



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

(per 82 O.S. §1457 as amended by Senate Bill 972 in 2002)

● 2006 Update ●



Coordinated and Prepared By:

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Introduction

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. This report constitutes the Update for 2006.

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. The most recent data and information were presented in the 2005 Strategy Update, and these impairments are reflected in the State's recently revised Oklahoma 2004 Integrated Water Quality Report/303(d) list.

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.

Over the past decade, 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 that it also regulates commercial fertilizer application, the Arkansas legislation contains several provisions that allow for unregulated litter application under certain circumstances. First, the 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 a use other than land application to be considered an "alternative use" under the Arkansas statute (Arkansas Code Title 15 § 20-1110(c)(2)). After approximately 18 months of delay, Arkansas finally promulgated permanent rules to implement its new nutrient management statutes in the fall of 2005. However, the prohibition against land application of poultry litter except according to the requirements of an animal waste management plan was deferred until January 2007.

As described in previous Updates, 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. The future applicability 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 2005, the ODEQ has conducted multiple inspections of wastewater treatment plants within Scenic River watersheds in an effort to ensure compliance with permit requirements.

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

- Tahlequah - Permit issued on June 13, 2005 with a reduced limit for Phosphorus of 1mg/l.
- Tahlequah – DEQ has received and is currently reviewing an application from Tahlequah for a small MS4 (multi-sector) stormwater permit.
- Westville - Permit issued on July 1, 2005 with a reduced limit for Phosphorus of 1mg/l. DEQ is working with Westville to move toward the construction of a new wastewater plant that will allow them to meet the newly established limits.
- Westville - DEQ approved a one-time application of biosolids from Westville’s wastewater treatment facility in a manner that ensured application occurred outside of any Scenic River watershed.
- DEQ has completed work on a project, initiated in 2002 under an EPA grant, to evaluate metals and pesticides on stream segments within Scenic River watersheds that had been suspected of impairment. Monitoring was conducted at two sites on the Illinois River, two on the Baron Fork, and one site on Flint Creek under base flow and high flow conditions. In addition to water samples, sediment and fish tissue samples were also collected and tested. DEQ has submitted a draft report to EPA Region VI for final approval and anticipates having the final document available soon.
- 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 adjacent states to protect our waters. A few examples of proposed actions on which DEQ has commented are:
 - Osage Basin - proposed new sewage treatment facility
 - Arkansas proposed 303(d) list of impaired waters
 - Water Quality Management Plan amendment for new Fayetteville sewage treatment facility
 - Proposed discharge permit for new Fayetteville sewage treatment facility
 - Proposed renewal of discharge permit for the Town of Hatfield (Upper Mountain Fork watershed)

- Water Quality Management Plan amendment for City of Rogers
 - Proposed renewal of discharge permit for the City of Rogers
- When considering 401 Water Quality Certification for Corps of Engineers (Corps) nationwide permits (404 dredge and fill operations) within Scenic River watersheds, DEQ continues to evaluate unique conditions to determine if additional justification is required or if certification denial is warranted.
- As a result of a joint effort between the Corps and DEQ, the Corps has designated all Scenic Rivers as Critical Resource Waters.
- As a result of a joint effort between the Corps and DEQ, a regional general permit for common Corps projects involving Critical Resource Waters has been developed. This permit includes additional protections for Critical Resource Waters.
- Targeted training has been provided to local DEQ staff on addressing issues that are unique to Scenic River watersheds. This proactive step allows for a prompt and appropriate DEQ response to situations that arise.
- DEQ has increased stormwater awareness in the Scenic River areas of Oklahoma over the last year. The increased effort included conducting yearly inspections of all permitted stormwater sites within the corridors of designated scenic rivers. Additionally, DEQ staff working within the Scenic River watersheds are attempting to stop at all construction sites (of sufficient size to warrant a stormwater permit) to educate the contractors/owners on proper stormwater controls and permitting.
- DEQ continues to investigate complaints and to pursue enforcement, where warranted, within Scenic River watersheds. A few examples of such actions are as follows:
 - Investigated complaints concerning the removal of gravel by the Adair County Commissioner Districts 1-3 (Cairns Ford) and Cherokee County Commissioner Districts 1-3 (Buck Ford) from the Illinois River on January 14, 2005. Enforcement action was taken and the complaints were subsequently closed based on no further activity.
 - Investigated a complaint on gravel removal in Sager Creek on April 22, 2005. Enforcement action followed, and the matter is currently pending an Administrative Hearing.
 - Investigated a complaint on a resort on the Illinois River for gravel removal and unpermitted activity on May 9, 2005. Enforcement action followed, and the owner is in the process of completing the terms of the enforcement order.
 - Investigated the construction of an unpermitted diversion dam on the upper Baron Fork of the Illinois River in Adair County found during an investigation on July 15, 2005. Enforcement action followed and resolution is pending.
 - Investigated the construction of an unpermitted dam on the Baron Fork of the Illinois River in Cherokee County by a private recreational club on August 8, 2005. Enforcement action followed and resolution is pending.

- Investigated the removal of large boulders from a private recreational facility on Flint Creek on August 22, 2005. A Memorandum of Agreement has been offered to the facility owner.
- Investigated a site where clearing and bank stabilization had occurred on Flint Creek on August 22, 2005. A follow-up meeting with the owner took place at the site on October 5, 2005. Resolution is pending.

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 Natural Resources 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 382 Animal Waste Management Plans for poultry operations.
 - ✓ Conducted inspections of all poultry operations located in the watersheds.
 - *343 inspections were performed by ODAFF poultry inspectors from July 1, 2005 to December 31, 2005.*
 - ✓ Provided technical assistance to poultry operators on 1,790 occasions in fiscal year 2004.
 - ✓ From August 1, 2004 to December 31, 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.

- ✓ Continue to pursue cost-effective alternative methods of disposal of excess litter through ODAFF Market Development Division and the Office of the Secretary of the Environment.
 - ✓ Continue to assist growers in developing Animal Waste Management Plans (AWMP) and/or Nutrient Management Plans (NMP).
 - ✓ Accelerate inspection and enforcement actions against violators of the Registered Poultry Feeding Operations Act and implementing rules, as well as those who do not comply with requirements of Animal Waste/Nutrient Management Plans.
- 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 P₂O₅ 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 1.

Table 1. Estimated annual amount of litter and nutrients generated in the Scenic River watersheds in Oklahoma.⁽¹⁾

Watershed	Litter (ton)	Total N (ton)	P ₂ O 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 P₂O₅ 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 P₂O₅ 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 P₂O₅ 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 approximately 12.5%.
- The contents of nitrogen and phosphorus under the form of P₂O₅ 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 (NH₄) will be converted to ammonia (NH₃) 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. Several Scenic Rivers, especially the Illinois River, were affected by the presence of a high level of Phosphorus. Controlling Phosphorus will be very critical in the restoration and protection of these rivers.

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 120, 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 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. Using 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. Table 2 presents the estimated amounts of extra poultry litter, based on these different STP thresholds of 120, 250 and 300, which should either be transferred out of each watershed or be applied onto other phosphorus deficient lands in the watersheds.

Table 2. 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 NO₃-N in 1989 to 10 mg/l in 1996. They also agreed to reduce the Phosphorus (total) level down to 1 mg/l.

In order to accomplish its goal of reducing 100% of the agricultural-related pollution within 10 years, ODAFF recommends the following to advance its regulatory oversight of these activities:

- Evaluate the accuracy of STP data of lands located in the watersheds as submitted by poultry applicators through required annual reports to ODAFF; spot check the STP data by conducting on site inspection and soil sample collection. Notify the applicators of the sites with currently more than an STP of 250, and do not allow them to apply additional litter on these lands.
- Coordinate with growers in locating available lands in the watersheds with STP less than 250 for future land application of litter. This will help determine the amount of litter, if any, to be transferred out of the basins/watersheds.
- Measure in-stream P levels upstream and downstream of the poultry operations and/or litter land application sites by setting up monitoring stations in the Scenic Rivers. Get access to and evaluate currently available OWRB BUMP or USGS data on nutrient levels in the watersheds.
- Evaluate the above data to determine effectiveness of land application restrictions, and the appropriateness of the recommended STP threshold value.
- Select a typical litter land application site located within ¼ mile of a Scenic River, coordinate with grower and/or NRCS to monitor phosphorus levels in the runoff water within 100 feet outside of the perimeter of the land application field after storm events, and measure the phosphorus content of the soil to determine the phosphorus amount leaving the field, if any, in order to develop or adjust the STP threshold specific for the watershed or sub-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.

Recreational Sector

As the only State agency created with the specific charge of protecting the Illinois River and its tributaries, the Oklahoma Scenic Rivers Commission (“OSRC”) has been extremely active in all watershed efforts, particularly in policing the rivers and educating users about the value of Scenic Rivers. Over the course of 2005, OSRC reports the following milestones and successes:

- First and foremost, the OSRC worked with OSE and sister State agencies to communicate and coordinate with Northwest Arkansas cities to secure their commitment to design/construct approximately \$300 million in waste water treatment plant (“WWTP”) improvements (Fayetteville \$180 million, Rogers \$24 million, Siloam Springs \$20 million, Springdale \$30 million, Northwest Arkansas Conservation Authority/Bentonville \$20 million). Most of these Arkansas cities are designing their new WWTPs to meet or exceed the new phosphorus nutrient standard of 0.037 mg/L for Oklahoma Scenic Rivers.
- With DEQ support, OSRC placed 24 portable toilets in areas adjacent to the Barren Fork Creek, Flint Creek and Illinois River from June thru August. A total of 5,950 gallons of wastewater were collected and appropriately disposed of during the service period.
- Additionally, OSRC pumped and properly disposed of 14,400 gallons of wastewater from 12 permanent toilet facilities in public access areas located in the same area.
- Approximately 400,000 individuals visited the Scenic River areas located within the OSRC operating area. Of this total, more than 130,000 floated the Illinois River in commercial flotation devices, generating an approximate \$12 million economic impact within Cherokee County alone.
- OSRC Education Outreach communicated/coordinated with approximately 3,800 stakeholders, including Spring Programs in public schools that had 1,388 participants, Educational Fairs with 1,400 participants, and Campground Programs (each Saturday evening June-August) that attracted 419 participants.
- Three river clean-up events were hosted:
 - June 3rd, 23 participants
 - July 8th, 109 participants
 - September 9th, 217 participants
- OSRC employed two seasonal team members from June thru August who floated the Illinois River in two canoes (one individual per canoe) and policed approximately 800 bags of trash (approximately 16,000 pounds of trash collected by both team members).
- OSRC Maintenance staff collected an additional 55,000 pounds of trash from public access and other areas of the Illinois River, Barren Fork Creek and Flint Creek. In addition, the Maintenance staff picked up over one hundred automobile, truck and farm equipment tires that had been illegally dumped adjacent to river areas

- Additionally, the OSRC provided the following services:
 - In partnership w/ODEQ, provided more than 40,000 trash bags to visitors and commercial flotation device operations.
 - Communicated efforts with stakeholders in publishing a newsletter and maintaining the website www.oklahomascenicrivers.net
 - Published and distributed 10,000 floater guides
 - Provided environmental review for approximately 400 projects to local communities, county and sub-state planning districts, and Indian Tribes in Oklahoma
 - Partnered with ODEQ to identify, enforce and bring about remediation projects on six major environmental damage incidents causing impacts to Scenic River areas
 - OSRC Law Enforcement issued 359 citations for violations, 22 written warnings, 510 verbal warnings and 125 arrests
 - Partnered with the US Army of Corps of Engineers to provide law enforcement and maintenance services for areas they own but are unable to provide services
 - Board of Commissioners established a new watershed values subcommittee to coordinate more closely with Illinois River stakeholders. This resulted in a \$1.1 million donation from the poultry companies who are located within the Illinois River basin to advance environmental outreach, riparian protection/streambank stabilization and improved toilet projects. Approximately \$800,000 may be leveraged through the Oklahoma Conservation Commission to match USDA-Farm Service Agency funds to establish a \$4 million Conservation Reserve Enhancement Program (CREP) project
 - Partnered with OSE and the Oklahoma Conservation Commission to utilize a \$300,000 EPA 319 Grant to implement a new riparian protection lease project with stakeholders to set aside approximately 400 acres of riparian buffer zones for lease terms of up to 30-years
 - OSRC Administrator has directed and participated in the development of pending House Bill 1505 and Senate Bill 1019 that will be considered by the Second Session of the Fiftieth Oklahoma Legislature to designate the Blue River (in Johnston and Pontotoc Counties) as Oklahoma's seventh designated scenic river area

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 1). 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.

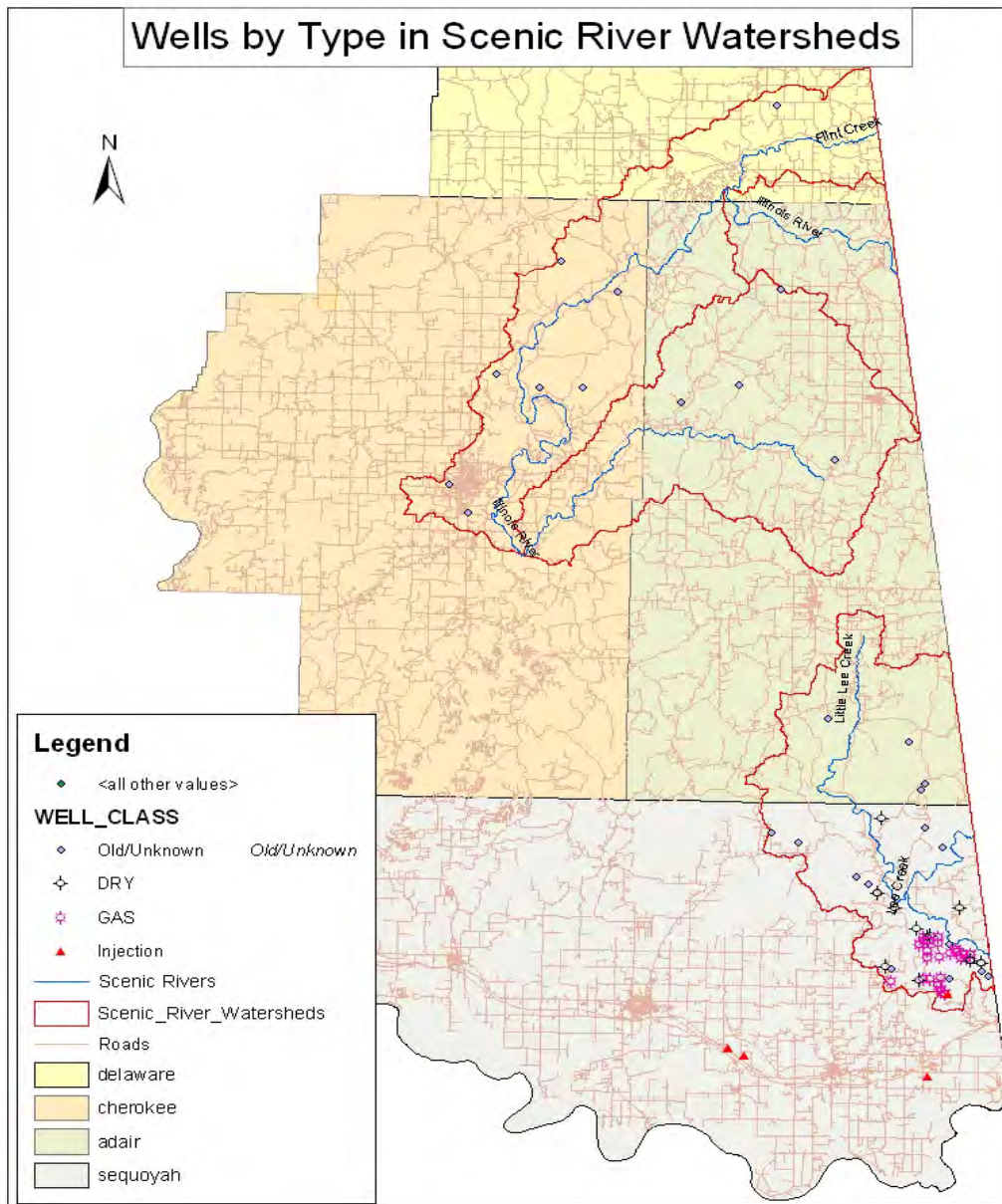


Figure 1. Oil and gas wells by type in Scenic River watersheds.

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

Continued monitoring and evaluation of Lake Tenkiller is equally important in understanding the affects of watershed activities on water quality in the watershed, as well as in evaluating whether pollution control efforts are achieving positive results. The OWRB's report titled "Monitoring of Tenkiller Ferry Lake Near Horseshoe Bend and Caney Creek to Support Lake Tenkiller TMDL and BMP Activities" clearly demonstrated that from 1998 through 2000, the total

phosphorus load at Horseshoe Bend of Lake Tenkiller was more than double the recommended 40% reduction goal and was actually 124% of the established 1996 baseline load.

Sampling of Lake Tenkiller Ferry by the Tulsa District Corps of Engineers ("COE") showed that a new and potentially toxin-producing algae is present in the lake. Test results by the COE, OWRB, and OU Health Sciences Center show that the blue-green algae *Cylindrospermopsis raciborskii* has colonized Lake Tenkiller. Algae of the genus, *Cylindrospermopsis* have been known to produce the potent cytotoxin, cylindrospermopsin. Because of this potential, Lake Tenkiller was included in the OWRB's Harmful Algae Bloom ("HAB") project. Here, BUMP lake sampling was leveraged to allow a grab sample of algae community to be enumerated and compared against World Health Organization criteria of risk due to recreational exposure. HAB algae samples were taken in August 2004, March 2005, and May 2005 from five lacustrine zone sites in the lake. The overall recreational risk in Lake Tenkiller due to HAB toxins was found to be moderate. Algae of the genus *Cylindrospermopsis* and *Aphanocapsa* presented the greatest risk for cyanotoxin production in Lake Tenkiller. *Aphanocapsa* is known to produce microcystin, a hepatotoxin. An unusual note was that the haptophyte, *Chrysochromulina parva*, was noted in the March 2005 samples. This mixotrophic algae is in the same family and may fill the same ecological niche as its cousin, *Prymnesium parvum*, AKA "golden algae".

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 its historical funding level of \$1.2 million per year. Continued support of the USGS monitoring and stream gauging programs is critical to the data needs inherent to this effort, as well. Additionally, routine monitoring of Lake Tenkiller should be resumed in order to determine the magnitude of impact from continued phosphorus loading on its beneficial uses. The feasibility of mitigating in-lake impacts should be revisited, as well, with an eye towards the potential of short-term relief while efforts toward a long-term solution continue.

Also critical to water quality monitoring is the development of tools to better assess water quality conditions. The Oklahoma Water Resources Board adopted a criterion of 0.037 ug/L total phosphorus to protect Oklahoma's six Scenic Rivers in March 2002. EPA Region VI approved the criterion in May 2004. This criterion has become the basis for substantial remedial efforts in the watershed. OWRB has subsequently continued efforts to protect and restore the Scenic Rivers with development of protocols and rules to determine if Scenic Rivers are impaired by phosphorus. OWRB also has proposed a criterion to provide additional protection for the drinking water use of Lake Tenkiller by adding a Nutrient Limited Watershed designation.

Scenic River Assessment Protocol

Working with state environmental agencies, EPA Region VI and the Arkansas Department of Environmental Quality, OWRB staff proposed an assessment protocol for determining if the Scenic Rivers Aesthetics Beneficial Use is supported with respect to concentrations of total phosphorus. This protocol established minimum data requirements and a decision rule to determine if routine monitoring data indicate that the 30-day geometric mean concentration of 0.037 mg/l total phosphorus is exceeded. This protocol was adopted by the OWRB and

promulgated as state rule in OAC 785:46-15 following the Oklahoma Administrative Procedure Act. The rule became effective July 1, 2005.

Lake Tenkiller NLW Designation

Staff of the OWRB have proposed designation of the Tenkiller watershed as a Nutrient Limited Watershed ("NLW") based upon the Clean Lake Study and current monitoring data indicating that nutrient loading is contributing to the impaired beneficial uses of the lake. As of January 17, 2006, the proposal to designate Tenkiller Ferry Reservoir as an NLW is pending approval by the Board, legislative review and gubernatorial approval as specified in the Oklahoma Administrative Procedures Act.

Lake Tenkiller Chlorophyll-a criterion

OWRB staff also have proposed a criterion for protection of the Public and Private Water Supply Beneficial Use of Sensitive Water Supplies ("SWS") and other critical sources of drinking water. The proposed 10 ug/l criterion for chlorophyll-a would apply to Tenkiller Ferry Reservoir, Wister Lake and lakes designated as SWS in Appendix A of the Oklahoma Water Quality Standards. The criterion is intended to limit the occurrence of offensive taste and odor problems in drinking water and costs for treatment that are caused by excessive algae and blue green algae. As of January 17, 2006, the proposed criterion is pending approval by the Board, legislative review and gubernatorial approval as specified the Oklahoma Administrative Procedures Act.

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. In 2000, the ODWC began conducting 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 ten surveys have been completed at four of the Scenic Rivers. Surveys were conducted on the Illinois River in 2000, 2003, and 2005; three were conducted on Barren Fork Creek in 2001, 2002, and 2004; and two were conducted on both Flint Creek and the Mountain Fork River in 2002 and 2003. These data provide baseline information needed for long-term monitoring.

Electrofishing surveys were conducted at a minimum of four sites during each survey. These sites were selected for each stream from a pool of potential sites using probability routines. Both accessible and remote areas were sampled to minimize bias associated with stream access. All surveys were conducted in late summer and fall after sport fish spawning had occurred.

All electrofishing surveys were conducted from a boat using pulsed direct current (Smith-Root 2.5 GPP) and a boom-mounted anode array. Sportfish (*Micropterus* spp., *Lepomis* spp., rock bass *Ambloplites rupestris* and warmouth *Chaenobryttus gulosus*) were captured during multiple five-minute electrofishing runs. Species name, lengths (mm; nearest five mm length group) and weights (gm) were recorded for all sportfish, as well as pedal time (seconds) from each sample site. All fish were released back into the stream below a natural barrier after processing.

Population assessments were made for individual species within each stream when sample sizes were sufficient. Relative abundances were calculated for individual electrofishing runs by dividing catch by pedal time. Mean relative abundances were determined by averaging results from individual electrofishing runs. Sportfish collected from all electrofishing runs were pooled by species and stream to calculate condition.

The survey results (Table 4) indicate that longear sunfish are the most abundant sportfish species in all four of the Scenic Rivers sampled from 2000 through 2005. All four streams support significant populations of smallmouth bass and moderate largemouth bass populations. The Illinois River and 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 our surveys. In northeastern Oklahoma streams, bluegill sunfish, shadow bass, warmouth sunfish and green sunfish populations abundance varied among streams but all populations appear to be stable. Redear sunfish have only been collected from Barren Fork Creek and the Illinois River, and abundance was low in both systems. 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, and electrofishing equipment is 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 2000 and 2005. 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 greater than 350 mm was below acceptable levels. In 2003, largemouth bass condition was below acceptable levels for fish less than 379 mm but was acceptable for fish greater than 380 mm. Similarly, spotted bass less than 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 reardear 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 be 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 levels in 2001, but all size groups were in good condition in 2002. The condition of reardear sunfish populations found in Barren Fork Creek was poor in 2001 and 2002, but fish greater than 149 mm were found to be in good condition in 2004.

Table 4. Catch per unit effort estimates for sportfish populations in four Scenic Rivers sampled by ODWC between 2000 and 2005.

Stream Sampled	2000	2001	2002	2003	2004	2005
	C/f (fish/hr)	C/f (fish/hr)	C/f (fish/hr)	C/f (fish/hr)	C/f (fish/hr)	C/f (fish/hr)
Illinois River						
Largemouth bass	11	-	-	5	-	7
Smallmouth bass	16	-	-	18	-	25
Spotted bass	37	-	-	21	-	15
Bluegill	24	-	-	11	-	11
Longear sunfish	71	-	-	115	-	76
Green sunfish	10	-	-	10	-	4
Warmouth sunfish	2	-	-	1	-	0
Shadow bass	20	-	-	13	-	25
Redear sunfish	1	-	-	0	-	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	-	
Mt. 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

For over three decades, the State of Oklahoma has worked diligently to ensure that its six Scenic Rivers receive the protection and reverence that they deserve. 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. Indeed, 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.