Section 319
NONPOINT SOURCE PROGRAM SUCCESS STORY
New York

Multitiered Management Efforts Reduce Sediment and Phosphorus Impacts

Waterbody Improved

Excess phosphorus from agricultural runoff and on-site wastewater systems from lakeside residences violated water quality standards and contributed to eutrophication of New York's DeRuyter Reservoir. The problem included excessive growth of rooted aquatic vegetation that impaired boat traffic and discouraged fishing. As a result, the New York State Department of Environmental Conservation (NYS DEC) added the reservoir to the state's 1998 303(d) list for nutrients. A combination of nonpoint source management projects addressing each of the three principal sources of impairments—sediment, agriculture and on-site wastewater systems—improved water quality. Therefore, NYS DEC proposed removing DeRuyter Reservoir from New York's 2008 303(d) list of impaired waters for nutrients (phosphorus).

Problem

DeRuyter Reservoir is one of the larger lakes in Madison County. The 557-acre lake has a distinctive history and hydrology. It was established early in the 19th century as part of the water feeder system for the original Erie Canal, which did not receive any significant amount of water from natural sources and depended on the man-made feeder system. Artesian springs feed the lake at its southern end, supplementing natural runoff from its inlet streams and small watershed. The DeRuyter Reservoir outlet forms the eastern headwater tributary of Limestone Creek, which supports a good trout population, and ultimately converges with Chittenango Creek before flowing into Oneida Lake (Figure 1).

New York added DeRuyter Reservoir to its 1998 303(d) list because aquatic life and recreational uses (fishing) were impaired. New York originally listed DeRuyter Reservoir as impaired by *nutrients*; however, in more recent listings, the state identified the cause of impairment as *nutrients (phosphorus)*. Excess phosphorus loads caused the reservoir to violate the numeric water quality standard, which states that for waters classified as ponded (i.e., lakes, reservoirs and ponds, excluding Lakes Erie, Ontario and Champlain), the epilimnetic summer mean total phosphorus level shall not exceed 20 micrograms per liter (µg/L), based on biweekly sampling, conducted from June 1 to September 30. Sources of the impairment include sediment from the watershed, agricultural runoff and on-site wastewater systems from lakeside residences.

Figure 1. Photograph of DeRuyter Reservoir.

Project Highlights

The Madison County Planning Department and Soil and Water Conservation District received support from the Finger Lakes–Lake Ontario Watershed Protection Alliance to complete a sediment control project in 2007 on a seasonal stream feeding the DeRuyter Reservoir. The stream flows down a steep hill and was eroding rapidly and contributing high sediment loads to the reservoir. The project team installed five grade-control structures that prevented further downcutting and reduced sediment inputs.

Madison County Soil and Water Conservation District worked with operators on three farms

in the watershed to develop and implement Comprehensive Nutrient Management Plans (CNMPs), which have successfully reduced agricultural sources of nutrients and sediments. The CNMPs use scheduled soil sampling and annual manure samples, manure spreading schedules and fertilizer recommendations to minimize nutrient runoff while at the same time maximizing crop production. Implementing additional best management practices (BMPs) such as manure storage and silage leachate control helped use the nutrients on the farm more efficiently and reduced field runoff potential. Work on these farms has been underway since 2001. In addition, the DeRuyter Reservoir Septic Tank Pumping Project pumped nearly 25 percent of the residential systems on the lake and led to upgrades of nearly one-fifth of those systems pumped.

Hydrologic management changes of the reservoir as part of the canal feeder system might have also contributed to water quality improvements over time. When reservoir levels become low, water managers may allow water from the Tioughnioga River, a distinctly separate watershed, to enter the DeRuyter Reservoir. That watershed, with considerably greater agricultural land use, constitutes a potential source of nutrients. However, no Tioughnioga River inflow has been needed in DeRuyter Reservoir since 1993.

Results

This multitiered approach to managing nonpoint sources of sediments and nutrients contributed to water quality improvements. Lake monitoring data show that eutrophic indicators fall below New York's assessment criteria. For example, mean summer phosphorus concentrations average approximately 12 μg/L—well below the phosphorus standard of 20 μg/L—and show no increasing trend. The 20-year trend in chlorophyll a data shows a decline from nearly 8 μg/L (New York's assessment criterion for threatened waters) to approximately 4 μg/L. The New York's Citizens Statewide Lake Assessment Program recently conducted a user perception assessment that indicated excellent to slightly impacted recreational use support. NYS DEC has determined that DeRuyter Reservoir meets the water quality standard for phosphorus and has proposed removing the reservoir from the state's 2008 303(d) list.

Partners and Funding

Local, regional and state agencies along with citizen and farmer groups have partnered to restore DeRuyter Reservoir. Local leadership included Madison County's Soil and Water Conservation District, Planning Department and Health Department. Regional support included both the Finger Lakes–Lake Ontario Watershed Protection Alliance and the Oneida Lake Watershed Task Force, which includes the Oneida Lake Watershed Agricultural Program that addresses agricultural nonpoint source management for the entire watershed (including DeRuyter Reservoir). Citizen support included the DeRuyter Lake Association and the Citizens Statewide Lake Assessment Program. State agency partnerships among the NYS DEC, NYS Department of Agriculture and Markets, the NYS Soil and Water Conservation Committee and the NYS Canal Corporation supported the goals and objectives of these local and regional groups.

More than $175,000 from the NYS Environmental Protection Fund (EPF) through the NYS Agricultural Nonpoint Source Abatement and Control Program (ANSCAP), as well as cost-sharing from three farms, funded the agricultural BMPs. ANSCAP and EPF funds are often used to match section 319-funded grant projects. In addition, approximately $20,000 in combined funding from EPF (through the Finger Lakes–Lake Ontario Watershed Protection Alliance) and NYS DEC funded the sediment control and septic tank management projects.

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