Suspended Sediment and DDT in the Lower Yakima River Watershed: Progress Update

The Yakima River begins near the crest of the Cascade Range, and flows southeast for over 200 miles to join the Columbia River. The Yakima River is divided into "upper" and "lower" sections where the Naches River enters the Yakima River (at the city of Yakima). The lower Yakima River watershed is one of the most intensively irrigated and agriculturally diverse areas in the United States. During each growing season, a complex system of canals, ditches, and pipes delivers millions of gallons of water to crops throughout the watershed. Water that runs off cropland during irrigation often carries soil and pesticides to the river.

Why are we targeting the lower Yakima River watershed?

Earlier studies found that during a normal irrigation season, over 300 tons of sediment entered the lower Yakima River every day. Most of the sediment was topsoil eroded from

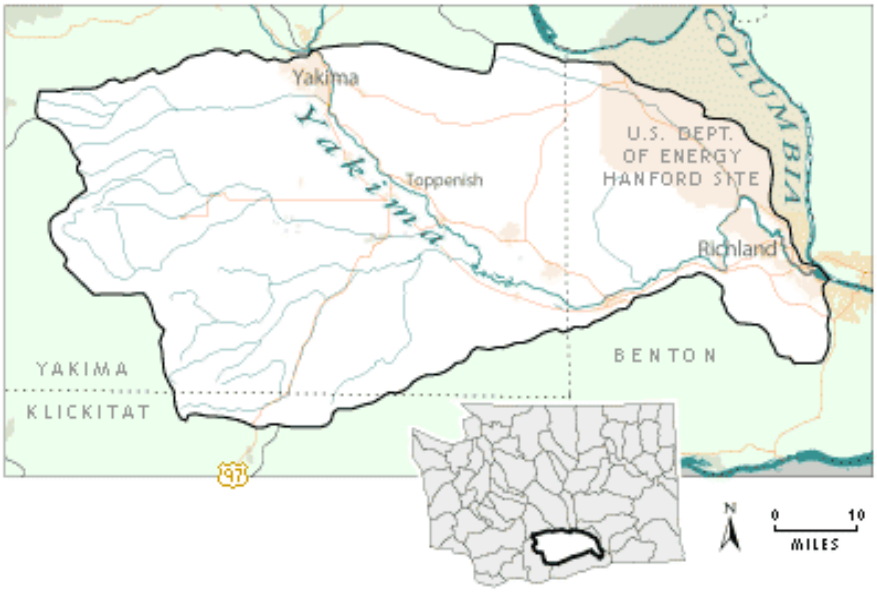

Figure 1: Lower Yakima River watershed

The lower Yakima River is much cleaner, but it still needs your help!

In the 1990s, scientists found that erosion from irrigated agricultural lands was polluting the lower Yakima River with suspended sediment, turbidity, and the pesticide DDT. By 2003, area farmers and others had significantly improved the river's water quality, mainly due to better irrigation practices and much hard work. Three of the four primary irrigation drains met interim water quality improvement goals, and all other sites showed major progress toward meeting these goals. Today, while the lower Yakima River and its tributaries are much cleaner than they were 10 years ago, they are not yet meeting all of the water cleanup requirements.

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irrigated farmlands. These sediments carry pesticides and other pollutants into the river, interfering with fish migration and spawning, and endangering critical fish habitat. Other studies showed that fish in the lower Yakima River had one of the highest concentrations of DDT in the nation.

In 1993, the Washington State Department of Health issued an advisory with a warning about eating large amounts of these fish. Because the river failed to meet water quality standards, the state requires a water quality improvement plan (also called a total maximum daily load plan or TMDL) under the federal Clean Water Act.

How do water quality standards help protect the uses of our waters?

The Department of Ecology (Ecology) sets water quality standards for streams in Washington State. The U.S. Environmental Protection Agency approves the standards. These standards protect the most sensitive uses of local waters.

In the lower Yakima River watershed, the most sensitive protected uses are salmonid spawning, rearing, and migration. The federal Endangered Species Act lists two types of Yakima River fish as "threatened": steelhead and bull trout. These fish require exceptionally clean water to live and thrive.

Why are we concerned about suspended sediments and DDT?

Suspended sediments can settle to the bottoms of rivers and creeks, covering spawning gravel, smothering fish eggs, and changing both the habitat and the types of food available for fish and other aquatic creatures. Sediment loads also interfere with irrigation withdrawals and delivery.

Turbidity, or cloudiness of the water, is associated with the amount of suspended sediment in the water. High turbidity can interfere with fish migration, feeding, and spawning. High turbidity also alters biological productivity by reducing the amount of light that penetrates the water and by increasing stream temperatures.

Certain pesticides, like DDT, attach to soil particles on the croplands where the pesticides were applied. Soil that erodes from these lands can carry the DDT into nearby streams.

Figure 2: Sulphur Creek in 1997. Sulfur Creek is a tributary to the lower Yakima River.

Figure 3: Sulphur Creek today.

Although banned in 1972, DDT does not break down easily in the environment. In areas where DDT was widely used, such as the Yakima Valley, it remains in river bottom sediments and continues to move through the food web. DDT is linked to cancer in humans and animals.

DDT can also weaken eggshells, lowering the rate of chick survival in wild birds. Finally, DDT can harm or kill aquatic insects—a critical food for many salmonid species.

What has happened so far to clean up the lower Yakima River?

In 1997, after years of study and public review, Ecology set water clarity targets for the irrigation returns and streams discharging to the lower Yakima River. These limits, set in five-year increments over 20 years, set goals for improving water clarity and reducing the amount of sediment and pesticides entering the river.

The Roza-Sunnyside Board of Joint Control (RSBOJC), comprised of the two largest irrigation districts in the lower Yakima River watershed, worked with local farmers and other landowners to develop a comprehensive Water Quality Policy that set specific on-farm turbidity targets. Many farmers voluntarily converted thousands of acres of cropland from erosive rill and furrow irrigation methods to less-erosive sprinkler and drip systems. Many other organizations also supported these efforts.

In 2003, Ecology conducted follow-up water quality monitoring to evaluate the success of the cleanup efforts. Results of the effectiveness monitoring showed that three of the four major agricultural drains, including Sulfur Creek, met the TMDL goals for turbidity. The sediment loads carried by the fourth drain had decreased by about 80 percent, even though this level did not meet the goals. The mainstem Yakima River was also cleaner, where levels of total suspended sediment had decreased from 50 to 70 percent.

What happens next?

Building on the successes of earlier years, Ecology is expanding the lower Yakima River watershed water quality improvement project. Ecology is now collecting data for a large study of various toxic chemicals in the entire Yakima River watershed (upper and lower). This new larger study will include an update of DDT levels in the watershed as well as an evaluation of several other banned compounds, including polychlorinated biphenyls (PCBs), chlordane, endosulfan, and so on.

Ecology has also recently collected new suspended sediment and turbidity data, which show that some of the earlier pollution reduction efforts may have regressed a bit. Ecology will continue to work with irrigators to encourage them to redouble their efforts and surpass their earlier achievements.