



NONPOINT SOURCE SUCCESS STORY

Delaware

Implementing Agricultural Best Management Practices Reduced Bacteria Levels in Coursey Pond

Waterbody Improved

Nonpoint source pollution from agricultural animal operations and septic systems caused elevated bacteria levels in

Delaware's Coursey Pond. As a result, the Delaware Department of Natural Resources and Environmental Control (DNREC) added Coursey Pond to Delaware's Clean Water Act (CWA) section 303(d) list in 2002 for bacteria impairment. Project partners provided technical and financial assistance to farmers to encourage the implementation of agricultural best management practices (BMPs) such as nutrient management planning, cover crop implementation and the installation of structural BMPs. Water quality improved as a result of these restoration activities, enabling DNREC to remove Coursey Pond from the 2004 impaired waters list for bacteria.

Problem

Delaware's Coursey Pond, in southeast Kent County, is a 58-acre pond draining to the Murderkill River, a tributary to Delaware Bay. The Murderkill River basin is bounded on the south by the Mispillion watershed, on the east by the Delaware Bay, and on the north and west by the St. Jones River and Marshyhope Creek watersheds (Figure 1). The headwaters of the Murderkill River begins just west of Felton and flow generally eastward, towards Bowers Beach, with the lower 10.5-mile portion of the river influenced by tides. Coursey Pond, Killens Pond, McColley's Pond, McGinnis Pond and Andrews Lake all flow into the Murderkill River.

Land use composition in the Coursey Pond watershed is similar to the encompassing 68,000-acre Murderkill watershed: 55 percent agriculture, 17 percent wetlands, 14 percent urban and 11 percent forest. The outfall of the pond flows to a tributary of the main stem Murderkill River. A rare species of naturally occurring bald cypress trees and significant remaining populations of Atlantic White Cedar are also found in the Coursey Pond watershed.

For freshwater primary contact recreation, Delaware's water quality standard for bacteria allows for a geometric mean of 100 colonies (col)

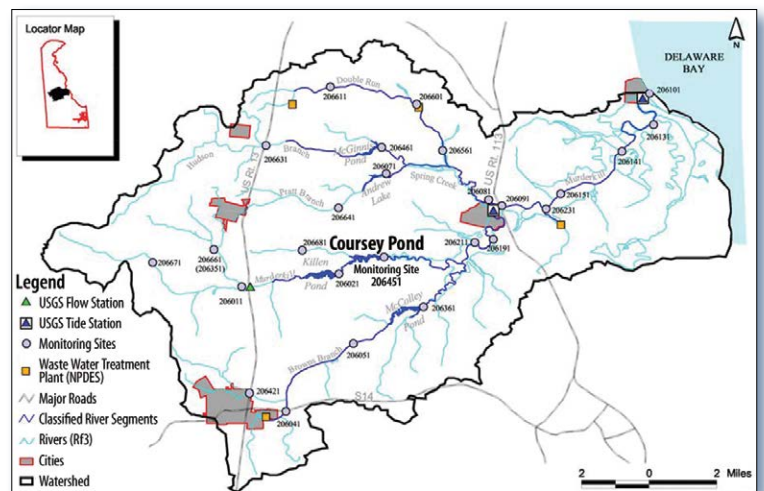


Figure 1. The Murderkill River watershed is in central Delaware. Coursey Pond is in the center of the watershed.

of Enterococcus bacteria per 100 milliliters (mL) of water. Monthly data collected from September 1996 through August 2001 indicated that Coursey Pond exceeded the water quality standard for bacteria. Therefore, DNREC placed Coursey Pond (segment DE220-L03_00) on the CWA section 303(d) list for high bacteria counts in 2002. Likely contributors to the degraded water quality include agriculture operations, lawn care products and leaking septic systems.

Project Highlights

The Kent County Conservation District (KCD) offers technical assistance to the farming community by providing nutrient management planning, cost-share funding for agricultural BMPs, and partnering with the U.S. Department of Agriculture's (USDA's) Natural Resources Conservation Service (NRCS) to develop conservation plans and Environmental Quality Incentive Program (EQIP) contracts.

The Delaware Nonpoint Source (NPS) Program (within DNREC) used CWA section 319 funding to support two KCD planners. With technical assistance provided by the planners, farmers installed the following agricultural BMPs from 2002 to 2004: nine manure storage structures, eight dead-bird composters, six heavy use protection areas and 732 acres of cover crops. Mandatory state regulations for nutrient management planning, septic system pump-outs, concentrated animal feeding operations and the conversion of onsite wastewater systems to central systems have also helped decrease bacteria in runoff to Coursey Pond.

In addition, practices installed through the Delaware Conservation Reserve Enhancement Program (CREP) after 2004 contributed to maintaining the delisting of the waterbody. This included 14 acres of grass buffers and 31.2 acres of hardwood trees which have improved water quality within the Coursey Pond watershed. Although no total maximum daily load (TMDL) was developed for bacteria before the Coursey Pond delisting (a watershed-wide bacteria TMDL was developed in 2006), ongoing TMDL implementation efforts taken to address nutrients and oxygen helped reduce bacteria levels throughout the watershed.

Results

The General Assessment Monitoring Network provides for routine water quality monitoring of surface waters throughout Delaware. Data from this network showed that Coursey Pond attained Delaware's standards for bacteria leading up to the 2004 reporting period based on data from September 1998 through August 2003. The improvement has been maintained after the delisting. Sampling data noted in the state's 2012 CWA section 305(b) report showed that Coursey Pond had a geometric mean of 44 col/100 mL bacteria, which meets the Delaware's freshwater bacteria water quality standard. Monitoring will be ongoing in Coursey Pond to ensure that the pond continues to meet water quality standards.

Partners and Funding

The successful removal of the bacteria impairment for Coursey Pond was the result of collaboration between the KCD, the USDA NRCS, USDA Farm Service Agency, Delaware Department of Agriculture, and the Delaware NPS Program. Federal CWA section 319 funds supported BMP implementation costs in the Coursey Pond watershed. Additional funding was provided through the USDA EQIP and CREP programs, the Delaware Conservation Cost Share program and KCD. Between 2002 and 2004 the project was supported by more than \$470,000, which included CWA section 319 funds (approximately one-third of total) and EQIP and state cost share funds (remainder of total). KCD provided \$32,940 in funding for 732 acres of cover crop over 5 years. The 14 acres of CREP grass buffers and hardwood plantings were installed at a total cost of \$17,460. To assist in CREP program development and implementation, the NPS Program created a full-time CWA section 319-funded Delaware CREP Program Coordinator position.



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

EPA 841-F-15-001EE
August 2015

For additional information contact:

Bob Palmer
Delaware DNREC
Nonpoint Source Program
302-739-9922 • robert.palmer@state.de.us