Section 319
NONPOINT SOURCE PROGRAM SUCCESS STORY
Rhode Island

Outhouse Removal Eliminates Source of Bacteria

Waterbody Improved

Rhode Island placed Gilbert Stuart Stream on its 2000 303(d) list of impaired waters because it did not meet the state's fecal coliform bacteria water quality standard. The bacteria impairment was caused by an outhouse near the shore of a pond that serves as the stream's source. After removing the outhouse, bacterial levels dropped, and the segment now meets water quality standards. Rhode Island removed the stream from its list of impaired waterbodies in 2008.

Problem

Gilbert Stuart Stream is the largest freshwater tributary to Narrow River and an important anadromous fish run. Narrow River is in southern Rhode Island, west of Narragansett Bay. Its watershed lies within the towns of North Kingstown, Narragansett and South Kingstown. Gilbert Stuart Stream originates at the discharge spillway of Carr Pond at the Gilbert Stuart Museum historical site in North Kingstown, travels approximately 0.3 km through hardwood wetlands and terminates at the northern end of Upper Pond, which is the beginning of the Narrow River (Figure 1). The surrounding watershed is sparsely settled with several camps and low-density residential development. Local organizations and the general public enjoy hiking, camping and canoeing in the watershed.

Water quality monitoring data collected during the development of the Narrow River Total Maximum Daily Load (TMDL) for pathogen impairments indicated that Gilbert Stuart Stream's fecal coliform (FC) levels were sporadically very elevated and consistently violated the state's bacteria water quality standards. Rhode Island classifies Gilbert Stuart Stream as a Class A waterbody. The water quality standard for fecal coliform (an indicator of pathogen contamination) in Class A waters requires that concentrations do not exceed a geometric mean value of 200 MPN (per 100 milliliters (mL), and not more than

Figure 1. An aerial view of the project location. Inset pictures show a fish ladder at the Carr Pond Dam (top left) and two views of the Gilbert Stuart Museum site (right).

10 percent of the total samples shall exceed a value of 400 MPN/100 mL, where MPN is the most probable number.

Rhode Island Department of Environmental Management's (DEM's) 1999 water quality data showed that, at a sampling station immediately downstream of the Gilbert Stuart Museum, the dry-weather geometric mean of the stream was 182 FC/100 mL, while the wet-weather geometric mean was 573 FC/100 mL. The calculated weighted-geometric mean for the segment was 290 FC/100 mL, and the 90th percentile value was 4,320 FC/100mL. DEM determined that Gilbert Stuart Stream did not meet standards necessary to support its designated use (primary recreation) and added the stream to its 2000 303(d) list of impaired waters.

Project Highlights

DEM determined that human activity was likely the dominant source of fecal coliform bacteria. A failing septic system at the Gilbert Stuart Museum (at the headwaters of the stream) was replaced around 1997; however, fecal coliform concentrations in the stream remained elevated. During the 1999 sampling effort, the primary source of fecal coliform contamination to the stream was localized to the Gilbert Stuart Museum property (Figure 2). DEM identified an outhouse within 35 feet of Carr Pond as the probable source. Museum curators agreed to replace the outhouse with a portable toilet in 1999. Removal of this outhouse was the only remedial measure deemed necessary for Gilbert Stuart Stream in the Narrow River TMDL report.

Figure 2. The Gilbert Stuart Museum and waterwheel.

Results

Data indicate that Gilbert Stuart Stream water quality has improved significantly. Project partners collected and analyzed 29 water samples from 2000 to 2005. Results show a geometric mean of 45.75 FC/100 mL with only 2 of the 29 samples exceeding 400—a drastic decrease in fecal coliform levels. The stream now meets the state's Class A water quality standard and supports its designated use for primary recreation. Therefore, Rhode Island removed the stream from its 303(d) list in 2008.

Partners and Funding

University of Rhode Island Watershed Watch volunteers contributed to the water quality monitoring effort. Rhode Island DEM used Clean Water Act section 319 funding to develop the Narrow River TMDL.

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

EPA 841-F-08-001J
August 2008

For additional information contact:

Ernie Panciera
Office of Water Resources, Rhode Island Department of Environmental Management
401-222-4700 x7603
ernie.panciera@dem.ri.gov