

**Project: 11**

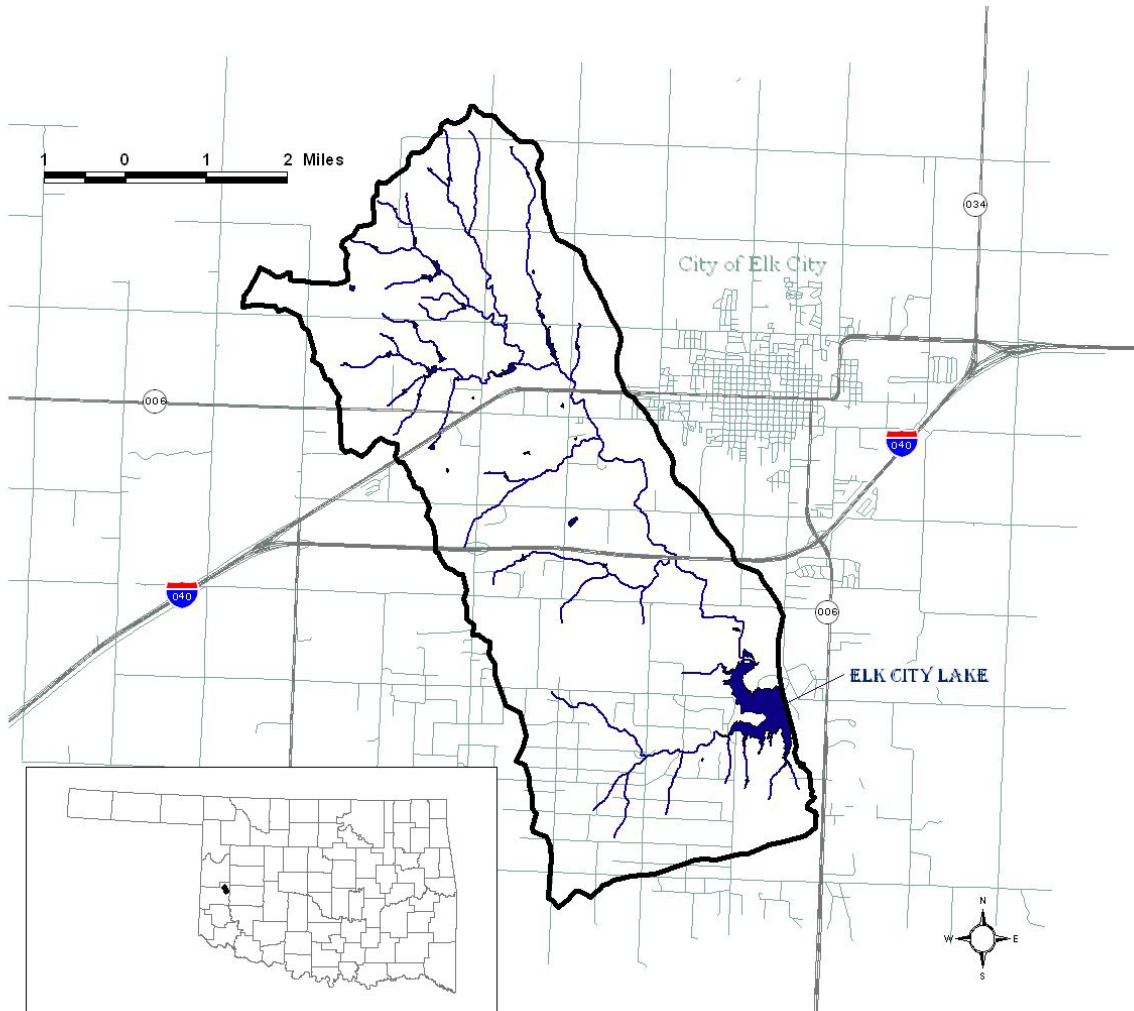
**Agency: Oklahoma Conservation Commission**

**Title: Elk City Lake Watershed Implementation Project**

**INTRODUCTION:**

**Project Location:**

The Elk City Lake watershed is located in the west-central part of the state in Beckham County. The watershed drains approximately 15,500 acres (24 sq. mi.) and occurs in the Lower North Fork of the Red River basin (HUC8: 11120303). West Elk Creek (OK311500030110) was impounded in 1970 to form the lake (OK311500030120). Below the lake, West Elk Creek flows into Elk Creek, which eventually joins the North Fork of the Red River.



The lake was built as part of the USDA Small Watershed Program (PL-566) in a network of small lakes in the area to reduce the impact of flooding in the area and provide water supply for the area. Although the city does not currently use the lake as a drinking water source, the lake is heavily used for recreation in the area.

## **Problem Statement**

Elk City Lake is designated as a Primary Body Contact Recreation (PBCR) waterbody in the Oklahoma Water Quality Standards (OWQS) and experiences heavy recreational use, particularly swimming, during warm weekend and holiday periods. In addition, the lake has use designations for Aesthetics, Agriculture, Fish and Wildlife Propagation--Warm Water Aquatic Community (FWP--WWAC), Industrial and Municipal Process and Cooling Water (I&M), and Fish Consumption. The lake is also designated as a nutrient limited watershed (NLW), which denotes watersheds with waterbodies that are adversely impacted by excess nutrients. In the 2004 Beneficial Use Monitoring Program (BUMP) report, Lake Elk City was classified as eutrophic, indicative of high primary productivity and nutrients (OWRB 2004). According to the State's 2006 Integrated Report (pending), the PBCR and FWP designated uses of Elk City Lake are not being supported. Impairments on the pending 303 (d) list include dissolved oxygen, turbidity, and *Enterococcus*.

In late 2006, the City of Elk City, which owns and operates the lake, approached the Oklahoma Conservation Commission Water Quality Division (OCC) about implementing a watershed project to address the sources of the lake's impairments, particularly the pathogen problems. Landuse in the watershed is primarily range, pasture, and cropland with little to no riparian buffer along much of the stream courses and direct access by livestock. Because there are no municipal discharges or feedlot operations in the watershed, it is most probable that the potential sources of bacteria contributing to the lake's impairment are resulting from these landuses.

## **Objective:**

A Watershed Based Plan (WBP) has been drafted for the watershed. The plan sets initial load reduction goals of 30% for sediment, nitrogen, phosphorus, BOD, and fecal bacteria. Should these reductions be achieved and beneficial use status in the lake not attained, TMDLs may be drafted for the watershed to set additional loading reductions. The TMDLs and future evolutions of the WBP may further define the water quality problems and identify additional measures needed to achieve water quality improvements in the Elk City Lake Watershed. This project will focus on the nonpoint source (NPS) water quality problems identified to date. Agricultural activities appear to be the major NPS sources of impact. Therefore, activities in this workplan will focus on reduction of agricultural impacts to the watershed. The activities in this work program will become major components of future evolutions of the WBP and will be revisited once TMDLs or other major activities in the watershed are complete.

Based on the knowledge gained through similar watersheds, the objective of this project is to initiate a watershed scale effort to reduce NPS loading and eliminate threats and

impairments to the Elk City Lake Watershed. In accomplishing this goal, loadings as established in Watershed Based Plan and concentrations specified in Water Quality Standards will eventually be met. The education, implementation, and monitoring activities outlined in this work plan are only the first step in what should be a long-term effort to achieve the objective.

Activities in this watershed will utilize 319 and USDA Conservation Reserve Enhancement Program funding to implement practices to reduce sediment, nutrient, bacterial and BOD loading. Matching funds will be provided by the City of Elk City as an investment in their natural resources.

### **Overview:**

This project will be managed by the OCC with oversight from the Office of the Secretary of Environment. Judith Wilkins, OCC's Environmental Project Coordinator will be the overall Project Manager although completion of individual tasks will be the responsibility of various individuals as detailed later. The project activities will be fund two years of the program, to be continued at a later date with additional 319 and other sources of funding. Activities funded under this workplan will begin in July, 2008 and end in September 2010. Certain activities may be contracted out to insure completion of a quality product in a timely, cost effective manner. Further discussion of the project overview is detailed under each project task.

This project was developed based on the nine key components of a watershed based plan. Although not all components of the WBP are addressed specifically in the workplan, it was developed to work towards the goals and activities outlined in the WBP.

### **Project Tasks:**

#### **Task 11.1. Demonstrate Practices and Achievable Water Quality Improvements**

This task describes the implementation of practices projected for the Elk City Lake Watershed. The BMPs that will be implemented in the demonstration area will focus on reduction of nutrient, sediment, and bacteria loading. Based on the current landuse in the watershed, the suite of practices that should be most effective at reducing this type of loading is riparian protection. Therefore, this program will focus on livestock exclusion and riparian protection. Funding for the implementation of livestock exclusion (fencing and incentive payments), riparian planting, and off-site watering will be provided through the USDA Conservation Reserve Enhancement Program. Over a fifteen year period from 2008 – 2023, USDA will contribute approximately \$2,946,895 towards these practices in the watershed. In support of this program, the City of Elk City will contribute \$368,362 over a fifteen year period, which the State will use to match 319 funds to support water quality monitoring in the watershed, and fund upland practices such as winter feeding facilities or practices such as streambank stabilization to compliment the riparian protection implemented through CREP. In addition, City and

319 funds, through this and subsequent projects may be used to fund riparian protection or streambank stabilization in portions of the watershed that are not CREP eligible (urban, shrubland).

Oversight of implementation will be the responsibility of the Conservation District with support from the OCC CREP Coordinator<sup>1</sup> with assistance from an OCC Project Coordinator<sup>2</sup> and additional OCC staff. The OCC staff will draft the farm plans and agreements between the landowner and conservation district to implement approved practices. Distribution of funds will follow the pattern established with previous projects.

A detailed plan for the implementation will be appended to the Watershed-Based Plan, annually, based on sign-up for 319 and USDA programs. This plan will detail the location of the initial cooperators and the initial planned practices. This plan will also evaluate the load reduction likely to result from the planned practices. It is likely that not all producers in the critical areas will be willing or able to participate initially in the project. This implementation plan will allow project planners to evaluate the completeness of the initial effort and such that a follow-up effort can be developed as necessary to target producers who did not participate in the initial program but who could have a significant impact on water quality in the watershed. This plan will be presented to NRCS (at the state and local levels) in an attempt to facilitate cooperation between the 319 program and the use of EQIP funds.

### **Task 11.2 Tracking of BMP Implementation**

A GIS data layer of farm plans will be created and maintained by the Conservation Districts and the CREP Coordinator and supporting OCC staff. BMPs as planned and implemented will be tracked for future watershed modeling and for reporting project performance. Project staff will make regular site visits to assess progress in implementing planned BMPs. Semiannual progress reviews will formally assess cooperator performance. Where implementation problems are identified, the CREP Coordinator will follow through with plan revisions or cancellation of the cooperator's agreement and reallocation of the funds to demonstrate practices elsewhere within the project area. Details will be summarized in the project final report.

The final report will attempt, where possible, to report on BMPs implemented in the watershed through other means such as through the CREP, the EQIP program, the State-funded, locally-led cost-share program, and solely through landowner funding. NRCS does not routinely release this information and therefore, it is unknown to what extent USDA program information can be reported. As possible, implementation data will be presented in a GIS format. At a minimum, financial information concerning EQIP and locally led cost-share funds will be presented. In addition, load reductions expected due to 319 implementation of practices will be estimated using a watershed-based model such as SWAT or StepL.

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<sup>1</sup> Funded under Projects such as the FY 2007-2008 Project 7.

<sup>2</sup> Funded under Projects such as the FY 2007-2008 Project 5.

Task Objective: The purpose of this task is to implement those practices to reduce NPS loading to the Elk City Lake Watershed.

Task Schedule:

Subtask #	Milestone Description	Due Date
11.1.1	Appendix to WBP to summarize watershed implementation for this project and the CREP program which will provide greater detail on practices to be implemented as part of this project and expected results	December 2008, December 2009
11.1.2	BMP Implementation	July 2008 – June 2010
11.2	Tracking of BMP Implementation	July 2008 – June 2010

Deliverables:

Subtask #	Description	Due Date
11.1.1	Appendix to WBP to summarize watershed implementation for this project and the CREP program which will provide greater detail on practices to be implemented as part of this project and expected results	December 2008, December 2009
11.1.2	Summary of BMP Implementation	Included in final report

Task Budget:

District Support Total	Supplies	Contractual	
\$8,000	\$2,000	\$6,000	
Total Demonstration	Producer Input	City of Elk City Funds for BMP Demonstration	Federal Funds for BMP Demonstration
\$96,915	\$11,000	\$49,115	\$36,800

**Task 11.3. Measurement of Success**

The Oklahoma Water Resources Board currently monitors Elk City Lake as part of their Beneficial Use Monitoring Program. This monitoring identified the water quality problems as shown in the introductory paragraphs of this work plan. This information could provide a baseline for comparison to evaluate changes in water quality and potential sources over the project period.

**Subtask 11.3.1: Follow-up GIS evaluation of Land Use/Land Cover Changes.**

The ultimate measure of success of the project will be restoration of beneficial use support in the watershed. A monitoring program is proposed below to evaluate this success. However, due problem in Elk City Lake and the plan for the CREP program and coordinating programs to be implemented over a fifteen year period, it is unlikely that water quality standard attainment will be measurable at the end of this two year project period. Therefore, landuse changes brought about by the project and through the CREP program will be evaluated through use of the STEPL or a similar program to estimate potential loading reductions at the end of the project period.

**Subtask 11.3.2. Water Quality Monitoring**

OCC will install an autosampler in the Elk City watershed and one in a control watershed to estimate changes in water quality as a result of the project implementation. These autosamplers will be used to collect continuous, flow-weighted samples. In addition, OCC will conduct routine physico-chemical monitoring at autosamplers sites, along with collection of bacteriological samples weekly during the recreation season. Biological and habitat monitoring also be completed as part of this project to estimate changes over time. Water Quality Monitoring will begin once the QAPP is approved, and continue throughout the length of the project.

To focus on the parameters of concern, and to reduce monitoring expenses, water quality samples will be analyzed only for total phosphorus, nitrate-nitrogen, nitrite-nitrogen, ammonium nitrogen, total coliform, *E. coli*, and *Enterococcus* bacteria. Field parameters to be collected include dissolved oxygen, pH, temperature, turbidity, conductivity and instantaneous discharge, and alkalinity. The QAPP will be submitted by July 2007.

The Oklahoma Water Resources Board will continue to monitor Elk City Lake throughout the CREP program fifteen year period and beyond. This data sources will also be evaluated according to Oklahoma’s water quality standards and Use Support Assessment Protocols to determine whether or not measurable water quality changes have occurred as a result of project efforts.

**Subtask 11.3.3.**

In addition, OCC will document success with before and after photos of implementation sites. Initial photos will be taken at the time of farm plan preparation. Secondary Photos will be taken immediately following BMP installation. Final photos will be taken near the end of the project. This documentation will be summarized in the final report.

The results of these efforts, along with the project, will be detailed in the project final report.

Task Schedule:

Task #	Milestone Description	Due Date
Task 11.3.1	Follow-up GIS evaluation	August 2010
Task 11.3.2	Water Quality Monitoring	July 2008

	QAPP	
Task 11.3.3	Photodocumentation of BMPs	Throughout the project

Deliverables<sup>3</sup>:

Subtask #	Description	Due Date
11.3.1	Follow-up GIS evaluation	August 2010
11.3.2	Water Quality Monitoring QAPP	July 2008
11.3.3	Update to OCC Photodocumentation QAPP	September 2008
11.3.4	Final Report	September 2010

Task Budget:

Subtask #	Contractual	Equipment	Supplies
11.3.2	\$20,000	\$12,000	\$3,000

\*monitoring completed by staff funding under 2007-2010 Rotating Basin Monitoring Program Projects

**Total Project Outputs:**

Task #	Description	Person Responsible	Due Date
11.1.1	Appendix to WBP to summarize watershed implementation for this project and the CREP program which will provide greater detail on practices to be implemented as part of this project and expected results	OCC Tech Writers	December 2008, December 2009
11.1.2	Summary of BMP Implementation	OCC Tech Writers	Included in final report
11.3.1	Follow-up GIS evaluation	OCC Tech Writers	August 2010
11.3.2	Water Quality Monitoring QAPP	OCC Tech Writers	July 2008
11.3.3	Update to OCC Photodocumentation QAPP	OCC Tech Writers	September 2008
11.3.4	Final Report	OCC Tech Writers	September 2010
	Semi-annual Reports	OCC Tech Writers	April and October

**Project Management:**

This project will be managed by the Oklahoma Conservation Commission in cooperation with the Office of the Secretary of the Environment. The Oklahoma

<sup>3</sup> To be completed by OCC tech writers funded under FY 2006 – 2010 Project 2.

Conservation Commission will provide oversight for all project activities. NRCS and FSA will provide technical support and administration of USDA programs.

**Project Duration:**

Two years.

**Project Budget:**

Project 6. Elk City Lake Watershed Project	
State	\$60,115
Federal	\$79,800
Total	\$139,915
Object Class Categories	
a. Personnel	\$0
b. Fringe Benefits	\$0
c. Travel	\$0
d. Equipment	\$12,000
e. Supplies	\$5,000
f. Contractual	\$26,000
g. Construction	0
h. Other	\$96,915
i. Total Direct Charges (sum of 6a-6h)	\$139,915
j. Indirect Charges	
k. TOTALS (sum of i and j)	\$139,915