



Section 319

NONPOINT SOURCE PROGRAM SUCCESS STORY

Delaware

Providing Technical Assistance and Better Managing Livestock Reduces Bacteria Levels

Waterbody Improved

Excess bacteria from agricultural activities and failing septic systems impaired Trap Pond, one of Delaware's most important recreational resources. As a result, Delaware added the pond to its 1996 Clean Water Act (CWA) section 303(d) list of impaired waters. Providing technical assistance and implementing agricultural best management practices (BMPs) significantly reduced bacteria levels. Water quality improved, prompting Delaware to remove Trap Pond from its list of impaired waters in 2002.

Problem

Southern Delaware's Trap Pond is a tributary of Broad Creek, which drains to the Nanticoke River, which in turn flows into the Chesapeake Bay (Figure 1). Saunders Branch is the primary tributary to Trap Pond.

Surrounded by majestic stands of bald cypress (Figure 2) in the center of one of Delaware's state parks, Trap Pond supports abundant wildlife and offers exceptional recreation opportunities. Trap Pond State Park is home to the northernmost natural stand of bald cypress in the United States; one tree in the park is estimated to be more than 200 years old, is 127 feet tall, is almost 25 feet around, and has a 62-foot branch spread. The area also contains a 2,000-acre wetland, one of the largest surviving freshwater wetlands in Delaware.

Trap Pond was created in the late 1700s to power a sawmill. The area's bald cypress was coveted for its rot-resistant wood and harvested extensively throughout the 1700s. As a result, most of the bald cypress around Trap Pond is second-growth. After logging ceased, landowners enlarged the pond by installing drainage tiles to dry out the surrounding land for farming. In 1930, the federal government bought Trap Pond and the farmland surrounding it and brought in the Civilian Conservation Corps to develop the area for recreation.

Water quality monitoring data collected in 1990 and 1991 showed bacteria counts as high as 700 colony-forming units (cfu) per 100 milliliters (mL). The pond routinely exceeded Delaware's water quality standard, 100 cfu per 100 mL. A further study found



Figure 1. Trap Pond is in the Chesapeake Bay watershed in southern Delaware.

that Saunders Branch, the major tributary to Trap Pond, had elevated bacteria and phosphorus levels. Sanitary surveys revealed that the two probable causes were direct discharges from failing septic systems and manure from livestock that had direct

Photo by Joanna Wilson, Department of Natural Resources and Environmental Control



Figure 2. Trap Pond is surrounded by stands of bald cypress.

access to Saunders Branch or the drainage ditches feeding it. Based on this information, Delaware added the 88-acre Trap Pond to the 1996 CWA section 303(d) list of impaired waters for bacteria.

Delaware completed a total maximum daily load (TMDL) analysis for nutrients and dissolved oxygen in tributaries and ponds of the Nanticoke River and Broad Creek watersheds in 2000. Delaware developed a bacteria TMDL for the entire Chesapeake Bay drainage, including the Nanticoke River watershed, in 2006.

Project Highlights

The first phase of the restoration project, conducted in the very early 1990s, involved notifying property owners of their leaking septic systems. The systems were quickly repaired or replaced, and the affected areas of Saunders Branch responded immediately with decreased bacteria levels.

The next phase addressed removing livestock access to Saunders Branch and its drainages. A 1991 CWA section 319 grant funded the salary of a Sussex County Conservation District conservation planner working specifically in the Trap Pond watershed. Although removing livestock access to drainage areas in the watershed was a key project component, the planner also provided technical assistance to farmers who wanted help in implementing agricultural BMPs and conducting nutrient management planning throughout the Trap Pond watershed.

The conservation planner worked with two large swine operations that were immediately adjacent to Saunders Branch. The first operation covered 1,000 acres and produced 9,800 finish hogs annually; the second covered 100 acres and produced 1,200 finish hogs annually. The conservation planner helped develop farm-wide conservation plans for both farms.

Farmers installed BMPs on 29 poultry operations in the Trap Pond watershed, including 23 manure storage structures, 19 composters and 2 dead bird incinerators. The Natural Resources Conservation Service's (NRCS) Conservation Reserve Enhancement Program (CREP) and Conservation Reserve Program supported planting of 2.4 acres of wildlife habitat, 18 acres of hardwood trees and 5.0 acres of grass buffers. Sussex County Conservation District planners continue to work with farmers throughout the watershed to provide ongoing technical assistance to ensure improved water quality.

Results

Implementing BMPs throughout the watershed quickly reduced bacteria levels in Trap Pond. Monitoring data show that bacteria levels met the state water quality standard of 100 cfu per 100 mL beginning in 1992. Water quality data collected through 1999 show that bacteria levels in Trap Pond remained well below the state standards (Table 1). On the basis of these data, Delaware removed Trap Pond from the 2002 CWA section 303(d) list of impaired waters for bacteria.

Table 1. Monitoring Data for Trap Pond from 1992 through 1999

Year Sampled	Geometric mean (cfu/100 mL)
1992	6
1994	4
1995	9
1996	16
1998	16
1999	21

Partners and Funding

The Trap Pond project was a partnership involving the Sussex County Conservation District, the Soil Conservation Service (now NRCS), and the Delaware Nonpoint Source Program. Approximately \$84,000 in federal CWA section 319 funds supported the costs of a Sussex County Conservation District planner working strictly in the Trap Pond watershed. Additional funding was provided through the NRCS' Environmental Quality Incentive Program and CREP, and the state of Delaware's Conservation Cost Share Program.



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