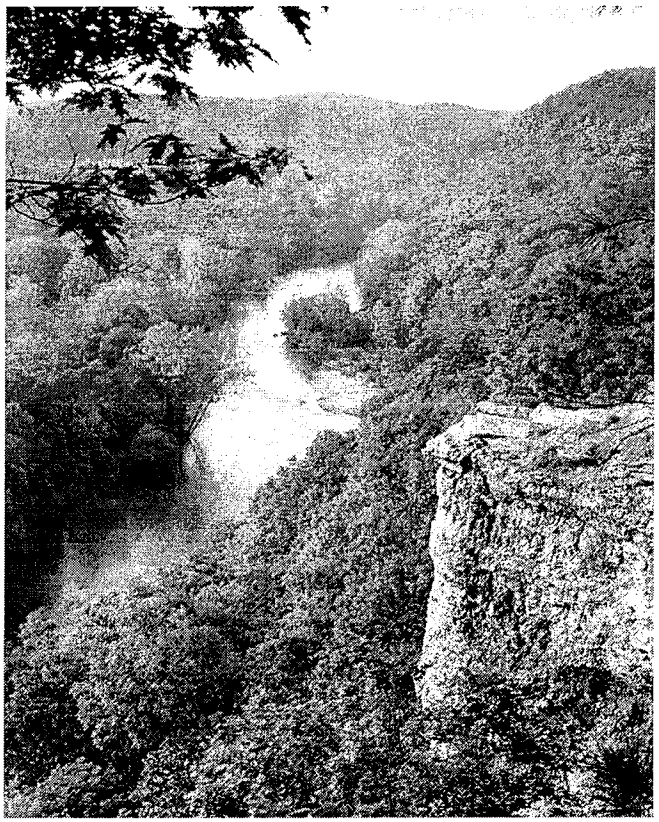
Coordinated Watershed Restoration and Protection Strategy for Oklahoma's Impaired Scenic Rivers

(per 82 O.S. §2457 as amended by Senate Bill 972 in 2002)

• 2005 Update •



Coordinated and Prepared By:
Office of the Secretary of the Environment
Miles Tolbert, Secretary of the Environment
3800 North Classen Boulevard
Oklahoma City, Oklahoma 73118

September 30, 2005

EXHIBIT
7

Executive Summary

Since the enactment of the Scenic Rivers Act in 1970, the Oklahoma Legislature has advocated for, and placed special emphasis on, the protection of the state's Scenic Rivers. During its 2002 Session, the Legislature passed Senate Bill 972, which charged the Secretary of the Environment with coordinating with the other state environmental agencies to develop a "watershed restoration and protection strategy for each impaired scenic river in this state" ("Strategy"). In particular, the Strategy was to list "all permitted or registered water pollution sources," and to describe the efforts of state environmental agencies to identify and mitigate pollutants causing impairment of these most treasured watersheds.

This information is required in subsequent annual reports in order to check the progress of actions initiated by the state environmental agencies in their efforts to restore and protect Oklahoma's Scenic Rivers. These annual reports ("Updates") are to be coordinated and compiled by the Secretary of the Environment and submitted to the Governor, the President Pro Tempore of the Senate, and the Speaker of the House of Representatives.

Since the first Strategy was compiled in 2003, remarkable strides have been made in the effort to restore & protect Oklahoma's Scenic Rivers. Most notably, the State of Oklahoma promulgated, and EPA approved, a 0.037 mg/L phosphorus standard to protect the beneficial uses of Scenic Rivers. Also noteworthy is the interim commitment of large cities in Northwest Arkansas to meet the same 1 mg/L phosphorus effluent limit that is required of Oklahoma's dischargers in these watersheds, a move that should result in significant reductions in phosphorus loading to the Scenic Rivers during normal flow conditions. This good-faith commitment on the part of Arkansas' larger cities, in addition to other State cooperative actions, was embodied in a landmark accord signed by the two states on December 18, 2003 called the "Statement of Joint Principles and Actions" ("Statement").

In the wake of the Statement, several accomplishments underscored that parties in both states intended to follow through on their commitments:

- Monitoring data provided by the large Northwest Arkansas municipalities showed that several of them were already meeting or beating a 1 mg/L phosphorus limit in their discharges by making simple modifications to their existing treatment plants.
- The City of Siloam Springs, Arkansas announced its intent to go well beyond the 1 mg/L phosphorus interim commitment and seek funding to construct a treatment plant that would discharge 0.037 mg/L phosphorus.
- The two states worked cooperatively to develop a joint monitoring strategy for the Scenic River watersheds and took the strategy to Washington in an attempt to secure Federal funding for the effort.
- Concomitantly, both states are working cooperatively to secure additional Federal funds for installing practices that will reduce pollutant runoff in the watersheds
- Building upon the successful partnerships formed while developing the joint monitoring strategy, both states held initial discussions aimed at crafting a joint watershed plan for the Scenic River watersheds.

It would now appear that these efforts are bearing fruit. Apparently as a result of the municipal dischargers treating their effluent to achieve concentrations less than 1 mg/L, recent water quality monitoring data indicate reduced phosphorus in the Scenic Rivers at base flow

conditions. Over time, and with continued reductions in phosphorus discharged to the streams following wastewater treatment plant improvements, this decline in instream phosphorus concentration is expected to result in progress towards meeting water quality standards.

Unfortunately, all of the water quality improvements realized at base flow conditions are promptly erased when rainfall in the watersheds causes runoff of phosphorus exposed to the elements. The most significant source of this phosphorus is surface-applied poultry litter. Even though the 2003 Arkansas Legislature enacted new poultry laws similar to those enacted by Oklahoma in 1998, passage of permanent rules to implement these new statutes has proven impossible to-date. And while both states continue to encourage (or require, in the case of Oklahoma) utilization of animal waste management plans to govern the amount of poultry litter that is land applied in the watersheds, the lack of a common, quantitative land application standard setting forth uniform, environmentally safe land application rates confounds efforts to improve water quality and frustrates interstate relations.

As noted in the previous two reports, the poultry integrator companies could resolve the aforementioned impasse simply by assuming responsibility for all poultry litter that cannot be safely land applied in the watersheds. Indeed, soil nutrient experts at both Oklahoma State University and the University of Arkansas agree that a soil test phosphorus ("STP") level greater than 65 to 100 is of no value to crops. Notwithstanding this consensus, the phosphorus index debate continues as scientists try to determine how much litter can be land applied above the agronomic rate without harming the environment – a debate that is conducted only because of concerns over the cost of transporting the litter offsite for proper utilization or disposal. The situation in the Scenic River Watersheds is in sharp contrast with the actions being taken in the Eucha-Spavinaw watershed, where a combination of court-ordered and voluntary poultry management measures has resulted in measurable improvements in water quality over the past several years.

In addition to the efforts to reduce pollution from municipal dischargers and poultry operations, which together contribute the vast majority of the pollutant load to the Illinois River and Lake Tenkiller, state agencies continue to survey and inspect other potential sources of pollutants. In addition, voluntary programs that provide both technical and financial assistance to landowners in an effort to reduce their environmental impact are ongoing. To reduce the disproportionate burden on Oklahoma sources, as well as to minimize confrontation between jurisdictions, Oklahoma hopes to work cooperatively with Arkansas to develop a comprehensive watershed plan aimed at restoring the Scenic Rivers to their beneficial uses. Obviously, this voluntary and cooperative approach only works if all parties accept responsibility for their pollution and are willing to commit the resources necessary to resolve such pollution. In the end, the State of Oklahoma will continue to spend significant resources to monitor, inspect, plan, and rehabilitate its treasured Scenic River watersheds.

The Scenic Rivers

The Oklahoma Legislature resolved to protect a handful of treasured streams when in 1970, it passed the "Scenic Rivers Act" (*82 O.S. 1451-1471*) as a means to identify and preserve the unique characteristics and uses of the state's most scenic streams. This same legislation identified four streams to be designated as "Scenic River Areas": Flint Creek, Illinois River, Barren Fork Creek, and Upper Mountain Fork River. In 1975, the Legislature added Lee Creek and Little Lee Creek. The primary purpose of the Scenic Rivers Act, and the subsequent water quality standards regulations promulgated pursuant thereto, is to preserve the high quality of these outstanding resource waters.

Recent water quality data collected by the Oklahoma Water Resources Board ("OWRB") at its Beneficial Use Monitoring Program ("BUMP") permanent monitoring stations indicate that water quality is presently impaired in Flint Creek, Barren Fork Creek, and the Illinois River (all within the Illinois River watershed), as well as in Lee Creek and the Upper Mountain Fork River (see Table 1). These impairments are reflected in the State's recently revised Oklahoma 2004 Integrated Water Quality Report/303(d) list.

Table 1. **Permanent Ambient Trend Monitoring Stations and their Beneficial Use Support Status.**

STATION NAME	FWP	PBCR	PPWS	AG	AES
Barren Fork, SH 51, Eldon	S	NS (6,7,8)	NS	S	NS (14)
Flint Creek, US 412, Flint	S	NS (6,7,8)	NS (15)	S	NS (14)
Illinois River, US 59, Watts	NS (5)	NS (6,7,8)	NS	S	NS (14)
Illinois River, US 62, Tahlequah	NS (5)	NS (6,7,8)	NS	S	NS (14)
Lee Creek, SH 101, Short	S	NS (8)	S	S	S
Mountain Fork, SH 4, Smithville	NS (2, 3, 4, 5)	S	S	S	NS (14)

ASSIGNED OWQS BENEFICIAL USES	
FWP = Fish & Wildlife Propagation	PBCR = Primary Body Contact Recreation
PPWS = Public & Private Water Supply	AG = Agriculture
AES = Aesthetics	

SUPPORT CODES		
S – FULLY SUPPORTING	PS – PARTIALLY SUPPORTING	NS – NOT SUPPORTING
N/A – NOT APPLICABLE	NT– NOT THREATENED (NUTRIENTS)	T – THREATENED (NUTRIENTS)

WATER QUALITY VARIABLES		
1 – DISSOLVED OXYGEN	2 – METALS (ACUTE)	3 – METALS (CHRONIC)

4 – pH	5 – Turbidity	6 – Fecal Coliform
7 – Escherichia coli	8 – Enteroccoci	9 – Metals
10 – Total Dissolved Solids	11 – Chlorides	12 – Sulfates
13 – Total Phosphorus (TP)	14 – TP Ok Scenic River Criterion	15 – Nitrite + Nitrate

Restoration/Protection

Since the 1970 enactment of the Scenic Rivers Act, the Oklahoma Legislature has placed special emphasis on the protection of the state's Scenic Rivers. Through a combination of cooperative initiatives, coupled with occasional administrative and legal actions, monumental strides have been made in the effort to stem degradation of these treasured resources. Table 2 shows a chronology of key events in the effort to protect Oklahoma's Scenic Rivers.

Table 2. Chronology of key events in the effort to protect Oklahoma's Scenic Rivers.

Date	Event
March 17, 1970	*Scenic Rivers Act* becomes law
1986	Oklahoma sues EPA to stop City of Fayetteville's municipal discharge into Illinois River
1992	U.S. Supreme Court decides: (1) Fayetteville must meet Oklahoma's Water Quality Standards ("OWQS") at the state line, and (2) evidence did not establish that City of Fayetteville's discharge would violate OWQS.
1996	Tenkiller Lake Clean Lakes Study report recommends approximately **80% phosphorus load reduction** in Illinois River Basin to reverse impairment of the lake.
1997	Arkansas-Oklahoma Arkansas River Compact Commission adopts voluntary goal to reduce phosphorus in the Illinois River Basin by 40% in an effort to slow, not halt or reverse, eutrophication of Tenkiller Lake.
1998	University of Arkansas Cooperative Extension Service publication "Soil Phosphorus Levels: Concerns and Recommendations" (FSA-1029) states, "Arkansas scientists agree that there is **no agronomic reason or need for [soil test phosphorus] levels to be greater than about 80 to 100 pounds per acre.**" (emphasis added)
1998	Oklahoma State University publication "Managing Phosphorus From Animal Manure" (F-2249) states, "... nutrient utilization standards that are protective of the environment would require that **animal manure applications do not result in soil test phosphorus levels that exceed 120.**" (emphasis supplied)
1998	President Clinton's Clean Water Action Plan requires EPA and/or states to establish numerical nutrient criteria for ALL waters by December 2004.
1999	Derek Smithee of the OWRB selected as one of two State representatives to serve on EPA's National Nutrient Criteria Work Group.
1999-present	Beneficial Use Monitoring Program ("BUMP") data confirm continued water quality deterioration and impairment in the Illinois River Basin.
August 2000	"Clark Study" (USGS report) recommends **0.022 mg/L** total phosphorus to prevent nuisance aquatic algae growth in streams.

December 2000	EPA's "Ambient Water Quality Criteria Recommendations: Rivers and Streams in Nutrient Ecoregion XI" recommends a total phosphorus criterion of **0.010 mg/L** for the nutrient ecoregion that includes ALL of Oklahoma's Scenic Rivers.
2001	OWRB staff reviews available studies/data to develop total phosphorus numeric criterion to protect Oklahoma's Scenic Rivers; nexus between the phosphorus concentrations measured at the best 25% of ALL waters and the "worst" 25% of "high quality waters" occurs at **0.037 mg/L**.
March 12, 2002	OWRB Board adopts OWQS revisions, including proposed 0.037 mg/L phosphorus criterion.
May 6, 2002	Governor Keating approves OWQS at OAC 785:45, including 0.037 mg/L phosphorus criterion.
June 3, 2002	Arkansas and Oklahoma officials convene first "official" meeting between the states to discuss an amicable settlement to the phosphorus dispute; General Edmondson releases a press statement shortly after adjournment of the Arkansas-Oklahoma meeting acknowledging that his office would defer the filing of lawsuits as long as it appears that progress is being made
July 1, 2002	OWRB-promulgated OWQS revisions, including 0.037 mg/L phosphorus criterion, become effective as State law.
October 28, 2002	Arkansas officials submit data on estimated phosphorus loading reductions and projections on excess poultry litter generated in the Illinois River Basin (excluding other Scenic River watersheds). By its own estimates, Arkansas shows that **80,000 tons of litter** is generated each year in the Illinois River Basin that cannot be safely applied on-farm (roughly 55% of the total generated each year). They also estimate a **65% reduction** in phosphorus loading from the four major municipal dischargers in the Illinois River Basin would result from the proposed 1 mg/L concentration limits.
November 25, 2002	Arkansas' major municipalities (i.e., Fayetteville, Springdale, Rogers, Bentonville, and Siloam Springs) send a letter to Governors Huckabee and Keating relaying their commitment to clean water and pledging to meet a **1 mg/L phosphorus discharge limit**.
March 13, 2003	Arkansas and Oklahoma officials attend meeting at EPA Region 6 offices in Dallas to develop an amicable resolution to the conflicts between the two sides in advance of EPA's approval of Oklahoma's WQS and phosphorus criterion.
December 18, 2003	Oklahoma and Arkansas principals sign "Statement of Joint Principles and Actions."
March 10, 2004	Oklahoma and Arkansas agencies and technical experts meet at a "special meeting" of the Arkansas-Oklahoma Arkansas River Compact Commission in Ft. Smith, AR to continue discussions regarding development of a joint monitoring protocol for the Scenic River watersheds.
May 21, 2004	EPA approves Oklahoma's phosphorus criterion to protect the aesthetics beneficial use of its Scenic Rivers.
June 22, 2004	OWRB facilitates meeting with relevant state agencies and the ADEQ re development of a USAP for the phosphorus criterion.
June 13, 2005	Oklahoma files litigation against several poultry companies over pollution of the Illinois River.
June 21, 2005	Oklahoma and Arkansas Officials meet to discuss the development of a watershed plan pursuant to the "Statement of Joint Principles and Actions."

Over the past five years, the State has heightened efforts to restore and protect its Scenic Rivers, primarily as a result of the promulgation of a numeric phosphorus criterion in Oklahoma's Water Quality Standards ("OWQS"). The high level of cooperation and support of

all state environmental agencies, coupled with the solid technical justification derived from extensive research, paved the way for State and U.S. Environmental Protection Agency ("EPA") adoption of a 0.037 mg/L phosphorus criterion to protect the state's nutrient-imperiled Scenic Rivers. With the numerical phosphorus criterion, the state now has an invaluable regulatory tool for addressing nutrient loading to its Scenic Rivers.

For its part, the State of Arkansas expressed its concerns regarding the proposed criterion and vehemently opposed its passage due to the regulatory implications on its municipalities and industries as a result of a previous Supreme Court decision that held that downstream states' water quality standards could be imposed upon upstream states. Shortly after Governor Keating's approval of the new OWQS in May of 2002, State officials from Oklahoma and Arkansas met in an effort to reach agreement on necessary phosphorus reductions in both states while, at the same time, avoiding what could be costly and protracted litigation.

Over the course of the negotiations, the major municipalities in Arkansas vowed to upgrade their treatment facilities in order to meet the same 1 mg/L effluent limit for phosphorus that is required of Oklahoma's municipal dischargers in the Scenic River watersheds. Further, the Arkansas General Assembly passed legislation in 2003 establishing a poultry regulatory program somewhat like the one enacted by Oklahoma's Legislature in 1998. In addition to regulation of poultry litter, this Arkansas legislation seeks to regulate the land application of other nutrient sources in vulnerable watersheds, including commercial fertilizer.

Albeit more encompassing in its regulation of commercial fertilizer application, the Arkansas legislation contains several provisions that allow for unregulated litter application under certain circumstances. First, the more stringent land application standards can be deferred if "there is no alternative use for litter or there are no readily available, affordable alternative nutrient supplies for which litter has been used" (Arkansas Code Title 15 § 20-1111(c)(2)). Second, poultry operators must be adequately compensated for the value of their litter in order for something to be considered an "alternative use" under the Arkansas statute (Arkansas Code Title 15 § 20-1110(c)(2)). Arkansas has failed to promulgate permanent rules to implement its new nutrient management statutes, and the emergency rules expired in May 2005. Because the Arkansas General Assembly will not convene again until early 2007, it appears likely that no regulatory system will exist in Arkansas in the near term to ensure the environmentally safe application of poultry litter.

As described in last year's Update, both Oklahoma and Arkansas came together to sign a Statement of Joint Principles and Actions ("Statement") on December 18, 2003, which laid the groundwork for future collaboration and cooperation in reducing phosphorus loading in the Scenic River watersheds. At the time, Oklahoma anticipated a 75% reduction in existing point source phosphorus loading to the Scenic Rivers as a result of the point source reductions embodied in the Statement. As noted in the following section regarding water quality monitoring, data seem to indicate progress in this regard already.

Because the majority of the phosphorus and other pollutants of concern, such as bacteria and sediment, stem from nonpoint source runoff, efforts to restore the Scenic Rivers are obstructed by the lack of a similar commitment on the part of the poultry integrator companies that operate in Scenic River watersheds to address the single largest contributor of nonpoint source pollution – surplus poultry litter generated at their farms. As noted earlier, recently enacted

Arkansas statutes establish new regulatory authority regarding poultry operations and their land application practices. Currently, no permanent regulations exist to implement these statutes, but the future enactment of regulations will inevitably place additional mandates on contract poultry growers to find ways to get rid of surplus litter that cannot be safely land-applied onsite. Thus, it is imperative that the poultry integrator companies take responsibility for the safe disposal of surplus litter at their corporate-owned and contract facilities in both states in order to remove one of the most significant sources of phosphorus pollution in Oklahoma's Scenic Rivers. This is one of the specifically identified purposes of the current litigation.

Since Federal approval of the State's numeric phosphorus criterion, Oklahoma is in a much stronger position to utilize the customary Clean Water Act process and seek significant Scenic River protections, including the drafting of watershed plans and, as needed, total maximum daily loads ("TMDL") for each pollutant causing impairment. Either process can result in the calculation of an "overall pollutant-specific load reduction" called for in *82 O.S. 2002, section 1457(B)(2)(a)*, which can serve as the target "to bring each impaired scenic river back into compliance with water quality standards." However, neither process will be effective without the cooperation of Arkansas and commitment of those entities on both sides of the border, such as the poultry integrator companies and municipal dischargers, who contribute pollutants. Accordingly, Oklahoma hopes to cooperate with Arkansas in developing and implementing plans that encompass the Arkansas portion of the Scenic River watersheds.

Municipal/Industrial Sector

Both the Arkansas Department of Environmental Quality ("ADEQ") and the ODEQ will enforce the discharge permits issued pursuant to the Statement of Joint Principles and Actions. Over the course of 2004, the ODEQ inspected Tahlequah's wastewater treatment plant ("WWTP") four times, and three inspections were performed on the Westville WWTP. No violations were cited at either facility, and the Town of Westville continues to operate under a consent order to upgrade its treatment works to meet a 1 mg/L phosphorus limit even though it is a minor facility (i.e., less than 1 MGD design capacity).

Other efforts of the ODEQ to restore and protect Scenic Rivers include the following:

- Watts - In 1999, DEQ entered into an agreement with the Town of Watts for the Town to perform a Supplemental Environmental Project (SEP). Under the SEP, the Town pursued a Storm Water Drainage Improvement project for downtown Watts to reduce inflow and infiltration to the Sanitary Sewer Collection System. This project was completed in the summer of 2004.

- Westville - In 2000, the DEQ issued the Westville Utility Authority a new OPDES discharge permit that contained more stringent conventional pollutant (BOD and TSS) effluent limits and effluent phosphorus limits aimed at protecting the Illinois River basin. The 2005 renewal of the Westville permit (currently sent to Westville for review and public notice) further reduces the concentration limit for phosphorus to 1 ppm, which reduces the loading to the stream by 50%. To achieve these reductions will require the construction of a new wastewater treatment plant that should be completed by mid-2006.

- West Siloam Springs - DEQ permitted and inspected a new wastewater collection system in the Town of West Siloam Springs. The collection system was constructed to replace numerous failing septic systems in the Town. This new collection system was completed in 2002 and conveys untreated wastewater from the Town to the City of Siloam Springs, Arkansas, for treatment.

- Tahlequah – DEQ is in the process evaluating the City of Tahlequah's wastewater permit for renewal (sent to Tahlequah for public notice). The City has met a 1 mg/L phosphorus limit since 1992.

- Tulsa Development Company – In the spring of 2004, a development company cleared approximately 30 acres of land adjoining the Illinois River, including wetlands, without obtaining approvals and required permits. As a result of this unauthorized activity, DEQ took enforcement action against this company and is in the process of negotiating a settlement agreement.

- Land Clearing – In the summer of 2004, a local resort cleared land near the Illinois River without obtaining approvals and required permits. As a result of this unauthorized activity, DEQ pursued an enforcement agreement resulting in an appropriate monetary settlement.

- DEQ is pursing a monitoring project for pesticides and metals at various locations within Scenic River watersheds. This project, initiated in 2002 under an EPA grant, monitors for metals and pesticides on stream segments that had been suspected of impairment. Two sites on the Illinois River, two on the Baron Fork, and one site on Flint Creek were tested under base flow and high flow conditions. In addition to water samples, sediment and fish tissue samples were also collected and tested.

A significant effort has been made by DEQ to provide comments and information to adjacent states concerning those wastewater activities that may have some impact on our state waters, particularly our Scenic Rivers. By providing comments on proposed permits, or simply providing supporting information to decision makers, DEQ works with those adjacent states to protect our waters. A few examples of proposed actions DEQ has commented on:

- Prairie Grove, AR NPDES Permit
- Siloam Springs, AR NPDES Permit
- Rogers, AR NPDES Permit
- Fayetteville, AR NPDES Permit
- Springdale, AR NPDES Permit
- Lincoln, AR NPDES Permit
- Osage Basin, AR proposed NPDES Permit
- Gentry, AR NPDES Permit
- US Forest Service – Lake Wedington Recreation Area NPDES Permit
- Fayetteville, AR Water Quality Management Plan revisions
- Osage Basin, AR Water Quality Management Plan revisions
- Cave Springs, AR Water Quality Management Plan revisions
- Bentonville, AR proposed discharge
- Arkansas 303(d) list revisions - 2000 and 2002
- Hatfield, AR NPDES permit

- DEQ provided comments on and participated in meetings held between the State of Oklahoma and EPA, Region 6 concerning the Region 6 General CAFO Permit. Based on the comments and meetings, protections were placed in the General CAFO Permit for Oklahoma's Scenic Rivers.

- When considering 401 Water Quality Certification for Corps of Engineers (Corps) nationwide permits (404 dredge and fill operations) within Scenic River watersheds, DEQ may require additional justification for special conditions or deny certification.

- In an effort to provide extra protections for Scenic Rivers in nationwide permits or individual permits in some cases, DEQ has entered into negotiations with the Corps to have scenic rivers designated as Critical Resource Waters.

- DEQ has worked with the Corps to develop regional general permits for Critical Resource Waters, including scenic rivers, providing additional protections.

Agricultural Sector

The Oklahoma Department of Agriculture, Food, & Forestry ("ODAFF") has the authority to ensure compliance with the revised nutrient management plans at registered poultry feeding operations in Oklahoma. Because the Arkansas Legislature passed legislation to require compliance with nutrient management plans in Arkansas, the Arkansas Soil & Water Conservation Commission and/or ADEQ should eventually assume similar regulatory authority in their state. Subsequent annual progress reports will provide updates on the progress of these activities.

Except for two nurseries, none of the agricultural related activities under ODAFF's jurisdiction have permits to discharge to Scenic Rivers. However, land application of poultry litter or other agricultural waste above the agronomic rates or applying on land already saturated with nutrients yields polluted runoff contributing to the degradation of water quality in the Scenic Rivers. The irrigation tail-water return flow from plant nurseries in the Illinois River watershed could also contribute to the degradation of the water quality of the Scenic Rivers.

Tasks performed by ODAFF in an effort to restore and protect Scenic River watersheds included:

- For Poultry Operations:
  - ✓ Assisted growers in developing Animal Waste/Nutrient Management Plans. Currently more than 80% of poultry operations have submitted copies of these plans to ODAFF. Two ODAFF contract soil scientists have written 301 Animal Waste Management Plans for poultry operations.
  - ✓ Conducted inspections of all poultry operations located in the watersheds.
    - *102 inspections were performed by ODAFF poultry inspectors from August 1, 2004 to May 1, 2005.*
  - ✓ Provided technical assistance to poultry operators on 1800 occasions in fiscal year 2004.

- ✓ From August 1, 2004 to May 1, 2005, ODAFF performed 44 enforcement actions against violators of poultry statutes and rules located in the watersheds.
- ✓ Coordinate with other agencies in developing Comprehensive Nutrient Management Plans ("CNMP") for the point and non-point sources located in the impaired watersheds. Agricultural Environmental Management Services ("AEMS") Division of ODAFF has recently finalized a cooperative agreement with Natural Resources Conservative Service ("NRCS") of USDA to develop CNMPs for those operations applying for Environmental Quality Incentives Program ("EQIP") cost-share assistance for improving their systems.

- For Nursery Operations:
  - ✓ Nursery operations were monitored monthly for nitrate-nitrogen, total-phosphorous and pesticides from 1989 to 2001. Results have been published in *The Curtis Report 1989 –1992*, 1993, 1994, 1995, 1996, 1997
  - ✓ Signed voluntary compliance agreements with nursery operations to reduce nutrient loading.
  - ✓ Notified nurseries when they were out of compliance.

Based upon its inspection and oversight activities, ODAFF evaluated and assessed the impact of its regulated activities in the Scenic River watersheds:

- Poultry Farms
  - There are 111 poultry operations (more than half raising broilers) registered with ODAFF, consisting of 92 operations in the Upper Illinois River ("UIR") watershed encompassing parts of Adair County, Cherokee County and Delaware County; 3 operations in the Lee Creek/Little Lee Creek ("LLC") watershed encompassing parts of Adair, Leflore and Sequoyah Counties; and 16 operations in the Upper Mountain Fork ("UMF") watershed encompassing part of McCurtain County. These operations manage a total of 462 houses with 429 houses and 8,001,330 birds in UIR watershed, 8 houses and 140,800 birds in LLC watershed, and 25 houses and 301,400 birds in UMF watershed.

  - The number of operations, as well as number of poultry houses, has decreased in recent years. However, houses are being built larger, resulting in the number of bird spaces increasing from 8,309,510 in 2004 to 8,443,530 in 2005 (approximately 1.6% increase). The actual number of birds raised in UIR watershed increased approximately 2.9 % (from 7,766,710 in 2004 to 8,001,330 in 2005). During the same period the number of birds in LLC and UMF watersheds decreased 23% and 16%, respectively.

  - Because the majority of the poultry operations in the watersheds raise broilers, the total amounts of litter and nutrients produced for all operations are estimated based on the broiler production rate of 18 lbs of litter per year per space and its nutrient values of 46 lbs of total nitrogen and 53 lbs of P_2O_5 per ton of litter.[1] The estimated amount of litter and nutrients generated per year in the Oklahoma portion of the different watersheds is listed in Table 3.

Table 3. Estimated annual amount of litter and nutrients generated in the Scenic River watersheds in Oklahoma.[1]

Watershed	Litter (ton)	Total N (ton)	P_2O_5 (ton)	Phosphorus P (ton)
UIR	72,012	1,656	1,908	833
LLC	1,267	29	34	15
UMF	2,713	63	72	31
Total	**75,992**	**1,748**	**2,014**	**879**

[1]Table 11: Estimated Solid Manure Characteristics, Manure Characteristics, Manure Management System Series, Midwest Plan Service (MWPS)-18, Section 1.

- Compared to last year, there is a slight increase (about 1.6 %) in litter produced, from 74,785 tons to 75,992 tons, resulting in a small increase of P_2O_5 generated: from 1,981 tons in 2004 to 2,014 tons in 2005.

- The above estimation based on the actual bird space is more conservative than the traditional method of estimating based on a litter production rate of 125 tons per year per house. Since the houses are larger, the number of chicken spaces per house increase as well as the amount of litter generated. The total amount of manure produced per the latter method would be 57,750 tons (53,625 tons in UIR, 1,000 tons in LLC and 3,125 tons in UMF). Thus, the former method is more appropriate in evaluating the impact of poultry industries in the watersheds. It is also noted that the Oklahoma State University ("OSU") Extension Fact Sheet F-2228, *"Fertilizer Nutrients in Animal Manure,"* specified an average content of P_2O_5 of manure in Oklahoma of 61lbs per ton of manure for broilers. Based on this phosphorus content and the latter method for estimating manure produced of 57,750 tons, the total amount of P_2O_5 generated in the watersheds would be 1,761 tons, compared to 2,014 tons per the former method as presented in the above table. The difference between the two methods is within 12.5 % of each other.

- The contents of nitrogen and phosphorus under the form of P_2O_5 in poultry litter are almost the same ratio (1:1). However, litter is normally applied only onto the soil surface, and a considerable amount of nitrogen in the form of ammonium (NH_4) will be converted to ammonia (NH_3) and released to the atmosphere. Thus, the total nitrogen available for plant use is reduced. Meanwhile the demands of nitrogen for most crops are much higher than for phosphorus. To satisfy crop growth based on nitrogen needs, litter would have to be applied at a higher rate, resulting in the build-up of unused phosphorus in the soil. Runoff and erosion can carry the extra phosphorus to nearby streams.

ODAFF inspectors collected soil samples for STP at poultry operations located in several counties in the Scenic River watersheds in Summer and Fall of 2002. The results indicated that more than 39% of samples collected exceeded the STP of 250. Samples collected by ODAFF inspectors also indicated that more than 77% of the samples exceeded the STP of 12, and more than 33% of the samples exceeded the STP of 300.

- Since the above samples do not cover all lands located in the watersheds that are either being used as land application sites or that may be available for future land application sites, the extra phosphorus loading, above and beyond the soil capacity for agronomic use, could not be accurately estimated using this data. On the other hand, the limited data on STPs for lands currently being used for litter application in the watersheds, which have been submitted to ODAFF by Poultry Litter Applicators in their annual reports for the year 2004, showed a better picture with approximately 25.9% of samples exceeding STP 120, 5.6% of the samples exceeding the STP of 250, and 3.2% of samples exceeding STP 300. These undoubtedly appear to be more positive than sampling done by ODAFF inspectors.

- Based on a threshold STP of 250 and the results of soil tests collected by ODAFF inspectors, it is assumed that 39% of lands with STP of 250 located in the watersheds that are being used for litter application are at capacity for P loading. Similarly, based on STP thresholds of 120 and 300, and ODAFF inspector soil test results the percentage of land at capacity for P loading would be 77% and 33%, respectively. The estimated amounts of extra poultry litter presented in Table 4, based on different STP thresholds of 120, 250 and 300, should either be transferred out of each watershed or be applied onto other phosphorus deficient lands in the watersheds.

Table 4. Estimated amounts of extra poultry litter generated in Oklahoma, based upon different soil test phosphorus thresholds, that should not be applied to traditionally used land application fields.

Watershed	Excess Litter (STP 120)	Excess Litter (STP 250)	Excess Litter (STP 300)
UIR	55,449 tons	28,085 tons	23,764 tons
LLC	976 tons	494 tons	418 tons
UMF	2,089 tons	1,058 tons	895 tons
Total	**58,514 tons**	**29,637 tons**	**25,077 tons**

- The percentage of lands at capacity for P loading and the estimated amount of excess litter listed above will need to be revised once all STP data are submitted and verified by ODAFF and/or additional STP samples are collected by ODAFF inspectors.

- Nursery Operations
  - There are two large containerized plant nurseries along the Illinois River that have had irrigation tail-water return flow enter the river. These operations were monitored monthly for nitrate-nitrogen, total-phosphorous and pesticides from 1989 to 2001. One operation became totally contained in 1998 and only has runoff leaving its property during large rainfall events. These nurseries signed voluntary compliance agreements with ODAFF to reduce the yearly average nitrate level in their discharge from a high of 27.99 mg/l NO_3-N in 1989 to 10 mg/l in 1996. They also agreed to reduce the Phosphorus (total) level down to 1 mg/l.

ODAFF recommends the following in order to advance its regulatory oversight of these activites:

- ✓ Continue to pursue cost-effective alternative methods of disposal of excess litter through ODAFF Market Development Division and Office of the Secretary of the Environment.

- ✓ Increase inspection and enforcement actions against violators of the Registered Poultry Feeding Operations Act and the permanent rules, as well as those who do not comply with requirements of Animal Waste/Nutrient Management Plans.

- ✓ Add instream monitoring stations to measure nutrient levels upstream and downstream of the regulated operations, above and below the operations and at the state line for monitoring of interstate phosphorus contributions, should be established. Additional monitoring data would also help in reevaluating the effectiveness of pollution prevention measures applied in the watershed, as well as the appropriateness of currently recommended STP threshold values. In monitoring nutrient levels at the edge of the operation fields or land application areas, site-specific STP threshold could be developed for each watershed and put in use for stricter control of Phosphorus loading in the watershed.

Beyond the aforementioned regulatory efforts to reduce pollution from municipal dischargers and poultry operations, which together contribute the vast majority of the pollution to Scenic Rivers, projects designed to enlist voluntary cooperation from watershed landowners continue in the Scenic River watersheds. Such projects are designed to provide government cost-share assistance for landowners to install best management practices ("BMPs") that are designed to reduce the pollutants causing impairment. Significant Clean Water Act §319(h), USDA Environmental Quality Incentive Program ("EQIP"), and/or State Cost-Share Program monies have been expended in both Arkansas and Oklahoma to reduce nutrient impacts on water quality, particularly in the Illinois River watershed. Oklahoma hopes to continue working with Arkansas on these essential nonpoint source pollution abatement projects in the future so that voluntary efforts to reduce Scenic River impairment are intensified.

Some of the projects implemented or designed by the Oklahoma Conservation Commission ("OCC") over the past year include:

- **Illinois River/Baron Fork Priority Watershed Implementation Project**
  The OCC recently completed a five-year, $2,038,558 Clean Water Act Section 319 Priority Watershed Project in the Illinois River Watershed. The intent of the project was to demonstrate the benefits of best management practices on the water resources of the river and to provide technical and financial assistance and education to promote such practices.

  The OCC established a local watershed advisory group, made up of the stakeholders in the watershed (cattlemen, poultry growers, dairymen, canoe operators, etc.) to recommend practices and cost-share rates for the program. This local involvement, which is critical in a voluntary program, helped insure that the practices offered would be beneficial to the environment, but still meet the producers' needs, and that the cost-share rates offered would be sufficient to encourage landowners to adopt the practices. The primary partners in the program were the Adair and Cherokee County Conservation Districts, who housed

local project personnel, coordinated contract development and payment to cooperators, and publicized the program locally.

Through this effort, 197 landowners participated in the program (see Figure 1), installing $1,335,860 ($763,475 federal, $333,533 state, and $238,852 landowner) worth of best management practices (BMPs). Through installation of these BMPs:

- ✓ over 50 river miles were protected with riparian buffers, which have been proven in other trials to reduce sediment and nutrient runoff from bordering fields by as much as 90% and stabilize streambanks
- ✓ seven poultry growers installed poultry litter storage sheds to store litter cleaned out of houses until it can be applied properly to pastures in the area or transported out of the watershed
- ✓ three new dairy lagoons were installed, and waste from eleven existing lagoons was removed and land applied based on soil test nutrient recommendations
- ✓ eighteen new septic tanks and lateral fields were installed and five additional lateral fields were installed to replace failing existing systems in the watershed
- ✓ twenty-nine winter feeding facilities (see Figure 2) were installed in the watershed to reduce nutrient, sediment, and fecal bacteria pollution related to beef cattle production in the watershed
- ✓ approximately 16,000 acres of pastureland were improved through installation of cross-fencing, alternative water supplies (ponds, freeze-proof tanks, wells) to encourage rotational grazing and improve the quantity and quality of forage in pasture in the watershed, which reduces pollutant runoff,
- ✓ six heavy use areas were installed to reduce runoff of sediment, nutrient, and bacteria runoff from areas that receive a great deal of cattle traffic such as around watering tanks, in travel lanes, etc.

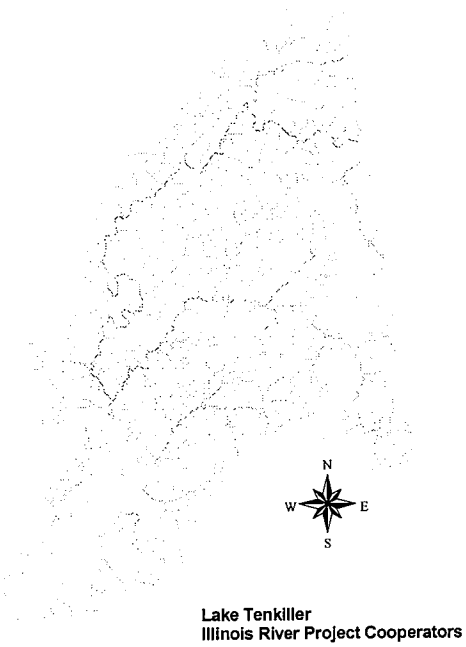


Figure 1. Cooperators in Illinois River Watershed

Figure 2. Winter feeding facility constructed in Illinois River watershed.

Although water quality data are not yet available to document improvements related to these efforts, experience in the adjacent Eucha/Spavinaw watershed suggests that these

practices, when implemented on a widespread basis and combined with other source controls, non-point source phosphorus loading from the Adair and Cherokee County portions of the watershed could be reduced by as much as 30%.

- **Poultry Litter Transfer in the Illinois River Watershed**
  In response to a request from the Poultry Federation to mirror an Arkansas effort to encourage movement of poultry litter out of the Illinois River Watershed into areas of the state where it would pose a lower risk to water resources, the OCC partnered with the poultry integrators to use $300,000 federal 319 funds and $200,000 of integrator money to supplement litter hauling from the Illinois River watershed. This money is being used to move at least 50,000 tons of litter to areas of Oklahoma where it can be safely utilized as a soil amendment and fertilizer. This program mimics the Arkansas program in every detail (except that Arkansas litter goes to Arkansas and Oklahoma litter to Oklahoma) including the contractor used to facilitate the program – Sheri Herron of *BMPs, Inc.* *BMPs, Inc.* has used its close ties with the integrators to secure their financial commitments to the effort as well as their power over growers to encourage participation in the program. The intent of the effort is to facilitate the establishment of both a network of sellers, buyers, and litter transporters that will ultimately become a self-sustaining litter market. As agricultural producers in other areas of the State become aware of the agronomic benefits of litter, and as commercial fertilizer continues to rise in cost, the demand for litter could increase to a level where transport costs are no longer a limiting factor in moving it from nutrient limited watersheds.

- **Protecting Water Quality in the Illinois River through Establishment of Riparian Easements**
  OCC will partner with the Scenic Rivers Commission to establish fifteen to thirty-year riparian easements in the Illinois River Basin to reduce nonpoint source pollution in the watershed. Through contacts made with landowners in the watershed, the program will also summarize the impediments to establishing a continuous corridor of protected riparian zones along the river. Identification of these impediments could help the state design a program to work around them, although it may also determine that riparian protection throughout the watershed is not feasible. The program will use approximately $290,500 of federal, state, and local funds to install long-term riparian easements in the watershed. Results of this project, in addition to long-term protection of areas of the watershed, can also be used to tailor future conservation efforts in the watershed.

- **Conservation Reserve Enhancement Program**
  USDA Farm Services Agency ("FSA") and NRCS are partnering with the OCC to propose a Conservation Reserve Enhancement Program ("CREP") to install riparian buffers in the Illinois River, Lake Eucha, Fort Cobb Reservoir, and Sugar Creek (Caddo County) watersheds. The OCC will seek the required State match to acquire the federal funds during the next legislative session. If funding is approved, thus securing the requisite State match, State USDA offices and OCC will submit a proposal to the National FSA offices with almost certain approval for funding.

  This CREP program will build upon lessons learned from 319, FSA, and NRCS efforts in these watersheds to insure adoption of the practices by landowners and utilize approximately $30 million to $40 million of State, Federal, and Local funds to install over 20,000 acres of

protected riparian area in these watersheds. The program will protect these areas for at least fifteen years, although many will probably remain protected for longer. Given that riparian buffers can reduce nonpoint source pollution by up to 90%, these programs should have a significant impact on water quality in these four watersheds.

Mining Sector

The Oklahoma Department of Mines ("ODM") has specific regulations governing gravel mining operations on Oklahoma's Scenic Rivers (at OAC 460:10-13-3 and 10-13-4). These guidelines establish more stringent operational requirements for permitting and operation on Scenic Rivers as defined by Oklahoma Statute. A total of four operations are currently permitted by ODM under these more stringent guidelines.

Some of the operational requirements implemented by ODM as detailed in OAC 460:10-13-4 include:

a. Reference other state required permits pertaining to the site.
b. Comply with all state water quality environmental laws when removing or stockpiling gravel.
c. Mining in or driving into the wetted portion of the riverbed is prohibited.
d. Changing the course of the river is prohibited.
e. Maintain a 100-foot buffer of natural vegetation between the river's edge and any processing plant site other than normal access to the stream. If no plant is located on the property, the operator shall take precautions to preserve stream bank integrity.
f. Where appropriate, BMPs such as sediment traps and fences shall be installed and maintained to minimize sediment and spoil return to a stream.

ODM has promulgated additional rules making the operational and permitting guidelines applicable for High Quality Waters and Outstanding Resource Waters. Prior to ODM permit issuance, the applicant must submit approved copies of other state, federal, and local government permits or licenses, (460:10-13-4). These permits include but are not limited to:

- ✓ Stormwater permit
- ✓ Pollution prevention plan
- ✓ NPDES and/or OPDES
- ✓ Floodplain permit
- ✓ Stream water permit
- ✓ Copies of notifications sent to state and federal fish and wildlife agencies
- ✓ Army Corps of Engineers notification
- ✓ Closure plan

Additionally, prohibitive practices have been established to protect water quality. These practices include:

- ✓ Operations are prohibited from mining in, or driving in, the wetted portion of the riverbed.
- ✓ Operations are prohibited from changing the course of the river.
- ✓ A minimum 100-foot border of natural vegetation between the water's edge and any plant site on the permitted area shall be left undisturbed.

Finally, a provision has been added that will require a stream water monitoring plan to be submitted and implemented prior to, and during, mining operations. This rule allows for the use of any plan filed with other agency jurisdictions.

Oil & Gas – Historically, oil and gas activity in the Scenic Rivers watersheds has been extremely limited, and there has been no activity in these watersheds during the past five years (Figure 3). Furthermore, there has been no recent or historic oil and gas activity near the Mountain Fork River. In April 2005, Oklahoma Corporation Commission staff physically inspected the Illinois River watershed, including the Flint Creek and Barren Fork tributaries. They found no new oil and gas drilling or inspection activity.

The only recent oil and gas activity in a Scenic River Watershed is near Lee Creek. Of the 40 wells in Sequoyah County with new activity initiated from 2000 to present (including 3 new wells or re-completions in progress in 2005), seven (six new gas well completions and one well in progress) are in the Lee Creek watershed. These wells ranged from ¼ mile to 4 miles from Lee Creek.

The limited extent of oil and gas activity in these watersheds comports with the few complaints in the Oklahoma Corporation Commission database for Adair, Cherokee, and Delaware counties, which all deal with Petroleum Storage Tank ("PST") related problems. Only in Sequoyah County, near Lee Creek, have there been oil and gas activity related complaints. There were two complaints (one in 2000 and one in 2004), both for wells in the gas producing area at the south end of the watershed. Both complaints were investigated and resolved.

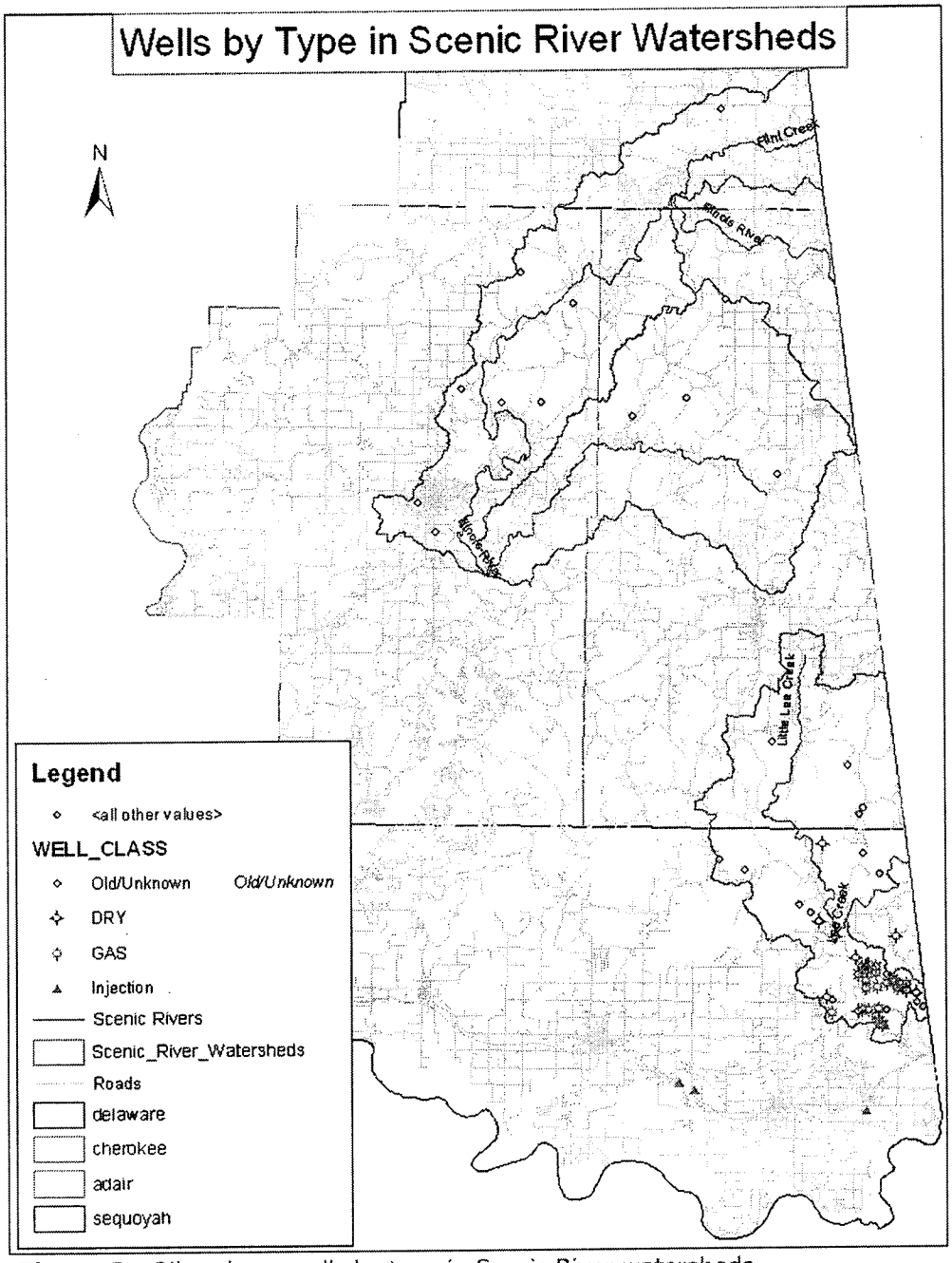


Figure 3. Oil and gas wells by type in Scenic River watersheds.

Monitoring

Closing the loop on the Clean Water Act process involves intensive water quality monitoring, which will be critical to providing answers regarding the success of measures taken to reverse the impairment of Oklahoma's Scenic Rivers. Monitoring is vital to establishing water quality trends in the Scenic Rivers and to determining whether or not other impairments exist, particularly in the Lee and Little Lee Creek watersheds where more data are needed. This same long-term monitoring will ascertain the degree to which existing water quality standards adequately protect the beneficial uses and antidegradation provisions assigned to the Scenic Rivers. Any shortcomings in regulatory or voluntary tools employed to reverse impairment will be identified through water quality monitoring, and modifications to those tools, including possible water quality standards revisions and TMDL modifications, will result.

Under its Beneficial Use Monitoring Program, OWRB staff maintains several stations within the Illinois River, Lee Creek, and Upper Mountain Fork River watersheds (Table 3). All but two of the stations have been monitored since the program's inception in November 1998. Caney Creek near Barber was added in 1999 because of its potentially significant influence on Tenkiller Lake. Lee Creek was added in 2002 so that all of Oklahoma's Scenic Rivers could be adequately monitored over the long-term. Although not included in Table 3, the Cherokee Nation Office of Environmental Services ("CNOES") is also monitoring Little Lee Creek at several locations. In addition, through cooperative agreements with the OWRB and the Oklahoma Scenic Rivers Commission ("OSRC"), the United States Geological Survey ("USGS") maintains stream flow gauges in each watershed and conducts targeted water quality studies throughout the Illinois River watershed.

Table 3. BUMP monitoring stations located in the Illinois River, Lee Creek, and Upper Mountain Fork River watersheds.

STATION I.D.	STATION NAME	COUNTY	PERIOD OF RECORD
AT197000	Barren Fork, SH 51, Eldon	Cherokee	11/98-present
AT197360	Caney Creek, off SH 100, Barber	Cherokee	9/99-present
AT196000	Flint Creek, US 412, Flint	Delaware	11/98-present
AT195500	Illinois River, US 59, Watts	Adair	11/98-present
AT196500	Illinois River, US 62, Tahlequah	Cherokee	11/98-present
AT249800	Lee Creek, SH 101, Short	Sequoyah	1/03-present
AT338750	Mountain Fork, SH 4, Smithville	McCurtain	11/98-present
AT195865	Sager Creek, off US 412, West Siloam Springs	Delaware	11/98-present

Additionally, The OCC is in the final stages of a Section 319 National Monitoring Program project in the Peacheater Creek Watershed. Peacheater Creek is a tributary to the Barren Fork River in the Illinois River Watershed. This EPA National Monitoring Program project is intended to demonstrate the quality and quantity of water quality monitoring necessary to document changes related to implementation of practices to reduce nonpoint source pollution. The OCC began this effort in 1995 with pre-implementation monitoring, implemented BMPs in the

watershed between 2000 and 2003, and recently completed final collections in a two-year post-implementation monitoring effort.

The results of this data interpretation will be used to determine whether water quality improvements can be related to implementation of BMPs in the watershed. Lessons learned during this ten-year monitoring effort have already been transferred to similar OCC monitoring efforts such as the Beaty Creek (Lake Eucha) project where a recent review from EPA region 6 touted the monitoring effort as "the strongest design and analytical approach I've seen implemented in Region 6".

In order to build upon the momentum of the State's efforts to restore and protect Oklahoma's treasured Scenic Rivers, the support of the Oklahoma Legislature in providing adequate funding and resources is vital. Continued support of the BUMP program at a funding level of one million dollars annually has been crucial to the coordinated efforts of the State. It would be preferable to increase funding of the BUMP to it historical funding level of $1.2 million per year. Continued support of the USGS monitoring and stream gaging programs is critical to the data needs inherent to this effort, as well.

Also critical to water quality monitoring is the development of tools to better assess water quality conditions. After promulgation of the total phosphorus criterion to protect Scenic Rivers, an additional rule became necessary for assessing data to determine if a Scenic River is fully supporting or not supporting the aesthetics beneficial use. The approved criterion is now a benchmark with which Oklahoma assesses the Scenic Rivers to determine their beneficial use support status. OAC 785:46-15 prescribes how the state will assess its waters. The assessment protocols at OAC 785:46-15 are applied to compile the state's annual BUMP report and the Clean Water Act mandated 305b/303(d) Integrated Report.

A technical working group comprised of staff from State environmental agencies met July through October 2004 to develop a new assessment protocol based upon the new phosphorus criterion. Oklahoma State University, USGS, EPA Region 6 and Arkansas DEQ representatives participated, as well. The group evaluated many alternatives for assessing phosphorus concentrations, including long-term geometric means, short-term assessment variables, assessment periods, combination criteria, data requirements, and the influences of flow and concentrations on algae growth. A draft protocol for evaluating Scenic Rivers phosphorus data was developed based upon input from this group.

The assessment protocol for evaluating Scenic Rivers phosphorus data was presented at public meetings in September, October and November 2004 and formally proposed December 15, 2004 following the requirements of the Administrative Procedures Act. Subsequent to the formal comment period and hearing, the OWRB approved the proposed rule with a unanimous vote on March 8, 2005. The new assessment protocol in OAC 785:46-15-10 became effective July 1, 2005.

Sportfish Population Assessments

In addition to water quality monitoring, sportfish population assessments conducted by the Oklahoma Department of Wildlife Conservation ("ODWC") are beneficial in tracking the biological health and productivity of the Scenic Rivers. Since 2001, the ODWC has conducted Fall electrofishing surveys at selected streams in eastern Oklahoma to assess the relative abundance and condition of sportfish in these systems. Since this time, a total of eight surveys have been completed at four of the Scenic Rivers. One survey was completed at the Illinois River in 2003, three at Baron Fork Creek in 2001, 2002, and 2004 and two at Flint Creek and the Mountain Fork River in 2002 and 2003. These data provide baseline information needed for long term monitoring.

The survey results (Table 5) indicate that longear sunfish are the most abundant sportfish species in all four of the Scenic Rivers sampled from 2001 through 2004. All four streams support significant populations of smallmouth bass and moderate largemouth bass populations. The Illinois River and the Mountain Fork River also support significant populations of spotted bass. However, only one spotted bass was collected from Barren Fork Creek, and none were collected from Flint Creek during the surveys. In northeastern Oklahoma streams, bluegill sunfish, shadow bass, warmouth sunfish and green sunfish population abundances varied among streams, but all populations appear to be stable. Redear sunfish have only been collected from Barren Fork Creek, and abundance was low in this system. The Mountain Fork River also supports an abundance of green sunfish, while bluegill and warmouth populations are small in this system. It should be noted that the conductivity of the Mountain Fork River is significantly lower than streams found in the northeast part of the state making electrofishing equipment much less efficient in this system. Therefore, it is likely that sportfish abundance has been underestimated, and data from southeast Oklahoma should not be compared to data collected from northeast Oklahoma streams.

The mean body condition of all black bass greater than 200 mm collected from the Illinois River, Barren Fork Creek and Flint Creek were above acceptable levels during each survey completed between 2001 and 2004. Body condition for largemouth bass and spotted bass collected from the Mountain Fork River varied among species and length groups in 2002 and 2003. However, smallmouth bass body condition was acceptable in both survey years. In 2002, body condition for largemouth bass between 201 and 299 mm were within acceptable levels, but condition of fish >350 mm was below acceptable levels. In 2003, largemouth bass condition was below acceptable levels for fish <379 mm, but was acceptable for fish >380 mm. Similarly, spotted bass <280 mm were in good condition in 2002, but condition of fish over 280 mm were below acceptable levels. In 2003, spotted bass between 180-279 mm were in poor condition, but all other size groups were in excellent condition.

Body conditions for most other sunfish species were not calculated due to either low sample sizes or a lack of suitable models for those species. However, condition of bluegill and redear sunfish was determined from samples collected at Barren Fork Creek and Flint Creek. At Barren Fork Creek, body condition of bluegill populations were found to below acceptable levels for all size groups in 2001 and 2002. In 2003, condition of fish between 75 and 149-mm was above acceptable levels, but all other length groups were below standards. At Flint Creek, the condition of bluegill populations was below acceptable level in 2001, but all size groups were in good condition in 2002. The condition of redear sunfish populations found in Barren Fork Creek was poor in 2001 and 2002, but fish >149 mm were found to be in good condition in 2004.

Table 5. Catch per unit effort estimates for sportfish populations in four Scenic Rivers sampled by ODWC between 2001 and 2004.

Stream Sampled	2001	2002	2003	2004
	C/f (fish/hr)	C/f (fish/hr)	C/f (fish/hr)	C/f (fish/hr)
Illinois River				
Largemouth bass	-	-	5	-
Smallmouth bass	-	-	18	-
Spotted bass	-	-	21	-
Bluegill	-	-	11	-
Longear sunfish	-	-	115	-
Green sunfish	-	-	10	-
Warmouth sunfish	-	-	1	-
Shadow bass	-	-	13	-
Redear sunfish	-	-	0	-
Barren Fork Creek				
Largemouth bass	31	20		28
Smallmouth bass	33	56		72
Spotted bass	1	0		2
Bluegill	72	76		49
Longear sunfish	66	193		101
Green sunfish	12	21		10
Warmouth sunfish	4	6		10
Shadow bass	19	32		40
Redear sunfish	6	8		13
Flint Creek				
Largemouth bass	-	10	19	-
Smallmouth bass	-	47	18	-
Spotted bass	-	0	0	-
Bluegill	-	38	41	-
Longear sunfish	-	152	195	-
Green sunfish	-	26	14	-
Warmouth sunfish	-	1	0	-
Shadow bass	-	58	53	-
Redear sunfish	-	0	0	-
Mountain Fork River				
Largemouth bass	-	3	19	-
Smallmouth bass	-	24	7	-
Spotted bass	-	24	11	-
Bluegill sunfish	-	8	7	-
Longear sunfish		225	180	-
Green sunfish	-	74	67	-
Warmouth sunfish	-	2	1	-
Shadow bass	-	0	0	-
Redear sunfish	-	0	0	-

Conclusion

Over 30 years ago, the Oklahoma Legislature decided to carve out six treasured, unique streams and hold them worthy of special focus and protection. Thus for over three decades, the State of Oklahoma has worked diligently to ensure that these six Scenic Rivers receive the protection and reverence that they deserve. No other watershed in Oklahoma has received the level of funding, scrutiny, and technical assistance that has been focused on the Illinois River watershed, which is the iconic Scenic River for Oklahoma and includes the Barren Fork Creek and Flint Creek Scenic River watersheds.

And yet with all of this intense scrutiny and effort, Oklahomans have continued to see water quality deteriorate in many of these once pristine systems. Volumes of data have been collected, comprehensive studies have been done, and all signs point to what the river outfitters and lay public already know – Oklahoma's Scenic Rivers and the reservoirs that they supply are growing greener with algae and more unhealthful with bacteria despite the determined efforts to stem this tide.

Without question, there are numerous success stories in these watersheds, ranging from the significant pollution reduction commitments made by municipal dischargers to the best management practices employed by farmers and ranchers. But the sheer magnitude of the population growth (both human and avian) in the Illinois River watershed, in particular, coupled with the fact that the majority of the pollutant loading stems from across state lines, often frustrates and masks the incremental improvements made by the efforts of Oklahoma.

With these realities and circumstances in mind, it is incumbent upon the State of Oklahoma to redouble its efforts to secure further pollutant reductions in the Scenic River watersheds, both in Oklahoma and Arkansas. It is only that way that we can restore what one early chronicler described as "One of the prettiest rivers on the continent, sparkling with crystal waters."