



Section 319

NONPOINT SOURCE PROGRAM SUCCESS STORY

Nebraska

Watershed Project Reduces Sediment and Nutrient Loading

Waterbody Improved

Excess sediment and nutrient loads from crop production practices impaired the aquatic life designated use of Nebraska's Wildwood Reservoir, prompting the Nebraska Department of Environmental Quality (NDEQ) to add the waterbody to the state's 1994 Clean Water Act (CWA) section 303(d) list of impaired waters. Landowners implemented best management practices (BMPs) that reduced nutrient and sediment loading in the reservoir. Water quality improved, and the reservoir now supports its aquatic life designated use. As a result of the improvements, NDEQ removed Wildwood Reservoir from the Nebraska CWA section 303(d) list of impaired waters for nutrients and sediment in 2004.

Problem

Wildwood Reservoir is a 103-acre multipurpose impoundment (Figure 1) in southeast Nebraska. The Lower Platte South Natural Resources District (LPSNRD) built the dam in 1978 in cooperation with the U.S. Department of Agriculture Natural Resources Conservation Service (NRCS). The watershed drains an area of approximately 4,835 acres, most of which is used for crop production. Watershed slopes are typically 6 to 12 percent, and soils are considered to be highly erosive. NDEQ and LPSNRD conducted a Clean Lakes Phase I Diagnostic and Feasibility Study of Wildwood Reservoir in 1988. The study indicated that excessive sediment and nutrient loads from crop production practices along with highly erosive soils adversely affected water quality in the reservoir. As a result of the study's findings, NDEQ added Wildwood Reservoir to the Nebraska 1994 CWA section 303(d) list for impairments to its aquatic life designated use because of excessive sediment loading. In 1998 NDEQ added nutrients and atrazine to the list of pollutants impairing the aquatic life designated use. NDEQ removed the atrazine impairment in 2002 after Nebraska's atrazine water quality standard/aquatic life criterion was increased.

Project Highlights

In 1992 LPSNRD, NDEQ, and University of Nebraska Cooperative Extension Service initiated a watershed treatment project to reduce sediment loadings. Of the 40 watershed landowners, 16 participated in the project, treating approximately 38 percent of the cropped ground and 60 percent of the critical areas targeted for treatment. Landowners implemented

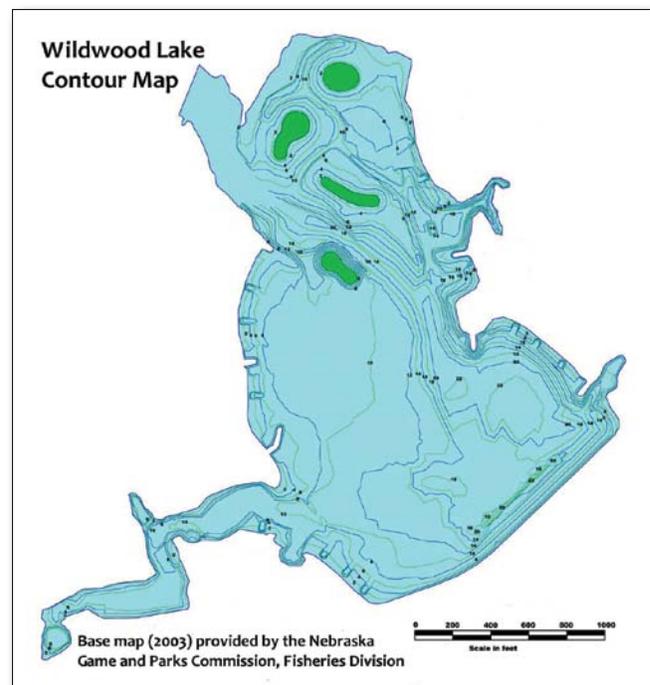


Figure 1. The 103-acre Wildwood Reservoir is in extreme southeast Nebraska. Green areas represent islands.

numerous BMPs, including storage terraces, grade-stabilization structures and sediment control basins. An additional sediment basin was constructed in the upper end of the reservoir on the primary inflow, thereby allowing sediment to settle out before the water reaches the reservoir (Figure 2). In 2001 LPSNRD and Nebraska Game and Parks Commission (NGPC) drained the reservoir to remove organic, rich-bottom sediments; repair eroding shorelines; and develop habitat. Additional restora-



Figure 2. Projects partners constructed a sediment basin above Wildwood Reservoir to complement land treatment measures implemented in the watershed.

tion efforts included stabilizing shoreline, removing sediment, developing habitat and renovating the fishery within the reservoir.

Results

The watershed project effort was a success—it achieved the sediment loading reduction target by 1998 (Figure 3). The U.S. Environmental Protection Agency’s (EPA’s) Spreadsheet Tool for Estimating Pollutant Load was used to determine nutrient loading reductions associated with the implemented BMPs. Model results show that BMPs reduced sediment loads by 4,893 tons per year (39 percent), equating to an annual volume loss reduction of 0.58 percent. While partners’ efforts helped to achieve targeted reductions by 1998, a watershed loadings assessment was not conducted until the lake restoration project was completed. The assessment concluded that the reservoir’s average annual volume loss (reduced to 0.58 percent) met the state criterion of 0.75 percent per year.

In addition, by draining the reservoir and removing organic, rich-bottom sediment, LPSNRD and NGPC helped reduce annual loadings of total phosphorus and total nitrogen (49 and 63 percent, respectively). On the basis of those findings, NDEQ believes that Wildwood Reservoir is supporting its aquatic life designated use and removed it from the state’s 2004 CWA section 303(d) list of impaired waters for nutrients and sediment.

NDEQ added *Escherichia Coli* bacteria to the monitored parameter list in 2009 to assess the recreational/full body contact designated use. Results indicate that bacteria is not a pollutant of concern and does not impair recreational use. However, NDEQ will not officially document that result or designate the reservoir as fully supporting its recreational use until the next Integrated Water Quality Report is completed in 2010.

Partners and Funding

Numerous partners supported the watershed project, including LPSNRD, NDEQ, NRCS, watershed landowners and EPA. Partners relied on CWA section 319 funding to support land treatment projects (\$114,629), in-lake wetlands and sediment basin construction (\$54,563), monitoring and modeling (\$51,500), technical assistance, education and project coordination (\$65,000), and project administration (\$9,375). LPSNRD also contributed funding for land treatment projects (\$146,585), in-lake wetlands and sediment basin construction (\$32,652), and monitoring (\$12,402). Watershed landowners contributed \$81,198 toward land treatment measures. The NRCS provided technical assistance to landowners in designing management practices. The reservoir restoration project, conducted from February 2001 through June 2003, was funded by LPSNRD (\$201,877) and NGPC (\$551,100).

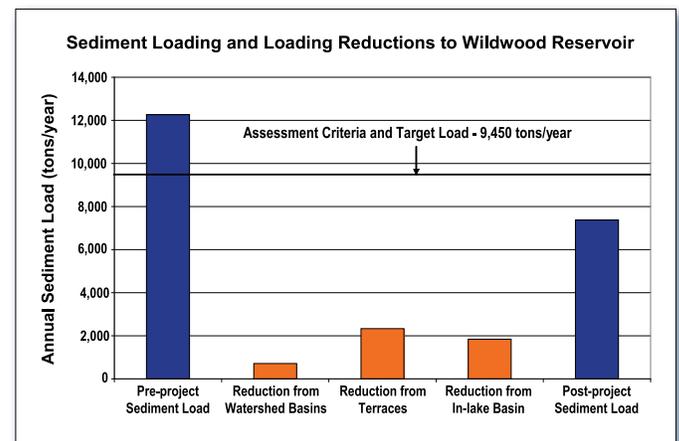


Figure 3. Bar graph showing sediment loading reductions from various protection measures in addition to pre- and post-project loads. Pre-project loads were determined by analyzing watershed data collected from 1988 through 1991, while post project loads were determined from watershed data collected in 1999.



U.S. Environmental Protection Agency
Office of Water
Washington, DC

EPA 841-F-09-001BB
September 2009

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