Section 319
NONPOINT SOURCE PROGRAM SUCCESS STORY

Washington

Implementing Best Management Practices Reduces Bacteria Levels

Waterbody Improved

Fecal coliform (FC) bacteria from agricultural activities and leaking septic systems impaired shellfish harvesting and primary contact recreation uses in western Washington's Willapa River watershed. As a result, the Washington Department of Ecology (Ecology) added 15 segments of the river and its tributaries to the state's 2004 Clean Water Act (CWA) section 303(d) list of impaired waters. To address the problems, farmers installed numerous agricultural best management practices (BMPs), and local governments increased their efforts to identify and upgrade septic systems. Bacteria levels have declined across the watershed. Eight of the 15 segments now consistently meet FC water quality standards for bacteria, and Ecology will propose removing them from Washington's impaired waters list in 2012.

Problem

The Willapa River drains a basin of about 260 square miles before discharging into Willapa Bay along the coast of southwestern Washington (Figure 1). The primary land cover and activities in the Willapa River watershed are forest (80 percent); agriculture (8 percent); and non-forestland, developed land, open water and wetlands (totaling 12 percent). Agricultural land uses (including dairy operations and numerous other livestock operations) are common along the valley floor at lower elevations. Willapa Bay supports an important shellfish industry.

Ongoing concerns about water quality prompted Ecology to conduct a total maximum daily load (TMDL) study in 2000, which showed that FC bacteria levels at multiple water quality monitoring sites exceeded water quality standards. As a result, Washington added 15 segments in the Willapa River watershed to the state's impaired waters list in 2004. The TMDL identified the bacteria sources as largely nonpoint in origin, entering the watershed from recreational uses, failing on-site sewage systems, and runoff from livestock operations, hobby farms, urban areas and wildlife. Existing permit limits for sewage treatment plants discharges met TMDL requirements.

Photo by Adrienne Stutes

Figure 1. Sunset over Willapa Bay, Washington.

Project Highlights

For years, partners in the Willapa River watershed have collaborated to improve water quality. They have implemented numerous BMPs throughout the watershed—planting riparian buffers, adding livestock exclusion fencing and alternative water sources, replacing and repairing septic systems, adopting nutrient management plans, building manure containment structures, removing invasive weeds, restoring wetlands, adopting conservation easements, controlling stormwater runoff, and educating landowners and the public about water quality issues.

All nine dairies in the Willapa River watershed developed and implemented farm management plans to comply with the state's Dairy Nutrient Management Act (DNMA), enacted in April 1998. The Natural Resources Conservation Service (NRCS) used federal Environmental Quality Incentive Program (EQIP) funds to help dairy farmers with the initial costs of implementing the DNMA requirements.

Grants paid for capital improvements such as manure containment and dry-stacking, which allows farmers to capture and use animal waste, decreasing nutrient runoff into surface water.

Multiple landowners and agencies (NRCS, Ducks Unlimited, Washington Department of Fish and Wildlife, and Washington State Department of Transportation) partnered on an eight-year effort (2000 to 2008) to remove a dike and restore 300 acres of estuary wetlands at Potter Slough in the lower Willapa River watershed (Figure 2). This project area provides wildlife habitat and has improved water quality by removing livestock from tideland pastures.

Figure 2. Numerous stakeholders partnered on the Potter Slough Estuary restoration project, shown here after completion.

Results

Data show that bacteria levels have declined in the Willapa River watershed. All the shellfish harvest areas in the Willapa River estuary are open for harvest. Baseline data collected by Ecology in 1998 showed that only 4 of 24 Willapa River sites sampled (approximately 16 percent) met FC bacteria standards. Of the 15 river segments originally listed as impaired for FC bacteria in 2004, eight now consistently meet water quality standards (Table 1). As a result, Ecology will propose removing the eight restored segments (covering 7.2 miles) from the state's impaired waters list in 2012 for bacteria impairment.

Partners and Funding

The Pacific Conservation District (PCD) received approximately $300,000 from the Centennial Clean Water Fund (CCWF) and other Washington state funding to help plan and implement efforts to reduce nonpoint source bacteria levels in the Willapa River watershed. More than $68,000 in CWA section 319 funds from the U.S. Environmental Protection Agency supported septic system assessment and growth planning in the watershed. The PCD and NRCS continue to work with landowners to implement agricultural and riparian BMPs using funds from EQIP, the Conservation Reserve Program, the Wetland Reserve Program, and the Wildlife Habitat Incentive Program.

The cities of Raymond and South Bend monitor to identify and address bacteria in stormwater runoff. Pacific County manages upgrades and replacements of leaking or failing septic systems. Local governments have committed more than $10 million from the state revolving fund program, American Recovery and Reinvestment Act and CCWF to upgrade or replace sewage treatment plant infrastructure in the watershed to ensure continued compliance with permit limits.

Table 1. Fecal coliform bacteria data summary (January–December 2006) for restored Willapa River segments (in colony-forming units per 100 milliliters [col/100 mL])

Impaired Waters List ID	Monitoring Site: Willapa River Mile (Tributary) Address	90th Percentile		Geometric Mean		Meets WQS?
		FC (col/100 mL)	WQS*	FC (col/100 mL)	WQS	
6688	3.0 (0.3)	64	200	12	100	YES
9983	37.5	156	200	20	100	YES
9989	7.2 (0.4)	108	200	25	100	YES
9998	6.4	59	200	14	100	YES
10002	17.5	154	200	39	100	YES
10003	21.4	157	200	37	100	YES
10004	25.2	121	200	31	100	YES
10009	12.0 (0.1)	99	200	16	100	YES

* WQS = water quality standard: The applicable FC water quality standard requires that FC organism levels not exceed a geometric mean value of 100 col/100 mL; in addition, no more than 10 percent of all samples obtained for calculating the geometric mean value may exceed 200 col/100 mL.

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For additional information contact:

Dave Rountry
Water Quality Program
Washington Department of Ecology,
Southwest Regional Office
360-407-6276 • drou461@ecy.wa.gov