



Section 319

NONPOINT SOURCE PROGRAM SUCCESS STORY

Washington

Multifaceted Approach Reduces Bacteria from Numerous Sources

Waterbody Improved

Washington State added the South Fork Skagit River (South Fork) and several tributaries of the lower Skagit River to the 1996/1998 Clean Water Act section 303(d) list of impaired waters because of high levels of fecal coliform (FC) bacteria from urban and agricultural sources. The FC levels impaired recreation use and raised concerns about the health of shellfish beds downriver. State and local government entities implemented a nutrient management program to control manure on dairy farms, reduced the number of failing septic systems, and upgraded a wastewater treatment plant (WWTP). Bacteria levels have decreased, and the South Fork meets water quality standards. Washington plans to remove this segment from the 303(d) list for FC in the next listing cycle. Although the South Fork has improved, several tributaries of the lower river continue to have elevated FC levels and will remain on the impaired waters list.

Problem

The Skagit is Washington's second largest river (Figure 1). The lower Skagit River divides into North and South Forks before emptying into Skagit Bay in northwest Washington. Land uses in the watershed include forestry; small farms; rural residential areas; several rapidly urbanizing areas; and dairy, ranching and other forms of agriculture. In the early 1990s the Washington Department of Health classified portions of the shellfish beds in Skagit Bay as restricted or conditionally approved because of bacterial contamination, raising concerns about the Skagit River's quality. A 1994/1995 monitoring study showed that the lower Skagit River and several tributaries violated water quality standards for FC. Therefore, Washington Department of Ecology (Ecology) added these waters to the state's list of impaired waterbodies (section 303(d) list).

Ecology developed a total maximum daily load (TMDL) for FC for the lower Skagit River watershed in 2000. The TMDL estimated that likely sources of FC contributing to violations of the water quality standard include stormwater, failing septic systems, agricultural manure and effluent (including combined sewer overflows) from WWTPs. The state bacteria standard has two parts: (1) FC levels must not exceed a geometric mean (GM) value of 100 colony forming units (cfu)/100 milliliters (mL), and (2) no more than 10 percent of all samples obtained for calculating the GM value can exceed 200 cfu/100 mL. Because the lower Skagit River discharges to a shellfish habitat, the TMDL outlines water quality targets that are more stringent than the regular state standards. The TMDL requires that (1) FC levels not exceed a GM value of 24 cfu/100 mL and (2) that no more than 10 percent of samples exceed 74 colonies/100 mL.



Figure 1. The lower Skagit River flows through the city of Mount Vernon, Washington.

Project Highlights

Efforts to improve water quality in the lower Skagit River and its tributaries have been underway for more than 10 years. Beginning in 1998 Ecology required that all dairies have farm plans, and dairies are subject to inspection by the Washington State Department of Agriculture. The farm plans require farmers to manage manure to protect water quality and to apply vegetative practices, such as riparian plantings and buffer maintenance, to protect watercourses from surface runoff of sediment, nutrients and bacteria. Approximately 25 dairy operations with more than 10,000 animals operate under farm plans in the watershed.

Since 2000 the Skagit County Public Health Department has intensified efforts to reduce the number of failing septic systems. Through its septic improvement pilot project, it offers rebates to homeowners for septic system inspections and installing lids and risers to promote access. To teach homeowners how to properly operate and

maintain septic systems, it held 110 *Septic 101* clinics since September 2000, with more than 2,800 attendees as of October 2008. It has increased numbers of septic system inspections—from about 100 in the second half of 2005 to more than 600 during the first half of 2008. It developed public service announcements and is increasing its social marketing efforts to spread the word about proper septic operation and maintenance.

Additionally, Mount Vernon undertook a major infrastructure expansion and improvement project at its WWTP. This has reduced combined sewer overflow discharges from an average of 116 million gallons (MG) in the mid-1990s to 11 MG in 2007. The cities of Burlington and Sedro-Woolley have expanded or improved their municipal sewer systems, which discharge to the Skagit, and likely eliminated failing septic systems. Both cities are also working with citizens and nonprofit organizations to restore reaches of Gages Slough and Brickyard Creek, small tributaries to the Skagit.

Results

Monitoring data for the past five years in the South Fork show that it has consistently met both parts of the state bacteria standard. Additionally, the river has met the first part of the stricter TMDL target year-round for the past five years (see Figure 2). It has met the second part of the TMDL target during the wet season (October through April) since 2005 and during the rest of the year since 2006 (Table 1). Therefore, the river has met both the state standard and the TMDL target for the past three years.

Because the South Fork consistently meets the state standard, Washington plans to remove this

Table 1. FC monitoring data for South Fork Skagit River—compliance with the second part (% exceedances) of the state standard¹ and the TMDL target²

Water year	October–April		May–September	
	% > 200	% > 74	% > 200	% > 74
2004	0%	7%	0%	18%
2005	0%	0%	0%	27%
2006	0%	0%	0%	10%
2007	0%	0%	0%	0%
2008	0%	0%	0%	9%

¹ State standard, part 2: No more than 10% of samples exceed 200 cfu/100 mL FC.

² TMDL target, part 2: No more than 10% of samples exceed 74 cfu/100 mL FC.

0.9-mile segment from the state impaired waters list in the next reporting cycle. More work is still needed in some lower Skagit River tributaries, including Nookachamps, Fisher, Hansen and Brickyard creeks, which continue to violate state bacteria standards.

Partners and Funding

Participating organizations include Ecology, Washington Department of Agriculture, Skagit Conservation District, Skagit County Public Health Department, Skagit County Public Works, Skagit County Planning and Development Services, local organizations and the cities of Mount Vernon, Burlington and Sedro-Woolley.

Funding for projects came from several sources. Ecology's Centennial Clean Water Funds supported projects to install Mount Vernon's larger combined sewer overflow interceptor (\$434,735), develop a watershed action plan and education efforts in the Nookachamps Creek watershed (\$164,511), monitor water quality (\$495,000), improve septic systems (\$152,976), and implement TMDL-related outreach and technical assistance projects in lower Skagit River tributaries (\$499,000). Washington State Water Pollution Control Revolving Funds supported an ongoing local loan program for replacing or repairing failing septic systems (\$5.8 million) and WWTP upgrades (\$27 million). A \$246,000 Clean Water Act section 319 grant supported watershed education and riparian restoration efforts in Nookachamps Creek.

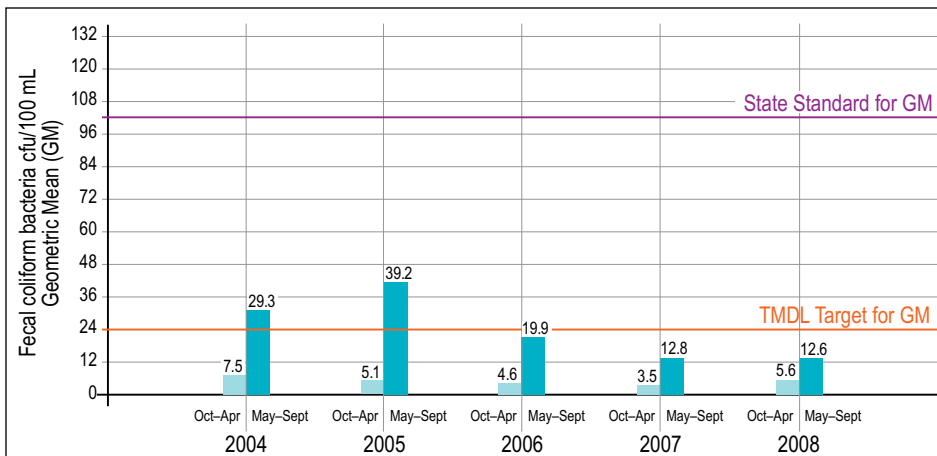


Figure 2. FC monitoring data for South Fork Skagit River—compliance with the first part (GM value) of the state standard and TMDL target.



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