



## Section 319

# NONPOINT SOURCE PROGRAM SUCCESS STORY

# Vermont

## Stream Restored through Improved Agricultural Practices and Erosion Control Work

### Waterbody Improved

Sediment and nutrients in agricultural, roadway, and parking lot runoff degraded Adams Brook's biological communities and resulted in the waterbody being listed on Vermont's section 303(d) list of impaired waters. The installation of several best management practices, including improvements to a manure storage facility and erosion control work in several areas, resulted in improved water quality and allowed Adams Brook to be removed from the 303(d) list in 2004.

### Problem

Adams Brook, a 3.5-mile stream in the central Vermont town of Randolph, is a tributary within the White River Basin. The Vermont Department of Environmental Conservation (VT DEC) classifies Adams Brook as a Class B water, a designation defined as "suitable for bathing and recreation, irrigation and agricultural uses; good fish habitat; good aesthetic value; acceptable for public water supply with filtration and disinfection."

In 1997, VT DEC monitored macroinvertebrates in Adams Brook using the EPT index, which measures the presence of pollution-sensitive aquatic insects in a waterbody. The index assumes that streams showing high EPT richness are less likely to be polluted than streams showing relatively low EPT richness in the same geographic region. In addition, VT DEC measured Adams Brook's biotic integrity (BI). Monitoring results from both indices indicated that Adams Brook failed to meet Vermont's Class B water quality standards for aquatic life support.

As a result of these findings, the state placed Adams Brook on Vermont's 303(d) list of impaired waters in 1998. Two VT DEC surveys and a concurrent White River Basin planning process indicated that the impairment was caused by nutrient and sediment loads coming from a nearby farm, poorly protected roadside



Ditch near Adams Brook prior to being lined with rock. Rock lining reduced sedimentation into Adams Brook.

ditches, and certain stretches of badly eroding streambanks.

### Project Highlights

In 1998, the U.S. Department of Agriculture and the Vermont Agency of Agriculture, Food and Markets worked with a local farmer to plug a leak in the farm's manure storage pit. They also expanded the pit size to better accommodate the volume and type of animal waste being generated. These actions helped to significantly reduce nutrient loading to the waterbody. Other activities helped to reduce sedimentation. In 2001, VT DEC secured the removal of an unauthorized culvert at an upstream tributary, thereby reducing the erosive force of stormwater in the channel. During



Geomorphic instability and an unauthorized culvert (upstream of the location in this photo) caused heavy erosion and the dumping of rock piles at the culvert shown here. Removing the unauthorized culvert helped to address the instability and reduce the water quality impacts on Adams Brook.

the summer of 2002, the Vermont Agency of Transportation lined the eroding roadway ditches with stone and stabilized erosion at a nearby parking lot. All these actions contributed to bringing the stream into compliance with Vermont's water quality standards.

## Results

Macroinvertebrate sampling in 2001 showed improvements in EPT taxa richness and BI, allowing Adams Brook to be assessed as "good" and attaining water quality standards. However, a waterbody cannot be removed from the state's impaired list until 2 years of biological monitoring data indicate compliance with water quality standards.

Consequently, Adams Brook was reassessed in 2002 and evaluated to be in "very good" condition, exhibiting only minor differences from nearby reference streams. The EPT richness remained well above the guideline for Class B waters (though down somewhat from the 2001 sampling period) and the BI value was significantly lower (better) than the previous 2 sampling years.

## Adams Brook Biomonitoring Results

Sampling Site	Date	Assessment Rating	EPT	BI
1.5	9/16/1997	Fair	<b>15.0</b>	<b>4.77</b>
1.5	9/10/2001	Good	23.0	4.30
1.5	10/2/2002	Very good	19.0	2.14
Class B Guideline			> 16.0	< 4.50

The table above compares Adams Brook biomonitoring results with Class B water quality guidelines. Data highlighted in bold indicate the waterbody's failure to meet aquatic life support biocriteria for Vermont Class B waters. These data led to Adams Brook being added to Vermont's 303(d) list in 1998.

Metric improvements in 2001 and 2002 indicated that the stream community was under less stress and the brook had achieved compliance with Vermont water quality standards. As a result, Adams Brook was removed from the 303(d) list of impaired waters in 2004. The next scheduled monitoring year for the brook is 2006.

## Partners and Funding

This project included financial and technical support from the U.S. Department of Agriculture Natural Resources Conservation Service and the Vermont Agency of Agriculture, Food and Markets for improvements to the animal waste storage facility. These improvements were also funded in part by the farm producer. The Vermont Agency of Transportation protected roadside ditches and established parking area erosion control measures. All the improvement and protection work was facilitated by the broader White River Basin planning process, which was managed by VT DEC and supported, in part, with approximately \$50,000 in section 319 funding.



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

EPA 841-F-06-003A  
May 2006

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