

Appendix Q

Umpqua Basin Report

1. Basin Description

The Umpqua Basin is in Southwestern Oregon and is one of only two Oregon rivers that extend from the Cascades to the Pacific Ocean, draining a varied landscape from steep-sloped uplands to low-gradient broad floodplain. The watershed basin boundary closely aligns with Douglas County’s political boundary. The Umpqua Basin itself is comprised of three subbasins: North Umpqua, South Umpqua, and the mainstem Umpqua. Within these three subbasins are 13 watersheds in the South Umpqua subbasin, 12 watersheds in the North Umpqua subbasin, and eight watersheds in the Umpqua subbasin. Watershed divides that delineate the basin are found at the crest of the High Cascade range to the east, in the Coast Range to the northwest and the Klamath Mountains to the south.

The headwaters of the North Umpqua River and the South Umpqua River are located in the Umpqua National Forest. The North Umpqua River flows generally west until it meets the South Umpqua downstream from Roseburg. The South Umpqua River flows west then north after its confluence with Cow Creek, a major tributary. After it flows through the Umpqua Valley, the South Umpqua meets the North Umpqua downstream of Roseburg. The mainstem Umpqua flows generally north then west where it enters the shellfish growing areas of Winchester Bay and then enters the Pacific Ocean.

Table Q-1: 2011 Land use and land cover for each subbasin in the Umpqua.

Subbasin	Watershed Area (km2)	% Urban/Roads	% Forest	% Cultivated	% Range/Forest Disturbance	%Other
North Umpqua	3558.417	1.1	77.6	2.9	17.3	1.2
South Umpqua	4665.559	3.1	67.7	5.9	22.6	0.7
Umpqua	3885.266	4.5	63.0	6.7	24.1	1.7

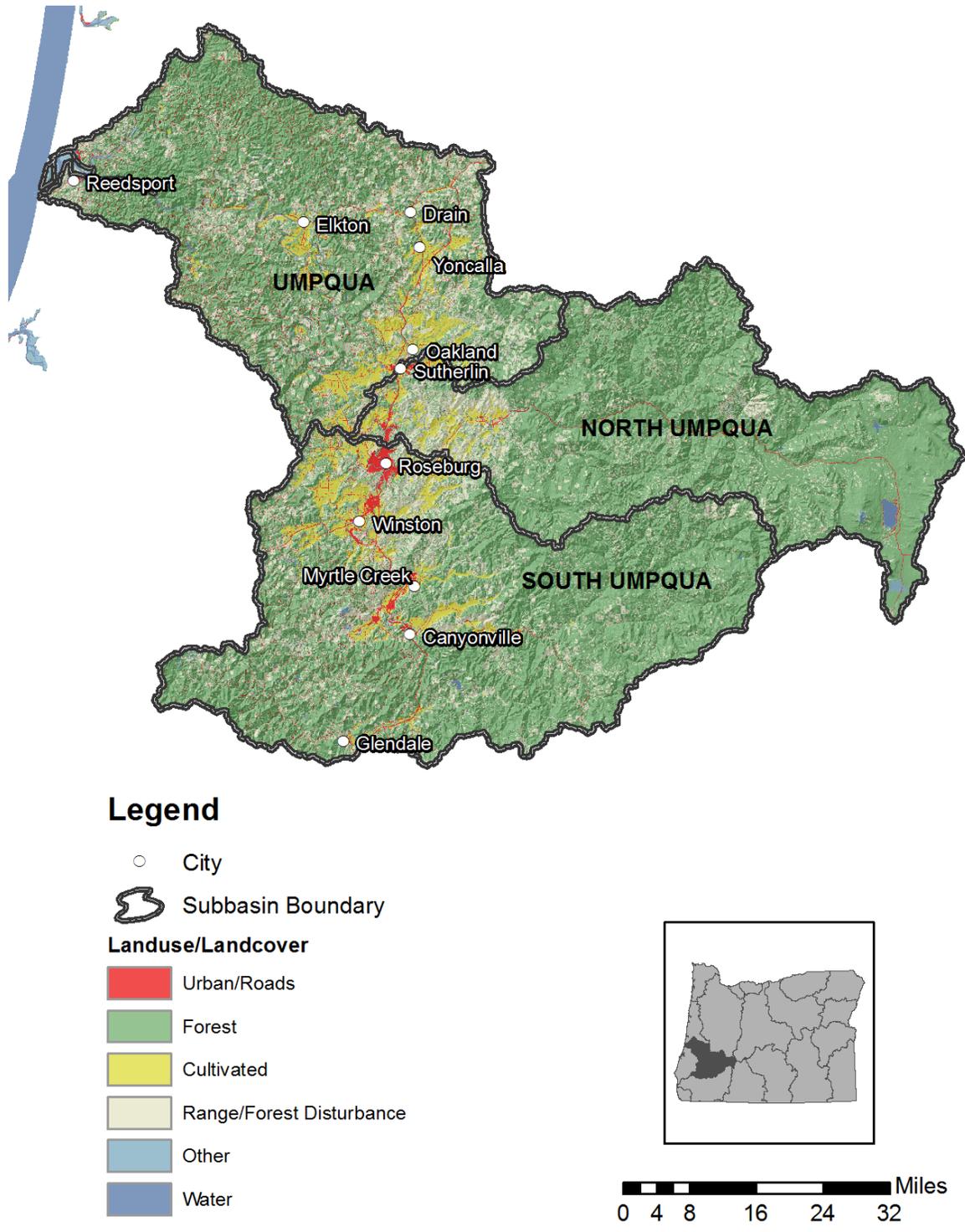


Figure Q-1: Land use in the Umpqua administrative basin.

1.1 Basin Contacts

Table Q-2: Oregon DEQ basin contact.

Administrative Area	DEQ Basin Coordinator
Umpqua Basin	David Waltz: 541-687-7345: waltz.david@deq.state.or.us
Umpqua Basin	Heather Tugaw: 541-776-6091: tugaw.heather@deq.state.or.us

2. Water Quality Impairments and TMDLs

2.1 Water Quality Impaired Stream Segments

Under Section 303(d) of the Clean Water Act, states, territories and authorized tribes must submit lists of impaired waters. Impaired waters are those that do not attain water quality standards or support all designated uses. The law requires that states establish priority rankings for waters on the lists and develop Total Maximum Daily Loads (TMDLs) for these waters. Table Q-3 identifies the number of Umpqua Basin waterbody segments impaired by parameter from the 2012 Integrated Report and the number of segments with approved TMDLs. Sources: [ODEQ](#), [USEPA](#)

Table Q-3: Number of impaired stream segments with and without a TMDL as identified in Oregon's 2012 Integrated Report and Assessment database.

Parameter	Segments without a TMDL	Segments with a TMDL
Ammonia	0	1
Aquatic Weeds Or Algae	5	3
Arsenic	6	0
Biocriteria	8	0
Biological Criteria	53	4
Cadmium	3	0
Chlorine	0	2
Chlorophyll a	0	1
Copper	4	0
Dissolved Oxygen	11	6
E. Coli	7	12
Fecal Coliform	0	9
Iron	6	0
Lead	3	0
Mercury	4	0
Nickel	1	0
pH	2	21

Parameter	Segments without a TMDL	Segments with a TMDL
Phosphorus	0	1
Sedimentation	5	4
Temperature	3	348
Total Dissolved Gas	0	1
Zinc	2	0

2.2 Total Maximum Daily Load Watershed Plans

The federal Clean Water Act requires that water pollutant reduction plans, called Total Maximum Daily Loads (TMDLs), be developed for water bodies that are listed in Category 5 of the Integrated Report (303(d) List). TMDLs describe the maximum amount of pollutants that can enter the river or stream and still meet water quality standards.

TMDLs take into account the pollution from major sources including discharges from industry and sewage treatment facilities, runoff from farms, forests and urban areas, and natural sources. TMDLs include a margin of safety to account for uncertainty, and may include a reserve capacity that allows for future discharges to a river or stream. DEQ typically develops TMDLs on a watershed, subbasin, or basin level and occasionally at the reach level depending on the type and extent of impairments.

The Water Quality Management Plan (WQMP) is the framework for TMDL implementation that is issued by Oregon along with the TMDL (Oregon Administrative Rules 340-042-0040(1)). The TMDL and WQMP serve as a multi-sector plan and provides the blueprint for TMDL related implementation activities. Table Q-4 lists the TMDLs that have been approved in the Umpqua Basin.

Table Q-4: Approved TMDLs in the Umpqua Basin and the impairments addressed by those TMDLs.

TMDL Document Name	Impairments Addressed
Little River Watershed TMDL	pH, Sedimentation, Temperature
Little River Watershed TMDL	pH, Sedimentation, Temperature
Umpqua Basin TMDL and WQMP	Algae, Bacteria (shellfish harvesting), Bacteria (water contact recreation), Dissolved Oxygen, pH, Temperature

3. Implementation Highlights

3.1 Section 319 Grants

Federal Section 319(h) funds are provided annually through the EPA to states for the development and implementation of each state’s Nonpoint Source Management Program. In Oregon a portion of 319 grant funding is “passed through” to support community or partner projects that address Oregon’s nonpoint source program priorities. Generally, DEQ requires grantees to report annually on the progress made implementing their grant project. This section highlights those outputs and accomplishments reported to DEQ in 2019. Note this section does not identify or include projects proposed and awarded a grant in

2019. Outputs and accomplishments for those projects will be reported to DEQ in future years once they have been implemented. For a listing of projects proposed and awarded a grant in 2019 see Section 3.6.2 of the main report.

In 2019 there were no 319 projects with reported outputs in the Umpqua.

3.2 Clean Water State Revolving Fund (CWSRF)

The Clean Water State Revolving Fund loan program provides below market rate loans to public agencies for the planning, design and construction of various projects that prevent or mitigate water pollution. Eligible agencies include federally recognized Indian tribal governments, cities, counties, sanitary districts, soil and water conservation districts, irrigation districts, various special districts and intergovernmental entities. DEQ partners with Oregon communities to implement projects that attain and maintain water quality standards, and are necessary to protect beneficial uses. This section highlights the ongoing projects and the outputs and accomplishments reported to DEQ in 2019.

In 2019 there were no nonpoint source related Clean Water State Revolving Fund projects with reported outputs in the Umpqua.

3.3 Source Water Protection Grants

The Oregon Health Authority regulates drinking water under state law and the Safe Drinking Water Act and works cooperatively with DEQ on source water protection efforts. Using the Drinking Water Revolving Loan Fund, OHA funds Source Water Protection Grants (up to \$30,000 per public water system) for source water protection activities, monitoring, and planning in Drinking Water Source Areas. In addition, loans are available for improving drinking water treatment, source water protection activities, or land acquisition in source areas. Oregon’s Infrastructure Finance Authority is responsible for administering these projects. The loan fund set-asides also fund five Drinking Water Protection positions at DEQ that provide technical assistance to public water systems and communities while they develop and implement strategies that reduce the risk within the delineated source water areas. This section highlights the ongoing projects and the outputs and accomplishments reported to DEQ in 2019.

In 2019 there were two nonpoint source related Drinking Water Source Protection program projects active that reported project outputs and accomplishments to DEQ. Combined the projects have a total budget of \$57,000. Table Q-5 describes the projects and the reported outputs.

Table Q-5: Nonpoint source Drinking Water Source Protection program projects and outputs for 2019.

Project Name	Grantee	Project Description	Reported Outputs
Glide Geomorphic Roads Analysis and Inventory for Forest Roads Partnership	Glide Water Association (00326)	Prioritize forest roads for turbidity reduction repair work to improve water quality in Glide Water Association’s drinking water source area. Collected GRAIP data and purchased and installed a bench top turbidimeter to evaluate raw water quality in watershed.	In collaboration with USFS Umpqua National Forest, Prioritize forest roads for turbidity reduction repair work. Collected GRAIP data and purchased and installed a bench top turbidimeter to evaluate raw water quality in watershed. Project completed 10/8/19.

Project Name	Grantee	Project Description	Reported Outputs
Riparian Zone Security Improvements at North Umpqua River Intake	Glide Water Association (00326)	Reduce/eliminate human activities in the area that contribute sediment, fecal matter, and garbage to the river upstream of Glide Water Association's drinking water intake. Includes installation of security fencing, locking gates and signage to discourage entrance to the sensitive area and educate people that this is a drinking water supply.	Reduced/eliminated human activities in the area surrounding the public water supply intake by installing security fencing, locking gates and adding signage to discourage entrance to the sensitive area and educate people that this is a drinking water supply. This work reduces human impacts that contribute sediment, fecal matter, and garbage to the river and was done in conjunction with the property owner (Glide School District).

3.4 Drinking Water Provider Partnership Grants

Oregon DEQ participates in the Drinking Water Providers Partnership (DWPP) with USDA Forest Service Region 6, EPA Region 10, the U.S. Bureau of Land Management OR/WA Office, the Washington Department of Health, Geos Institute and WildEarth Guardians. Together, these partners coordinate a competitive grant solicitation and award program for environmental conservation and restoration projects in municipal watersheds across the Northwest. The Drinking Water Providers Partnership made the first of the annual awards in 2016 and most projects have a focus on nonpoint sources of pollution. The goal of the Partnership and the funding is to develop and support local partnerships to restore and protect the health of watersheds which communities depend upon for drinking water while also benefiting aquatic and riparian ecosystems, including the native fish that inhabit them. This section highlights the ongoing projects and the outputs and accomplishments reported to the DWPP in 2019.

In 2019 there were four Drinking Water Providers Partnership projects active that reported project outputs and accomplishments to the DWPP. Combined the projects have a total budget of \$118,000. Table Q-6 describes the projects and the reported outputs.

Table Q-6: Drinking Water Providers Partnership projects and outputs for 2019.

Project Name	Grantee	Project Description	Reported Outputs
Callahan Creek Restoration	South Umpqua Rural Community Partnership	The South Umpqua Rural Community Partnership and Umpqua National Forest will replace a failing 5 foot diameter culvert on Forest Road 3230 that is at risk of failing and delivering an estimated 900 cubic yards of fill to the river. The culvert will be replaced with a properly sized fish passage crossing structure. The drinking water grant money will be used to	This project was completed in 2019 and included all work required for designing a replacement for the failing culvert. The partners obtained additional funding for the implementation and a construction contract has been awarded (\$400K). The larger project (no DW money involved) is planned for completion in Fall 2020.

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Project Name	Grantee	Project Description	Reported Outputs
		complete the design for the culvert replacement in preparation for seeking funding for the larger effort of implementation.	
Upper South Umpqua Aquatic Habitat Improvement Project Phase VI	South Umpqua Rural Community Partnership	The South Umpqua Rural Community Partnership is collaborating with the USFS Tiller Ranger District to complete the multi- year Emerson Bridge project. The old bridge’s pressure-treated decking leached creosote into the river, upstream of Tiller’s water supply and created a nick point in the river, degrading fish habitat. This final phase of the project will remove the former road segments and plant native riparian vegetation at the old crossing site. Objectives: Removal of a culvert that is currently a total barrier to aquatic organism passage; decommission 0.5 miles of paved road within riparian reserves; construct a small 0.06 acre wetland on an old compacted log landing; and provide environmental education opportunities for elementary school students. This project will complete Essential Project #1 in the Skillet-Emerson WRAP.	Project completed in 2019. In 2019 partners placed 8 logs, and another 7 logs with rootwads attached (26" - 80" dbh; 43’ to 127’ long) in a debris jam just upstream of the rock outcrop used for the old bridge. Additional work completed includes road decommissioning, wetland development, and outreach/education.
Steamboat Creek Roads: Sediment Analysis and Inventory using GRAIP	Umpqua National Forest	The Umpqua National Forest is systematically identifying roads that are at an elevated risk of mass wasting or are actively contributing sediment to streams in Steamboat Creek. By pinpointing the highest risk areas, the partners can prioritize their road maintenance, stream crossing, and decommissioning activities to have the greatest benefit to fish habitat and water quality for Glide Water Association	In 2019 Glide Water Association purchased an online turbidity meter to track implementation effectiveness. In August 2019, Glide Water Association and Umpqua National Forest (USFS) agreed to terminate the use of OHA grant money for this project. The rest of this Phase II DWPP project will be implemented by USFS in Summer 2020 in coordination with ODFW. Umpqua National Forest will send a completion

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Project Name	Grantee	Project Description	Reported Outputs
		<p>and other downstream towns. Glide Water will purchase turbidity monitoring equipment and begin regular use to track project effectiveness. Beyond this project, the Umpqua National Forest plans on implementing projects to treat areas with elevated risk, and estimates they can reduce the amount of sediment runoff from entering our drinking water source by half.</p>	<p>report once the project is finished.</p>
<p>Steamboat Creek Roads: Sediment Abatement on Forest Roads. Phase II of Geomorphic Roads Analysis</p>	<p>Umpqua National Forest</p>	<p>With previous years' DWPP funds, the Umpqua National Forest and Glide Water Association performed a sediment source inventory and analysis on roads within the Steamboat Creek drainage using the Geomorphic Roads Analysis and Inventory Package developed by the Rocky Mountain Research Station. In 2019, they will correct the road sites most contributing sediment to Steamboat Creek by improving drainages and road surfaces at those locations.</p>	<p>Project was completed in 2019. 2019 tasks included collection of GRAIP data from additional roads in the watershed for a total of over 160 miles for the project. Based off the collected data the USFS pinpointed key areas that have high sediment runoff leading into streams. In addition, the project funds were used to purchase a benchtop turbidimeter for regular turbidity sampling by the City. Future outputs beyond this project: The Umpqua National Forest proposes to treat these areas by installing cross drain culverts prior to stream crossings which will reduce the volume of sediment delivered into streams from road ditches. They also plan to shape the road surfaces to have the runoff drain onto the forest floor instead of draining into nearby streams.</p>



Figure Q-2: Example of significant sediment delivery site identified in Glide's drinking water source area due to stream crossing failure and stream diversion. Photo Credit: Mark Sommer, USFS.



Figure Q-3: Emerson Bridge Site After Large Wood Placement. Photo Credit: Calib Baldwin, USFS.

3.5 OWEB Grant Funded Projects

The Oregon Watershed Enhancement Board (OWEB) is a state agency that provides grants to help Oregonians take care of local streams, rivers, wetlands, and natural areas. These grant projects often address nonpoint sources of pollution and are thus included in this report.

Based on the most recent data available in OWEB’s Oregon Watershed Restoration Inventory (OWRI) database, there were 114 OWEB funded projects completed in 2018 with a total cash and in-kind budget of \$1,396,333. The tables below summarize reported outputs for different project activities in each Umpqua subbasin.

Learn more about OWEB grant programs at <https://www.oregon.gov/OWEB/grants/Pages/grant-programs.aspx>.

Table Q-7: Summary of OWEB grant funded fish passage projects completed in 2018, the most recent year data is available in the OWEB OWRI database.

Subbasin	Fish Passage Crossing improvement (Number of treatments)
North Umpqua	1

Table Q-8: Summary of OWEB grant funded instream projects completed in 2018, the most recent year data is available in the OWEB OWRI database.

Subbasin	Instream habitat: Boulder placement (Number of treatments)	Instream habitat: Large wood placement (Number of treatments)
South Umpqua	NA	222
Umpqua	2348	2198

Table Q-9: Summary of OWEB grant funded riparian projects completed in 2018, the most recent year data is available in the OWEB OWRI database.

Subbasin	Voluntary riparian tree retention (Acres)	Voluntary riparian tree retention (Miles)
Umpqua	128.7	20.2

Table Q-10: Summary of OWEB grant funded riparian projects completed in 2018, the most recent year data is available in the OWEB OWRI database.

Subbasin	Livestock stream access/crossing created or improved (Area treated)
Umpqua	0.1

Table Q-11: Summary of OWEB grant funded riparian projects completed in 2018, the most recent year data is available in the OWEB OWRI database.

Subbasin	Riparian invasive plant control (Length of treatment)
South Umpqua	0.7

Table Q-12: Summary of OWEB grant funded road projects completed in 2018, the most recent year data is available in the OWEB OWRI database.

Subbasin	Peak flow passage improvement (Number of treatments)	Surface drainage improvement (1 station or 100 Feet)	Surface drainage improvement (Number of treatments)
North Umpqua	NA	210.0	NA
Umpqua	1	67.1	11

Table Q-13: Summary of OWEB grant funded upland projects completed in 2018, the most recent year data is available in the OWEB OWRI database.

Subbasin	Upland invasive plant control (Area treated)	Upland vegetation planting (Area treated)
South Umpqua	3	3
Umpqua	15	NA

3.6 TMDL Implementation Highlights

TMDL implementation actions taken by Designated Management Agencies (DMAs) or third parties are described in the table below. Most of these actions were summarized from annual reports submitted by DMAs to DEQ in calendar year 2019.

Table Q-14: TMDL implementation activities reported in 2019 by Designated Management Agencies or third parties.

TMDL	DMA	Reported Actions
Diamond Lake and Lake Creek Aquatic Weeds, Dissolved Oxygen and pH TMDL	ODFW	The ODFW stocked 321,404 Rainbow trout fingerlings in the spring of 2019. Additionally 5,621 Brown trout and 15,040 Tiger trout were stocked. Both Brown and Tiger trout stocked are sterile. Macro-invertebrate sampling was conducted. Processing and analysis of samples is still in progress (3/12/2020). Summer trap netting was conducted to monitoring and remove non-native cyprinids. Trapping efforts removed 1 Tui chub and 45,849 Golden shiners from Diamond Lake.
Diamond Lake and Lake Creek Aquatic Weeds, Dissolved Oxygen and pH TMDL	U.S. Forest Service	The Forest Service has monitored water quality conditions in Diamond Lake and Lake Creek through an agreement with the Center for Lakes and Reservoirs at Portland State University (PSU). In 2019 two monitoring events were completed by PSU. The Diamond Lake Health Monitoring Index (HMI) is used as an indicator of water quality. The HMI includes water quality parameters that reflect the metabolic, primary producer, and secondary producer components of water quality important in Diamond Lake. Parameters measured in situ in Diamond Lake and Lake Creek were made using a multi parameter data sonde and included pH, temperature, specific conductance and dissolved oxygen. Water samples in Diamond Lake were collected and analyzed for chlorophyll-a, phytoplankton, zooplankton, total nitrogen, total phosphorus, nitrate, ammonia nitrogen and silicon. Secchi depth measurements were made by Forest Service staff and during PSU monitoring events.

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TMDL	DMA	Reported Actions
Umpqua Basin Temperature TMDL	U.S. Forest Service	Temperature monitoring (53) locations on three districts); monitoring long term trends, implementation of forest management plans and projects that include stream or riparian protection/restoration and watershed action plans that identify restoration opportunities.