Appendix R
Willamette Basin Report

1. Basin Description

The mainstem Willamette River begins where the Coast Fork and Middle Fork Willamette meet. It flows north to the Columbia River, adding stream flows of 12 subbasins that together comprise the Willamette Basin. The basin encompasses the Willamette Valley, the west slope of the Cascades Range, and the east slope of the Coast Range. There are about 187 river miles on the mainstem Willamette, 193 additional miles of side channels, and 21,317 miles of perennial tributaries, on which there are 13 major water storage reservoirs. These streams support the richest native fish fauna in the state as well as federally listed threatened or endangered species including spring Chinook salmon and summer steelhead trout.

The predominant land use surrounding Willamette streams and rivers is forest with about 60 percent of stream length. Roughly 30 percent of stream miles are in agricultural land use and about 10 percent are in urban areas. The upper reaches of the watershed are mostly federal lands in national forests or the checkerboard ownership of the Bureau of Land Management. While forestry use is active from the higher elevations to the foothills, agriculture represents the largest category of land use in the lowlands. About 66 percent of Oregon's population lives in the Willamette Basin.

Lower Wilamette Subbasin The Lower Willamette Subbasin is in the northernmost portion of the Willamette Basin and is drained by the Willamette River, Multnomah Channel and tributaries. The subbasin's 408 square miles extend from the divides shared with the Sandy and Clackamas subbasins in the Cascade foothills on the east, across the Willamette River to the Tualatin divide on the west, north to the town of St. Helens and south to Willamette Falls at river mile 26.6. The southeastern portion of the subbasin drains directly to the Willamette River and contains the majority of the Portland metropolitan area, while the northwestern portion generally drains rural and agricultural lands through tributaries that discharge to the Multnomah Channel.

The Lower Willamette Subbasin includes the Columbia Slough, which is a 19-mile long complex of channels on the floodplain of the Columbia River between Fairview Lake on the east and the Willamette River at Kelley Point Park on the west. The Columbia Slough Watershed drains approximately 51 square miles of land. Fairview Creek, which drains to Fairview Lake, also lies within the geographic boundary of the Columbia Slough Watershed.

Most of the subbasin is privately owned, with scattered parcels in the northwest portion owned by the U.S. Forest Service and state wildlife refuge lands in the lowlands surrounding Sturgeon Lake. Land use is primarily urban, forestry and agriculture. Waterbodies within the Lower Willamette foster salmon and trout rearing, and several reaches of the Lower Willamette watershed, such as Scappoose and Milton Creek watersheds in the northwestern part of the Lower Willamette and Johnson and Crystal Springs creeks in the southeastern part of the watershed have active salmon and steelhead spawning.

Clackamas Subbasin The Clackamas River and tributaries drain the Clackamas Subbasin (Hydrologic Unit Code 17090011), in the Willamette Basin. The subbasin's 940 square miles extend from the Mt. Hood National Forest northwest to the Willamette River and include portions of Clackamas and Marion Counties, a small portion of the Confederated Tribes of the Warm Springs Reservation, and the cities of Oregon City, Gladstone, Sandy and Estacada. The subbasin also contains the smaller communities of Damascus and Boring. The Clackamas River provides drinking water for approximately 175,000 people in Clackamas County, the metropolitan area and Estacada. The U.S. Forest Service manages most of the 72 percent of the subbasin that is publicly owned; the Bureau of Land Management manages about 2 percent of land in the subbasin, usually in portions smaller than one square mile.

Approximately 25 percent of land in the Clackamas Subbasin, mostly in the lower watershed, is privately owned. Timber companies own private land within and outside of the Mt. Hood National Forest boundaries, and Pacific Gas and Electric owns land associated with its hydropower facilities. Individual, commercial and industrial land owners operate in the lower watershed.
Forestry is the dominant land use by area, although much of the land in the upper watershed is protected to varying degrees from timber harvest. The Clackamas Subbasin contains two wilderness areas; the Bull of the Woods Wilderness Area protects 34,900 acres in the Collawash and Hot Springs Fork of the Collawash drainages, and the Salmon Huckleberry Wilderness Area protects 44,600 acres, including a portion of the Eagle Creek drainage. Approximately 50 miles of the Clackamas River, and 14 miles of the Roaring River, are designated Federal Wild and Scenic Rivers. The Clackamas River designation extends from Big Spring, in the Olallie Lake Scenic Area, to Big Cliff, just upstream of North Fork Reservoir. Commercial and industrial land use is concentrated near the mouth of the Clackamas River, as well as in and around smaller urban areas and along major transportation corridors. Agricultural production consumes much of the lower third of the watershed.

Tualatin The Tualatin River drains an area of 712 square miles of the Tualatin Subbasin. The headwaters are in the Coast Range and flow in a generally easterly direction to the confluence with the Willamette River. The subbasin lies almost entirely within Washington County. There are also small portions of the sub-basin in Multnomah, Clackamas, and Yamhill, Tillamook and Columbia counties. The Tualatin River is approximately 83 miles in length and has a very flat gradient for most of its length. There is a reservoir-like section between river mile 24 and 3.4. Major tributaries to the Tualatin River include: Scoggins, Gales, Dairy (including East Fork, West Fork, and McKay Creeks), Rock (including Beaverton Creek), and Fanno Creeks. Summer flow is supplemented with releases of water from Hagg Lake (Scoggins Reservoir) on Scoggins Creek and from Barney Reservoir, located on the Trask River, which diverts water into the upper Tualatin River.

The subbasin supports a wide range of forest, agriculture and urban related activities The urban area, which makes up approximately 26% of the basin, is rapidly growing and includes the cities of Banks, Beaverton, Cornelius, Durham, Forest Grove, Gaston, Hillsboro, King City, Lake Oswego, North Plains, Sherwood, Tigard, Tualatin, West Linn and portions of Portland. Agricultural land use makes up approximately 35% of the basin with forestry land use making up the remaining 39%. Approximately 92% of the basin is in private ownership with state and federal lands making up the remaining eight percent.

Molalla-Pudding Subbasin The Molalla-Pudding subbasin is in the northeastern portion of the middle Willamette Basin. The Molalla River flows into the Willamette River between river miles 35 and 36. The Molalla River drains approximately 878 square miles of which the Pudding River drains approximately 530 square miles. The Pudding River flows into the Molalla River at approximately 0.7 miles upstream of the Molalla River's confluence with the Willamette River. The topography, surficial geology, stream channel characteristics, and land use are distinct between the Molalla River and Pudding River portions of the subbasin. The Molalla-Pudding subbasin is within Clackamas and Marion Counties, and includes the cities of Woodburn, Mt. Angel, Silverton, Canby, Molalla, Hubbard, Gervais, Aurora, Brooks, Barlow, Colton, Scotts Mills and portions of Salem, Keizer, Donald and Wilsonville. Most land in the Molalla-Pudding Subbasin is privately owned. The Bureau of Land Management administers the largest portion of public land in the subbasin, including Oregon and California railroad lands. The U.S. Forest Service manages comparatively little land in the far eastern and southeastern portions of the subbasin. The largest portion of state-managed land is Silver Falls State Park, in the south central portion of the subbasin.

Agriculture and forestry land uses predominate in the subbasin. Agriculture is most common in the lower elevation and western portions of the subbasin. Forestry land use occurs mainly in the eastern portion of the subbasin. Urban land use is concentrated around the cities of Woodburn, Silverton, Mt. Angel, Canby

and Molalla. Urban land use associated with the larger cities of Salem and Keizer occurs in the southwestern corner of the subbasin. In general, agricultural watersheds with the highest crop diversity are those in the northern part of the basin. In the northern part of the basin row crops, berries, orchards, nurseries, and vineyards are common, whereas in the southern part of the basin grass seed and other seed crops predominate.

Yamhill Subbasin The Yamhill Subbasin (Hydrologic Unit Code 17090008)is located in the Western portion of the Willamette Basin and drains portions of the Coast Range. The Yamhill River flows into the Willamette River just upstream of the City of Newberg. The Subbasin's 772 square miles (493,762 acres) include the following eight watersheds:

- Willamina Creek Watershed
- Agency Creek-South Yamhill River Watershed
- Mill Creek Watershed
- Deep Creek-South Yamhill River Watershed
- Salt Creek Watershed
- North Yamhill River Watershed
- Yamhill River Watershed

The subbasin is within portions of Yamhill and Polk counties, and includes the Cities of Amity, Carlton, Dayton, Lafayette, McMinnville, Sheridan, Willamina, and Yamhill. The subbasin is primarily owned by private landowners, however federal and state ownership accounts for 14% of the total land use in the subbasin. There are scattered landholdings by the U.S. Forest Service and Bureau of Land Management. The subbasin consists of forestry, agriculture and urban land uses.

Middle Willamette Subbasin The Middle Willamette Subbasin, Hydrologic Unit Code (HUC) 17090007, includes the Willamette River from Willamette Falls at river mile 26.6 to river mile 108, near the Santiam River. It is located in the northwest portion of the Willamette Basin and drains parts of the Cascade foothills from the east and the Coast Range from the west. The Willamette River longitudinally divides the subbasin with several medium to large tributaries and many smaller tributaries throughout its length. The 698 square miles (446,718 acres) of the subbasin have been divided among the following four watersheds:

- Rickreall Creek Watershed
- Mill Creek Watershed
- Chehalem Creek-Willamette River tributaries Watershed
- Abernethy Creek-Willamette River tributaries Watershed

The political jurisdictions within the subbasin include portions of Marion, Polk, Yamhill, Clackamas, and Washington Counties. There are fifteen incorporated cities: Stayton, Turner, Oregon City, Wilsonville, Newberg, Canby, Dundee, Donald, Saint Paul, Keizer, Salem, Dallas, Independence, Monmouth, Aumsville, Sublimity, and a portion of West Linn. The subbasin is almost entirely in private land ownership. Land uses are primarily agriculture, forestry, and urban. However there are small, scattered areas of public land managed by the Bureau of Land Management and the State of Oregon.

South Santiam Subbasin The South Santiam Subbasin (Hydrologic Unit Code 17090006) is located in the eastern portion of the Willamette Basin and drains the Cascade foothills. The South Santiam River flows into the Santiam River just upstream of the City of Jefferson. The Subbasin's 1,041 square miles (666,237 acres) include the following eight watersheds:

- Headwaters Middle Santiam River Watershed
- South Santiam River Watershed, downstream of Canyon Creek
- Quartzville Creek Watershed
- South Santiam River-Foster Reservoir Watershed
- Wiley Creek Watershed
- Crabtree Creek Watershed
- Thomas Creek Watershed
- Hamilton Creek-South Santiam River Watershed

The subbasin includes portions of Linn County, and the Cities of Scio, Sweet Home, Waterloo, and portions of Lebanon and Sodaville. The subbasin is primarily owned by private landowners, however federal and state ownership accounts for 30 to 40% of the total land use in the subbasin. There are scattered landholdings by the U.S. Forest Service and Bureau of Land Management. The subbasin consists of forestry, agriculture and urban land uses.

North Santiam Subbasin The North Santiam Subbasin (Hydrologic Unit Code 17090005) is located in the eastern portion of the Willamette Basin and drains the Cascade Range. The North Santiam River flows into the Santiam River just upstream of the city of Jefferson. The Santiam River drains into the Willamette River at river mile 109. The Subbasin's 764 square miles (488,958 acres) includes the following six watersheds:

- Breitenbush River Watershed
- Headwaters North Santiam River Watershed
- Upper North Santiam River Watershed
- Middle North Santiam River Watershed
- Little North Santiam River Watershed
- Lower North Santiam River Watershed

The subbasin's political jurisdiction is within Linn and Marion County, and includes the Cities of Jefferson, Marion, Stayton, Sublimity, Lyons, Mehama, Mill City, Gates, Detroit, and Idanaha. A small portion of the upper subbasin is located within the Confederated Tribes of Warm Springs Reservation. Land ownership in the subbasin is almost equally shared by both private and public landowners. The United States Forest Service dominates public ownership, but there are also scattered parcels of lands managed by the Bureau of Land Management and the U.S. Army Corps of Engineers throughout the subbasin. The subbasin is primarily forest land, with agricultural land use mainly occurring downstream of the Little North Santiam River Watershed.

Upper Willamette Subbasin The Upper Willamette Subbasin (Hydrologic Unit Code 17090003) is located in the southwest portion of the Willamette Basin with tributaries that flow to the Willamette River. The subbasin's 1,861 square miles (1,190,770 acres) extend from the foothills of the Cascade Mountains on the east to the Coast Range foothills on the west. The subbasin includes the following six watersheds:

- Long Tom River Watershed
- Marys River Watershed
- Upper Calapooia River Watershed
- Lower Calapooia River Watershed
- Luckiamute River Watershed
- Muddy Creek-Willamette River Watershed

The subbasin includes portions of Lane, Linn, Benton, and Polk Counties. The following cities are within the Upper Willamette Subbasin: Adair Village, Albany, Brownsville, Coburg, Corvallis, Eugene, Falls City, Halsey, Harrisburg, Junction City, Lebanon, Millersburg, Monroe, Philomath, Sodaville, Springfield, Tangent, and Veneta. The subbasin is owned almost entirely by private land owners. However, the U.S. Bureau of Land Management, United States Forest Service and the State of Oregon own a small portion of the subbasin, Map 10.2. The land use is primarily agriculture in the low-land valley, scattered urban developments in the valley, and forestry in the upper subbasin.

McKenzie Subbasin The McKenzie Subbasin (Hydrologic Unit Code 17090004) is located in the southeast portion of the Willamette Basin with tributaries that flow to the Willamette River at river mile 171.8. The subbasin's 1,338 square miles (856,466 acres) extend from the Cascade Mountains on the east to the Willamette River. The subbasin includes the following seven watersheds:

- Horse Creek Watershed
- Headwaters McKenzie River Watershed
- South Fork McKenzie River Watershed
- Blue River Watershed
- Quartz Creek-McKenzie River Watershed
- Mohawk River Watershed
- Lower McKenzie River Watershed

The subbasin boundaries includes portions of Lane and Linn counties. The city of Springfield is the largest city in the subbasin, however there are many smaller communities within the McKenzie Subbasin: Thurston, Walterville, Deerhorn, Nimrod, Leaburg, Rainbow, Marcola, Leaburg, Vida, and McKenzie Bridge. The subbasin is owned by numerous private land owners, however the Bureau of Land Management owns a small portion of the land downstream of Cougar and Blue River reservoirs, and the United States Forest Service primarily owns the land upstream of Cougar Reservoir and Blue River Reservoir. The land use is primarily forestry. The lower watershed valley floodplain is owned by private landowners, and agricultural, commercial and residential development is dominant.

Coast Fork Willamette Subbasin The Coast Fork Willamette Subbasin (Hydrologic Unit Code 17090002) is located in the southern most portion of the Willamette Basin. The Coast Fork Willamette River flows into the Willamette River at the confluence of the Middle Fork Willamette River. The subbasin's 666 square miles (426,238 acres) include the following four watersheds:

- Mosby Creek Watershed
- Row River Watershed
- Upper Coast Fork Willamette River Watershed
- Lower Coast Fork Willamette River Watershed

The subbasin is located within portions of Lane and Douglas Counties, and includes the cities of Cottage Grove and Creswell. The U.S. Forest Service and Bureau of Land Management administer much of the upland area, but most of the land in the subbasin is privately owned. The land use is primarily forestry, with agriculture and urban land uses near the mainstem Coast Fork Willamette River. The Coast Fork Willamette River and the Row River are a source of drinking water for the City of Cottage Grove.

Middle Fork Willamette Subbasin The Middle Fork Willamette Subbasin (Hydrologic Unit Code 17090001) is located in the south eastern portion of the Willamette Basin and drains the Cascade Range. The Middle Fork Willamette River flows into the Willamette River at its mouth at river mile 186. The Subbasin's 1,355 square miles (867,110 acres) include the following 10 watersheds:

- Headwaters Middle Fork Willamette River Watershed
- Hills Creek Watershed
- Salt Creek Watershed
- Salmon Creek Watershed
- Hills Creek Reservoir Watershed
- North Fork of Middle Fork Willamette Watershed
- Lookout Point Reservoir Watershed
- Little Fall Creek Watershed
- Fall Creek Watershed
- Pudding Creek Watershed

The subbasin is located within Lane and Douglas Counties, and includes the cities of Lowell, Hemlock, Oakridge, and a portion of Springfield. The subbasin is dominated by forested land use with some agriculture and residential land use near the mouth of the subbasin. Ownership is about 85% Federal, most of that managed by the Willamette National Forest (USFS) and the Bureau of Land Management Eugene District. Small, private landholders and industrial timber companies operate throughout the remainder of the subbasin.

The Middle Fork Willamette Subbasin has four man-made reservoirs, Fall Creek Reservoir, Dexter Reservoir, Lookout Point Lake, and Hills Creek Lake. Waldo Lake, located in the North Fork of the Middle Fork Willamette watershed, is the only large natural lake in the subbasin. The subbasin provides habitat for bull trout, spring Chinook, summer steelhead and winter steelhead. There are two real-time USGS flow monitoring stations in the subbasin, Middle Fork Willamette River near Dexter and Middle Fork Willamette River at Jasper.

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

Subbasin	Watershed Area (km2)	% Urban/Roads	% Forest	% Cultivated	% Range/Forest Disturbance	%Other
Clackamas	2441.682	3.6	75.2	6.7	13.7	0.7
Coast Fork Willamette	1726.141	3.4	64.6	7.9	23.2	0.9
Lower Willamette	1060.847	45.3	27.7	10.8	9.4	6.9
McKenzie	3468.167	1.3	75.5	2.1	17.1	3.9
Middle Fork Willamette	3540.459	1.0	78.6	2.0	15.4	3.0
Middle Willamette	1841.474	19.9	17.3	53.3	6.7	2.9
Molalla-Pudding	2267.505	6.6	39.2	37.2	16.5	0.6
North Santiam	1979.340	2.2	70.3	9.2	15.8	2.5
South Santiam	2696.156	1.9	59.1	14.0	23.9	1.2
Tualatin	1835.950	22.1	32.9	26.6	17.2	1.1
Upper Willamette	4850.165	11.1	31.1	39.3	16.3	2.2
Yamhill	1998.608	6.6	38.8	34.3	19.4	1.0

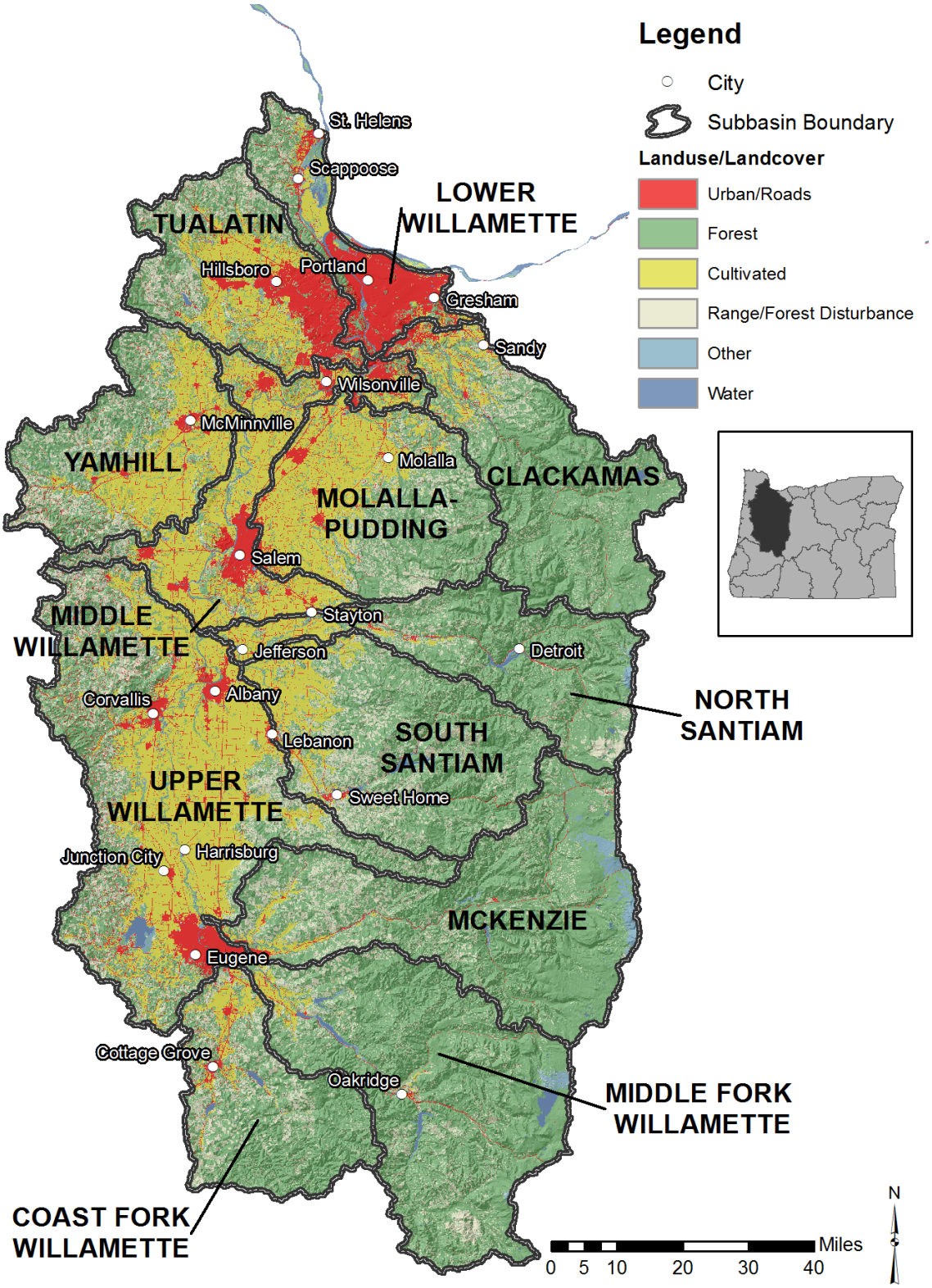

Figure R-1: Land use in the Willamette administrative basin.

1.1 Basin Contacts

Table R-2: Oregon DEQ basin contact.

Administrative Area	DEQ Basin Coordinator
Clackamas Subbasin	Kristi Asplund: 503-229-6254: asplund.kristi@deq.state.or.us
Coast Fork, McKenzie, Middle Fork Willamette, and South Santiam Subbasins	Priscilla Woolverton: 541-687-7347: woolverton.priscilla@deq.state.or.us
Lower Willamette Subbasin	Andrea Matzke: 503-229-5350: matzke.andrea@deq.state.or.us
Middle Willamette Mainstem, North Santiam, Pudding, and Yamhill Subbasins	Nancy Gramlich: 503-378-5073: gramlich.nancy@deq.state.or.us
Tualatin Subbasin	Brian Creutzburg: 503-229-5046: creutzburg.brian@deq.state.or.us
Coast Fork, McKenzie, Middle Fork Willamette, South Santiam Subbasins, Middle Willamette Mainstem, North Santiam, Pudding, and Yamhill Subbasins	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 R-3 identifies the number of Willamette Basin waterbody segments impaired by parameter from the 2012 Integrated Report and the number of segments with approved TMDLs. Sources: ODEQ, USEPA

Table R-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
4,4´-DDE	7	2
4,4´-DDT	4	4
Aldrin	3	0
Ammonia	2	5
Aquatic Weeds	12	0
Aquatic Weeds Or Algae	17	4
Arsenic	11	0

Parameter	Segments without a TMDL	Segments with a TMDL
Biological Criteria	92	3
Chlordane	1	1
Chlorophyll a	4	11
Chlorpyrifos	7	1
Chromium	2	1
Copper	13	0
Cyanide	1	0
Diazinon	2	0
Dichloroethylenes	2	0
Dieldrin	9	3
Dioxin (2,3,7,8-TCDD)	0	12
Dissolved Oxygen	143	40
E. Coli	12	102
Endosulfan	2	0
Endosulfan sulfate	2	0
Endrin aldehyde	1	0
Enterococcus	0	2
Ethylbenzene	1	0
Fecal Coliform	10	30
Fish tissue, DDT	1	0
Guthion	3	0
Heptachlor	1	0
Hexachlorobenzene	1	0
Iron	28	2
Lead	26	1
Malathion	0	1
Mercury	17	0
Nitrates	1	2
Pentachlorophenol	0	1
pH	13	8
Phosphorus	0	44
Polychlorinated Biphenyls (PCBs)	6	1
Polynuclear Aromatic Hydrocarbons	3	0
Sedimentation	4	0
Silver	1	0
Temperature	30	413
Tetrachloroethylene	3	0

Parameter	Segments without a TMDL	Segments with a TMDL
Thallium	1	0
Total Dissolved Gas	0	2
Total Phosphorus	3	0
Trichloroethylene	1	0
Turbidity	2	1
Zinc	4	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(l)). The TMDL and WQMP serve as a multi-sector plan and provides the blueprint for TMDL related implementation activities. Table R-4 lists the TMDLs that have been approved in the Willamette Basin.

Table R-4: Approved TMDLs in the Willamette Basin and the impairments addressed by those TMDLs.

TMDL Document Name	Impairments Addressed
Coast Fork Water Quality Report TMDL	Dissolved Oxygen, Nutrients, Periphyton, pH, Temperature
Columbia Slough TMDL	Algae, Bacteria (water contact recreation), DDT/DDE, dieldrin, dioxin, Dissolved Oxygen, Lead, PCBs, pH
Molalla-Pudding Subbasin TMDL and WQMP	Bacteria (water contact recreation), chlordane, DDT, dieldrin, Iron, Nitrate, Temperature
Pudding River Water Quality Report TMDL	Dissolved Oxygen
Rickreall Creek Water Quality Report TMDL	Dissolved Oxygen
TMDLs for the Yamhill River	Algae, pH
Tualatin Subbasin TMDL	Algae, Bacteria (water contact recreation), Chlorophyll a, Dissolved Oxygen, pH, Temperature
Tualatin Subbasin TMDL and WQMP	Dissolved Oxygen, pH
Willamette Basin TMDL	Temperature

TMDL Document Name	Impairments Addressed
Willamette Basin TMDL and WQMP	Bacteria (water contact recreation), DDT, dieldrin, Dissolved Oxygen, Mercury, Temperature, Turbidity

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 six 319 projects active that reported project outputs and accomplishments to DEQ. Combined the projects have a total grant budget of $94,051. Table R-5 describes the projects and the reported outputs.

Table R-5: Project outputs reported in 2019 for Section 319 pass through grants.

Project Name	Grantee	Project Description	Reported Outputs
Macroinvertebrate Rapid Bioassessment Sampling to Test for Restoration Efficacy	Clackamas River Basin Council	The purpose of this project is to complete macroinvertebrate and baseline water quality sampling as well as and stream channel characteristic measurements at seven sampling sites in Clackamas in the late summer of 2019. Monitoring and reporting will inform efficacy of both riparian restoration and in-stream restoration projects over time.	2019 outputs included completing macroinvertebrate and baseline water quality sampling as well as and stream channel characteristic measurements at seven sampling sites in Clackamas in August of 2019.
City of Scappoose Stormwater Master Plan	City of Scappoose	The primary objective of this project is to complete a portion of a comprehensive update to the City's current stormwater plan, which was originally developed in 1998. The city is working with a consultant to complete this work.	This project is currently on hold due to scheduling delays.

Project Name	Grantee	Project Description	Reported Outputs
Cully Rain Gardens	Columbia Slough WC	This project worked with the Multnomah Youth Cooperative and Verde to install approximately six raingardens for homeowners in the Cully neighborhood of North Portland.	This project was completed in 2019. The watershed council and partners doubled their goal of planting four raingardens and instead completed eight. Fourteen homeowners participated in workshops focusing on rain garden theory, design and maintenance. High school students received field-based training in STEM curriculum, including watershed science, green infrastructure, and rain garden design. Raingarden construction resulted in a reduction of 5,950 square feet of impervious surface, and approximately 133,527 gallons of stormwater are diverted from stormwater infrastructure.
Mitchell Creek Inline Pond Removal/Temperature Reduction	Johnson Creek WC	The primary objective of this project is to restore full salmonid passage by removing two culverts and to remove a pond that is raising the temperature of Mitchell Creek by as much as 14 degree C.	The inline pond on Mitchell Creek was removed and a full salmonid passage was restored in the summer of 2019. Section 319 grants supported another large grant to do this work.
Pilot Project: Shading Amazon Creek from Private Commercial and Industrial Lands	Long Tom Watershed Council	There remains opportunity in the Amazon Creek watershed to improve and enhance riparian shading on private lands. Enhancing shade along Amazon Creek, specifically on industrial and commercial lands, will have a positive impact on multiple parameters, including temperature, bacteria, mercury and other pollutants found in stormwater runoff. The first goal of this project is to develop a planting incentive program for commercial, industrial and residential private landowners. In addition,	In 2019, LTWC completed research and review of existing incentive programs and identified specific elements that should be included in a local planting incentive program. Informed by this reasearch as well as the results of the mapping exercise completed in 2018, LTWC conducted outreach to private landowners. This outreach resulted in two adjacent business owners opting into a voluntary pilot project(s), which will ultimately enhance and improve riparian vegetation

Project Name	Grantee	Project Description	Reported Outputs
		outreach and education will be conducted to private landowners with a goal of identifying at least one pilot project. The pilot project will include an individual site assessment, business education, and technical assistance for enhancement of riparian shading and installation of other stormwater best management practices identified as appropriate for the project site.	and stormwater management on their sites.
Sauvie Island Canal Bank Erosion Control Project	Scappoose Bay WC	The goal was to produce a ditch Operations and Maintenance Plan for the Sauvie Island Drainage Improvement Company (SIDIC).	The Operations and Maintenance Plan (OMP) was completed by the end of March 2019. The OMP contains a brief description of the canal system, operation and general flow regime and describes the current maintenance goals and methods. The watershed council produced a series of maps that describe vegetation along canals, ease of maintenance (accessibility), methods of vegetation and siltation maintenance, and maintenance activities and schedule. This information allows SIDIC to understand more clearly the operation that has been in place, and proposed additional BMPs to improve operations, including alternative methods to remove sediment and manage nutrients. The watershed council collected turbidity, E. Coli and nitrate samples.

Figure R-2: Inline pond removed and fish passage restored on Mitchell Creek in the Johnson Creek watershed.

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 two nonpoint source related Clean Water State Revolving Fund projects active that reported project outputs and accomplishments to DEQ. Combined the projects have a total budget of $792,000. Table R-6 describes the projects and the reported outputs.

Table R-6: Nonpoint source related Clean Water State Revolving Fund project outputs reported in 2019.

Project Name	Grantee	Project Description	Reported Outputs
Septic System	Clackamas Soil and Water	The Clackamas Soil and Water Conservation District received a local	In progress - implemented one septic

Loan Program	Conservation District	community loan to develop a pilot program to repair/replace failing onsite systems within its service area. The project will initially focus on previously identified hotspots; however, all private landowners will be eligible to participate in the program. The applicant will work with Clackamas County Water Environment Services to verify failing systems and recommend remediation options.	project. Expanded geogrpahic service area for eligible loans; expect two more septic loans are expected in the near future.
Nonpoint Source Loan Program	Clackamas Soil and Water Conservation District	The Clackamas Soil and Water Conservation District received a local community loan to develop a pilot program to repair/replace failing onsite systems within its service area. The project will initially focus on previously identified hotspots; however, all private landowners will be eligible to participate in the program. The applicant will work with Clackamas County Water Environment Services to verify failing systems and recommend remediation options.	In progress - executed and closed several small loans with several more in pipeline

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 six 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 $164,667. Table R-7 describes the projects and the reported outputs.

Table R-7: Nonpoint source Drinking Water Source Protection program projects and outputs for 2019.

Project Name	Grantee	Project Description	Reported Outputs
Prioritize areas for septic system risk reduction efforts, outreach, repair and education	Canby Utility Board (00157)	Address potential septic system impacts to groundwater and nearby streams in the Molalla River watershed	Canby Utility conducted education and outreach for septic system owners in Molalla Watershed through direct mailing to 2,202 rural homeowners located in higher risk areas and held two workshops attended by 51 people (excluding

Project Name	Grantee	Project Description	Reported Outputs
			those attending in an official capacity). Although there have been no requests submitted for septic system inspections, there were three cost-share rebates funded for repairs that totals $2,967.50.
South Santiam Source Water Protection Through Riparian Restoration	City of Lebanon (00473)	Remove invasives within riparian zone, restore banks and complete revegetation to minimize sediment and other runoff impacts to drinking water supply for City of Lebanon and downstream water systems.	Work performed in 2019 included planting of an additional 3,200 plants to address previous plant mortality. Funding from another grant is now supporting continued plant establishment activities until plants are free-to-grow without threat of competition from noxious weeds. DW SPF Project competed in 2019.
City of Monroe Surface Water Protection through Upstream Voluntary Green Infrastructure Projects	City of Monroe (00540)	Retrofit stormwater collection systems for stormwater quality improvement within watershed that provides drinking water to City of Monroe.	3 projects were installed in 2019 comprising removal of impervious surfaces, wetland improvements, and native plantings to improve stormwater treatment. In addition, a fourth project was designed through construction documents with the additional funding help of an SEP. Design proposals were developed for three other projects and vetted by the City permitting office. Seven additional projects are in the discussion/feasibility stage currently.
Implementation project - Decommission dry wells near city wellheads and redirect stormwater to a lower risk location	Columbia City (GW) (00203)	Implementation project - Decommission dry wells near city wellheads and redirect stormwater to a lower risk location	City installed new storm drain piping and catch basins, decommissioned two stormwater drywells, restored areas and completed paving, and complete required testing and reporting. Implementation of this project redirects stormwater to lower risk locations away from city wellheads. Project completed in 2019.
Custom Clackamas River Watershed Display	N. Clackamas County Water Commission (CRWP) (00580)	Develop public education and outreach tools for fostering connection to and understanding of the drinking water source area for the Clackamas River Water Providers. The CRWP is a coalition	Project completed. Developed a custom 3-D portable, interactive, and place-based display of the Clackamas River Watershed for use in public outreach and education. Distributed to each of the water providers and maintain 1 copy for education and outreach about the

Project Name	Grantee	Project Description	Reported Outputs
		of all seven municipal water providers who get their drinking water from the Clackamas River.	watershed and drinking water source area.
Rivergrove Water - Septic and Private Well Abandonment Assistance	Rivergrove Water District (GW) (00461)	Septic system / private well education & risk reduction program. Develop Source Protection & Contingency Plan	2019 work included issuing one rebate for septic system inspections/maintenance cost-share and advertised the program in their CCR. Grant has been extended due to staffing changes at the utility. Rivergrove plans to conduct additional education and outreach in 2020.

Figure R-3: Septic system education and outreach workshop to support protection of drinking water in the Molalla River (Sept. 24, 2019).

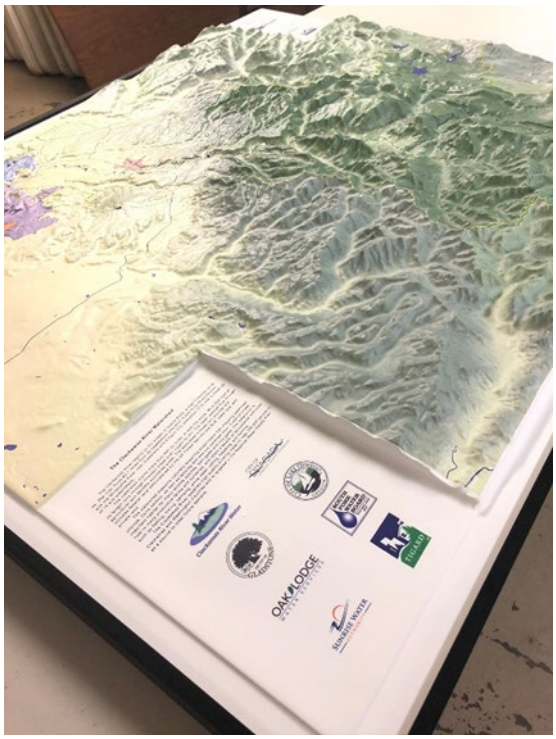

Figure R-4: (Left) Biochar is added to stormwater retrofit location involving removal of impervious area and treatment with new plantings. Photo Credit: Sarah Whitney, Long Tom Watershed Council. (Right) Custom relief map of the Clackamas drinking water source area for local education and outreach.

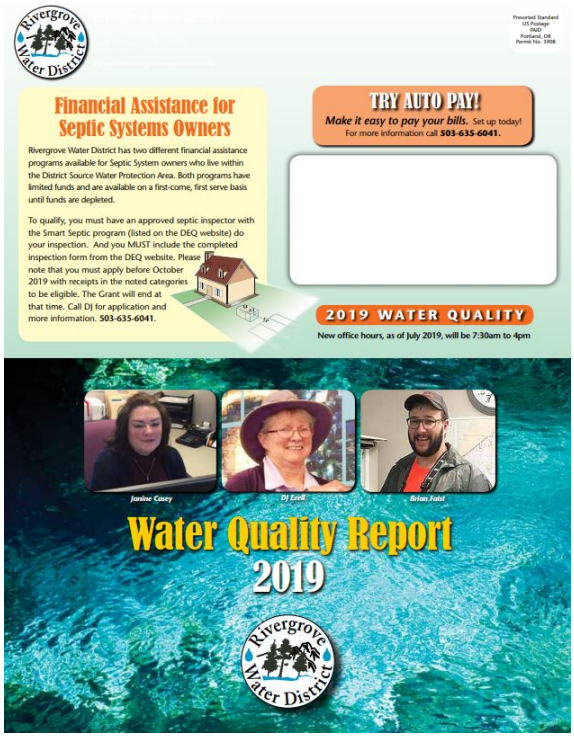

Figure R-5: Biochar is added to stormwater retrofit location involving removal of impervious area and treatment with new plantings. Photo Credit: Sarah Whitney, Long Tom Watershed Council.

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 two Drinking Water Providers Partnership projects active that reported project outputs and accomplishments to the DWPP. Combined the projects have a total budget of $90,600. Table R-8 describes the projects and the reported outputs.

Table R-8: Drinking Water Providers Partnership projects and outputs for 2019.

Project Name	Grantee	Project Description	Reported Outputs
Lower South Fork McKenzie Floodplain Restoration Project	McKenzie Watershed Council	The Lower South Fork McKenzie Restoration Project is a multi-year, large-scale effort to improve river function, habitat conditions, and water quality on 4.5 miles and over 600 acres of floodplain in the lower South Fork McKenzie River, below Cougar Dam. This project is a collaborative endeavor that is co-managed by the Willamette National Forest and the McKenzie Watershed Council and supported by many different partners. 2019 DWPP funding will be used for wood and fill transporting to the project area, earthmoving, wood placement, road decommissioning, planting and seeding disturbed areas, and treating weeds.	This project is now complete. Tasks performed in 2019 include wood and fill transporting to the project area, earthmoving, wood placement, road decommissioning, planting and seeding disturbed areas, and treating weeds. Also, post-project monitoring was performed.
Lower South Fork McKenzie River Floodplain Enhancement Project	USFS Willamette National Forest, McKenzie River Ranger District	This project is part of a multi-year large-scale effort involving the Willamette National Forest, Eugene Water & Electric Board and several other groups, to improve river function, habitat conditions, and water quality on 4.5 miles and over 600 acres of floodplain in the lower South	Tasks likely performed in conjunctin with and covered under the description for the 2019 project of the same name. Tasks completed in 2019 include wood and fill transporting to the project area, earthmoving, wood placement, road decommissioning, planting and

		Fork McKenzie River below Cougar Dam. Project is co-managed by the Willamette National Forest and McKenzie Watershed Council.	seeding disturbed areas, and treating weeds. (based on 2019 proposal and assumption that all tasks were completed in 2019)

Figure R-6: Lower S. Fork McKenzie Post Implementation including Wood Placement and Replanting. Photo Credit: Kate Meyer, 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 58 OWEB funded projects completed in 2018 with a total cash and in-kind budget of $6,116,822. The tables below summarize reported outputs for different project activities in each Willamette subbasin.

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

Table R-9: 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)
Lower Willamette	1
McKenzie	1
Tualatin	1
Upper Willamette	2

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

Subbasin	Stream bank stabilized (Miles)	Main stream channel modified / created (Feet)	Main stream channel modified / created (Number of treatments)	Engineered structures installed (Number of treatments)
Molalla-Pudding	0.1	NA	NA	15
Tualatin	NA	500	1	NA

Table R-11: 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: Large wood placement (Number of treatments)	Instream habitat: Structure placement (Number of treatments)	Off-channel habitat created, protected, or reconnected (Feet)	Off-channel habitat created, protected, or reconnected (Number of treatments)
McKenzie	3459	NA	15530	13
Middle Willamette	109	NA	NA	NA
South Santiam	87	NA	NA	NA
Tualatin	NA	7	500	3

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

SubbasinActual	Voluntary riparian tree retention (Acres)	Voluntary riparian tree retention (Miles)
Upper Willamette	3	0.4

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

Subbasin	Riparian fencing (Area treated)	Riparian fencing (Stream sides treated)
South Santiam	37.4	1
Upper Willamette	NA	1

Table R-14: 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 (Area treated)	Riparian invasive plant control (Length of treatment)	Riparian invasive plant control (Stream sides treated)	Riparian vegetation planting (Area treated)	Riparian vegetation planting (Length of treatment)	Riparian vegetation planting (Stream sides treated)
Coast Fork Willamette	41.0	0.2	2	0.9	1.0	3
Lower Willamette	NA	0.3	NA	2.4	NA	2
McKenzie	NA	0.6	NA	0.8	NA	1
Middle Willamette	1.2	0.1	2	NA	NA	NA
Molalla-Pudding	NA	0.2	NA	2.3	NA	1
North Santiam	NA	NA	NA	24.0	NA	2
South Santiam	37.4	0.8	2	NA	0.2	NA
Upper Willamette	15.0	0.2	1	NA	NA	NA
Yamhill	NA	NA	NA	33.0	NA	2

Table R-15: 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)	Road decommission (1 station or 100 Feet)	Road stabilization (1 station or 100 Feet)	Surface drainage improvement (1 station or 100 Feet)	Surface drainage improvement (Number of treatments)
Middle Fork Willamette	1	NA	NA	NA	NA
Middle Willamette	NA	NA	NA	NA	1
Molalla-Pudding	8	30.3	1.6	162.8	13
North Santiam	1	NA	NA	573.2	11
Upper Willamette	1	NA	NA	NA	NA

Table R-16: Summary of OWEB grant funded upland projects completed in 2018, the most recent year data is available in the OWEB OWRI database.

Subbasin	Upland erosion control (Acre)	Upland erosion control (Number of treatments)
Coast Fork Willamette	0.5	NA
Middle Fork Willamette	1.5	NA
Upper Willamette	52.0	1

Table R-17: Summary of OWEB grant funded upland projects completed in 2018, the most recent year data is available in the OWEB OWRI database.

Subbasin	Nutrient/manure management (Acre)	Nutrient/manure management (Number of treatments)
Coast Fork Willamette	0.5	NA
Middle Fork Willamette	0.1	1
South Santiam	1.0	1
Upper Willamette	2.5	3

Table R-18: 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 tree planting (Area treated)	Upland vegetation management (Area treated)	Upland vegetation planting (Area treated)
Middle Fork Willamette	65.0	10.0	17.0	20.0
Middle Willamette	23.1	2.5	177.0	33.9
Upper Willamette	185.2	7.7	218.2	69.7
Yamhill	NA	NA	0.2	0.2

Table R-19: Summary of OWEB grant funded urban projects completed in 2018, the most recent year data is available in the OWEB OWRI database.

Subbasin	Sustainable stormwater management (Area treated)	Sustainable stormwater management (Number of treatments)
Clackamas	0.4	1

Table R-20: Summary of OWEB grant funded instream projects completed in 2018, the most recent year data is available in the OWEB OWRI database.

Subbasin	Wetland improvement (Area treated)	Wetland invasive plant control (Area treated)	Wetland vegetation planting (Area treated)
Middle Willamette	42.0	42.0	4.7
Upper Willamette	113.5	185.6	37.8

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 R-21: TMDL implementation activities reported in 2019 by Designated Management Agencies or third parties.

TMDL	DMA	Reported Actions
Willamette Basin Mercury TMDL	City of Albany	The city inspected 73% of their stormwater facilities during the reporting period, and dedicated over 750 labor hours to rehabilitation of a regional stormwater detention facility. In addition, the city installed 22 new post-construction, public stormwater facilities in 2019.
Willamette Basin Bacteria TMDL	City of Albany	The city installed seven new pet waste stations in city parks and distributed 160,000 pet waste bags during the reporting period. The city also clocked over 400 volunteer hours, facilitated through their Parks and Recreation program, related to outreach and education to community members about actions they can take to reduce bacteria inputs to local waterways.
Willamette - Middle	City of Aumsville	The city, partnered with Marion Soil and Water Conservation District, has implemented the tree protection program since it was adopted in 2018.
Willamette Basin Temperature TMDL	City of Cottage Grove	The city enhanced the riparian area of the Coast Fork Willamette near Harrison Bridge. 200 trees were planted.
Willamette Basin Temperature TMDL and Willamette Basin Mercury TMDL	City of Creswell	The city partnered with the Coast Fork Willamette Watershed Council to re-stablish and expand a native riparian buffer along a tributary to Camas Swale creek, which is a tributary to the Coast Fork Willamette River. This tributary is susceptible to increased temperatures due to sparse riparian vegetation. The city's waste water treatment plant outfalls are also located on this tributary. In 2019, invasive plants were removed and the first year plantings were completed, which resulted in expanding the riparian buffer on a city-owned property from thin strips to approximately to 35 feet. This project is also supported by an OWEB grant.
Willamette - North Santiam	City of Detroit	The city received 3.2 million dollar loan to replace and repair aging distribution lines and upgrade a city park for Detroit Flats Day Use Area.
Willamette - North Santiam	City of Detroit	The city is conducting an implementation assessment on forming sewer district in a wastewater system with neighboring cities.
Willamette - Pudding	City of Donald	The city has held a very successful citywide cleanup day, which supports the education, outreach and public involvement measure. The city's on-going efforts in support of the protection of water quality include improvement on roads, ditches, parks/green space, swale maintenance

TMDL	DMA	Reported Actions
		procedures, etc., and utilization of a city website to house water quality materials.
Willamette - Middle	City of Dundee	The city has required all construction projects to implement stormwater best management practices.
Willamette - Upper Willamette	City of Falls City	The city adopted the Parks Master Plan in 2017 and acquired 1.13 acres to expand Michael Harding Park, expanding the riparian buffer zone of the park. The city achieved 2.5 miles of river bank clean-up, invasive weed removal and riparian planting, maintained pet waste stations, and maintained summer porta potties at all three river parks. The city conducts street sweeping 2 times per month, and continues the outreach program.
Willamette - Pudding	City of Gervais	The city completed the Stormwater Master Plan (including TMDL goals) in July 2019 and adopted it by August 2019. Other activities include tree planting around Sam Brown Creek, and ongoing pollution prevention with IDDE BMPs.
Willamette Basin	City of Gresham	The city began restoration efforts on Miller Creek in the Johnson Creek watershed in fall 2018. Approximately 1,100 trees and shrubs across five acres were installed through the assistance of the Northwest Youth Corps during winter of 2019. Invasive weed treatments focused on Himalayan blackberry. Site herbicide treatments were completed by a contractor.
Columbia Slough	City of Gresham	The city has conducted restoration actions for ten years on Fairview Creek headwaters wetlands to control reed canary grass and restore headwater wetlands. Site work consists of spreading mulch and live staking (700 willow/dogwood/black cottonwood) on two acres to reduce reed canary grass growth. All work was completed by the Reynolds Learning Academy students.
Willamette - Pudding	City of Hubbard	The city continues its efforts in public education and outreach, public involvement and participation, and implementation of IDDE programs. Other activities include street sweeping, catch basin cleaning, and providing a stormwater hotline, pet waste stations, and porta potties for large events.
Willamette - Middle	City of Jefferson	The city has created a storm water fee according to passed Ordinance 711.The city maintained and updated storm water conveyance map, cleaned 75% of the stormwater catch basins, and assessed and confirmed ordinance for post-construction
Willamette - North Santiam	City of Mill City	The city, partnered with North Santiam Watershed Council, continues to preserve Snake-DeFord riparian area within urban growth boundary.
Willamette - Pudding	City of Mt Angel	The city's on-going efforts in support of the protection of water quality include improvement on roads, ditches, parks/green space, swale maintenance procedures, etc.

TMDL	DMA	Reported Actions
Willamette Basin	City of Portland	The city is collaborating with DEQ and other stakeholders to inform DEQ's Lower Willamette River Coldwater Refuge Plan to address a jeopardy decision of the 2015 National Marine Fisheries Service Biological Opinion on the approval of Oregon's 2003 water temperature standard. The 2006 Willamette Basin TMDL WQMP required DMAs along the lower 50 miles of the Willamette River to identify and protect cold water refuges. Portland has provided DEQ with continuous and instantaneous water temperature data for sampling sites on the Willamette River and on tributaries of the Willamette. Additionally, the city has contributed information on fish distributions and abundance to help locate cold water refugia and characterize fish usage of refugia. BES staff are serving on DEQ's expert scientific and technical panel on cold water refuge identification, use, and sufficiency in the lower Willamette River.
Willamette - Middle	City of St Paul	The city took immediate action to install pet waste station after DEQ approved the city's revised plan.
Willamette - Middle and North Santiam	City of Stayton	The city installed 60-inch and 84-inch water quality manholes on Evergreen Ave., as part of an SEP, located upstream of the Salem Ditch, and removed invasive species from N. Santiam River. The city conducted monthly street sweeping and collected 2,112 cubic yards of debris in 2019. In addition, the city has cleaned 194 catch basins and 5.3 miles of storm pipes. The city is working on language to update existing standards for erosion control on construction sites size less than 1 acre. The city has collected water quality samples from the storm outfalls as part of an IDDE program in 2019 and will develop the IDDE code to be adopted in the 2019-2020 fiscal year.
Willamette Basin Temperature TMDL	City of Sweet Home	The city prioritized removal of invasive plants on Ames Creek, which is a tributary to the South Santiam River. The city worked with the local school district to engage and include 29 high school students in the project. City staff and student time totaled 120 hours, which resulted in 1000 linear feet along the creek and approximately 50,000 square feet of invasives removal.
Willamette Basin Bacteria TMDL	City of Veneta	The city identified legacy properties within the city that remain on septic systems. The city conducted outreach to owners at 16 different properties and began the process of connecting these sites to city sewer. The city expects to complete transitioning these properties to city sewer by 2022.
Tualatin, 2001/2012	Clean Water Services	CWS provided public education programs and materials to foster water quality protection, including Canines for Clean Water, the Gardening with Native Plants poster, The Stream Care Guide and River Rangers. These programs and materials teach proper disposal of hazardous wastes, water-friendly and chemical-free gardening, pet waste cleanup and riparian protection. In addition, the District cosponsored SOLVE

TMDL	DMA	Reported Actions
		cleanup efforts, provided storm drain markers to volunteers to deter illicit discharges and published information about littering, illegal dumping and water quality on its website, in billing inserts and in the Clean Water Connection electronic newsletter and City newsletters.
Tualatin, 2001/2012	Lake Oswego	Lake Oswego funds a Habitat Enhancement Program. The program enhances riparian habitat and provides public education. Over a four-year period ending Fiscal Year 2019, the program has restored 11 acres and planted 4200 native trees and shrubs.
Columbia Slough	Port of Portland	The Port of Portland continued to fund the second year of implementing the Multnomah County Drainage District's Island Canopy Establishment Project. This included weed control and establishment of native shrub and tree species on islands within the Middle Columbia Slough. The target islands are intermittently scattered between NE 22nd Ave and the intersection of the Columbia Slough mainstem with the Whitaker Slough. Although the total acreage is relatively small, the initial investment to manually create these islands years ago for habitat enhancement supports the need to invest resources to maintain and enhance these islands.
Willamette - Temperature	United States Army Corps of Engineers	The Corps has developed draft designs for Detroit dam fish passage and temperature control and strategic funding for Willamette mainstem floodplain reconnection and acquisition. The Corps continues its efforts in facilitation of Willamette Biological Opinion Habitat Technical Team and Steering Committee, interim temperature control at Detroit Dam, and operation of Cougar temperature control tower.
Tualatin, 2001/2012	Washington County	Washington County promoted water quality protection through educational and outreach programs.
Tualatin, 2001/2012	West Linn	SOLVE, a non-profit volunteer organization, finished multiple projects within the City at 7 different parks. Over 1,200 volunteers removed over 100,000 square feet of invasive species and planted about 1,500 trees and shrubs.
Willamette - North Santiam	NA	North Santiam Watershed Council collaborated rural, urban, agricultural and forestry programs in North Santiam and facilitated funding applications for OWEB technical assistance grants.
Statewide All Subbasins	Oregon Parks and Recreation Department	The large number of projects OPRD have implemented have been due in part to the large funding opportunities available through the Focused Investment Partnership (OWEB) and matching funds provided by Meyer Memorial Trust and Bonneville Power Administration on the Willamette. The OPRD projects in the last four years have primarily focused on side channel enhancement, including opening fish access and fish passage at culverts. OPRD has begun designing on several additional projects focused on improving stream

TMDL	DMA	Reported Actions
		connection in floodplains and enhancing cold water refuges. OPRD utilizes a formal park development project review process that includes review of proposed park development projects by natural resource staff experts.