

Umpqua Basin TMDLs

What is a Total Maximum Daily Load (TMDL)?

Many waterbodies in Oregon do not meet water quality standards for various pollutants, including over a quarter of the Umpqua Basin's 5,000 miles of streams and rivers. Bacteria, temperature, nutrients, sedimentation, and several other parameters have been identified as problems for Umpqua Basin water quality. The Umpqua TMDL defines how much of each identified pollutant a river or stream in the Basin can receive and still meet water quality standards.

Background

The Umpqua Basin TMDLs deal with the violation of seven water quality parameters: bacteria, temperature, nutrients, sedimentation, chlorine, total dissolved gases and biological criteria. When waterbodies do not meet water quality standards, they are listed as impaired. The list is known as the 303(d) list, because it is based on that section of the federal Clean Water Act. When rivers or streams are listed, they receive a TMDL for the parameters where they do not meet water quality standards.

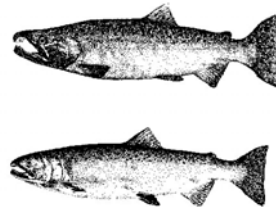
Bacteria TMDLs

High bacterial levels can impact the health of Oregon's citizens who recreate in the Umpqua's waters, and can restrict the harvest of shellfish from those waters. There is a standard for each of these concerns and the Umpqua Basin bacteria TMDLs address both aspects of the standard. Water quality will be restored when sources of bacteria pollution reduce their contribution to the targets identified in the TMDL. The reductions apply to wastewater treatment plants, as well as nonpoint sources. Nonpoint source refers to pollution that does not come from a

pipe, but is carried from the landscape in runoff. Various land uses affect nonpoint runoff.

Temperature TMDLs

DEQ's water quality standards are applied to protect the most sensitive beneficial uses in a waterbody. Numeric criteria in the temperature standard were developed to protect different aspects of the life stages of salmon and trout: spawning, rearing and migration.



Coho salmon
(*Oncorhynchus kisutch*)
Photo Courtesy Washington DFW

For point sources of heat such as wastewater treatment plants, waste load allocations have been developed that will allow increasing the temperature of the receiving stream no more than 0.1°C above the applicable criterion. For nonpoint sources, the load allocation is based on the development of system potential vegetation in the area adjacent to the waterbody, known as the riparian zone. System potential species and heights were determined by ecoregion, a geographic concept that takes into account climate, soils, slope, elevation and natural vegetation. When point sources achieve their waste load targets, and system potential vegetation is reached, temperature in the system will either achieve the numeric criteria or will be near the natural temperature for the system.



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Umpqua Basin 303(d) listed Streams (2002)



Nutrient TMDLs

Nutrient enrichment is the underlying cause for most of the Umpqua Basin's 303(d) listings for dissolved oxygen, pH, phosphorus and aquatic weeds/algae. High stream temperatures and water which has little natural capacity for nutrient assimilation due to the area's geology contribute to the problems. Both nonpoint and point sources contribute nutrients, but streams with wastewater treatment plants typically show the most impact, particularly in the late summer and fall.

For most of the stream listings, mathematical water quality models were used together with extensive instream data to determine the Loading Capacity for nutrients. Model results were used to develop wasteload allocations for the point sources and load allocations for nonpoint sources for achieving water quality standards in these systems.

Sediment Summary

Four North Umpqua subbasin streams were listed for sediment: Canton Creek, Little Rock Creek, Horseheaven Creek and Steamboat Creek, all in the Steamboat Creek Watershed. These four streams have been proposed for de-listing on the next 303(d) list based on data submitted by the Umpqua National Forest that indicates the criteria are being met. No TMDLs are proposed for these streams.

The South Umpqua Subbasin has three listings for excess sediment: Beaver Creek, Jackson Creek and the South Umpqua River. Extensive re-analysis of the data supporting the listings in light of recent scientific advances indicates that there is no clear evidence that sediment levels are impairing salmonid habitat or spawning. These streams will remain on the 303(d) list until criteria is established for sedimentation and additional data can be collected. TMDLs will be developed if deemed necessary at that time.

Chlorine TMDLs

The South Umpqua River and Cow Creek were both listed as water quality limited for violation of the chlorine standard. These violations were determined to result from discharges of wastewater treatment plants in the vicinity.

Analysis indicated that the problem could be addressed through provisions of the DEQ NPDES permits applicable to the wastewater treatment plants. Those permits have been renewed recently, and contain effluent limitations for chlorine. Since this will adequately address the listings, TMDLs and allocations are not necessary.

Biocriteria TMDLs

The Umpqua Basin has seven listings for Biological Criteria on six waterbodies. For each biocriteria listing, analysis indicated that the cause was likely heat or another pollutant which is being addressed elsewhere in the TMDL. Implementing the allocations for those causal pollutants is expected to result in a return to biocriteria conditions that meet standards. Because other measures are already identified to resolve the biocriteria problems, no additional allocations were developed for the biocriteria listings.

Diamond Lake

Diamond Lake, in the Umpqua National Forest, is listed for algae and pH, which have led to the overgrowth of *Anabaena flos-aquae*, a species of blue-green algae which produces toxins under certain conditions. Algae blooms during the summer, and most recently, the fall, have led to closures of the lake due to danger from the toxins.

Extensive studies have been conducted by the Umpqua National Forest, EPA, and DEQ. The studies identified the massive population growth of an invasive fish (Tui chub) as the source of the nutrients fueling the algae growth.

The proposed TMDL will restore water quality in the Lake through limitations on

biomass, implemented by removing or killing all fish in the lake, followed by limited stocking of sport fish by the Oregon Department of Fish and Wildlife. Continued monitoring will determine fish stocking levels. The treatment to remove all fish was implemented this past fall.

Total Dissolved Gases Summary

Four streams in the North Umpqua Subbasin, all within the PacifiCorp North Umpqua hydroelectric project, are listed for excess total dissolved gases related to operation of the turbines in the system. These problems have been addressed through the Clean Water Act Section 401 certification process required as part of the system's relicensing by the Federal Energy Regulatory Commission.

Water Quality Management Plan

The TMDL includes a Water Quality Management Plan (WQMP) designed to identify strategies and approaches for implementing the TMDLs. The WQMP identifies the Designated Management Agencies (local, state and federal government agencies with responsibility for addressing pollution problems), as well as proposed management strategies designed to meet the allocations in the TMDLs.

The WQMP also establishes a schedule for the submission of Implementation Plans, and incorporates voluntary action plans developed by the former Umpqua Basin Watershed Council (now known as Partnership for the Umpqua Rivers).

Public Process

The Umpqua Basin TMDLS have been developed over a course of many years and have involved extensive participation by the public during public meetings addressing various aspects of the TMDL process. In addition, a technical advisory committee representing basin stakeholders made many recommendations during the process that have greatly improved these TMDLs.

The public comment period on the draft Umpqua Basin TMDL opened February 21, 2006 and closed April 24, 2006. Informational meetings to present background on the technical and modeling components of the draft TMDLs were provided preceding the public hearings on March 9, 14, 16 and 21, 2006. Public hearings were held in Reedsport (March 30, 2006) and Roseburg (April 6, 2006).

Copies of the document were made available at various locations within the basin including the various Douglas County libraries, Douglas County Commissioner Offices, area Tribal and Watershed Councils as well as at the Roseburg, Eugene, Medford and Portland DEQ offices and on the internet.

DEQ received comments on the draft TMDLs from 21 parties including

Federal, State, County and City Officials; various stake holders; interest groups and private citizens.

DEQ summarized the issues raised, prepared responses and made revisions to the draft TMDL and WQMP. The Response to Comments document along with the comments and the modified TMDLs are included with the submittal to EPA.

For more information

For more information about the Umpqua Basin TMDLs, or to request a presentation for your group, please contact Paul Heberling, 541-440-3338, extension 224.

Alternative Formats

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