



NONPOINT SOURCE SUCCESS STORY

Massachusetts

Addressing Agricultural Runoff Restored Martin's Pond Brook

Waterbody Improved

Martin's Pond Brook, which flows through a critical area known for its unique biological, physical and cultural resources, had been impacted by agricultural nonpoint source pollution since the late 19th century. Excess sediments and nutrients from livestock areas caused in-stream turbidity, siltation, and organic enrichment/low dissolved oxygen, which prompted the Massachusetts Department of Environmental Protection (MassDEP) to add Martin's Pond Brook to the state's 1992 Clean Water Act (CWA) section 303(d) list of impaired waters. The Town of Groton partnered with local watershed groups, farmers, and state and federal agencies to implement best management practices (BMPs). A local farm also lowered its herd size. As a result, Martin's Pond Brook now meets Massachusetts' state water quality standards, prompting MassDEP to remove the brook from the impaired waters list in 2012 for turbidity, siltation, and organic enrichment/low dissolved oxygen.

Problem

Martin's Pond Brook is in the Nashua River watershed and flows 2.3 miles from Martin's Pond to Lost Lake near Groton, Massachusetts (Figure 1). The brook flows through the Petapawag Area of Critical Environmental Concern (ACEC). The Petapawag area was designated an ACEC in 2002 for its unique biological, physical and cultural resources, including 16 state-listed rare species, 15 state-certified vernal pools, unique and highly significant archaeological and historical resources, and scenic landscapes of statewide significance.

Nonpoint source pollution from agricultural operations have impacted Martin's Brook since the as early as 1897. A 240-acre farm had been a cattle farm for nearly 60 years when, in 2005, this area was purchased to support an apple orchard, an organic vegetable operation and a beef farm. The Martin's Pond Brook was designated in the 1992 Integrated Report as impaired for siltation, turbidity, and organic enrichment/low dissolved oxygen in part due to nonpoint source pollution, including stormwater runoff in livestock areas and physical degradation by the livestock.

Story Highlights

In 2000, the MassDEP, Massachusetts Department of Conservation and Recreation (MassDCR), the U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS), Town of Groton, and

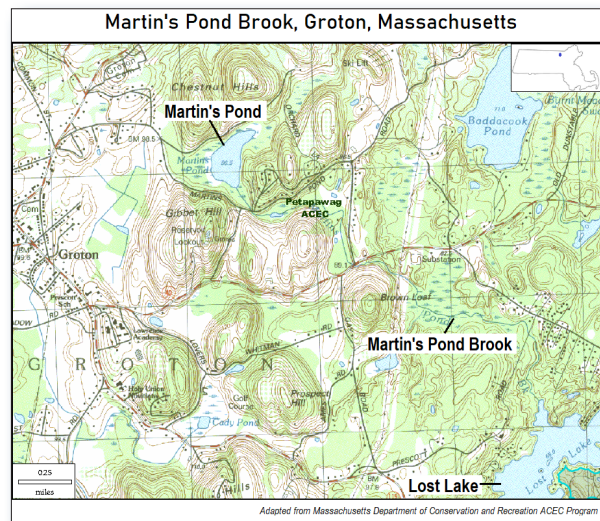


Figure 1. Martin's Pond Brook is in northern Massachusetts.

local landowners began to address the brook's impairments. The Town of Groton, through its Conservation Commission, also became involved with associated water quality issues (turbidity, siltation, organic enrichment/low dissolved oxygen) in the Martin's Pond Brook watershed by helping implement conservation restrictions and management plans. The watershed was once the center of farming operations for Gibbet Hill Farm, a premier Angus cattle breeding facility. The farm was sold in 2000; in 2002, a Conservation Restriction was put on its 250 acres with help from the

town, MassDCR, and private funding. At the sale, the former farmlands were separated into two properties: (1) a significantly reduced cattle operation with approximately 65 head of cattle (down from approximately 120 cattle); and (2) an equestrian center with some cattle grazing and hay production. These parcels continue to be working farms, and both had conservation plans developed by the NRCS (Figure 2). The plans, which were created in 2005 and updated in 2009, address issues such as manure and nutrient management, excluding livestock from wetlands, and maintaining permanent vegetative cover. In 2010, to further ensure the area is protected, the Massachusetts Executive Office for Environmental Affairs (EOEA) provided a Local Acquisition for Natural Diversity (LAND) grant to fund the purchase and protection of 7 acres for the Martin's Pond Conservation Area. Additionally, in 2004, the state purchased an Agricultural Preservation Restriction on 114 acres of the property's 191 acres.



Figure 2. Cattle graze on Gibbet Hill in Groton, Massachusetts, after the improvement project was completed.

Results

In July 2004, MassDEP's Division of Watershed Management (DWM) collected benthic macroinvertebrates and periphyton at a site just downstream of the farming area. The Rapid Bioassessment Protocol (RPB) III score, when compared to a reference site, indicated that the benthic macroinvertebrate community was *slightly impacted*. The DWM conducted monthly in-situ water quality monitoring at another site downstream of the farming area on three occasions during July, August, and September 2004. All parameters measured—dissolved oxygen, temperature, pH, total dissolved solids, and conductivity—were indicative of good water quality conditions and did not show any violations of state water quality criteria.

Water quality improvements indicated by MassDEP sampling were the result of conservation restrictions placed on agricultural lands in 2002 and BMPs implemented on the farms with assistance from NRCS and MassDCR, two of MassDEP's close nonpoint source

pollution partners. The conservation restrictions, along with a conservation plan for the remaining agricultural operations and an overall decrease in the number of livestock, led to noticeable decreases in the amounts of sediment and nutrients entering Martin's Pond Brook.

As a result of improved water quality due to restoration activities, the brook attained all assessed uses, including primary and secondary contact, aquatic life, and aesthetics. As a result, MassDEP removed Martin's Pond Brook from the state's list of impaired waters in 2012.

Partners and Funding

This project involved cooperation of the Town of Groton Conservation Commission and Great Pond Advisory Committee, NRCS, MassDCR, MassDEP, and the Nashua River Watershed Association. In 2002 the Town of Groton's Conservation Fund paid \$500,000 of the \$3.5 million conservation restriction purchase price; the remainder was paid by MassDCR and the Groton Conservation Trust. The 2010 Massachusetts Executive Office for Environmental Affairs provided a Local Acquisition for Natural Diversity (LAND) grant of \$93,600 to purchase and protect seven acres for the Martin's Pond Conservation Area.



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

EPA 841-F-20-001NN
December 2020

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