

Making Progress in the Bear Creek Watershed

Stakeholders' watershed approach reduces phosphorus levels

Water Quality Improving

For decades, urban, forested and agricultural areas contributed excess nutrients and other pollutants to Oregon's Bear Creek, prompting DEQ to add 26.3 miles of Bear Creek and some of its main tributaries to the state's list of impaired waters in 1998.

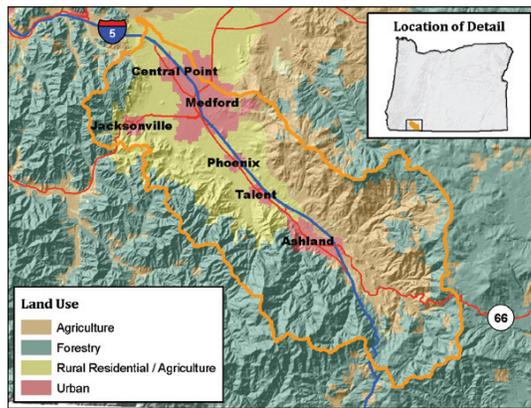


Figure 1. Southwest Oregon's Bear Creek watershed includes a mix of urban, agricultural, rural residential and forested areas.

To reduce excess nutrients like phosphorus in Bear Creek, watershed stakeholders upgraded a wastewater treatment plant, educated landowners, and implemented numerous agricultural and urban best management practices. As a result, phosphorus levels have dropped steadily in Bear Creek and in four tributaries.

Current data indicates measurable progress toward achieving water quality goals in these waterbodies but there is still more work that needs to be done as the two water bodies do not yet meet water quality standards and remain on Oregon's list of impaired waters for phosphorus and other pollutants.

The Problem

Pollutants from numerous sources have contributed to problems in the Bear Creek watershed for decades. Nonpoint source pollution such as runoff from agricultural and developed areas and irrigation water returning to the stream have contributed nutrients, sediment and fecal coliform to surface waters. A wastewater treatment plant along Ashland Creek, a headwaters tributary of Bear Creek, also

contributed high levels of nutrients in its effluent.

A combination of point and non-point pollution sources led to low pH, low dissolved oxygen levels, excessive amounts of aquatic weeds, and high levels of fecal coliform in numerous waterbodies in the Bear Creek watershed. The pollutants of concern for Bear Creek include phosphorus, dissolved oxygen, chlorophyll a, pH, ammonia, temperature and fecal coliform. DEQ listed Ashland Creek as impaired in 1998 because of fecal coliform, ammonia and phosphorus. Other tributaries were added to the state's list of impaired waters the same year for a variety of pollutants, including fecal coliform, temperature and dissolved oxygen.

The Solutions: Project Highlights

Many partners have cooperated to identify and implement pollution-reduction efforts. In 1992 DEQ developed total maximum daily loads – or "TMDLs" as they are often called - for pH, dissolved oxygen, aquatic weeds and algae, temperature, sediment and fecal coliform. A TMDL is a technical analysis that establishes pollutant limits that are needed to meet state water quality standards.

The Rogue Valley Council of Governments and the Bear Creek Watershed Council completed a Watershed Assessment and Action Plan for Bear Creek in 1995 and for its tributaries in 2001.

In 2005 the Oregon Department of Agriculture and the Bear Creek Local Advisory Committee developed an agricultural water quality management area plan to address agriculture-related water quality issues.

The Medford and Talent irrigation districts reduced sediment and nutrients from irrigated lands by converting flood irrigation to sprinkler irrigation and adding protective liners along canals or replacing the canals with pipes to reduce erosion.

The Jackson Soil and Water Conservation District and the U.S. Department of Agriculture's Natural Resources Conservation Service are helping farmers to implement agricultural best management practices such as nutrient management, exclusion fencing



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(typically to prevent livestock from accessing riparian areas), pesticide management, pasture fencing and pasture management.

The Rogue Valley Council of Governments facilitates local efforts to conduct regional stormwater management planning; it also implements demonstration projects (Figure 2), educates watershed residents about water quality issues, and encourages participation in corrective actions.



Figure 2. Local students led by AmeriCorps planted wetland species as part of a stormwater wetlands project in the Bear Creek watershed.

In 2002 Ashland upgraded its wastewater treatment plant by adding a tertiary treatment phosphorus removal system that operates from May until November each year. Municipalities installed stormwater control practices, including adding a large stormwater treatment wetland in Ashland. In 2008 the U.S. Environmental Protection Agency recognized the Rogue Valley Sewer Services stormwater program as the best in the country.

Data and Results

Water quality has measurably improved since 1996. The 1992 Bear Creek TMDL established that the in-stream concentration of total phosphorus must be less than 0.08 milligram per liter (mg/L) from May 1 through November 15 to meet water quality standards. Although Bear Creek and its tributaries do not yet meet this goal consistently, significant progress had been made.

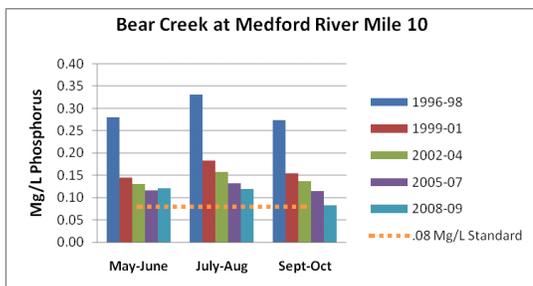


Figure 3. Phosphorus levels in Bear Creek have declined over time and almost meet water quality standards.

Data from monitoring stations in the Bear Creek watershed (main stem and tributaries) show that phosphorus levels are steadily declining. At Bear Creek river mile 10 in Medford, for example, phosphorus levels have declined from an average high of 0.33 mg/L in July/August 1996–1998 to an average low of 0.08 mg/L in September/October 2008–2009 (Figure 3).

In Ashland Creek, upgrading the wastewater treatment plant contributed to large phosphorus decreases in Ashland Creek and the upper main stem of Bear Creek (Ashland Creek joins Bear Creek at river mile 24).

Efforts to reduce non-point source pollution are also contributing to lower phosphorus levels seen in Bear Creek. Data show that Neil Creek’s phosphorus levels have declined from an average high of 0.23 mg/L in May/June 1996–1998 to an average low of 0.07 mg/L in September/October 2008–2009. Phosphorus levels are also declining in Griffin Creek and Jackson Creek.

Partners and Funding

Many state and federal agencies, organizations, and local municipalities, are working to restore the Bear Creek watershed including:

- Rogue Valley Council of Governments
- Bear Creek Watershed Council and Local Advisory Committee
- Oregon DEQ
- Oregon Dept. of Agriculture
- Oregon Dept. of Forestry
- Oregon State University
- USDA Natural Resources Conservation Service
- USDA’s Farm Service Agency
- Jackson County SWCD
- Talent, Medford and Rogue River Valley irrigation districts
- Rogue Valley Sewer Services

Jackson County and the cities of Medford, Ashland, Phoenix, Central Point, Jacksonville and Talent provide financial support to the Rogue Valley Council of Governments for the ongoing Bear Creek water quality monitoring program.

Since 1997, stakeholders have spent more than \$39.5 million on water quality improvement projects within the Bear Creek watershed. Ashland upgraded its wastewater treatment plant for \$33.6 million. The Oregon Watershed Enhancement Board provided more than \$715,000 for restoration and watershed management projects by the Jackson SWCD, the Rogue Valley Council of Governments and the Bear Creek Watershed Council. Support for irrigation system upgrades was provided by the Bureau of Reclamation (more than \$1.575 million) and Talent and Medford irrigation

districts (more than \$2.2 million). Landowners contributed more than \$1 million to support irrigation upgrades. DEQ's Water Resources Department provided more than \$430,000 in CWA section 319 funding to support a variety of NPS pollution-reduction projects.