

Water Quality

Chapter 4

Water Quality

Edited by Travis Williams, Riverkeeper & Executive Director, Willamette Riverkeeper



Photo by Shan Gordon

Over 30 years ago, the federal Clean Water Act set two goals: eliminating the discharge of pollutants into the nation's waters and achieving water quality standards that would ensure that the nation's waters would be both swimmable and fishable within a generation. Today in Oregon, too many waterways fail to meet this goal. Oregon is home to more than 12,000 named rivers and 6,000 lakes, ponds, and reservoirs, including approximately 100,000 miles of stream channels. These waterways are an integral part of the state's natural and cultural resources. Economic, commercial, and social activities revolve around them as Oregonians work and play together. The health and viability of fish, wildlife, plants, and people depend on the network of water that stretches across the Oregon landscape.

Water pollution is generated through industrial, commercial, and municipal practices, including logging, mining, grazing, agriculture, municipal wastewater disposal, land development, industrial waste disposal, and our streets and parking lots. Contaminants entering water systems from specific discharge points, such as outfall pipes, are considered "point source pollution." Contaminants can also be washed into water systems from many places, including city streets, clear-cut forests, construction sites, leaking septic tanks, and farms. This pollution, with no clear point of discharge, is called "nonpoint source pollution."

How Does Oregon Protect Clean Water?

Three decades ago, Oregon led the nation in adopting water protection standards. But in recent years, our waters have become increasingly degraded by a variety of pollutants and activities. Under the federal Clean Water Act, each state is required to set water quality standards that must meet federal minimum standards. But states are free to strengthen these standards. The state must then identify streams, rivers, and lakes that do not meet water quality standards.

In 2002, a total of 13,300 stream miles in Oregon failed to meet water quality standards and were classified as "water quality limited," according to the Department of Environmental Quality's (DEQ) 2002, 303(d) list. DEQ no longer provides the public with the total miles of degraded streams, but we do still know that a high percentage of streams are not meeting the minimum standards. For example, the 2004/2006 list of degraded waters concludes that 35% of the Willamette Basin streams are in "poor" condition for temperature.

The Oregon DEQ's responsibility is to protect Oregon's surface waters from point source discharges through a pair of permit systems. These systems do not prohibit pollution; they simply limit and legalize it. The Clean Water Act's National Pollutant Discharge Elimination System (NPDES) program requires the DEQ to regulate direct wastewater discharges into surface water. The state's Water Pollution Control Facility (WPCF) Program governs wastewater disposal that, although not directly discharged into rivers, may affect surface waters.



In 2002, a total of 13,300 stream miles in Oregon failed to meet water quality standards and were classified as "water quality limited," according to the Department of Environmental Quality's (DEQ) 2002, 303(d) list.

Under federal and Oregon law, nonpoint source pollution is addressed in a far more limited way. The DEQ's Nonpoint Source (NPS) Program emphasizes watershed protection and enhancement, voluntary stewardship, and partnerships between all watershed stakeholders.

How Does Oregon Protect Drinking Water?

Polls consistently show that Oregonians rank safe drinking water as one of their most serious environmental concerns. A safe drinking water supply consists of a sufficient quantity of water to meet public needs at a quality that ensures public safety.

Oregonians rely on both surface and groundwater for their drinking water. While a diversified water supply system creates greater reliability, it also creates a wide range of quality and quantity challenges.

The federal Environmental Protection Agency (EPA) is responsible for safeguarding water purveyed to the public. The EPA establishes permissible levels of contaminants in public water systems for human consumption. The Safe Drinking Water Act requires states to meet the standards set by the EPA. The Department of Human Services (DHS) and the DEQ ensure that Oregon's drinking water meets these standards.

In 1977, the DEQ adopted the so-called "Three Basin Rule," which is designed to preserve the "existing high water quality" of Oregon's North Santiam, McKenzie, and Clackamas watersheds. These three river basins supply drinking water to about 30 percent of Oregon's citizens. The original rule prohibited any further wastewater discharges into protected portions of these watersheds. Although the rule has been weakened slightly since its creation, it still provides a higher level of protection than is given to other waters in Oregon.

Standards Inadequate

Existing standards do not always adequately protect our drinking water. Lack of data is a problem. Forty percent of commonly used pesticides have never been tested to determine the long-term health impacts caused by their presence in drinking water. As a result, DEQ has not established standards or any limits on the discharge of these pollutants.. Moreover, very little research has been done regarding the cumulative effects of these contaminants on human health. Where we do have data, standards have been set with the adult in mind. This leaves children, the elderly, and people with immune-compromising diseases at risk from current drinking water standards.

While quality is important, an adequate supply of water is equally important. Quantity affects quality as well as the availability of water for drinking and other purposes (see Chapter 11, Water Quantity).

What about Groundwater Contamination?

Underground water supplies often receive less attention than above ground sources in our environmental programs. Yet, a vast majority of public water systems rely at least in part on groundwater for permanent or backup water supplies. Stored below the ground in layers of rock or sediment known as aquifers, groundwater is the world's largest source of fresh water.

The majority of wells in Oregon are less than 200 feet deep. These shallow wells draw from unconfined aquifers located in river valleys. Unconfined aquifers are among the most sensitive to pollution. They are recharged as rain, snow, and surface waters are absorbed into the ground.



Existing standards do not always adequately protect our drinking water. Lack of data is a problem. Forty percent of commonly used pesticides have never been tested to determine the long-term health impacts caused by their presence in drinking water. As a result, no standards have been established.

When downward percolating water encounters contaminants, those contaminants can dissolve and be carried into the underlying aquifer. When a well pumps, it lowers the water table in the immediate area. Because groundwater moves from areas where the water table is high to areas where the water table is low, groundwater pumping increases the tendency of groundwater to move towards the well. If that groundwater is polluted, the polluted water eventually will be pumped to the surface.

Groundwater contamination can be caused by a variety of sources, including leaking underground oil storage tanks, buried wastes, defective or failing septic systems, the use of fertilizers and pesticides, and unlined or improperly lined landfills.

During real estate transactions involving a domestic supply well, the well must be tested and the results of the test submitted to the Department of Human Services. Landowners are notified of the presence of any well and of any legal obligations concerning that well by standard forms included with property deed records. That information is also available from DHS's web-site at www.dhs.state.or.us/publichealth/dwp/.

In Oregon, we attempt to protect groundwater with the voluntary Oregon Wellhead Protection Program and the Oregon Groundwater Protection Act. However, the DEQ has never been given adequate funding to fully implement the Groundwater Protection Act. Preventing groundwater pollution is very cost effective when compared with the costs of cleaning up groundwater or the costs of developing new drinking water supplies.

Case Study – The Willamette: A River in Need

Perhaps no single water body in Oregon demonstrates the struggle for clean water as clearly as the Willamette River and its tributaries (a basin totaling 12,000 square miles), though others such as the Columbia face significant pollution issues as well. The Willamette basin is home to more than 70 percent of Oregon's population and 75 percent of Oregon's economy. Because of its proximity to people, the Willamette River's health should be of serious concern to all Oregonians.

It was not until the 1960s that effective state controls were established for reducing pollution in the Willamette. The adoption of the federal Clean Water Act in 1972 further spurred protection for the river. While much was done in the past 30 years, we have learned a great deal since that time about what affects river health - including abundant information about toxic chemicals.



River Toxins and Health Risks: While the river has improved according to one measure of water quality - dissolved oxygen content - the Willamette continues to be a river at risk. The EPA declared Portland Harbor a Superfund site in 2001, meaning it's among the nation's most significantly contaminated harbors. The 187 miles of the Willamette main stem fail to meet minimum water quality standards for a variety of pollutants.

The 2002 303(d) list, which lists streams with water quality violations, cites multiple violations. The Willamette River exceeds state standards for mercury, Aldrin, Arsenic, DDT, PCB, and PAH among others. Temperatures are also dangerously high for fish.

Oregon DHS has issued advisories that people avoid eating fish from the entire main stem of the Willamette due to mercury contamination. Because the main stem of the Willamette does not meet water quality standards for temperature and mercury, a Total Maximum Daily Load (TMDL) was completed in September 2006.

The 187 miles of the Willamette main stem fail to meet minimum water quality standards or a variety of pollutants. ... The Willamette River exceeds state standards for mercury, Aldrin, Arsenic, DDT, PCB, and PAH among others. Temperatures are also dangerously high for fish.

The TMDL is now in implementation phase. This phase will be critical and must be fully funded to include adequate staff time at DEQ and collaboration between DEQ and the Oregon Department of Agriculture (ODA), the Oregon Department of Fish and Wildlife (ODFW), and many others. As part of this TMDL, a significant amount of riparian vegetation must be planted. Because private landowners own much of the land in the Willamette Basin, finding incentives and developing plans to get more vegetation planted is critical. In addition, the biggest point source polluters need to reduce the level of mercury they release into the Willamette and establish better monitoring systems.

Stormwater: Many riverside cities discharge pollutants through their stormwater. When it rains heavily, the flush of water carries pollutants from roads, parking lots, and other surface areas into local creeks and rivers. Because of the risk this kind of pollution poses, municipalities must obtain stormwater (MS4) permits. In 2004, permits were developed by DEQ for Eugene, Portland, Salem, and other major cities in the state. Unfortunately, too many of these permits had no enforceable standards and inadequate plans for testing and evaluation. It is essential that these permits require tangible, enforceable standards that safeguard our water. Careful monitoring is critical, as are changes to permits when it is clear that standards are not being met.

Persistent Bioaccumulative Toxins: Many of the pollutants legally released into the river are persistent, bioaccumulative toxins (PBTs). These are highly poisonous, long-lasting substances that can build up in the food chain to levels harmful to human and ecosystem health. They include many familiar toxic substances such as mercury, dioxin, PCBs, and DDT, as well as many others that are not so familiar. These chemicals threaten the health of Oregonians, particularly those who consume fish caught in the lower Willamette. The DEQ was given a mandate by a 1999 Executive Order from Governor Kitzhaber to institute a program to eliminate discharges of PBTs into Oregon's environment by the year 2020, but little has been done by DEQ in response (see Chapter 6, Toxic Chemicals).

Pesticides: Given that much of Oregon relies on agricultural production, a significant amount of pesticides are used in the Willamette Valley and beyond. Considering the vast amount of chemicals applied to the land, it is imperative to track the types and amounts of pesticides used, and to implement the state's Pesticide Use Reporting System efficiently (see Chapter 7, Pesticide Use).

Wetlands: Nearly 90 percent of the Willamette's wetlands have been developed, despite the fact that floodplains and wetlands provide natural water purification and flood control, in addition to critical habitat for fish, waterfowl, and other animals. The Department of State Lands, the DEQ, and the US Army Corps of Engineers are charged with protecting these natural resources and issuing permits for modifications to wetland areas. Due to continuous threats, there is a need for robust protection of the state's wetlands.

Riparian Lands: Riparian areas occur as the banks of rivers, streams, and lakes, and the land immediately adjacent to these waterways. These areas have been significantly degraded along the Willamette and its tributaries. Riparian areas with native vegetation provide shade, and buffers nonpoint pollution so that less of it reaches the water. It is essential that the State of Oregon provide matching funds for federal dollars that are set aside to restore such areas.

Other Impacts: Dams, erosion, riverside development, upstream logging and farming, continued urbanization, and other land use practices have contributed to the decline in the Willamette's wild fish populations and the failure of much of the Willamette to meet federal and state water quality standards.



Nearly 90 percent of the Willamette's wetlands have been developed, despite the fact that floodplains and wetlands provide natural water purification and flood control, in addition to critical habitat for fish, waterfowl, and other animals.

Solutions: As the population of the Willamette Valley continues to increase, Oregonians must come together as responsible, committed stakeholders in the development of a basin-wide river protection plan. A comprehensive program for improving the condition of the Willamette River will provide a model for the cleanup and restoration of other Oregon river basins.

Legislative and Agency Priorities

- ◆ Eliminate the widespread use of Mixing Zones: Today there is a significant loophole in the way that the State of Oregon implements the Clean Water Act. Too often the state allows discharges of chemicals and heavy metals into the Willamette to exceed water quality standards. The area where this occurs is called a "Mixing Zone." The toxic mixing zone loophole should be closed.
- ◆ Provide funds for implementation of water quality standards (TMDL) for the Willamette: Over the next two to three years, the state will implement its program to ensure the Willamette meets water quality standards for temperature and mercury through the Total Daily Maximum Load program. The Oregon Legislature must help secure the funding that DEQ, the Oregon Department of Agriculture, and the Oregon Department of Forestry need to implement the TMDL and protect public health.
- ◆ Provide adequate funds to maintain a robust Stormwater Program at DEQ: Because of the many stormwater permits up for renewal, DEQ must have a strong program to protect water quality from urban and suburban stormwater impacts.
- ◆ Protect drinking water: Approve sufficient funding to allow the Department of Human Services (DHS) Drinking Water Program to completely implement and enforce existing laws protecting drinking water quality and human health.
- ◆ Decrease persistent toxins: The state must keep its commitment to eliminating Persistent Bioaccumulative Toxins (PBTs) state-wide.
- ◆ Curb agricultural pollution: While some landowners are doing a marvelous job, there is a real need for the state to provide stronger monitoring and oversight of agricultural runoff throughout Oregon.
- ◆ Establish a fish testing program for toxic chemicals: Approve sufficient funding to allow a comprehensive fish testing program in Oregon through DEQ and DHS.
- ◆ Provide a significant amount of funding, through OWEB, dedicated to restoration projects along the Willamette mainstem and key tributaries to the river.

Key Messages

- ◆ Oregonians want and need clean water. Polls consistently rate clean water as Oregonians' top environmental concern.
- ◆ We have failed to meet too many of the basic goals set by the Clean Water Act nearly 30 years ago. We must commit to more stringent nonpoint source pollution tracking and reduction.

- ◆ Oregonians have made a commitment to the elimination of persistent toxins from Oregon waterways. But that goal can be achieved only if we work together to develop and implement a statewide zero discharge strategy for such toxins.
- ◆ Public health must be protected in all situations. The drinking water of all Oregonians must meet or exceed current standards set by the EPA. Outreach programs must be developed to educate all Oregonians about the dangers and risks associated with eating fish from particular areas of the Willamette.

Experts and Resources

Department of Human Services
 Drinking Water Program
 Attn: David Leland, Program Manager
 Portland State Office Building
 800 NE Oregon Street, Suite 611
 Portland, OR 97232-2162
 503-731-4010
david.e.leland@state.or.us
www.dhs.state.or.us/publichealth/

Water Quality Division,
 Department of Environmental Quality
 Attn: Michael Kortenhof, Manager,
 Surface Water Management Section
 811 SW 6th Ave
 Portland, OR 97204
 503-229-6066
kortenhof.mike@deq.state.or.us
www.deq.state.or.us

Oregon Environmental Council
 Attn: Teresa Huntsinger
 222 NW Davis St., Suite 309
 Portland, Oregon 97209
 503-222-1963, ext. 112
teresah@oeconline.org
www.oeconline.org

Willamette Riverkeeper
 Attn: Travis Williams
 49 SE Clay
 Portland, Oregon 97214
 503-223-6418
travis@willamette-riverkeeper.org
www.willamette-riverkeeper.org

Oregon State Public Interest Research Group
 Attn: Jeremiah Bauman
 1536 SE 11th Ave.
 Portland, OR 972041
 503-231-4181 ext. 313
jeremiah@ospirg.org
www.ospirg.org