Section 319
NONPOINT SOURCE PROGRAM SUCCESS STORY

Oregon

Stakeholders Implement Practices to Reduce Bacteria in the Kilchis River

Waterbody Improved

Bacteria from livestock and human sources caused Oregon's Kilchis River to violate water quality standards, prompting the Oregon Department of Environmental Quality (ODEQ) to add the Kilchis River to the state's Clean Water Act (CWA) section 303(d) list of impaired waters in 1998. With support from multiple organizations, landowners installed best management practices (BMPs) throughout the Kilchis River watershed. Data show that bacteria levels have dropped significantly and have met water quality standards for recreation since 2009. However, the Kilchis River remains listed as impaired while additional assessments are performed.

Problem

The 65-square-mile Kilchis River watershed (Figure 1) drains into Tillamook Bay on Oregon's coast. The dominant land use in the Kilchis River watershed is state and federal forestlands, accounting for 97 percent of the watershed's total area. Agricultural land uses cover about 2 percent of the watershed, primarily in the lowland areas.

The Kilchis River is protected for recreational contact use and aquatic life. Oregon's water quality criteria for these uses require that the 30-day log mean should not exceed 126 *Escherichia coli* counts per 100 milliliters (mL), based on a minimum of five samples; and no single sample shall exceed 406 *E. coli* counts per 100 mL.

Beginning in the late-1980s, data indicated that bacteria levels exceeded water quality criteria during the summer near the river's mouth. Between 1986 and 1994, 81 percent (17 of 21) of summertime samples exceeded the applicable criteria. As a result, the ODEQ added a 13.1-mile segment of the Kilchis River to the CWA section 303(d) list of impaired waters in 1998 for bacteria. This segment was divided into two separate segments (OR-1238985454957-2.3-8.5 and OR-1238985454957-8.4-15.4) on Oregon's 2002 list of impaired waters.

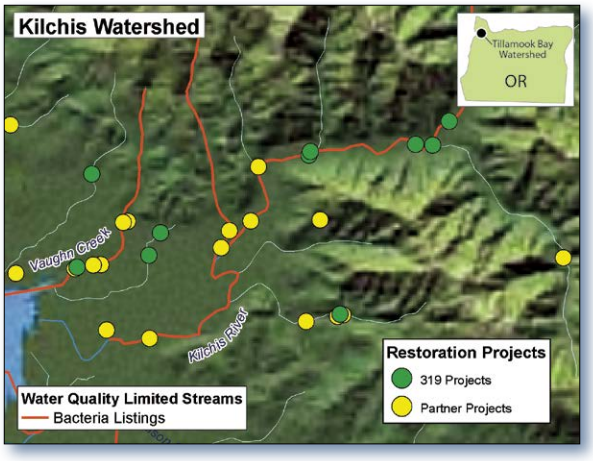

Figure 1 Stakeholders completed numerous restoration projects in the lower Kilchis River watershed (2000–2012).

Project Highlights

The Tillamook Bay National Estuary Program, now known as the Tillamook Estuaries Partnership (TEP), developed a watershed assessment report for the Kilchis River in 1998. The report described watershed conditions and recommended actions that address issues of water quality, fisheries and fish habitat, and watershed hydrology. On a larger scale, the TEP worked closely with community, state and federal entities to develop and implement the Tillamook Bay Comprehensive Conservation and Management Plan beginning in 1999.

ODEQ completed a Tillamook Bay watershed total maximum daily load (TMDL) for temperature and bacteria in 2001 (addresses all Bay rivers, including the Kilchis River). Also in 2001, the U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS) and the Tillamook Soil and Water Conservation District (SWCD) published a Watershed Plan/Environmental Assessment for the Lower Tillamook Bay watershed. The 2001 document outlined agricultural facilities, practices and restoration activities needed to address TMDL-related water quality issues.

In 2001 TEP began working with Oregon State University on a 3-year genetic marker study on bacteria in the Tillamook Bay watershed. The study found that both humans and ruminants (including livestock) contributed bacteria to the Kilchis River. Using these data, watershed managers began targeting practices to reduce bacteria.

In collaboration with NRCS and the Oregon Department of Agriculture, the Tillamook County SWCD worked directly with landowners to evaluate and address problems with manure application/storage, runoff and erosion between 2000 and 2012 (see Figure 1). In the lower Kilchis River watershed, the SWCD helped landowners install seven aboveground wet storage manure tanks, 22 underground wet storage manure tanks and 12 dry storage manure tanks. The SWCD also implemented seven riparian fencing and planting projects with private landowners and worked to promote BMPs such as nutrient management, waste utilization and prescribed grazing. Landowners adopted rotational grazing plans on three farms.

Partners have implemented numerous riparian and habitat restoration projects. For example, TEP has worked with landowners to complete more than 10 restoration projects in the lower Kilchis River through its Backyard Planting Program (BYPP), many in partnership with Tillamook SWCD. TEP, in collaboration with Oregon Department of Fish and Wildlife and the Tillamook County Creamery Association, removed a dam and improved aquatic habitat by adding large woody debris and restoring riparian areas along a Kilchis River tributary in 2009.

Both the TEP and SWCD conducted numerous education and outreach activities in the Kilchis River and greater Tillamook Bay watersheds, including distributing fact sheets, hosting field trips, holding workshops and classroom-based discussions, and publishing articles in local newspapers.

Results

Data collected in partnership with local groups show that the Kilchis River main stem now meets recreational use standards for bacteria. TEP collects monitoring data in the Kilchis River watershed. Data show three stations (K4, K5 and K6) on the main stem have met the two-part recreational use water quality standard for *E. coli* bacteria since 2009. The data for station K4 (the station closest to the mouth of the river) are presented in Figure 2. Data from four additional monitoring stations on Kilchis River tributaries show significantly decreasing trends in bacteria. Previous DEQ assessments classified the river as an impaired water covered by the Tillamook Bay TMDL and restoration plans. Because Tillamook Bay does not support its shellfish waters designated use due to elevated bacteria levels, the Kilchis River, which feeds into the bay, will remain listed as impaired for bacteria pending additional water quality assessments in the larger Tillamook Bay watershed.

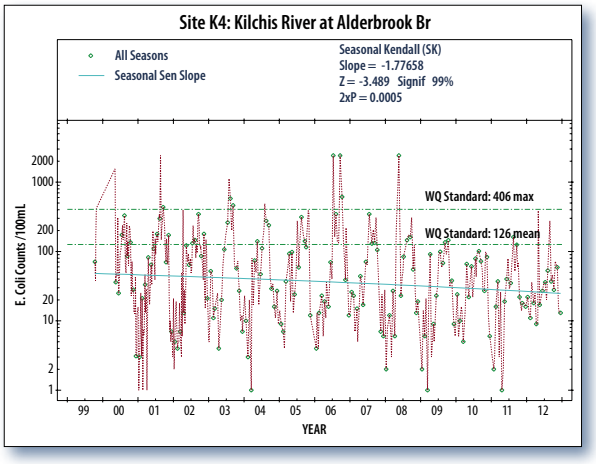

Figure 2. Bacteria levels in the lower Kilchis River have declined since 2000 and now consistently meet water quality standards for recreation.

Partners and Funding

Partners working to restore Tillamook Bay and its watershed have included the Oregon Watershed Enhancement Board, Oregon Department of Agriculture, ODEQ, Oregon Department of Fish and Wildlife, TEP, Tillamook County, U.S. Fish and Wildlife Service, Tillamook County Creamery Association, Tillamook SWCD, Tillamook Native Plant Cooperative and private landowners.

Partners spent more than $1.8 million dollars restoring and protecting the lower Kilchis River watershed. The Tillamook Pioneer Museum spent $1 million (mostly private funds) on the purchase of Tillamook Bay-front property. Partners also completed 17 riparian restoration projects at a cost of $103,789, approximately $71,757 of which was provided by CWA section 319 funding.

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