



NONPOINT SOURCE SUCCESS STORY

Iowa

Watershed Improvements Restore and Maintain Water Quality at West Lake Corning (“City Reservoir”)

Waterbody Improved

Water quality in West Lake Corning (known locally as the “City Reservoir”) declined following land use changes in the watershed

in the 1980s and early 1990s, as farmers and landowners converted pasture and grasslands to row crop production. The land use changes accelerated sheet and rill erosion in the watershed and the delivery of sediment and nutrients to the lake, which degraded the lake’s fishery. As a result, the lake was placed on Iowa’s first Clean Water Act (CWA) section 303(d) list of impaired waters in 1998 with a siltation impairment. Through the Three Lakes Water Quality Project, farmers and landowners implemented a series of best management practices (BMPs) in targeted areas of the watershed, which reduced sediment delivery to the lake and improved water quality. Following the project, West Lake Corning was removed from Iowa’s impaired waters list in the 2006 listing cycle.

Problem

Built in 1915, West Lake Corning is a 13-acre lake within a 418-acre watershed in southwest Iowa (Figure 1). Along with Lake Icaria and Binder Lake, it serves as a public drinking water supply for the city of Corning, and for regional water supplies in the area. The three lakes also serve as important regional hubs for outdoor recreation in southwest Iowa, primarily for fishing and boating. West Lake Corning is the smallest of the three lakes.

The Iowa Department of Natural Resources (DNR) determined through a 1996 CWA 305(b) water quality assessment that excessive sediment from the watershed was harming the aquatic life in West Lake Corning. As a result, the lake was placed on Iowa’s 1998 CWA list of impaired waters for not supporting its aquatic life designated use (using narrative criteria), based upon the best professional judgement of DNR Fisheries biologists.

A total maximum daily load (TMDL) analysis for West Lake Corning was completed by DNR in 2001, funded through a U.S. Environmental Protection Agency (EPA) CWA section 319 grant. Using land use data provided by the Adams Soil and Water Conservation District (SWCD), sediment loading to the lake was estimated at 579 tons per year.

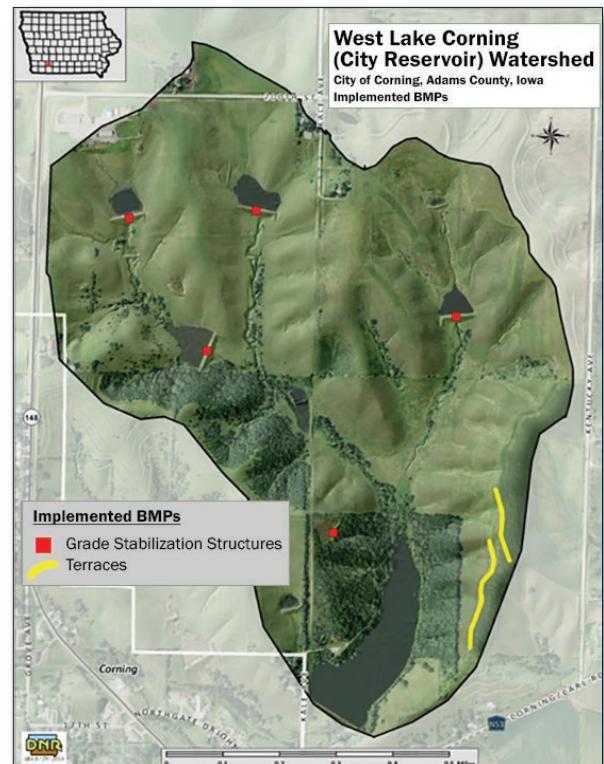


Figure 1. Landowners implemented targeted erosion-control BMPs throughout the West Lake Corning (City Reservoir) watershed.

Table 1. Pre-project and post-project erosion in the watershed and sediment delivery* to the lake

	Before Project	After Project	Change
Average sheet and rill erosion per acre per year	5.79 tons	2.73 tons	-53%
Total sheet and rill erosion per year	2,565 tons	1,211 tons	-53%
Average sediment delivery to the lake per acre per year	1.31 tons	0.53 tons	-60%
Total sediment delivery to the lake per year	579 tons	236 tons	-59%

*Estimates based on *Predicting Rainfall Erosion Losses, The Revised Universal Soil Loss Equation, Section I* (NRCS 2000) and *Erosion and Sediment Delivery Procedure, Section I* (NRCS 1998)

Project Highlights

The Three Lakes Project, administered by the Adams SWCD in Corning, was created in 1996 to implement BMPs in the West Lake Corning watershed, as well as in the Lake Icaria and Lake Binder watersheds. It received primary financial support from the Iowa Department of Agriculture and Land Stewardship—Division of Soil Conservation (IDALS—DSC) through the Water Protection Fund and Watershed Protection Fund (WPF/WSPF) and from the DNR through EPA CWA section 319 funding. The project employed a full-time watershed project coordinator to help landowners implement BMPs in all three watersheds.

With the assistance of the project coordinator, landowners and farm operators installed five sediment and water control structures at key locations in the West Lake Corning watershed, enrolled approximately 40 acres of targeted cropland directly above the lake in the U.S. Department of Agriculture's (USDA's) Conservation Reserve Program (CRP) and planted it in perennial vegetation, built terraces on cropland on the east side of the lake, and implemented rotational grazing practices to improve pastureland and reduce runoff in the watershed.

Results

The BMPs implemented through the project reduced estimated sheet and rill erosion in the watershed and sediment delivery to West Lake Corning by more than 50 percent (Table 1). The reduction in sediment delivered to the lake improved the lake's water



Photo: Amanda Schmeink, Iowa DNR (2016)

Figure 2. West Lake Corning now fully supports its designated uses.

quality, which in turn improved the fish populations in the lake. Based on monitoring by DNR Fisheries after 2004, the fish populations were no longer negatively impacted by siltation and the lake met its aquatic life designated use. As a result, the lake was removed from the impaired waters list in the 2006 listing cycle, and still fully supports its designated uses (Figure 2).

The West Lake Corning fishery has improved since 2008. There has been an increase in the number of bluegills over 8 inches in length and large bass over 18 inches, according to DNR Fisheries data. In addition to improvements made in the watershed through the Three Lakes Project, DNR Fisheries staff added cedar tree brushpiles to the lake during the winter of 2014–2015 to increase the fish habitat in the lake and improve angler fishing success. As an example of the increased number of large bass in West Lake Corning, DNR Fisheries staff captured a 21-inch largemouth bass during electrofish sampling in 2015.

Partners and Funding

Project partners providing funding and technical assistance for the Three Lakes Water Quality Project included the Adams SWCD, the city of Corning, IDALS, USDA Natural Resources Conservation Service (NRCS) and Farm Service Agency, Iowa DNR and private landowners. Project funding from public sources totaled \$1,431,790: \$813,110 from IDALS WPF/WSPF, \$80,036 from IDALS General Fund, \$245,281 from EPA CWA section 319 (via Iowa DNR), \$259,005 from Iowa Publicly Owned Lakes Program, and \$34,358 from USDA NRCS Environmental Quality Incentives Program. (The total contribution from private landowners is not available).

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