WATERSHED RESTORATION ACTION STRATEGY (WRAS)

for the

ILLINOIS RIVER/BARON FORK WATERSHED

prepared by:
Oklahoma Conservation Commission

July 1, 1999

INTRODUCTION:

In keeping with the 1998 mandates of the *Clean Water Action Plan* (CWAP), which establishes goals and implementation schedules for numerous strategies dealing with point and nonpoint sources, states are required to develop a *Unified Watershed Assessment* (UWA) strategy. Oklahoma's UWA is a document that was developed and will be implemented based on directives of the state's UWA Work Group. The UWA process is intended to focus various agency efforts to more cooperatively work on the most significantly impaired watersheds in the state. Through the UWA process, the Work Group identified three "Category I" watersheds in Oklahoma that are recognized as needing immediate federal and state funding to target restoration activities. The Illinois River (including the Baron Fork subwatershed) was one of these high priority watersheds.

Following the requirements of the CWAP, a *Watershed Restoration Action Strategy* (WRAS) must be developed for each of the priority watersheds. This *Watershed Restoration Action Strategy for the Illinois River/Baron Fork Watershed* will summarize the efforts necessary and mechanisms by which restoration and protection activities will be pursued in the Illinois River/Baron Fork Watershed (IR/BF).

It has been suspected since the early 1980's that the Illinois River and Lake Tenkiller in northeastern Oklahoma were experiencing water quality degradation, primarily perceived as reduced clarity. Numerous studies verified that the lake and river were experiencing accelerating eutrophication from excessive nutrient loading caused by landuse changes in the watershed. Research linked water quality problems to sources including both point sources and nonpoint sources such as the poultry and grazing industries in the basin.

Considerable efforts have already been made to address the sources of these water quality problems in the basin and extensive work is planned for the near future. These efforts include reductions in point source loading due to cooperation between the Oklahoma Department of Environmental Quality (ODEQ) and cities of Tahlequah and Stillwell,

education programs developed by the Oklahoma Scenic Rivers Commission (OSRC), the Cherokee County Conservation District, and the Oklahoma Conservation Commission (OCC), and various programs to reduce nonpoint source loading from agricultural sources in the watershed. These programs are incorporated into the framework of the WRAS for the IR/BF Watershed.

The WRAS for the IR/BF Watershed has been developed as a dynamic document that will be revised, when necessary, to incorporate the latest information, address new strategies, and define new partnerships between watershed shareholders following this initial WRAS documentation. Also, it is understood that the water quality goals set forth in this WRAS, as well as the WRAS technical approach to address the goals, may not be comprehensive, and it may be necessary to revise or expand them in the future.

Federal and state funding allocations for future water quality projects designed to address IR/BF Watershed problems should not be based solely upon their inclusion in this WRAS, rather the WRAS should be considered a “focal point” for initial planning and strategy development.

In order for this WRAS to become an integral part of the entire watershed restoration program, it must be amenable to revision and update. It is anticipated that at least biannual revisions may be necessary, and that the responsibility for such revisions will rest primarily with the OCC with support from the OSE and the UWA Work Group.

The following six items are based upon EPA Guidance and have been designated by OSE as the essential components of each WRAS.

I. PUBLIC OUTREACH:

This section identifies agencies and organizations responsible for the development of the WRAS and implementation of the Public Outreach components. There have been several important Public Outreach programs recently implemented statewide that address animal waste nonpoint issues. There have also been several Public Outreach programs initiated within the IR/BF Watershed by the OSRC, Cherokee County Conservation District, OCC, and other agencies.

The OSRC is the primary agency responsible for public outreach along the river corridor between the Oklahoma/Arkansas State line and the headwaters of Lake Tenkiller. As such, the OSRC will play a major role in developing, coordinating and implementing Public Outreach programs within the watershed. They have developed a management plan to focus on and protect the river’s natural, cultural, and historical values. The OSRC formed working groups made up of concerned citizens to develop plans to deal with issues of river corridor values (landowner cooperation, reduction of streambank erosion, restrictions on

floodplain development), recreation resources (canoeing, hunting, fishing, etc.), and water quality problems. These groups identified goals and strategies to deal with the particular problems in the watershed. Although the role of the OSRC is limited to the river corridor, many of the goals and strategies its plan outlines can be applied to the entire watershed.

Because the majority of the problem is due to the effects of nonpoint source pollution, the Oklahoma Conservation Commission (as the state's technical lead nonpoint source agency) will work through the Cherokee County Conservation District to supplement the OSRC's public outreach program towards the remainder of the watershed. Also integral in this program will be the interaction of the Watershed Advisory Group (WAG), put together by the OCC. The WAG will be made up of local shareholders in the watershed (including private citizens, government, and tribal officials) who will help direct the program based on information supplied to them by technical agencies and their knowledge of the needs of the watershed residents.

A. WRAS DEVELOPMENT:

Several organizations have been actively involved in development of the WRAS for the IR/BF Watershed protection program. The role of each is described below:

1. Unified Watershed Assessment Work Group (UWA-WG)

This state-wide Work Group was established by the Oklahoma Office of Secretary of Environment (OSE) to facilitate implementation of the EPA Clean Water Action Plan and other state water quality programs, particularly with respect to non-point sources and TMDLs. The UWA-WG is providing technical support and leadership in development of all WRAS programs in the state. The UWA-WG and OSE conduct meetings, set WRAS development schedules, and assist with WRAS development guidance.

2. Oklahoma Conservation Commission (OCC)

The OCC is the primary agency responsible for development of the WRAS for the IR/BF Watershed. The draft WRAS will be forwarded for peer review to members of the State's Nonpoint Source Working Group to insure its consistency with other agency programs. The OCC staff is coordinating the development of all WRAS documents for Oklahoma and will insure that all document formats are consistent and that all items are adequately addressed.

B. WRAS IMPLEMENTATION:

The success of water quality protection programs in the IR/BF Watershed depends on the approval and cooperation of the local landowners and various government agencies. The Watershed Advisory Group should be the primary mechanism through which this is accomplished and its composition should be developed to insure the success of this function.

The WAG will be one of the primary mechanisms to accomplish public outreach in the IR/BF Watershed. These efforts will be supplemented substantially through the activities of the OSRC and the OCC. In addition, other state and federal programs provide public involvement and education that complement these efforts.

Considerable work has already begun through public outreach to address the water quality and related concerns in the IR/BF Watershed. Early meetings and conferences consisted mainly of finger-pointing and denial of blame for water quality problems by various industries and groups in the watershed. However, as education and public outreach efforts advanced, meetings increasingly focus on successes and failures of participation in mandatory and voluntary programs to protect water resources. In other words, more potential contributors are willing to accept some responsibility for the problem and in doing so, implement practices to correct the problems. These efforts include participation in trash and human waste control by OSRC and canoe vendors, runoff control and treatment efforts by nurseries, improvements in wastewater treatment for municipalities, and numerous efforts by integrators and poultry growers to reduce the impacts of animal wastes.

A pilot program of BMP implementation to protect water quality in the watershed that included a public outreach component was the Battle Branch Creek Implementation Project, completed by the OCC in 1993. The Battle Branch Project focused on BMP implementation in a small subwatershed of the Illinois River watershed that had problems and sources typical of the remainder of the watershed. A considerable number of landowners participated in the program which resulted in improved water quality in Battle Branch Creek and provided researchers and managers with information about the sources of the problems and what activities might be effective at controlling those sources. The Battle Branch Project successfully improved water quality in the watershed. However, when the incentive money dried up and OCC presence was no longer “felt” in the watershed, practices began to backslide and corresponding water quality degradation occurred. It became apparent that sustainable, successful practices were necessary rather than just successful practices. It was believed that more public input would be necessary to determine the best way to implement sustainable, successful practices.

Most efforts to date have focused on development of reliable data to assess the extent and source of water quality-related problems in the watershed. New Public Outreach directions will focus more on stakeholder participation in implementation of BMPs for animal waste controls and other structural and non-structural practices to reduce nutrient loadings and erosion in the watershed.

Many local efforts, as well as state and federal agencies and other organizations, are collectively contributing to the Public Outreach efforts in the IR/BF Watershed. The roles of these groups and programs are summarized below:

1. Oklahoma Scenic Rivers Commission (OSRC) Illinois River Management Plan

The OSRC worked with Oklahoma State University (OSU) and the National Park Service to develop a management plan for the Illinois River Corridor. This program identified goals pertaining to river corridor values (property rights, development, riparian land, bank stabilization, and regional growth), water quality and recreation, along with strategies for reaching those goals. Specifically, the OSRC plan identifies action matrices to address the goals and strategies. The OSRC management plan incorporated a public outreach forum by allowing private citizens to develop goals and strategies for dealing with problems they perceived in "their" watershed. The WAG and OCC will incorporate the efforts and recommendations of the various OSRC workgroups that relate specifically to nonpoint source issues in implementing the 319 program in the watershed. The remaining recommendations of the OSRC plan that may not relate specifically to nonpoint source issues should also be considered in the overall implementation strategy for the watershed. The OSRC also operates a considerable education effort aimed at providing both school-age children and landowners in the watershed information about the importance of the resource and what they can do to protect it. This program works towards the recommendations and action strategies of the OSRC plan and the goals of such a program are essential towards insuring success of the WRAS.

2. Total Maximum Daily Load (TMDL)

The ODEQ is in the process of developing a TMDL to protect the Illinois River and Lake Tenkiller. The TMDL will set limits on the permissible nutrient load to the river and lake and help determine the necessary loading reductions to be contributed by point sources and nonpoint sources. The TMDL can only be implemented if local citizens and other stakeholders agree it has merit and are willing to take the necessary voluntary and mandatory steps to implement the recommended reductions.

3. Watershed Advisory Group (WAG)

The IR/BF WAG will provide essential guidance towards the direction of the project- a locally-led effort to solve local problems. The purpose of the WAG is to give guidance on the 319 program that the OCC will be implementing in the IR/BF Watershed. The OCC 319 program is a demonstration and implementation project which will give landowners the opportunity to implement best management practices (BMPs) that will protect water quality. The WAG is also putting into place an educational program that will take the "show and tell" approach to the public in the entire watershed. The WAG is made up of representative watershed stakeholders including various industries, civic groups, land-owners, etc.

4. The Oklahoma Conservation Commission (OCC) and Local Conservation Districts

The OCC has devoted over $2 million towards implementing best management practices to reduce nonpoint source pollution in the watershed. A portion of these funds will support the WAG, another portion will be devoted to monitoring the success of the program, but the majority of the funds will provide cost-share assistance to farmers to implement WAG-approved best management practices to protect the water resources of the watershed. The OCC's main function will be to provide technical guidance to the WAG and local conservation districts for implementation of the BMPs. The OCC will also be responsible for monitoring the success of the program and providing administrative support for the project.

5. Oklahoma Department of Agriculture (ODA) Hotline

The ODA established a toll-free poultry litter hotline in 1998 to match buyers and sellers of poultry litter. The hotline was established to develop mechanisms for marketing excess animal waste in the impaired watersheds (e.g. IR/BF) to areas that can benefit from land application of litter. The ODA Litter Hotline is 1-800-583-7131. The ODA hotline is also available on Oklahoma State University's Cooperative Extension Service web site at www.dasnr.okstate.edu/ poultry/haul.htm. Poultry growers in the Arkansas portion of the IR/BF Watershed are encouraged to contact the ODA hotline regarding export assistance. ODA maintains information concerning Arkansas sources of litter through the voluntary assistance of private individuals, since the ODA cannot directly target Arkansas growers who may have litter to sell.

6. Oklahoma State University (OSU) Education Program

OSU has a website on Animal Waste Nutrient Management which provides all the background information needed for developing Nutrient Management Plans and Animal Waste Management Plans. OSU organized the High Plains Animal Waste Management Conference in March, 1999. Also to date, OSU has provided training to approximately 1200 growers as required by recent Oklahoma legislation on poultry production. The

training includes general background on water quality and nonpoint source impacts as well as descriptions of BMP options and implementation resources.

7. OSU Web Page for Litter Marketing

In 1998, OSU's Department of Agricultural Economics established the Oklahoma Poultry Litter Line web page. It's purpose is "... to promote better understanding of the movement and application of poultry litter in Oklahoma." This market web site is designed for agricultural producers wanting bulk amounts of poultry litter as a soil fertilizer and/or soil amendment. The web address is http://www.dasnr.okstate.edu/poultry/haul.htm This list includes a list of contract haulers.

8. OSU Publications and Fact Sheets

OSU has developed several fact sheets including: (1) "Using Poultry Litter as Fertilizer", (2) "Soil Quality and Animal Manure", and (3) "Manure and Raising Soil pH". Other publications include a water quality driven soil handbook, "Oklahoma Soil Fertility Handbook". Also, OSU will produce a promotional video on poultry litter management and utilization that will support the marketing and export of poultry litter. Specific instances of loading, trucking, and spreading of poultry litter will be covered. OSU has developed a riparian handbook that provides information on the benefits and functions of riparian areas, as well as guidance for maintenance of effective riparian zones.

9. NRCS Local Offices - Oklahoma and Arkansas

The United States Department of Agriculture Natural Resource Conservation Service (USDA/NRCS) in Arkansas and Oklahoma have been involved with the IR/BF Priority Area for the Environmental Quality Incentives Program (EQIP). This is a joint venture for Oklahoma and Arkansas. The NRCS designated the Illinois River Watershed as an EQIP Priority Area for FY 1998. Funds are available through the NRCS to implement practices intended to reduce phosphorus loading to the Illinois River and Lake Tenkiller. The Illinois River watershed was also designated a priority area for FY 1999 and FY 2000 funding. An Education Plan will be developed under EQIP, and will include: 1) development of Animal Waste Management Handbooks. (2,000 are planned); 2) purchase of a Table Top Display unit for use in educational workshops to highlight water quality and conservation practices; 3) organization of an annual tour for producers to visually see the results of best management practices and effects of proper waste application; and 4) development of a Grassland/Wildlife Handbook for use in watershed protection.

10. Arkansas Soil and Water Conservation Commission (ASWCC)

The ASWCC developed a management plan to address nonpoint source pollution concerns in the Arkansas portion of the watershed. The plan identified problems including bacterial contamination, nutrient enrichment, sedimentation, and habitat degradation. Sources of these problems in Arkansas were identified as agriculture, urban runoff, construction, roads, streambank erosion, mining, on-site wastewater disposal, silviculture, point sources, background loading, and groundwater. The plan identified BMPs recommended for reducing the impacts of these sources and programs available to implement various NPS BMPs in Arkansas. Finally, the plan identified action items to address the water quality problems related to the 4 broad categories identified early in the plan. These action items correspond to many actions planned or already implemented in the Oklahoma portion of the basin, including drafting and revision of nutrient management plans for farmers, fertilizer application based on soil test results, and various other BMPs and regulatory controls.

11. Integrators

Presently, the poultry industry is represented by officials from Peterson Foods, Tyson Foods and Simmons Foods. These three integrators represent the vast majority of all poultry production in the IR/BF watershed. All three are actively pursuing public outreach and public education initiatives through relationships with their contract growers. All three have established dialogue with their contract growers concerning Oklahoma legislative and regulatory requirements on animal production and poultry waste issues. The Integrators have agreed to fund education programs for growers as required by Oklahoma legislation. A representative of the Integrators will be included in the WAG.

12. Poultry Federation

The newly formed Poultry Federation is currently involved with education of integrators and growers about legislative and water quality issues dealing with poultry production. This organization has become an important voice for the poultry industry. The Poultry Federation relies upon an effective education program for its members, and will be an important partner in the IR/BF watershed program.

13. University of Oklahoma (OU), Oklahoma State University (OSU), OU Health Sciences Center, Oklahoma Scenic Rivers Commission, EPA and NSF Illinois River Project.

Professors and students at OU, OSU, and OU Health Sciences Center are working with the Oklahoma Scenic Rivers Commission on an EPA and National Science Foundation (NSF) funded project aimed at developing an extensive model of the watershed for educational and practical applications. Extensive inputs are required, many of which

involve public outreach in the form of interviews, surveys, group meetings, etc. The project is looking at all aspects of the watershed, not just natural resources assessment, including economic and social impact assessment.

II. MONITORING/EVALUATION ACTIVITIES:

This section describes the water quality goals and expected outcomes for the IR/BF watershed. All monitoring and data collection completed by OCC will be done according to formal quality assurance planning. All data used to evaluate the effectiveness of the implementation efforts will be collected under EPA-approved Quality Assurance Project Plans. All watershed activities will have detailed budget information provided to OCC and the WAG, and all project outputs and milestones will be submitted to EPA. The OCC will maintain a database of OCC data that will be used to track the progress of all watershed activities, including fund allocations and sources, milestones, and accomplishments. The OCC will prepare periodic summaries of this database for management and make project information available to the public, to all work groups, and to government agencies and private companies, as requested. The Office of the Secretary of the Environment will oversee coordination of the various monitoring efforts ongoing in the basin.

A. GOALS AND OUTCOMES:

The following goals (in no specific order of importance) have been established for the IR/BF Watershed Program. These goals are directed at preserving and protecting not only the beneficial uses of the water resources, but at protecting the value of the resource as a whole, including natural, cultural, and socioeconomic resources. Many of these Goals have already been met or are presently being addressed by multiple agencies and interest groups.

1. Establish ***Data Quality Objectives*** and draft ***Quality Assurance Project Plans*** for all monitoring efforts.

2. Reduce ***non-point source nutrient loadings*** to IR/BF watershed and Lake Tenkiller by supporting and implementing appropriate nutrient management strategies and Public Outreach initiatives.

3. Develop a ***TMDL*** for nutrients for the Illinois River Watershed based upon results from current water quality studies, and recommend future TMDL strategies after completion of the preliminary TMDL.

4. Modify ***municipal NPDES permit allocations***, as necessary, for nutrients.

5. ***Coordinate monitoring efforts*** in the basin to better meet the needs of all water quality agencies and maximize quantity and quality of data that can be obtained in the watershed.

6. Support collection of ***soils and land use data*** for use with water quality assessments and development of Animal Waste and Nutrient Management Plans.

7. Create a ***common database*** for all water quality data and other information, provide backup to all databases, and link all data geospatially into a GIS system.

8. Establish a water quality ***Trend Monitoring Program*** after completion of intensive studies.

9. Develop a ***Comprehensive Watershed Management Plan*** or other similar watershed planning tool (e.g. WRAS) to establish water quality improvement goals, schedules, activities, milestones, outputs, funding and resource options, participants, and education goals. This plan should incorporate the already completed management plans of the OSRC and OCC and should complement the ASWCC plan.

10. Establish a ***Watershed Advisory Group*** to advise on which BMPs will most effectively reduce NPS pollution in the watershed, and provide other directives to facilitate cost-share-assisted programs. The WAG should consist of one member from each of the following groups: Poultry Producer, Poultry Integrator, Nursery Representative, Resident Homeowner, Cattle Beef/Dairy Producer, CD Board Member Adair County, CD Board Member Cherokee County, Minority Representative(s) (e.g. tribal), representative from River Recreational Outfitter, City Of Tahlequah, Tenkiller Ferry Lake Association, Environmental Association, Oklahoma Scenic Rivers Commission , Forest Landowner

11. Implement ***Best Management Practices*** (BMPs) and other Point Source and Non-Point Source control strategies to control nutrients and reduce erosion in the watershed and Lake Tenkiller.

12. Implement an effective ***Riparian Management Plan*** to develop, manage, and protect riparian zones in the watershed that function as nutrient filters and reduce streambank erosion. This plan will include efforts to minimize impacts of development and construction in the floodplain, promote riparian buffer development and protection, and evaluate streambank destabilization and efforts to reduce streambank erosion.

13. Support ***litter export*** and ***nutrient management*** activities in the watershed, including development of market-based litter uses as a value-added product,

creation of effective litter availability hotlines and other communication venues, cultivating commercial enterprises that use litter as a raw material, supporting delays in poultry house clean-outs to protect water quality, supporting development of water quality based Animal Waste Management Plans, investigating options for controlling nutrient levels in litter (e.g. by increasing use of phytase and alum and reductions in phosphorus in feed), supporting incentive payments through EQIP programs, and support of other programs as they become viable.

14. Develop and support ***Public Outreach*** and ***Education*** programs in the watershed to promote implementation of nutrient management strategies, awareness of water quality issues, and overall protection of the resource.

B. ASSESSING PROGRESS:

Multiple efforts conducted by multiple agencies, funded by several sources are concurrently ongoing in both states of the Illinois River Watershed. All projects have the same ultimate goal, protecting water resources, but the various jurisdictional responsibilities of the various agencies lends itself to less than optimal expenditures of effort and resources. Effective communication is one of the most difficult problems of managing multiple projects being conducted concurrently by different organizations. A number of avenues are being established by the OCC and various other state agencies to help relieve this potential problem.

1. Regular meetings of the Oklahoma Scenic Rivers Commission.

2. Frequent meetings of the IR/BF WAG.

3. Central Database Management by OCC and ultimate internet availability.

4. Frequent written reports and technical presentations to the WAG, the Oklahoma Water Quality Monitoring Council, and the OSRC.

5. Reports to and review by the State Nonpoint Source Working Group.

It may also be necessary to form a separate advisory group whose main purpose is to assess the progress in meeting goals outlined in this WRAS. It has been suggested that the former Illinois River Task Force, a group composed of local stakeholders (members of the local public and private sector) and state agency and government officials, would be an appropriate group. Although the Illinois River Task Force was assembled to deal mainly with point source issues and the conflict with Arkansas over municipal discharges, the composition of the group effectively represented all the main interests in the watershed.

III. CLEARLY DEFINE WATER QUALITY PROBLEMS:

A. PROBLEMS:

The Illinois River between the state line (Arkansas/Oklahoma) and the headwaters of Lake Tenkiller is designated as a State Scenic River. As such, it is recognized as one of the state's most valuable water resources for reasons ranging from aesthetic and recreational value to high water quality as a drinking water source. In addition, Lake Tenkiller is recognized as one of the states most aesthetic lakes with water clear enough to support a scuba diving industry and to provide additional exceptional recreational opportunities. However, it has been recognized since the early 1980's that the Illinois River and Lake Tenkiller were experiencing water quality degradation, primarily perceived as decreased clarity. As substantial research indicated that these perceptions were based on actual problems, efforts began to focus on the perceived sources of the problems.

Initial research concluded that the watershed was impacted by excess nutrients, and suggested that sources might include point sources from both Arkansas and Oklahoma, as well as nonpoint sources such as the substantial poultry industry, nurseries, and various other agricultural sources. Later research confirmed that the poultry industry was likely having a negative impact, but streambank erosion due to loss of riparian zones and cattle access to streams were also impacting the water resources. Much of the research concluded that watersheds with the most intense landuse (primarily those with the greatest concentration of poultry and cattle) were the greatest contributors to the water quality problems. These included most of the Baron Fork and Flint Creek subwatersheds.

The following principal water quality problems that must be addressed by the WRAS:

1. Eutrophication in the Illinois River/Lake Tenkiller.

2. Excess nutrient loadings from watershed (principally phosphorus and nitrogen).

3. Excessive streambank erosion in the Illinois River and tributaries throughout the watershed, resulting in alteration of stream geomorphology to less stable forms.

4. Loss of aquatic habitat in streams due to sedimentation and excessive gravel transport.

5. Continued decline in water quality (e.g. dissolved oxygen problems, aesthetics, productivity, eutrophication) in Illinois River and its tributaries, as well as Lake Tenkiller.

B. SOURCES AND THEIR CONTRIBUTIONS:

The extensive research in the basin identified various sources as having potential impacts on the water resources of the basin. Although it is recognized that some sources have less substantial impacts than others, it is believed that extensive effort is necessary on the part of all potential sources to protect the resource and insure its longevity. Efforts are already underway to control some of these sources, nevertheless, substantial additional work will be necessary. The following potential sources have been identified as contributors to the excess nutrients and sedimentation in the watershed:

1. Poultry litter and poultry production.

2. Production of other livestock (cattle, hogs).

3. Reduced or poorly maintained riparian zones.

4. Streambank erosion.

5. Poorly functioning private septic systems.

6. Municipal permitted point source dischargers.

7. Nutrient loadings from soil erosion.

8. Recreational users (primarily canoers and swimmers on the river).

9. Gravel mining operations.

10. Commercial Nurseries operating within the watershed.

11. Solid waste disposal.

IV. SPECIFIC ACTION PLAN AND WATER QUALITY GOALS:

A number of studies and programs have been conducted or are either planned or underway to address the water quality problems discussed above. The Oklahoma Water Resources Board (OWRB) and ODEQ are working on refining loading estimates and developing a TMDL to protect the resource. The OSRC has implemented a plan to significantly reduce the impacts of recreational use on the river by providing users with clean restroom facilities and trash collection services along the float path. The USGS (partnered with OSRC and OWRB) continues to monitor streamflow and water quality in the basin and will be increasing the number of stormflow samples collected. Nurseries in

the watershed are monitoring runoff and implementing practices to reduce the loading of nutrients, sediment, and pesticides from their runoff. In addition, the OCC and NRCS have begun studies under federal funding to address nutrient management in the watershed. These studies are described in Item VI and address the following action items:

A. Characterize NPS contributions from poultry, other livestock, septic systems and background contributions.

B. Evaluate nutrient impacts and nutrient dynamics in the River and tributaries.

C. Evaluate nutrient impacts and nutrient dynamics in Lake Tenkiller.

D. Evaluate point source discharger contributions.

E. Conduct soil sampling to: 1) determine the best relationship between phosphorus in soils and runoff and 2) reduce phosphorus runoff due to litter application to phosphorus-saturated soils.

F. Develop public education and outreach programs.

G. Designate priority areas for implementation based on contribution to overall water quality problems.

H. Develop a TMDL and Phosphorus Target Values for Illinois River and Lake Tenkiller.

I. Develop litter reduction and litter export programs (e.g. AWMPs and litter marketing and transport).

J. Establish riparian management and implementation programs. Included in this program will be an effort to encourage proper floodplain management.

K. Develop implementation programs to reduce the effects of nonpoint source pollution related to poultry and cattle production.

L. Evaluate the effects of streambank erosion on tributaries and the Illinois River. Estimate the nutrient and sediment loadings from this source.

M. Evaluate the impacts of Commercial Nurseries and develop effective mechanisms to reduce those impacts.

N. Evaluate the impacts of Commercial Gravel Mining and develop effective mechanisms to reduce those impacts.

O. Improve facilities and resources available for river users to reduce impacts of human waste and trash on the river.

P. Evaluate the impacts of solid waste disposal throughout the watershed (e.g. landfills, biosolids, illegal dumping, etc.) and develop effective mechanisms to reduce those impacts.

Q. Evaluate the need for septic system upgrades and establish support funding.

R. When necessary, support development of state and federal legislation to protect the watershed.

S. Implement a Comprehensive Watershed Management Plan or WRAS to manage the watershed.

T. Establish long-term water quality Trend Monitoring programs.

V. IMPLEMENTATION SCHEDULE

The following table provides a summary of all projects that have been completed, are currently underway or are being considered for the near future. This is by no means and exhaustive list, but focuses on the major problems and sources in the watershed. Included in the table is a reference to which specific goal listed in section IV the particular study addresses.

Lead Agency (ies)	**Project(s)**	**Duration**	**Section IV Goal(s) Reference**	**Status**
Oklahoma State University (OSU) and OCC	Illinois River Basin Treatment Prioritization Report	1992 - 1995	A, G	Completed
OSRC, OWRB, OCC, USGS	Sampling and testing water for water quality studies	1990 -	A, B	Ongoing
OSU and OWRB	Clean Lakes Study on Lake Tenkiller	1992 - 1995	A, B, C, D, H	Completed
OSU and OCC	Analysis of Bank Erosion on the Illinois River in Northeast Oklahoma	1996 - 1997	L	Completed

OWRB	Water Quality Monitoring to better estimate the total nutrient load to Lake Tenkiller - monitoring both Illinois River and Lake Tenkiller		B, C, H	Ongoing
OCC	Illinois River Comprehensive Basin Management Plan	1992 - 1999	A, B, D, E, F, G, I, J, K, L, M, N, O, P, R	Report completed, effort ongoing
OK Dept. of Ag (ODA)	Curtis Report- Loading from Commercial Nurseries in the Illinois River Watershed	1989 - 1996	M	Completed
OCC	Illinois River and Baron Fork Watershed Implementation Project	1999 - 2004 (5)	A, B, E, F, I, J, K, P, R	Planned
OSU and OCC	Capture and Treat Technology for Pollution Prevention in the Nursery Industry	1996 -	M	Ongoing
OSRC and OCC	Education programs to provide residents and users with understanding of the importance of the river and the tools to protect it	1992 -	F, I, J, K, L, M, N, O, Q	Ongoing
OCC	Poultry Litter Hotline, public education, rules development and enforcement	1997 -	F, I	Ongoing
Oklahoma Department of Environmental Quality (ODEQ)	Holistic source survey to determine point source locations of septic tanks. Conduct Preliminary TMDL.	1998 -	H, P	Ongoing

Cooperative Extension Service (OSU - CES)	Publications (fact-sheets, handbooks, videos, web-sites); Organize 1999 Waste Management Conference; Provide waste management training for growers; Provide demonstration projects on the benefits of poultry litter	1998 -	F, I	Ongoing
OCC	Peacheater Creek Paired Watershed Study	1992 -	A, B, G, J, K, L	Ongoing
OSRC and OCC	Canoer-only Access Areas and Port-a-pottie Project	1992 -	O	Ongoing
University of Oklahoma (OU), OSU, EPA, NSF	Ecological Risks, Stakeholder Values, and River Basins: Testing Management Alternatives for the Illinois River	1997 - 2000	A, B, C, D, F, J, K, L, M, N, O, P, R	Ongoing
AK Soil and Water Conservation Commission (ASWCC)	Comprehensive Plan for Nonpoint Source Pollution Management for the Illinois River Basin in Arkansas	1994 -	A, H, J, K, R	Ongoing
OCC and OK Attorney General's Office	Investigation of an unnamed gravel mining operation for purposes of permit renewal	1998 - 1999	N	Completed
OCC	Develop GIS database of point and nonpoint sources for the Illinois River Watershed. Provide quality assurance and technical support relating to water quality.	1998 -	A, G, K, S	GIS formatting completed, ongoing
USDA/NRCS - AR & OK	Environmental Quality Incentives Program (EQIP): Illinois River/Baron Fork Priority Area	1997 -	I, J, K	Ongoing

United States Geological Survey	Historical and real time water water quality data and stream flow data		A, B, H, S	Ongoing
OCC	Streambank Stabilization Efforts (Echota Bend, etc.)	1992 -	J, K, L	Ongoing
United States Army Corps of Engineers	Water Quality Monitoring and Management of Lake Tenkiller		C, R, S	Ongoing

VI. FUNDING NEEDS:

The information presented below pertains to recently completed, existing and proposed contracts for water quality projects in the Illinois River/Baron Fork watershed that support the WRAS goals. A brief outline of each contract's purpose is presented in Section V above. An extensive amount of effort has already been expended in the watershed that is not reflected below. Countless studies and millions of dollars have been expended towards support of goals that have been summarized in this WRAS.

1. Illinois River Basin Treatment Prioritization Report (OCC) (Completed Report)

Federal	State	Other	Total
$51,300	$34,200		$85,500

2. Water Quality Sampling for Loading Estimates, Beneficial Use Monitoring and Lake Tenkiller Assessment Monitoring (OWRB) (Ongoing)

Task	Federal	State	Total
IR Loading Estimation	$66,300	$3,480	$69,780
Illinois River Beneficial Use Monitoring		$15,800	$15,800
Tenkiller Assessment Sampling- quarterly		$12,000 (est.)	$12,000
Tenkiller Volunteer Monitoring (OK Water Watch)		$2,000 (est.)	$2,000

3. Illinois River and Baron Fork Watershed Implementation Project (OCC) (Planned Project)

Task	Federal	State Cost Share Funds	Other State and Local Funds	Total
On-Site Coordinator	$193,700			$193,700
Part-time Clerical Support	$45,400			$45,400
WAG Committee Support	$25,000			$25,000
District Support			$283,918	$238,852
Implementation	$763,475	$333,533	$238,852	$1,335,860
Monitoring	$95,320			$95,320
Education	$161,560			$161,560
Total	1,284,455	$333,533	$522,770	$2,140,758

4. Port-a-potties, Canoer- Only Access, and Education Programs (OSRC) (Current Program)

Task	Federal	State	Total
Initial Trash program & signage costs	$8000	$2700	$10,700
Port-a-potties Rental & Maintenance Contract	$9000	$6,000	$15,000 (annual)
Trashbags & pick-up	$2800	$2000	$4800 (annual)
Canoer-Only Access- installation of 1 facility	$38,000	$1000	$39,000
Education Program	$ 33,000		$33,000(annual)

5. TMDL Development (ODEQ) (Ongoing Project)

Task	Amount Contracted	Total
Tetra-Tech Contract for TMDL Development	$121,314 (est.)	$121,314*

*Does not include direct costs to ODEQ for TMDL development (unknown).

6. ODA - Hotline, public education, rules development and enforcement. (Ongoing Program)

Federal	State	Other	Total
	$10,000 (est.)		$10,000 (est.)

7. OSU - Education programs. (Ongoing Program)

Federal	State	Other	Total
		$10,000 (est.)	$10,000 (est.)

8. USDA/NRCS Environmental Quality Incentive Program (EQIP) for IR/BF Watershed (Ongoing Program)

Year	Total
1997	$80,000
1998	$65,000
1999	$162,000

9. Testing Management Alternatives for the Illinois River (OU, OSU, OSRC) (Ongoing)

Federal	State	Total
$873,496		$873,496

10. USGS, OSRC, OWRB -- Changes in Monitoring the Quality of the Illinois River in Oklahoma (Proposed Project)

Federal (USGS)	State Agency	Amount	Total
$143,090	OSRC	$71,545	$286,180
	OWRB	$71,545	

11. Implementation of Practices to Reduce Streambank Erosion (OCC) (Ongoing)

Task	Federal	State	Total
Echota Bend Restoration - completed	$84,043	$56,028	$140,071
Hanging Rock		$200,000 (est.)	

12. Other Potential Future Funding Needs

Task	Status	Agency(ies)	Estimated Cost
Upgrading Wastewater Treatment Facilities (WWTF)			$5,300,000
Upgrade Tahlequah WWTF	Completed	ODEQ, EPA, City of Tahlequah, OWRB	$1,500,000
Combine Sequoyah Schools WWTF with Tahlequah WWTF	Completed	ODEQ, EPA, City of Tahlequah, Cherokee Indian Nation	
Upgrade Stillwell WWTF	Ongoing	ODEQ, EPA, City of Stillwell, OWRB	$1,200,000
Upgrade Westville WWTF		ODEQ, EPA, City of Westville, OWRB	$2,600,000
Installation of Pit toilets/Improved toilets at Canoer Access Points to replace Portable Facilities		OSRC	$100,000 / $600,000
Streambank Stabilization in areas under jurisdiction of OSRC		OSRC	$200,000
Streambank Stabilization/Dredging at Former Lake Francis Site		OSRC, OCC, OWRB, State of AK, ODEQ, City of Siloam Springs	$300,000 - $1,000,000
BMP implementation throughout the IR Watershed to reduce impacts of Animal Waste	Started, but not all funding secured	EPA, OCC, NRCS, ASWCC, etc.	$10,000,000
Upgrade all Septic Systems in the IR Watershed	Started, but only a small portion of funding secured	EPA, ODEQ, NRCS, etc..	$40,500,000

Reduce Impacts of Gravel Mining		OK Dept. of Mines, EPA, etc.	????
Reduce Impacts of Nurseries		ODA, EPA, etc.	????

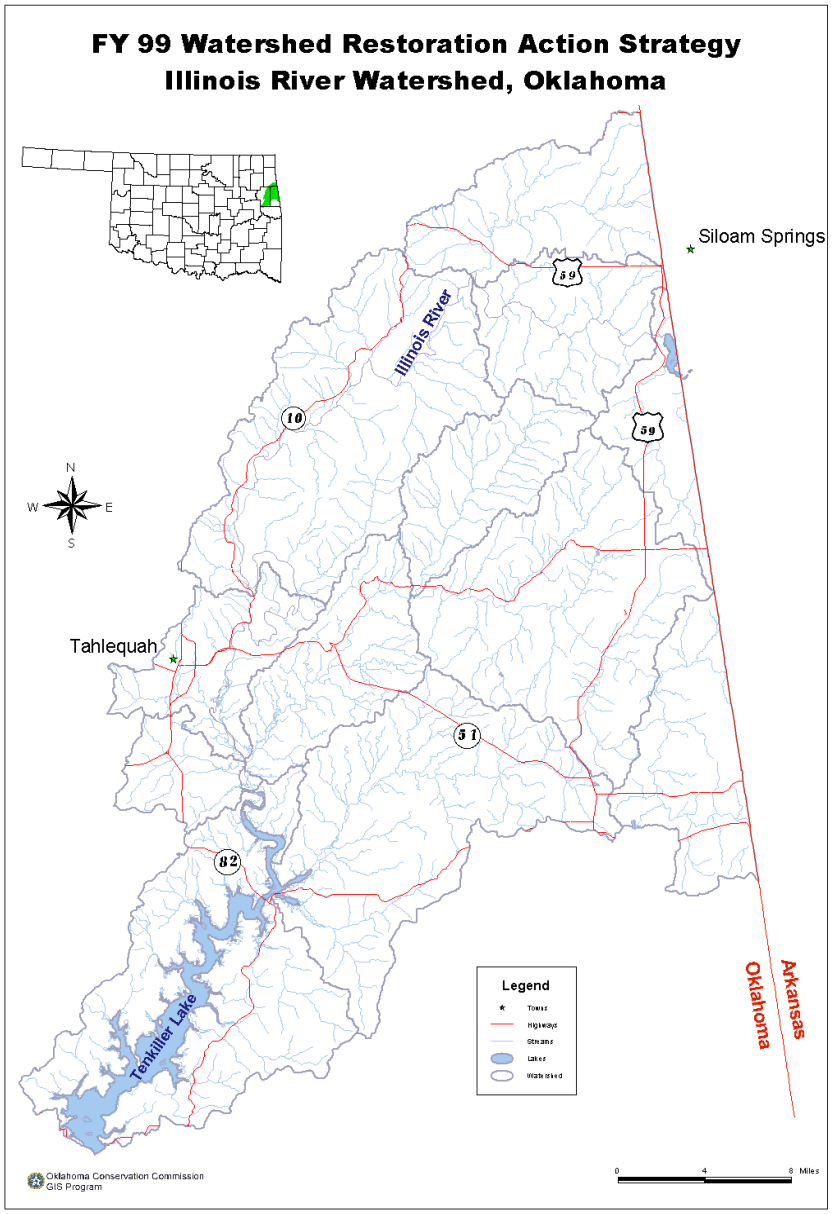

Figure 1 Location of Illinois River/Baron Fork Watershed