

Stillwater Creek

Watershed Implementation Project

The Stillwater Creek Watershed Implementation Project involved the collaboration of numerous government agencies, Oklahoma State University (OSU), and local landowners. Sediment and turbidity, attributed to agricultural activities, roadside erosion, and urban runoff, were the major nonpoint source (NPS) concerns for this 276 square mile watershed. Education, demonstration, and installation of best management practices (BMPs) were conducted to initiate a long-term, watershed scale effort to reduce NPS loading to Stillwater Creek and Lake Carl Blackwell.

Background:

- The City of Stillwater and the OSU campus have and continue to experience **rapid growth**, with construction of many new homes, apartment buildings, and dormitories.
- Several streams in the Stillwater Creek watershed, as well as Lake Carl Blackwell, were officially listed as **impaired for siltation and suspended solids** in 1998. **Pesticides and nutrients** were also listed as impairing the water.
- **Potential sources of pollution** were identified, including unimproved county roads, poor agricultural practices, oil and gas activities, and urban issues such as construction activities and overuse of fertilizers.
- The **Oklahoma Conservation Commission (OCC) began a collaborative project in 2001** to reduce NPS pollution in the watershed.



Project Planning:

Objective: To initiate a long-term watershed scale effort to decrease NPS loading and reduce and eventually eliminate impairments and threats to Stillwater Creek and Lake Carl Blackwell.

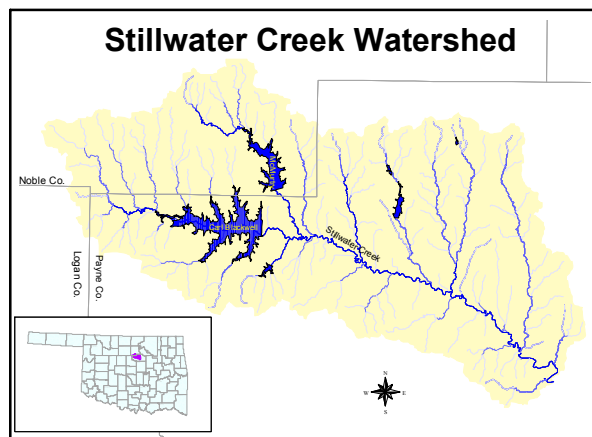
Funded through an EPA Clean Water Act, Section 319 grant with matching funds from the state and participating landowners. Project funding totaled **\$1,066,667**.

Partnered with the Payne and Noble County Conservation Districts, the Natural Resources Conservation Service (NRCS), OSU, the Oklahoma Cooperative Extension Service (OCES), the Oklahoma Water Resources Board (OWRB), and others to implement the various project programs.

Locally-led effort: Hired a local project coordinator to work with the individual landowners to develop conservation plans and agreements to participate in the program. Based practices and cost-share rates on the advice of a “watershed advisory group” comprised of local producers, city officials, OSU faculty, and NRCS staff.

Practices were targeted towards the most significant sources of sediment based on computer modeling by OSU. The model suggested that as much as 75% of the sediment load came from 8% of the basin (mostly areas of small grain and row crop production). Priority BMP categories included: (1) riparian establishment and management, (2) erosion control, (3) pasture and cropland management, and (4) waste management.

OCC contracted with the OWRB to develop a shoreline stabilization project for the lake and with OSU to develop a rural road erosion control project to fully address the major concerns in the watershed.



Project Implementation:

53 cooperators participated in the project, installing a **total of \$447,840** in agricultural BMPs on a cost-share basis. Funding by source:

\$135,538 from State funds
 \$146,337 from Federal 319 funds
 \$165,965 from landowners (37%)



Riparian fencing

Best Management Practices (BMPs) included:

- ◆ 14,840 linear feet of **fencing to establish riparian buffers**
- ◆ 21,011 linear feet of **cross-fencing to improve pastures**
- ◆ 26 ponds and 13 water tanks for **alternative water supplies**
- ◆ 390 acres of **vegetative planting for erosion control and pasture improvement**
- ◆ 13 **grade stabilization structures**
- ◆ 2 **grassed waterways**
- ◆ 1 **feeding facility** and 3 **heavy use areas**
- ◆ 20 **septic system** installations and 2 system upgrades

OWRB installed several **breakwaters in the lake** and monitored their effectiveness in reducing shoreline erosion. Also, **OSU staff who work on the lake were educated** about methods to decrease erosion and improve the lake's water quality.

OSU assessed **sediment loss from unpaved rural roads**, demonstrated BMPs to reduce erosion and sediment yield, measured erosion from road segments with and without BMPs, and **educated county road crews, county commissioners, city road crews, and the general public** about controlling erosion and sedimentation from unpaved roads.

OCES facilitated numerous educational events, including a **sediment control class for City of Stillwater personnel and developers** which addressed urban storm water and sediment control on construction sites. **Pesticide and fertilizer education programs** were conducted to educate the **community** about proper household, lawn, and garden use of fertilizer and chemicals.



Erosion control on unpaved roads

Project Monitoring and Results:

- ◆ Data collected from 2000-2006 at three OCC sites on Stillwater Creek were assessed. **Significant decreasing trends were evident in both total suspended solids and turbidity** at one of the three sites. These improvements are expected to continue and expand as effects of practices which were implemented near the end of the project take hold.
- ◆ **Educational efforts should be long-lasting and wide-reaching**, and vital partnerships between groups which were formed as a result of this project are expected to strengthen.
- ◆ The lake and several watershed streams remain on the 303(d) list for NPS related impairments, so **additional work is likely needed in the watershed to fully address the problems**.
- ◆ The NRCS has established a "Local Emphasis Area" consisting of all land that drains into Stillwater Creek and Lake Carl Blackwell. **Funding will be provided for sediment and erosion control measures**, with special consideration given to establishing permanent vegetation on cropland, adopting conservation tillage practices, and the development and protection of conservation buffers. **The NRCS will continue to focus available EQIP funding** in the watershed through this project, which should result in further water quality improvements.
- ◆ The **OCC will continue to monitor streams in the watershed** as part of its statewide Rotating Basin Monitoring Program, and results will be reported in the State's biannual "Integrated Water Quality Assessment Report."



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