sharing BMPs to prevent movement of nutrients into water bodies. Problems encountered in this project were due to the limited amount of farmland in the priority areas, which resulted in not all landowners needing a plan, landowners not interested, and non-response.



Continue Promoting Locally Led Efforts

Watershed management is a monumental task and is more than any agency or group can accomplish alone. Watershed management is best served when local stakeholders take ownership of restoration efforts and there is a public consensus that water quality issues are everyone's quandary. Locally led efforts are more likely to succeed and provide long-term results. Cited below are some of the locally led efforts.

Illinois River Watershed Partnership

A group of watershed stakeholders who recognized the point and NPS pollution issues in the Illinois River formed the Illinois River Watershed Partnership (IRWP). The members of the IRWP committed themselves to strive to improve the water quality of the Illinois River through education and positive actions. The IWRP encourages other Illinois River

Watershed residents to participate in order improved water quality in the river. The group recognizes that the problem is complex with many factors: confined animal agriculture and municipal wastewater dischargers contributing to the phosphorus problem, excessive fertilizer use, improperly functioning septic systems, sediment loads from pasture, construction, and eroding stream banks impact the watershed. The IRWP utilized 319 (h) funding for a number of projects, and is currently in the second year of **Upper Illinois Watershed Management Plan (07-1400)**. This project is the development of a Watershed Plan, in accordance with the EPA Watershed Based Plan's nine elements. The IWRP contracted with a firm to compile the data collected from previous projects, assess the validity and feasibility of BMPs used, and then use this information to create the plan. This project is currently schedule to be completed on time despite experiencing challenges with the first firm contracted. IRWP decided it was in the best interest to the success of the project to contract with a different firm.

Kings River Watershed Partnership

The Kings River Watershed Partnership formed from a small group of citizens and landowners who have a genuine concern about the possible declining water quality in the Kings River. Since its inception in 2002, the Partnership worked a number of projects that help them move toward their goal of "protecting the health, purity, and economic viability of the Kings River Watershed now and for future generations". The Kings River Watershed Partnership collaborated with Madison County Conservation District, Carroll County Conservation District, the Arkansas Game and Fish Commission to formulate the **Best Management Practices for Stream Corridor Restoration Project (06-500)**. The goals of this project are to perform education and outreach, monitoring, and stream bank restoration demonstrations in the Kings River Watershed. The group also prepared the Landowner's Guide to Streamside Living, which is a very informational handbook to teach landowners the history, conditions, and issues concerning the Kings River.

Larkin Creek Water District

In Eastern Arkansas, another locally led group of farmers and landowners are battling problems caused by sediment clogging Larkin Creek, the main drain for approximately 7,000 acres of cropland in the L'Angeuille River Watershed. Intensive agricultural practices along Larkin Creek clogged this outlet causing producers to lose crops and land as the floodplain encroaches. The farmers and landowners collaborated with the St. Francis County Conservation District to find a way to rectify the problem and ensure the same mistakes are not made again. The **St. Francis & Lee County Larkin Creek Sediment Prevention Demonstration Project (08-800)** contains plans to remove sediment, install buffer strips along both sides of the channel, restore timber areas, install drop pipes as needed, and develop conservation plans for all landowners with cropland that drains to the lateral ditch. The group of landowners organized and formed a legal drainage district to tax themselves to help pay for a portion of the restoration and to maintain it in the future. The landowners are now educated in how this problem happened and how to mitigate it; they now have personal ownership in the project and will have a sense of pride in maintaining it in the future.

The Need for more Implementation of Water and Sediment Control Practices in Row-Crop Agriculture

One of the major causes of sedimentation of streams in East Arkansas is water moving unbounded across agricultural fields then concentrating in low spots as it heads toward the outlet and causing gully erosion. Tons of sediment are transported into streams from agricultural land each year. Several very successful projects are addressing this problem by offering incentives to install water and sediment control practices.

The **Point Remove Erosion Control Project (06-1400)** is using these practices to prevent erosion, improve water quality, decrease damage to the land, and reduce losses with irrigation water conveyance. The Point Remove Project is in its fourth phase and has installed over fifty-three miles of pipe keeping approximately 1,000 tons of soil out of streams annually.



Edge of Field Drain Pipe

The **Arkansas County Pipe Project (06-1300)** and the **Desha County Pipe Project (06-1200)** are both very

successful projects that encourage producers to install erosion control practices with sediment and water control practices. Project leaders report high participation and satisfaction in the project among land users. Desha County has installed approximately 200 grade stabilization structures and 50 miles of pipe. These projects save approximately 3.8 tons of soil per 100 feet of pipe resulting in improvement in water quality. Demand is very high in these projects and funds available exhaust



quickly. Landowners are eager to participate due to the economic incentive of fifty percent cost-share pipe and the rapid increase of water quality.

The Natural Gas and NPS

Arkansas has seen a steady increase in the oil and gas exploration due to the discovery of the Fayetteville Shale gas play in 2004. Over 2.5 million acres have been leased in this area since the drilling began⁴. This geological natural gas formation is found in the heart of the State, mostly in Pope, Conway, Van Buren, Faulkner, Cleburne, and White Counties.

According to Arkansas Oil and Gas Commission (AOGC), the number of permits issued has increased by approximately 33% per year since 2005.⁵ The rapid increase of mining operations leads to many questions. ANRC is mostly concerned with the apparent void in evaluating its impact to the environment.



The mining of natural gas is a lateral operation, drilled vertically and then horizontally to extract the greatest amount of gas. The thickness of the producing zone ranges from 50 to 550 feet and wells range from 1,500 to 6,500 feet deep.⁶ Water is injected at a high pressure to drill in the shale formation. It is estimated to use more than a million gallons of water per well.

Transportation of water to the well site is a requirement in most cases. Trucks laden with thousands of gallons of water are disturbing the grounds and possibly streams surrounding these operations. Soil disturbances lead to erosion and increase run off that make their way in to the State's waters.

Not only is this a great strain on the water resources, what is left after drilling is a briny solution, contaminated with chemical residues, sand, and hydrocarbons from the gas being drilled. The AOGC is the agency in charge of permitting these operations and governs the disposal of the wastewaters. Currently the only allowed method of disposal is deep-water injection at permitted facilities. Companies may also transport the water out of the state. There are no definite answers on how this disposal method may affect water in the areas surrounding these locations.

ADEQ is the agency with oversight of the Fayetteville Shale and is required to do field inspections of these sites. It is a concern that ADEQ does not have the capacity to handle the increase in supervision that the oil and gas industry now needs. If a strain on the environment goes unimpeded, it is likely the effects will be seen in the quality of Arkansas' waters.

There is no determination if, in the future, problems associated with gas mining will trickle down to the NPS program. Who will be responsible for the impact to the environment? Will it be the gas companies or the landowners who leased their land or mineral rights, possibly without full understanding of their culpability? It is a concern that is worth addressing. It is clear that the potential to affect the NPS program is there and may just be a matter of time.

⁴ Arkansas Geological Survey, http://www.geology.arkansas.gov/fossil_fuels/gas.htm

⁵ Arkansas Oil and Gas Commission, <http://www.aogc.state.ar.us>

⁶ Arkansas Geological Survey, http://www.geology.arkansas.gov/fossil_fuels/gas.htm

Program Expenditures



The Arkansas NPS Program allocates most of its Clean Water Act 319(h) funds to partners willing to carry out projects that best meet the goals and milestones of the Arkansas NPS Program. Project awardees provide sufficient match in non-federal funds to complete the projects.

In FFY 2008, ANRC and project partners spent approximately \$7.5 million dollars to reduce and prevent NPS pollution in Arkansas. This included \$3.7 million in Federal Clean Water Act Section 319 funds, which were matched by \$3.8 million in non-federal

funds.

Figure 5 shows how federal funds disbursed for projects were allocated among monitoring, planning, outreach, and implementation projects. Monitoring expenditures increased from 10% of federal dollars in FFY 2007 to 17% on FFY 2008. Planning expenditures increased to 10% in FFY 2008 while outreach expenditures fell to 3%. Implementation expenditures reflected a small decrease in FFY 2008 with funds spent at 70%. Implementation projects still by far account for the greatest share of the total budget.

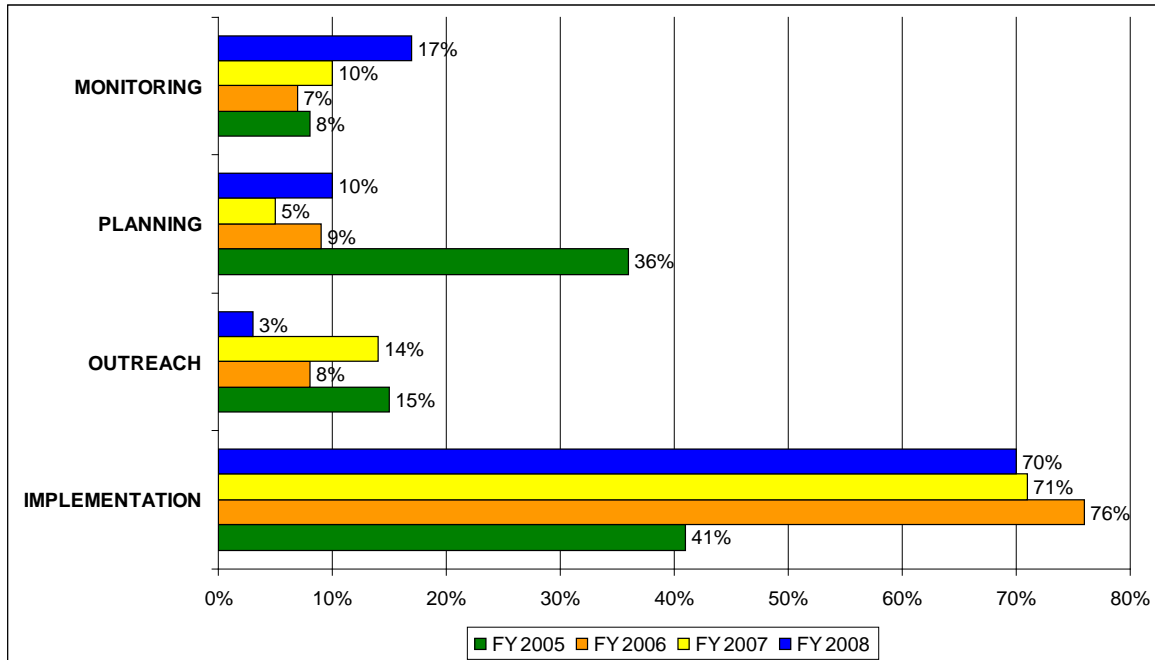


Figure 5: Percentage Federal Expenditures by Function, FFY 2005 - FFY 2008



Best Management Practices Implementation & Load Reductions

Estimated Load Reductions

Data collected for all implemented BMPs for each 319(h) project used a standardized BMP reporting form. The BMP type and affected land area was entered in either the Region 5 or STEPL load estimation models. Depending on the model used and the type of BMPs, several additional parameters (e.g. cover management factor, land use data, and animal population) may be required to complete the calculation. The models estimate annual pounds per year of nitrogen and phosphorus removed from water bodies as well as the annual tons per year of sediment removed.

Project #	Nitrogen Reduced (lbs/yr)		Phosphorus Reduced (lbs/yr)		Sediment Reduced (tons/yr)	
	FY 08	Project Life	FY 08	Project Life	FY 08	Project Life
02-164	8	5,029	4	2,517	4	1,902
02-172	347	347	173	173	187	187
03-150	224	1,287	112	669	151	863
03-151	69	7368	34	906	28	211
03-154	2,258	3,357	1,129	1,679	1,162	1,823
03-155	1,168	20,680	599	1,038	88	401
03-156	2,497	10,480	1,303	3,517	144	285
03-157	133	5,339	66	584	74	292
03-159	453	2,558	226	1,278	239	1,354
03-160	144	3,042	72	548	144	500
03-161	43	3,707	21	825	19	216
03-1101*	822,505	2,775,924	897,654	3,022,425	0	0
04-101	250	1,615	125	806	136	865
04-103	120	524	60	262	49	212
04-104	281	4,097	141	707	139	510
04-105	285	1,149	143	575	117	480
04-106	532	2,621	266	1,310	332	1,632
04-107	103	379	52	190	45	167
04-112	95	389	48	194	39	162
04-113	104	3,934	52	502	47	260

Project #	Nitrogen Reduced (lbs/yr)		Phosphorus Reduced (lbs/yr)		Sediment Reduced (tons/yr)	
	FY 08	Project Life	FY 08	Project Life	FY 08	Project Life
05-101	810	1,532	405	766	399	762
05-102	208	979	104	489	126	585
05-103	160	527	80	264	77	252
05-104	529	1,587	264	793	265	796
05-500	2,923	19,259	1,460	9,623	1,775	11,701
05-700	5,995	11,709	2,882	5,698	1,509	3,159
05-800	2,486	4,566	1,244	2,282	1,194	2,208
06-200	5,861	10,967	2,927	5,480	3,077	5,148
06-500					2,565	2,565
06-600					57	57
06-800	321	366	160	182	167	191
06-1200					75,000	75,000
06-1300					34,831	34,831
06-1400					194	194
07-800					225	225
Total	28,407		14,152		124,605	

Table 3: Load Reductions by Project, FFY 2008 and Life of Project * Project 03-1101, Litter Removal by transport excluded from total.

FFY 2008 Load Reduction	Nitrogen	Phosphorus	Sediment
	lbs/yr	lbs/yr	Tons/yr
Total	850,912	911,806	124,605

Table 4: Total Load reduction including Litter Removal, FFY 2008



Monitoring, Assessment & Planning Projects



Monitoring is needed to evaluate runoff conditions before installation of BMPs. This allows for effectiveness of those installed practices to be realized. The ANRC's monitoring supplements but does not duplicate ADEQ monitoring. The Arkansas NPS Program relies on ADEQ monitoring data and its assessment of the waters of the state to identify priority watersheds. Data from these projects are submitted to ADEQ for use in the development of the 303(d) list and administrative designing.

Watersheds requiring a Total Maximum Daily Load (TMDL) are automatically considered priority watersheds. A variety of monitoring projects in the 2008 program collected data before, during, and after stream restoration projects and installation of soil erosion practices. Below is a list of monitoring projects in the NPS program for 2008

2008 NPS Monitoring Projects

Monitoring Projects	Project #
L'Anguille Monitoring	07-117
Pipe Projects Monitoring	07-1300
Saline River Monitoring	07-118
Bayou Bartholomew	07-119
Kings River	07-112
West Fork of the White River	06-1000
West Fork of the White River	07-114
White River	07-115
Osage Creek Monitoring	07-113
Strawberry River	07-1000
Ballard Creek	04-180
Ballard Creek	07-110

Edge of Field Monitoring	05-1300
Illinois River Monitoring	07-111

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 Arkansas NPS Program includes assessments projects to better prioritize and approve future implementation projects. The assessment list contains hands on data collection for projects that involve stream bank restoration and BMP implementation to reduce sedimentation. The table below lists current assessment projects. The Kings River Watershed Partnership, The Nature Conservancy, Arkansas Forestry Commission and the ADEQ

have conducted assessments. These assessments will provide data from sub-watersheds to target implementation projects in the areas of greatest sediment loads.

NPS Assessment Projects

Project #	Assessment
06-500	Best Management Practices for Stream Corridor Restoration Project
06-400	Sediment Assessment of the Cache River
05-900	Assessing the Upper Saline
05-300	Silviculture Statewide Assessment
05-200	Middle Fork-White River Assessment

The **Best Management Practices for Stream Corridor Restoration Project (6-500)** conducted extensive surveys of stream bank erosion including 85 miles of the Kings and Osage surveying 203 sites using the Bank Erosion Hazard Index (BEHI), and evaluated 17.6 miles of eroded stream bank. The project also conducts chemical monitoring and biological assessments at 10 sites. Educational workshops and a handbook for landowners and a stream bank demonstration are results of this project.

The objectives of the **Sediment Assessment: The Cache River Watershed of Arkansas (06-400)** project installed continuous monitoring stations to characterize sediment flux and flow regime at each site, document bank stability conditions upstream from each site, and identify, rank, and prioritize major sources of suspended sediment for each site. Data from this assessment will help the group do stream restoration on a high priority stream bank identified in the assessment.

The goal of **Upper Saline Assessment (05-900)** also was to identify, rank and prioritize critical stream bank erosion sites using the Soil & Water Assessment Tool (SWAT) to evaluate urban, forest, timber, and pastureland, the Water Erosion Prediction Project (WEPP) to evaluate runoff from approximately 180 miles unpaved roads, and the Bank Erosion Hazard Index (BEHI) to evaluate in-stream erosion.

The **Silviculture Statewide Assessment Project (05-300)** completed a statewide assessment to evaluate the use of BMPs in silviculture activities. Aerial assessments were done at 274 sites involving 3,339 logging operations. Results from the assessment prompted the Arkansas Forestry Commission to conduct technical training for all foresters and loggers, and to provide non-technical landowner education.

The **Middle Fork of the White River Assessment (05-200)** worked to compile a database for the Middle Fork of the White River. The database will aid in the identification and prioritization NPS of pollution by conducting water quality monitoring, collection of stream morphology data, and conducting an erosion inventory. Ongoing efforts monitored 24-hour measurements of dissolved oxygen, ph, temperature, conductivity, and turbidity.



Project Summaries

There are seven 8-digit HUCs with a nonpoint source-related TMDL water body and thirteen 8-digit HUCs with a “truly impaired” nonpoint source-related water body, according to the 2008 list of impaired water bodies for Arkansas. ADEQ defines water bodies listed under category 5a as truly impaired and advises TMDL development or other corrective action for

the listed parameter. All but one of these watersheds (Upper Ouachita 08040102) are affected by a 319(h) funded project.

Priority watersheds are listed in the Arkansas 2005-2010 NPS Management Program Update. Each priority watershed has or had at least three 319(h) funded projects located within its boundaries. Below are summaries of implementation projects, categorized by watersheds. Please note that some projects are in multiple watersheds, the project appears first in **bold** and in *italics* in each subsequent appearance.

TMDL Watersheds

*Also includes truly impaired (5a listed) water bodies

Beouf

02-164 Drew County Drill Project— Drew County purchased a no-till drill and made it available to producers for pasture establishment. This reduced sediment and nutrients entering streams due to erosion on pasture ground with poor stands.

06-1200 Desha County Pipe Project— The Desha County Conservation District installed approximately 200 grade stabilization structures and 50 miles of pipe reducing tons of sediment from agricultural fields.

07-1300 Pipe Projects Monitoring— This project monitored pipes installed for water control and erosion control for their effectiveness at reducing total suspended solids in agricultural runoff.

Bayou Macon

06-1200 Desha County Pipe Project

07-1300 Pipe Projects Monitoring

Bayou Bartholomew (NPS Priority)

02-164 Drew County No-Till Drill

05-300 Silviculture Statewide Assessment Project — Conducted two statewide assessments of implementation of forestry

BMPs-both assessments performed with a sampling margin of error of 5% or less-and both based on aerial reconnaissance of counties within individual Arkansas Forestry Commission Districts.

06-111 Bayou Bartholomew Monitoring Project— Assembled the guidelines, standard procedures, analysis and results for water quality monitoring on the Bayou Bartholomew Watershed

06-1200 Desha County Pipe Project

07-116 Bayou Bartholomew Monitoring— The Ecological Conservation Organization conducted water quality sampling, analysis, and developed a trend hypothesis for the Bayou Bartholomew Watershed by taking automated and grab samples.

07-1300 Pipe Projects Monitoring

08-115 Bayou Bartholomew Monitoring— The Ecological Conservation Organization will conduct water quality sampling, analysis, and develop a trend hypothesis for the Bayou Bartholomew Watershed by taking automated and grab samples.

08-300 SWAT Modeling— The University of Arkansas Cooperative Extension Service will use the SWAT to model the Lake Conway Point Remove, Bayou Bartholomew, Beaver Reservoir, and Illinois River Watersheds at the 12 digit HUC scale and rank the 12 digit HUCs based on their contribution to NPS pollution.

Cache*

03-161 Prairie County Mini Grant— The Prairie County Conservation District purchased a no-till drill for the landowners in the White River Watershed. Through education and implementation, they were able to reduce the amounts of sediment entering this watershed.

04-112 Woodruff County Mini Grant— The Woodruff County Conservation District purchased a litter spreader and proposed to apply litter to at least 1000 acres.

06-400 Cache Phase II— Conducted investigations including water quality, biological samples, and channel cross-section analysis to generate baseline data and develop a watershed framework assessment.

Strawberry

03-151 Lawrence County Mini Grant— The Lawrence County Conservation District purchased a no-till drill for the landowners in the Strawberry River Watershed to reduce sediment levels entering their streams.

03-159 Fulton County— The Fulton County Conservation District purchased a no-till drill and a heavy duty tree planter to increase ground cover on pasturelands in the Strawberry and Spring River Watersheds. The increased vegetation resulted in 5 tons/acre/year less soil loss.

05-800 Strawberry River Cost Share Phase III— Reduced sediment delivery to the Strawberry River by making pasture improvement equipment available to producers who could not afford to buy it.

07-1000 Strawberry River Monitoring— The purpose of this project is to monitor the effectiveness of BMPs through water quality samples from two Strawberry River sub-watersheds.

08-500 Fulton County—The Fulton County Conservation District will implement a voluntary program for landowners in the Strawberry Sub Watersheds for the application of necessary BMPs. The goals of this project will be to implement 150 farm plans to restore pasture lands, reduce sedimentation through No-Till planting, and increase awareness through field days and demonstrations.

Beaver Reservoir* (NPS Priority)

03-150 Boone County Mini Grant— The Boone County Conservation District purchased an aerator for farmers to use on their compacted pasture and hay lands in the Bull Shoals, Crooked Creek, and Long Creek watersheds to reduce runoff of sediment and nutrients.

03-160 Newton County Mini Grant— The Newton County Conservation District purchased a no-till drill and a Rotowiper for the landowners in the Buffalo River and Piney Creek Watersheds. Landowners reduced sediment and herbicide runoff by using these techniques.

04-101 Benton County Mini Grant— The Benton County Conservation District purchased a no-till drill for the Benton County landowners in the Illinois, Beaver Lake, and Spavinaw Watersheds to reduce phosphorus runoff.

04-160 Carroll County Mini Grant— The Carroll County Conservation District stabilized a portion of eroding stream bank on Osage Creek in the Upper White River Watershed. Also, landowners were educated on solutions to eroding stream banks and NPS pollution problems.

05-1000 Urban Hispanic Outreach— The goal of this project is tailoring pollution preventative educational materials to target the increasing Hispanic population in North West Arkansas to engage the Latino community into actively participating in addressing issues affecting water quality protection.

05-102 Newton County Mini Grant— The Newton County Conservation District purchased a Lime Spreader for the landowners in the watersheds of Newton County. This Lime Spreader improved the grass cover by correcting the soil's pH and reduced erosion by an estimated 5 tons/acre/year.

05-200 Middle Fork– White River Assessment— Conducted a NPS assessment of the watershed.

06-1000 West Fork White River Monitoring— This project established two water-quality monitoring stations to determine accurately sediment and nutrient loading,

determine effects of restoration project, and gain a better understanding of the chemical and physical dynamics of the watershed area.

06-112 Kings River Monitoring— The Arkansas Water Resource Center (AWRC) continued water quality sampling, analysis, and load determinations for nutrients and solids on the Kings River at the Highway 143 Bridge through automated and grab sampling.

06-114 West Fork-White River Monitoring— This project was for water quality sampling, analysis, and determining annual loads for nutrients and solids on the West Fork of the White River. This annual project helps in determining BMP effectiveness, TMDLs, and trends in water quality.

06-115 White River Monitoring— This project was for water quality sampling, analysis, and determining loads for nutrients and solids at the Arkansas Highway 45 Bridge on the White River. The data collected was used to calculate pollutant loads and mean concentrations for the year.

06-141 Leatherwood Creek— The goal of this project was to reduce NPS pollution, especially pollution from urban storm water, within the Leatherwood Creek watershed through power point presentations, facilitated workshops, and the development of an educational brochure.

06-500 Kings River Demonstration— This project plans to conduct extensive surveys of stream bank erosion including 85 miles of the Kings and Osage surveying 203 sites using the BEHI and evaluating 17.6 miles of eroded stream bank. The project also conducts chemical monitoring and biological assessments at 10 sites. Educational workshops and a handbook for landowners and a stream bank demonstration are results of this project.

07-112 Kings River Monitoring— The Kings River Watershed Partnership conducted water quality sampling, analysis, and load determinations for nutrients and solids on the Kings River at the Highway 143 Bridge through automated and grab samples.

07-113 Osage Creek Monitoring— The ARWC and the Northwest Arkansas Conservation Authority conducted water quality sampling, analysis, and load determinations for nutrients and solids on Osage Creek near Elm Springs in the Illinois River Watershed

07-114 West Fork-White River Monitoring— The ARWC conducted water quality sampling, analysis, and load determinations for nutrients and solids at the Washington County Road 195 Bridge on the West Fork of the White River by taking automated and grab samples.

07-115 White River Monitoring— The ARWC conducted water quality sampling, analysis, and load determinations for nutrients and solids at the Arkansas Highway 45 Bridge on the White River just above Beaver Lake by taking automated and grab samples.

07-200 UA Biosolids— The ARWC and the University of Arkansas are utilizing water treatment residuals to reduce phosphorus runoff from biosolids in the Upper White River and Illinois River Watersheds. Reduction of phosphorus runoff by 50% and cost reduction compared to current practices will determine the success of the project.

07-400 WCRC West Fork— The Watershed Conservation Resource Center will be restoring sections of the West Fork of the White River to reduce sediment loads, improve

water quality, enhance aquatic and terrestrial habitat, and increase awareness about natural channel design.

07-500 BMPs in the West Fork of the White River— The Washington County Conservation District hoped to use implement BMPs to reduce sediment and nutrient transport. However, due to lack of interest in cost-share by the landowner's in the project area, this project will not be completed.

07-600 UACDC LID— The University of Arkansas Community Design Center will be implementing LID methods and BMPs to restore water quality in the urban areas of Fayetteville, AR of the White River and Illinois River Watersheds.

07-800 Arkansas Game & Fish Commission— The Arkansas Game and Fish Commission conducted restoration of unstable sections of the White River and its tributaries to improve water quality, enhance aquatic and terrestrial life, and increase awareness of natural channel design.

08-111 Kings River Monitoring— The Kings River Watershed Partnership will conduct water quality-sampling, analysis, and load determinations for nutrients and solids on the Kings River at the Highway 143 Bridge through automated and grab samples.

08-112 Osage Creek Monitoring-- The Northwest Arkansas Conservation Authority and Nelson Engineering will conduct water quality sampling, analysis, and load determinations for nutrients and solids on Osage Creek near Elm Springs in the Illinois River Watershed.

08-113 West Fork-White River Monitoring— The City of Fayetteville and Nelson Engineering will conduct water quality sampling, analysis, and load determinations for nutrients and solids at the Washington County Road 195 Bridge on the West Fork of the White River by taking automated and grab samples.

08-114 White River Monitoring— The Beaver Water District and Nelson Engineering will conduct water quality sampling, analysis, and load determinations for nutrients and solids at the Arkansas Highway 45 Bridge on the White River just above Beaver Lake by taking automated and grab samples.

08-200 Kings River Watershed Partnership Urban Stream Demo— The Kings River Watershed Partnership will be demonstrating BMPs for Urban Stream Corridor Restoration in the Mill Branch reach of the Kings River Watershed to reduce sediment, evaluate effectiveness of BMPs, and increase awareness to the public.

08-300 SWAT Modeling

L'Anguille* (NPS Priority)

04-103 Cross County Mini Grant— The Cross County Conservation District purchased a no-till drill to make available to producers in the watershed.

04-111 St Francis County Mini Grant— The St. Francis County Conservation District purchased a ground water model and conducted educational classes with schools,

producers, landowners, and civic groups to disseminate information about water quality issues in the L'Anguille River Watershed.

04-112 Woodruff County Mini Grant

04-121 Cooperative Extension Service L'Anguille Modeling— This project used the Soil Water Assessment Tool (SWAT) to prioritize the 12-digit HUCs in the L'Anguille Watershed. The 12-digit HUCs are ranked based on their contribution to flow of sediment and nutrients. Using this model, we can pinpoint 12-digit HUCs that need the most attention.

04-400 L'Anguille Demonstration with Cooperative Extension Service— The goal of this project is to educate farmers in East Arkansas the water quality and economic value of using side and multiple inlet irrigation systems and collect data from on-farm demonstrations.

05-105 St. Francis County Mini Grant— The St. Francis County Conservation District provided education to home owners in the L'Anguille River Watershed about Best Management Practices for their lawns.

05-1400 Abandoned Pesticides Project— See project description in Highlighted Projects Section

05-700 L'Anguille River Cost Share Phase II— Offered a cost share incentive for producers in the L'Anguille River Watershed to demonstrate BMPS to reduce soil erosion from agricultural fields.

06-113 L'Anguille Monitoring— This project's focus was continually monitoring water quality for sites in the L'Anguille watershed. The water samples were gathered, analyzed, and then utilized to develop a trend hypothesis for this watershed.

07-117 L'Anguille Monitoring— The Ecological Conservation Organization conducted water quality sampling, analysis, and developed a trend hypothesis for the L'Anguille Watershed by taking automated and grab samples.

07-1200 St. Francis County— The St. Francis County Conservation District worked with landowners to plan and design the restoration of a clogged drainage channel in the L'Anguille River Watershed.

07-300 Smart Ditches— The City of Harrisburg initiated this project to demonstrate the practicality, cost, and effectiveness of controlling gully erosion along streets and roads using a newly developed thermoformed plastic ditch lining technology that can be easily installed using local people.

08-116 L'Anguille Monitoring— The Ecological Conservation Organization will conduct water quality sampling, analysis, and develop a trend hypothesis for the L'Anguille Watershed by taking automated and grab samples.

08-800 St. Francis & Lee County Larkin Creek Sediment Prevention

Demonstration Project— The restoration of sediment clogged drainage, lateral to Larkin Creek in the L'Anguille River Watershed. Landowners have taken the initiative to tax themselves to pay for a portion of the project and maintain it in the future.

“Truly Impaired” Watersheds

Lower Ouachita-Smackover

05-300 Silviculture Statewide Assessment Project — Recognized the nature of silviculture activities and their direct impact on waters of the State of Arkansas. The project sought an ongoing assessment of silviculture use of BMPS to protect water quality.

Upper Saline (NPS Priority)

05-900 Upper Saline-The Nature Conservancy— Goals of this project are to identify, rank and prioritize critical stream bank erosion sites using SWAT, to use WEPP to evaluate runoff from approximately 180 miles unpaved roads, and BEHI to evaluate in-stream erosion.

06-116 Upper Saline Monitoring— This project’s goal was to monitor water quality for sites in the Upper Saline Watershed. Water quality samples were collected, analyzed, and then utilized to develop a trend hypothesis.

07-118 Saline River Monitoring— The Ecological Conservation Organization conducted water quality sampling, analysis, and developed a trend hypothesis for the Upper Saline Watershed by taking automated and grab samples.

08-117 Saline River Monitoring— The Ecological Conservation Organization will conduct water quality sampling, analysis, and develop a trend hypothesis for the Upper Saline Watershed by taking automated and grab samples.

Bull Shoals Lake

03-150 Boone County Mini Grant— The Boone County Conservation District purchased an aerator for farmers to use on their compacted pasture and hay lands in the Bull Shoals, Crooked Creek, and Long Creek watersheds to reduce runoff of sediment and nutrients.

04-106 Marion County Mini Grant— The Crooked Creek Conservation District purchased a no-till drill that will allow producers to improve pasture stands and plant cool season grasses for winter food and cover.

07-800 Arkansas Game & Fish Commission

North-Fork White

06-200 Fulton County Cost Share— Offers incentives to farmers to install BMPS involving cattle operations. Currently 168 farms have BMP plans.

07-800 Arkansas Game & Fish Commission

Current

04-181 Randolph County Drill— The Randolph County Conservation District will purchase a no-till drill for the landowners in the watersheds of Randolph County. This will reduce erosion and enhance water quality on pasture, and croplands.

05-104 Randolph County Mini Grant— The Randolph County Conservation District purchased a manure spreader and rotowiper for the landowners in the watersheds of Randolph County to reduce erosion and herbicides that enter water bodies through runoff.

Lake Conway-Point Remove (NPS Priority)

04-102 Conway County Mini Grant— A large group of partners utilized a variety of resources to build an outdoor classroom as a learning tool for the teachers of Morrilton Middle School. The objective of this project is to teach non-point pollution, BMPS, monitoring water quality, soil erosion, water quality, trees, landscaping, weather, etc to the students.

04-104 Faulkner County Mini Grant— This project allowed the Faulkner County Conservation District to purchase a no-till drill and pasture sprayer to improve pasture and reduce erosion.

04-109 Perry County Mini Grant— The Perry County Conservation District purchased a litter spreader and made it available for farmers to utilize litter.

04-113 Yell County Mini Grant— The Yell County Conservation District purchased a no-till drill so producers could no-till cool season grasses in pasture and utilize nutrients during the winter and provide winter cover to reduce erosion.

05-103 Point Remove Mini Grant— The Point Remove Wetlands Reclamation and Irrigation District purchased a no-till drill for the landowners in the Lake Conway Point Remove Watershed to reduce erosion in runoff by reduction of tillage and soil disturbances.

06-1400 Point Remove Project— Placed pipes on agricultural land to reduce gully and irrigation conveyance erosion.

07-1300 Pipe Projects Monitoring

08-300 SWAT Modeling

Fourche LaFave

04-109 Perry County Mini Grant

04-113 Yell County Mini Grant

Lower Arkansas-Maumelle

04-109 Perry County Mini Grant

05-107 Pulaski County Mini Grant— The Pulaski County Conservation District (PCCD) constructed an environmental garden that utilized BMPs to

educate children and their parents in the Arkansas River Watershed. The PCCD targeted around 500 students and secondarily educated their parents.

07-1100 Jefferson County— The Jefferson County Conservation District are purchasing pipe for the landowners of the Lower Arkansas-Maumelle and Lower Arkansas watersheds. The installation of these pipe structures should save around 60,000 tons/year of soil.

Lower Sulphur

04-107 Miller County Mini Grant— The Miller County Conservation District purchased a no-till drill and made it available for farmers to plant no-till.

Upper Ouachita

No current projects are within this watershed.

Other Watersheds

Illinois (NPS Priority)

03-1101 Litter Transport II— provided an incentive to facilitate the removal and transport of litter from the nutrient surplus area to selected areas outside nutrient surplus watersheds.

04-101 Benton County Mini Grant

04-180 Ballard Creek Monitoring— This project is for water sampling, analysis, and annual pollutant load calculations at the Washington County Road 76 Bridge on Ballard Creek. The IWRP and the AWRC water quality lab will oversee this continuing water-monitoring project.

05-1000 Urban Hispanic Outreach

05-1100 Urban Low Impact BMPs— The University of Arkansas goal for this project was to demonstrate LID methods and technologies in urban areas of the Illinois and White River Watersheds, educate the public of these methods, and reduce NPS pollution.

05-1300 Edge of Field Monitoring— addressed the need of evaluating BMPs across diverse landscapes to provide data supporting water quality improvement from practices on land utilizing animal manure.

05-400 Blossom way Project— The Arkansas Game & Fish Commission's goals for this project was to demonstrate BMPs for protecting stream banks in an urban area of the Illinois River Watershed, reduce sedimentation entering the Blossom Way reach of Osage Creek, and increase awareness to the public about stream bank stabilization and channel modification.

06-110 Ballard Creek Monitoring— The ARWC continued water quality sampling, analysis, and load determinations for nutrients and solids on Ballard Creek in the Illinois River Watershed through automated and grab sampling.

06-600 Natural Stream Channel Design— The City of Fayetteville and Watershed Conservation Resource Center propose to naturalize the stream corridor, reduce the enlargement of the stream channel, prevent contraction of the stream network, increase aquatic habitat, improve aesthetics, and promote the use of alternatives to traditional channel.

Lower Little (NPS Priority)

02-172 Polk County (Rich Mountain) Drill— This project leased a no-till grain drill to producers to help reduce soil erosion and water pollution caused by runoff of soil particles containing animal waste, commercial fertilizer, and pesticides.

03-157 Polk County Mini-Grant— The Polk County Conservation District leased a no-till drill to landowners to reduce erosion and nutrient runoff in the Mountain Fork of Little Red, Ouachita River, Millwood Lake, and Red River Watersheds.

05-300 Silviculture Statewide Assessment Project

Poteau (NPS Priority)

02-172 Polk County (Rich Mountain) Drill

03-157 Polk County Mini Grant

05-300 Arkansas Forestry Commission Silviculture Project

Lower Mississippi-Helena

03-156 Phillips County Mini Grant— The Phillips County Conservation District purchased a GPS surveying system to assist farmers in the Big Creek, Lower White, and Lower Mississippi watersheds with ways to reduce sediment and nutrient problems and educated landowners about water quality.

Lower White-Bayou Des Arc

03-155 Lonoke County Mini Grant— The Lonoke County Conservation District purchased a GPS surveying system to assist landowners in Lonoke, White, Pulaski, and Prairie Counties with ways to reduce runoff through various BMP techniques. In addition, there was a fact sheet produced to increase education about NPS pollution.

03-161 Prairie County Mini Grant

04-104 Faulkner County Mini Grant

04-105 Lonoke County Mini Grant-- The Lonoke County Conservation District purchased a chicken litter spreader for the landowners in the Bayou Meto, Plum Bayou, Lower Arkansas, and Lower White Bayou Des Arc watersheds to help reduce the nutrient surplus in North West Arkansas.

Lower White

03-156 Phillips County Mini Grant

03-161 Prairie County Mini Grant

06-1200 Desha County

06-1300 Arkansas County— The Arkansas County Conservation District will purchase and install pipe to reduce erosion and sediment loss in the White River, Bayou Meto, and Lower Arkansas Watersheds for the landowners of Arkansas County.

07-1300 Pipe Projects Monitoring

Big Creek

03-156 Phillips County Mini Grant— Phillips County Conservation District purchased a GPS surveying system to assist farmers in the Big Creek, Lower White, and Lower Mississippi watersheds with ways to reduce sediment and nutrient problems and educated landowners about water quality.

04-112 Woodruff County Mini Grant

Lower Arkansas

03-155 Lonoke County Mini Grant

04-105 Lonoke County Mini Grant

06-1200 Desha County

06-1300 Arkansas County

07-1100 Jefferson County

07-1300 Pipe Projects Monitoring

Bayou Meto

04-105 Lonoke County Mini Grant

06-1300 Arkansas County

07-1300 Pipe Projects Monitoring

Ouachita Headwaters

02-172 Polk County (Rich Mountain) Drill

03-157 Polk County Mini Grant

04-110 Pulaski County Mini Grant— The Pulaski Conservation District's goal for the project was to educate landowners in the Lake Maumelle Watershed (LMW) of the sources and effects of non point source (NPS) pollution with the intent of citizens implementing BMPs

04-113 Yell County Mini Grant

06-1100 Polk County Cooperative Extension Service— Leaders chose to implement individual BMPs on a number of farms to reach a large audience of producers. Selecting only two farms to implement these practices required more cost-share match than the farmers could provide, removing this limitation aids in the success of the project.

Little Missouri

02-172 Polk County (Rich Mountain) Drill

03-157 Polk County Mini Grant

Lower Saline

02-164 Drew County No-Till Drill

Middle White

05-500 Middle White Cost Share Project— provided a cost-share incentive for farmers to implement BMPs on pasture and hay land.

06-800 Stone County Cost Share— provided a cost-share incentive for land users to improve pasture conditions and reduce erosion from poor stands on steep slopes.

Buffalo

03-150 Boone County Mini Grant

03-160 Newton County Mini Grant

04-106 Marion County Mini Grant

05-102 Newton County Mini Grant

Upper Black

04-181 Randolph County Drill— The Randolph County Conservation District will purchase a no-till drill for the landowners in the watersheds of Randolph County. This will reduce erosion and enhance water quality on pasture, and croplands.

05-104 Randolph County Mini Grant— The Randolph County Conservation District purchased a manure spreader and Rotowiper for the landowners in the watersheds of Randolph County to reduce erosion and herbicides that enter water bodies through runoff.

Lower Black

04-181 Randolph County Drill

05-104 Randolph County Mini Grant

Spring

03-159 Fulton County

04-181 Randolph County Drill

05-104 Randolph County Mini Grant

Eleven Point

04-181 Randolph County Drill

05-104 Randolph County Mini Grant

Upper White-Village

04-112 Woodruff County Mini Grant

Little Red

05-106 Stone County Mini Grant— The Stone County Conservation District (SCCD) provided landowners in the Upper Little Red River Watershed with educational materials about soil and water conservation. The SCCD made brochures, fact sheets, presentations, and other visual aids for field days, civic meetings, fairs, and school presentations.

Elk

04-101 Benton County Mini Grant

Lower Neosho

04-101 Benton County Mini Grant

Robert S. Kerr Reservoir

06-700 Off Highway Vehicles Trails Assessment— This project assessed soil disturbances caused by off highway recreational vehicles and made recommendations for BMPS to be adopted to reduce soil erosion from public lands.

Frog-Mulberry

05-101 Franklin County Mini Grant— The Franklin County Conservation District purchased a manure spreader for the landowners in Six Mile Creek, Hurricane Creek, White Oak Creek, and the scenic Mulberry River Watersheds. This spreader increased production of ground cover in pasturelands and reduced erosion and sedimentation.

Dardanelle Reservoir

03-154 Logan County Mini Grant— The Logan County Conservation District purchased a 7 ton manure spreader and a spray rig for the landowners, primarily in the Six Mile Creek and Cane Creek watersheds, to improve vegetative growth, control weeds, and therefore reduce nutrients and sediment in runoff.

03-160 Newton County Mini Grant

04-113 Yell County Mini Grant

05-102 Newton County Mini Grant

Petit Jean

03-154 Logan County Mini Grant

04-109 Perry County Mini Grant

04-113 Yell County Mini Grant

Cadron

04-104 Faulkner County Mini Grant

Pecan-Waterhole

04-107 Miller County Mini Grant

Mountain Fork

02-172 Polk County (Rich Mountain) Drill

03-157 Polk County Mini Grant

06-1100 Polk County Cooperative Extension

McKinney-Posten Bayou

04-107 Miller County Mini Grant

Cross Bayou

04-107 Miller County Mini Grant

Appendix A: Arkansas Natural Resources Commission 319 Project Map

Appendix B: The 2008 Accomplishments toward the 2005-2010 NPS Management Program Plan

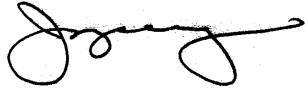
The entirety of the Arkansas 2008 Annual Report is the documentation of the progress made toward achieving the NPS Management Program Plan. While the main focus of work done is in the field of agriculture, this program has made contributions toward silviculture, surface erosion, and household and business activities. Objectives listed below are milestones where progress occurred. *In Progress* status are those areas in which current work is ongoing, and *Accomplished* are areas where it is felt the milestone is in attainment.

Objective	Milestone Description	Status
Agriculture		
4.1	Continue to encourage and provide technical assistance for the development of conservation plans, nutrient management plans and comprehensive nutrient management plans as well as implementation of BMPs through wide-ranging education and outreach programs.	In Progress
4.5	Identify additional sources of funding for projects that demonstrate systems approaches that enable farmers to achieve multiple goals (e.g., conserve water supply and protect water quality while achieving profitability goals).	In Progress
4.6.	Improve the availability and access to information on agricultural and other land uses at the watershed and sub-watershed levels in order to better target implementation projects. While maintaining mandated confidentiality, make available information on the types, extent and distribution of land uses, BMPs in use, riparian buffers and total acres enrolled in conservation programs.	Accomplished
4.7	Seek additional sources of funding to increase and improve the effectiveness of technical assistance to agricultural producers in planning resource management and with the implementation of BMPs, with special emphasis on nutrient surplus areas.	In Progress
4.8	Coordinate conservation planning to take full advantage of cost-share programs for riparian habitat improvement, Wetland Reserve Program (WRP), Conservation Reserve Program (CRP), the Wetland and Riparian Zone Tax Credit Program (through ANRC), and other programs.	In Progress
4.9	Encourage plans for alternative irrigation water supply and supplemental stream augmentation, including off-stream storage of surplus flows	Accomplished

4.10	Continue to focus on BMP implementation to improve conservation practices for erosion control, sediment retention, irrigation management and nutrient management on row crop and animal agriculture and farm forests. As appropriate, direct technical assistance to landowners in targeted watersheds giving emphasis to developing new conservation plans and areas that connect established riparian corridors.	In Progress
4.11	Continue to provide and improve extensive education and training to promote BMP implementation (e.g., risk management, demonstrations to acquaint landowners with the conservation practices most effective in reducing runoff, sediment detachment and transport, including but not limited to no-till, conservation-till, ridge-till, pipe drop outlets, riparian zone management, and wetland restoration).	Accomplished
4.12	Continue to encourage landowners to establish riparian buffer strips, grass drainage ways, stabilize stream banks, and restore riparian areas.	Accomplished
4.13	Continue to provide technical assistance and make available financial assistance to agricultural operations where cost-share is a component of approved 319(h) implementation projects.	In Progress
4.15	Identify nutrient deficit areas more precisely to facilitate export of surplus poultry litter and develop a system for tracking where surplus litter is utilized. Continue to research and develop programs to remove surplus poultry litter from nutrient surplus areas.	Accomplished
4.16	Work with major integrators and farm workers as well as landowners to encourage input from and cooperation with nutrient management planning and implementation.	Accomplished
4.17	Promote nutrient planning for farms that are below the threshold for classification as a Confined Animal Feeding Operation with dry manure.	In Progress
4.18	Expand education for poultry producers with a special focus on the role that the producer plays in the "Big Picture" of nonpoint source pollution management (e.g., the relationship between biological processes and agricultural production processes as they relate to water quality).	In Progress
4.19	Provide educational and technical assistance to support full implementation of nutrient application rules promulgated by the ANRC.	In Progress
4.20	Continue to promote positive relationships between state and federal agencies and agricultural producers in order to cultivate open communication in an environment of trust.	In Progress

Silviculture		
5.1	Continue to strengthen outreach and training programs in BMP implementation for landowners and loggers by: <ul style="list-style-type: none"> Developing additional mechanisms for delivering BMP implementation training targeted at private non-industrial landowners (e.g., educational workshops, expanded local partnerships in areas where there are high concentrations of private non-industrial landowners and increasing emphasis on woodland management in farm planning). 	Accomplished
Surface Erosion		
	<i>Instream Erosion:</i>	
7.6	Seek new sources of funds and promote increased cooperation aimed at shifting focus from bank stabilization to reach restoration.	In Progress
7.7	Develop and implement a watershed based assessment protocol and BMPs for stream bank erosion, including guidelines for riparian buffer widths for construction, as funds allow.	In Progress
7.8	Prioritize stream reaches and sites for restoration within priority watersheds, as funds allow.	In Progress
7.10	Promote tax credits, cost share and other incentive programs that are available for riparian zone and stream corridor restoration projects.	Accomplished
7.11	Improve coordination of existing data among cooperating entities	Accomplished
7.12	As funds allow, develop data and conduct analysis to fill information gaps...	In Progress
Household and Business Activities		
	<i>Household & Small Business Chemicals and Fertilizers:</i>	
8.5	Assess the impact of household and business use of fertilizers, pesticides and other common products that do not require permits but can affect water quality in order to more effectively target outreach and awareness programs aimed at increasing use of BMPs, as resources allow.	Accomplished
8.9	Hazardous waste and pesticide container collection programs aimed at agricultural producers will be encouraged to promote to and accept containers from households and businesses as well.	Accomplished

**Arkansas Natural Resources Commission
Fiscal Year 2008
Annual 319 Nonpoint Source Program Report
Authorizing Signature of State Lead Agency**



**J. Randy Young, P.E.
Executive Director**

January 15, 2009

Date