



Section 319

NONPOINT SOURCE PROGRAM SUCCESS STORY

Washington

Watershed-scale Efforts Reduce Bacteria Levels

Waterbody Improved

High fecal coliform (FC) bacteria levels in Washington's lower Nooksack River Basin violated water quality standards in the mid-1990s, prompting the Washington Department of Ecology (Ecology) to add numerous segments to the state's Clean Water Act (CWA) section 303(d) list of impaired waters. The high FC also polluted Portage Bay shellfish beds, causing the Lummi Nation to voluntarily close the shellfish beds to harvesting. Basin stakeholders completed a FC total maximum daily load (TMDL) study and implemented best management practices, including nutrient management planning, upgrading septic systems and excluding livestock from streams. FC levels have dropped, allowing all shellfish beds to be reopened for harvest. Three Nooksack River tributary segments have met water quality standards and TMDL load reduction targets for the past few years, prompting Ecology to remove them from the list of impaired waters in 2008.

Problem

The 826-square mile Nooksack River Basin flows primarily through Whatcom County in northwestern Washington State. While the upper Nooksack River flows through predominantly forested mountainous land of the Cascade Range, the lower Nooksack River drains primarily agricultural land. The Lummi Nation Reservation covers 33 square miles at the mouth of the Nooksack River near Portage Bay.

In December 1996 the Lummi Nation voluntarily closed a 60-acre portion of Portage Bay to commercial shellfish harvest because water quality sampling indicated high FC levels that violated National Shellfish Sanitation Program (NSSP) standards. In August 1998 the Lummi Nation closed an additional 120 acres to harvesting.

Monitoring in 1997 and 1998 showed that numerous segments in the lower Nooksack River Basin violated Washington's water quality standard for FC bacteria in freshwater. The lower Nooksack River is a Class A water, which requires that FC levels not exceed a geometric mean value of 100 colonies (col) per 100 milliliters (mL) and not have more than 10 percent of all samples obtained for calculating the geometric mean value exceed 200 col/100 mL. In 1996 and 1998 Ecology added 20 Nooksack River Basin segments to the state's CWA section 303(d) list for FC impairments.

In June 2000 Ecology developed a TMDL establishing FC pollution limits for the Nooksack River Basin. The TMDL identifies the key FC pollution sources as agriculture and leaking septic tanks. Municipal wastewater treatment plants also contribute. To ensure protection of downstream shellfish beds, the TMDL establishes FC geometric mean targets that are more stringent than water quality standards (Figure 1).

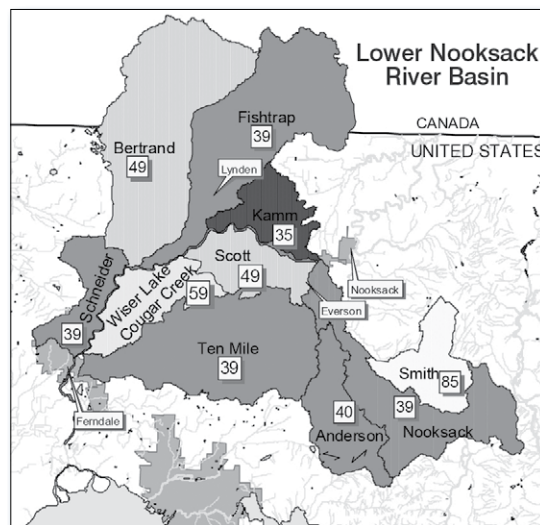


Figure 1. The 2000 TMDL assigns each tributary a FC geometric mean target value (noted in boxes) to protect downstream shellfish beds.

The TMDL geometric mean targets range from 39 col/100 mL to 85 col/100 mL, depending on the sub-watershed and its location within the larger Nooksack River Basin. Ecology worked closely with the Lummi Nation, Whatcom Conservation District (CD) and other stakeholders to develop a 2002 detailed implementation plan to help guide efforts to reduce FC.

Project Highlights

Nooksack River Basin stakeholders have worked to reduce FC levels through a variety of efforts. In 1998 Washington implemented a new state program that requires all dairies to adopt nutrient management plans and undergo regular inspections. Whatcom County farmers now operate more than 50,000 acres under nutrient management plans. Farmers installed fences

to exclude animals from creeks and are spreading manure only when fields can absorb it. Landowners have also installed hedgerows along 26 miles of watercourses and more than 400 miles of filter strips to protect against overspray and runoff of manure.

The Whatcom County Health Department and Lummi Natural Resources Department conduct on-site septic inspections in sensitive, high-risk areas and have worked with homeowners to replace numerous failing systems. Several partners hosted workshops to teach people about septic systems and how to care for them. The cities of Everson, Lynden and Ferndale have improved their sewer collection and waste treatment systems to minimize the amount of bacteria discharged into the Nooksack River. The cities have also implemented stormwater management plans.

The community-based Tenmile Creek Watershed Restoration Project worked with landowners to identify and correct pollution problems from agricultural land and leaking septic systems in Tenmile Creek, a major tributary of the Nooksack River. In 2001 project partners launched a program in which local farmers grow trees and give them to Whatcom County residents for water quality enhancement projects. Nooksack River Basin landowners have planted more than 100,000 trees since the program began. The Whatcom CD received an Ecology grant (CWA section 319 funds), which supported hiring a Tenmile Creek project manager and installing 11 miles of hedgerows and riparian buffers in that 35-square mile watershed alone.

Results

FC bacteria levels in the lower Nooksack River, Nooksack River tributaries and Portage Bay have declined since 1998. Data show that three segments—the two uppermost segments of Double Ditch Drain (tributaries of Fishtrap Creek) and the uppermost segment of Tenmile Creek—have consistently met both water quality standards and TMDL targets (Figure 1), prompting Ecology to remove them from Washington's impaired waters list in 2008. The key efforts that likely helped restore the Double Ditch Drain and Tenmile Creek segments include repairing leaking septic systems and implementing new dairy regulations. Tenmile Creek also benefitted from targeted streambank protection and restoration efforts.

Recent data show that the mainstem Nooksack River meets both the water quality standards and the more stringent TMDL targets at a number of monitoring sites. Data also show that many of the tributary segments are meeting the first part of the standard (100 col/100 mL geometric mean) but

do not yet meet the second part (no more than 10 percent > 200 col/100 mL) or the more stringent geometric mean TMDL targets. Ecology will continue to monitor progress to determine if additional segments should be removed from the list of impaired waters in the future.

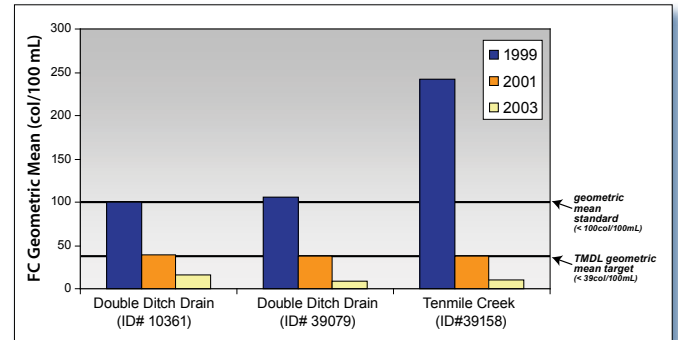


Figure 2. These three Nooksack River tributary segments meet both the geometric mean water quality standard and the target outlines in the Nooksack River Basin TMDL.

Shellfish conditions have improved. By 2003, 480 acres of the Portage Bay shellfish beds met NSSP standards, prompting the Lummi Nation to reopen them for harvest. The remaining 115 acres of Portage Bay shellfish beds reopened in 2006. Despite the improvements, the Lummi Nation remains concerned because the tribe's recent monitoring results indicate that FC levels have risen and sometimes exceed standards in the lower mainstem Nooksack River.

Since 2003, budget constraints and programmatic limitations have reduced technical and financial assistance for monitoring water quality, implementing farm plans and inspecting dairies throughout the Nooksack River Basin—all of which are critical to achieving continued water quality improvements.

Partners and Funding

Numerous partners have contributed to Nooksack River restoration efforts over the past decade, including the Lummi Nation, Ecology, Portage Bay Shellfish Protection District, Whatcom CD, Whatcom County, U.S. Environmental Protection Agency, the U.S. Department of Agriculture's Natural Resources Conservation Service, the Nooksack Salmon Enhancement Association, Dorie Belisle and the Tenmile Creek Watershed Restoration Project, and concerned citizens. Since 1999, more than \$1.7 million in CWA section 319 funds and almost \$900,000 from Ecology's Centennial Clean Water Fund have supported these groups' watershed restoration and monitoring projects.



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

EPA 841-F-09-001JJ
November 2009

For additional information contact:

George Boggs
Whatcom Conservation District
6975 Hannegan Road
Lynden WA 98264
360-354-2035 x115 • GBoggs@whatcomcd.org