

Oregon Nonpoint Source Pollution Program Annual Report for 2019

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Watershed Management

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DEQ is a leader in restoring, maintaining and enhancing the quality of Oregon's air, land and water.



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Executive Summary

In 2019 Clean Water Act Section 319(h) funds paved the way for projects across Oregon that helped restore and protect riparian buffers, ensured best management practices were implemented on forests, farms, and rangeland, improved pesticide management and provided valuable education on water quality to Oregonians of all ages.

The Oregon Nonpoint Source Pollution Program 2019 Annual Report documents activities and accomplishments of the Oregon Department of Environmental Quality's (DEQ) implementation of the state's Nonpoint Source Program. DEQ developed the report to meet the requirements of Section 319 of the federal Clean Water Act and the U.S. Environmental Protection Agency's 2014 Nonpoint Source Program and Grant Guidelines.

The report summarizes the nonpoint source activities implemented by the state during 2019 and highlights the progress Oregon is making toward meeting the challenges presented by nonpoint source impairments such as temperature, dissolved oxygen, sedimentation and bacteria, which account for approximately 72 percent of current impaired waters listings in the state. The report includes updates on milestones, implementation targets and annual reporting requirements identified in the 2014 Oregon Nonpoint Source Management Program Plan and the 2018-2020 Performance Partnership Agreement with EPA. Annual status updates ensure that Section 319 funding, technical support and other resources are effective and efficient.

The 2014 Oregon Nonpoint Source Management Program Plan and the 2018-2020 Performance Partnership Agreement have identified 87 nonpoint source program related actions. 67 of those actions or milestones were scheduled to be ongoing or completed in calendar year 2019. DEQ completed 57 (or 85%) of the action milestones identified. In addition, DEQ completed one action (2018/2020 Integrated Report) that was scheduled to be completed in previous years.

DEQ actions not fully meeting scheduled milestones include:

- Updating the Nonpoint Source Management Program Plan for 2020-2022.
- Developing TMDLs and WQMPs in accordance with 303(d) list schedule.
- Documenting Oregon's Watershed Measures and Waterbody Restoration Stories (EPA "Success Stories").
- Development of an approvable Coastal Nonpoint Pollution Control Program.
- Revising the DEQ/Oregon Department of Forestry MOA.

Due to limited program resources, some of DEQ's key vacancies continue to remain open in 2019. The 319 workload was redistributed to existing staff in order to meet deadlines in a more timely and efficient manner.

Some significant activities and actions accomplished in 2019 include:

- DEQ issued a revised Upper Klamath and Lost River Subbasins Nutrient TMDL that was approved by EPA in March of 2019. This set of TMDLs addressed dissolved oxygen, pH, ammonia toxicity, and chlorophyll a impairments. The TMDL was originally issued in December 2010. The nutrient part of the TMDL was revised by DEQ in December 2017. Three entities in the Klamath Basin requested reconsideration, which was granted by the Director of DEQ in early

2018. The TMDLs were updated to include new information as it pertained to the Water Management Districts and their responsibilities for TMDL implementation planning.

- DEQ issued and EPA approved the Upper Klamath and Lost Subbasins Temperature TMDL in September 2019. The Upper Klamath and Lost Subbasins Temperature TMDL is a crucial step for improving the health of these rivers by reducing river temperatures that are too warm for fish. Meeting the temperature water quality standard is critical for protecting fish and other aquatic life in these rivers, including endangered suckers.
- DEQ issued the revised Willamette Basin Mercury TMDL on November 22, 2019. On November 29, 2019, EPA disapproved the TMDL and established a new TMDL as required under the Clean Water Act and federal regulations. EPA's TMDL incorporated by reference many sections of DEQ's issued TMDL but included significant differences for some allocations. Both TMDLs found that the greatest source of mercury in the basin is from atmospheric deposition, which originates mainly from national and global sources including industrial and coal burning power plant emissions. Once mercury is deposited on the landscape, the major pathways to streams are erosion of sediment-bound mercury and surface runoff. Therefore, management actions to reduce mercury to waterbodies will largely focus on implementing nonpoint source BMPs and strategies to reduce erosion and runoff from urban, rural and forested lands.
- DEQ is required to submit a biennial water quality assessment report to EPA on the condition of Oregon's waters. The Integrated Report is a database report that combines reporting information for the Clean Water Act Section 305(b) assessment of all water bodies and the Section 303(d) list of water bodies that do not meet water quality standards. The draft 2018/2020 Integrated Report was released for public comment in September 2019. This report was based on a significantly improved robust methodology, and it created a framework and foundation for future assessments. This was the first time that DEQ conducted a statewide data call since the 2004/2006 Integrated Report. Using the updated and revised methodology, DEQ evaluated 10 years of data provided by over 70 organizations, totaling over 26,000 assessments. It was also the first time that DEQ released the report as an interactive map tool, including an interactive web map, interactive story map, online searchable database and geodatabase.
- Water Quality Status and Trends (WQS&T) Reports for Agricultural Rule and Plan Reviews continue to be developed. Oregon statute and administrative rules require ODA to consult DEQ during review of Agricultural Water Quality Management Area Rules and Plans (Oregon Revised Statute 568.930). DEQ TMDL and nonpoint source program staff conduct these reviews based on ODA's biennial review schedule of its area rules and plans. ODA's Agriculture Water Quality Program is outcome based, explicitly describing prohibited conditions, similar to DEQ's TMDL and nonpoint source programs which explicitly define water quality targets and goals. The WQS&T reports present data and analysis that will help DEQ fulfill its roles in the biennial review process. The reports present an analysis of water quality data readily accessible from public databases and available in sufficient quantity to indicate status and trends. Prior to 2019, the annual WQS&T report was a package of multiple basin/subbasins reports with full reporting structure in each report. The 2019 Report significantly improved report usability by producing a single statewide report, which focuses on methods, provides a high level summary of results in the body of the report, and includes the results of each station and assessment unit in tabular format as appendices. This Report adopted the Integrated Report methodology for status assessment with analysis on additional water quality parameters and best management practices reported to OWEB-OWRI. An interactive web map was also produced in association with the report, which allows exploration of the tabular results and plots, and allows users to download data of interest.

- The Drinking Water Protection Program continues to address nonpoint sources within watersheds used for drinking water by completing “Updated Source Water Assessments”. Ninety-eight assessments were conducted in 2019, which provided information on risks to drinking water supply and susceptibility. The Program team has hosted the Source Water Protection Workshops that focused on wildfire and emergency preparedness to encourage local partners and water systems to address source water areas. The Program also partnered with state (Oregon Health Authority and Business Oregon) and federal agencies (USDA Natural Resources Conservation Service, EPA, U.S. Forest Service, Bureau of Land Management) to fund watershed assessment and restoration and provide technical assistance to water systems and local partners throughout Oregon. For instance, DEQ participated in the Drinking Water Providers Partnership with USFS and BLM and has assisted Oregon NRCS in submitting of 10 funding proposals, of which, five were selected for the National Water Quality Initiative Source Water Protection Pilot projects in order to receive Federal Farm Bill funding to implement the measures specific to agricultural impacts to source water quality.
- DEQ continues to implement its statewide groundwater protection program to monitor, assess, protect and restore Oregon’s groundwater resources according to the Oregon Groundwater Quality Protection Act of 1989 (Oregon Revised Statute 468B.150-190). In 2019, DEQ submitted the biennial groundwater legislative report, which documents the recent groundwater monitoring activities in Northern Malheur County Groundwater Management Area, Lower Umatilla Basin Groundwater Management Area, Southern Willamette Valley Groundwater Management Area, and South Deschutes/North Klamath Groundwater Protection Project. The report also highlights that DEQ coordinates ground water protection and restoration efforts with other state agencies (e.g., the Oregon Health Authority, the Oregon Water Resources Department, and the Oregon Department of Agriculture), as well as interested parties, including state, local and private organizations, businesses and individuals. For example, DEQ helped to support a Water Resources Department groundwater study in Harney County, in which DEQ staff sampled 91 private wells, domestic and agricultural, in the spring and fall of 2018. The Harney County Study data and report was made publicly available in 2019.
- DEQ improved reporting efficiency for the Nonpoint Source Pollution Program Annual Report starting August 1, 2019 through the creation of new QTIME centers that directly summarize staff time implementing watershed based plans and which activities were completed using Federal Section 319(h), OWEB, and NRCS funds. DEQ uses the QTIME system to track staff time spent working on various activities or projects. Prior to August 2019, QTIME did not properly track time spent implementing activities that were eligible to be counted towards EPA’s Section 319(h) grant funding requirements. The hours and expenditures that were spent on ineligible activities were manually adjusted by asking staff to provide the proportion of their time spent on those ineligible activities. With the new set of QTIME codes, the eligible activity expenditure can be directly reported by pulling from the payroll data.

Oregon’s nonpoint source program continues to use innovative, cooperative, and community-based methods to protect and improve water quality affected by nonpoint sources of pollution. This is done by working with state, local and national partners as well as tribal nations on water quality protection and restoration, supporting and encouraging implementation of TMDLs and monitoring Oregon’s water quality to support water quality program needs. It is through this collaborative process that Oregon can identify emerging issues, understand water quality status and trends and inform management activities targeted at restoring quality and beneficial uses of the Oregon’s waters. The Oregon Nonpoint Source Program also leverages work from other Clean Water Act Programs within DEQ and relies on federal and state authority to protect and improve Oregon’s water quality.

1. Introduction

This Oregon Nonpoint Source Pollution Program 2019 Annual Report meets the requirements of Section 319 of the Federal Clean Water Act. The report documents the activities and accomplishments of the Oregon Department of Environmental Quality's implementation of the state's Nonpoint Source Program.

This report provides a summary of activities implemented by the state during calendar year 2019 and is intended to address nonpoint sources. The summary includes the progress on implementing the nonpoint source program, including the actions or milestones identified in the 2014-2018 Oregon Nonpoint Source Management Program Plan and in the 2018-2020 Performance Partnership Agreement between Oregon DEQ and EPA. Prior to finalization of the next five-year Plan (2020-2024), DEQ has continued implementation on the nonpoint source program in 2019 based on the 2014 Oregon Nonpoint Source Management Program Plan. This report also highlights the progress that Oregon is making in improving water quality in different parts of the state.

2. Oregon's Nonpoint Source Program

This section provides a description of Oregon's nonpoint source program and the baseline regulatory statutes and non-regulatory programs.

The nonpoint source program's long-term goal as identified in the 2014 Oregon Nonpoint Source Management Program Plan (the 2014 Plan) is to develop and implement strategies to prevent, control, and eliminate water pollution from nonpoint sources in waters of the state to meet water quality standards and TMDL load allocations. Protecting water quality also protects beneficial uses, the environment and Oregon's economy by reducing capital costs for water treatment infrastructure and flood mitigation. Implementation of the Plan is also informed by the 2018-2020 DEQ-EPA Performance Partnership Agreement (PPA).

The program's short term goals, as outlined in the 2014 Plan and the PPA, include implementation of key actions, commitments and ongoing program activities. Progress in implementation of the Nonpoint Source Management Program Plan is documented in this annual report. Current links to Oregon's Nonpoint Source Program website can be found here:

<http://www.oregon.gov/deq/wq/programs/Pages/Nonpoint.aspx>.

The program is built around a diverse set of programs, plans, and tools, which use regulatory, voluntary, financial, and technical assistance approaches to achieve a balanced program (Figure 1). These efforts and many of the funding sources are described immediately below and in more depth in subsequent sections.

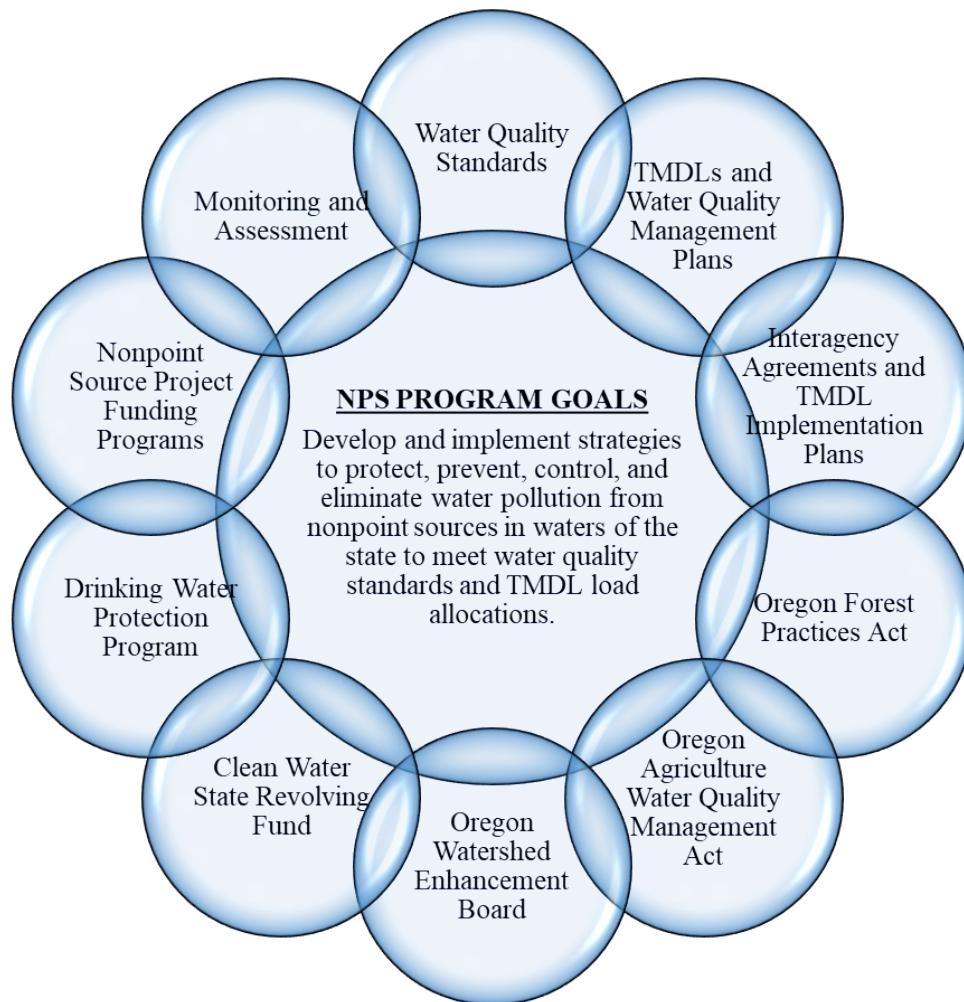


Figure 1. Representation of Oregon’s Nonpoint Source Program as a diverse, interlined set of programs.

2.1. Water Quality Standards

The Water Quality Program's mission is to protect and improve Oregon's water quality. Protecting Oregon's rivers, streams, lakes and estuaries keeps these waters safe for multiple beneficial uses such as drinking water, fish and aquatic wildlife habitat, recreation and irrigation. This is accomplished by identifying the most sensitive beneficial use and establishing the water quality level or target that is protective of that use. Establishing water quality standards for Oregon is at the core of DEQ’s Water Quality Program.

2.2. Monitoring and Assessment - Section 303(d) and 305(b)

Collection and assessment of water quality data is important for the Section 303(d) and 305(b) Integrated Report and other aspects of the Oregon Nonpoint Source Management Program. Oregon DEQ conducts both routine ambient monitoring and special studies such as toxics monitoring, groundwater monitoring,

biological monitoring, and pesticide monitoring. In addition to samples collected by DEQ, the Volunteer Monitoring Program supports collection of data from third parties across the state, such as local watershed councils and Soil and Water Conservation Districts. The program provides technical guidance on monitoring efforts and maintains a loan program for water quality monitoring equipment. This assistance helps third parties identify and begin addressing the state's water quality problems. In addition to supporting local water quality awareness and management, data collected by third parties is submitted to DEQ and is often a very valuable addition to DEQ's monitoring dataset.

Monitoring data is used in the nonpoint source program for understanding statewide water quality trends in major rivers and streams, identifying and characterizing toxic contaminants in water, supporting the development of new, or revised water quality standards, identifying impaired beneficial uses and waterbodies, and responding to environmental emergencies and investigations.

2.3. Total Maximum Daily Loads and Water Quality Management 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 a waterbody and still meet water quality standards.

TMDLs take into account the pollution from all 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 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 is the framework for TMDL implementation that is issued by Oregon along with the TMDL (Oregon Administrative Rules 340-042-0040(4)(l)). The plan provides the blueprint for TMDL implementation for multiple sectors plan and includes the reasonable assurance that the TMDL will be implemented and allocations will be achieved (see [Section 3.8](#)).

2.4. Oregon Forest Practices Act

Oregon's nonpoint source program for private non-federal forestlands is administered by the Oregon Department of Forestry (ODF) through the Oregon Forest Practices Act (FPA). ODF has exclusive jurisdiction over water quality regulation on non-federal forestlands unless additional protections are required by the federal Clean Water Act. Under ORS 468B.110(2), ORS 527.765, and ORS 527.770, the Board of Forestry establishes best management practices or other control measures by rule that, to the maximum extent practicable, will ensure attainment and maintenance of water quality standards. If the Environmental Quality Commission (EQC) does not believe that the FPA rules will accomplish this result, the EQC is authorized to petition the Board for rules that are more protective. If the EQC petitions the Board, the Board has two options: terminate review with the EQC concurrence or begin rulemaking.

If the Board determines that BMPs should be reviewed, rules specifying the revised BMPs must be adopted not later than two years from the filing date of the petition for review, unless the Board, with concurrence of the EQC, finds that special circumstances require additional time. Upon the EQC's request, the Board is required to take interim action "to prevent significant damage to beneficial uses" while the BMPs are being reviewed. The "BMP shield" under ORS 527.770 is lost if the Board fails to

complete BMP revisions, or makes a finding that revisions are not required, within the statutory deadline. In addition, under 468B.110(2), the EQC cannot adopt rules regulating nonpoint source discharges from forest operations and DEQ cannot issue TMDL implementation plans or similar orders governing forest operations unless “required to do so by the CWA.” This authority would also be triggered by the failure of the Board to adopt adequate BMPs to implement TMDL allocations for forestry or to avoid impairment of water quality such that standards are not met. The FPA rules are periodically evaluated to ensure that forest practices do not contribute to violations of water quality standards and that changes to rules be evaluated if the Board of Forestry finds evidence of resource degradation and the public policy process under ORS 527.714 is completed.

2.5. Oregon Agricultural Water Quality Management Act

The Agricultural Water Quality Management Act (ORS 568.900 to 568.933) authorizes the Oregon Department of Agriculture (ODA) to develop Agricultural Water Quality Management (AGWQMP) Area Plans (area plans) and rules throughout the state. ORS 561.191 authorizes the development of Agricultural Water Quality Management Area Rules (area rules), and states that ODA shall develop and implement any program or rules that directly regulate farming practices to protect water quality. The program or rules shall assure achievement and maintenance of water quality standards. ORS 568.912 authorizes ODA to require any landowner to perform those actions necessary to prevent and control water pollution from agricultural activities. ODA’s compliance efforts include statewide Strategic Implementation Areas, a proactive effort to identify areas that would benefit from additional compliance.

The Agricultural Water Quality Management Program is the main regulatory tool to prevent and control nonpoint source pollution from agricultural lands. The area plans and rules are reviewed every two years for each management area. DEQ provides review and comment on the area plans and rules during these biennial reviews. Water quality standards and TMDL load allocations for agricultural lands should be met through implementation of area plans and enforcement of area rules. The program staff members are also involved with the development of Ground Water Management Act action plans, and lead implementation of action plans to improve groundwater quality. DEQ and ODA’s program staff and management work collaboratively to address agricultural nonpoint source pollution.

2.6. Drinking Water Protection Program

The Oregon Health Authority (OHA) administers the Drinking Water Revolving Loan Fund (DWRLF). OHA, which regulates drinking water under state law and the Safe Drinking Water Act, works cooperatively with DEQ on source water protection efforts. Money from the loan fund is used to fund: Source Water Protection Grants (up to \$30,000 per water system) to fund source water protection activities, monitoring, and planning to reduce risk in Drinking Water Source Areas, and loans 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 also funds five Drinking Water Protection positions at DEQ. These positions integrate Clean Water Act programs (including the Nonpoint Source Program) with source water protection needs, provide technical assistance to public water systems, and research the impacts of nonpoint source pollution on surface and ground drinking water sources.

The Drinking Water Providers Partnership is a collaboration of the USDA Forest Service Region 6, DEQ, Washington Department of Health, EPA Region 10, the U.S. Bureau of Land Management OR/WA Office, and Geos Institute, Freshwater Trust and Wild Earth Guardians. Together, the partners coordinate

an annual competitive grant solicitation and award program for environmental conservation and restoration projects in municipal watersheds across the Northwest. The partners share a common vision that watershed restoration is an important and effective way to provide clean, inexpensive drinking water to communities and protect native fish populations, particularly when downstream and upstream users work together. Goals of the partnership are 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.
- Support local partnerships between drinking water providers, landowners, and restoration practitioners.

2.7. Clean Water State Revolving Fund

DEQ's Clean Water State Revolving Fund program offers below-market interest rate loans and bond purchases to public agencies for planning, design, construction or implementation of the following water quality improvement activities:

- Wastewater collection, treatment, water reuse and disposal systems
- Nonpoint source water pollution control projects
- Development and implementation of management plans for federally-designated estuaries in Oregon (Tillamook Bay and Lower Columbia River)

Eligible agencies include tribal nations, cities, counties, sanitary districts, soil and water conservation districts, irrigation districts, various special districts and certain intergovernmental entities. DEQ partners with Oregon communities to implement projects that attain and maintain water quality standards and are necessary to protect beneficial uses. Applicants that submit applications for eligible projects are included on the project priority list. However, DEQ does not commit or reserve funds for individual projects until an applicant meets all loan requirements. This indicates the project's readiness to proceed. DEQ funds projects that are ready to proceed in priority order.

DEQ accepts loan applications at any time but reviews and scores applications three times a year.

In addition to offering loans for nonpoint source pollution control, DEQ also offers a Sponsorship Option loan that can offset the overall debt service for a point source, treatment works project and a nonpoint source project combined, when an eligible applicant submits applications for both a point source and nonpoint source loan.

The loan program objectives include:

- Supporting emerging markets to obtain loans: irrigation modernization, tribal nations and local community loans;
- Encouraging innovative and non-traditional projects, such as green infrastructure, water and/or energy efficiency, climate resilience, sustainability, and environmentally innovative projects; and
- Encouraging communities to focus on high priority, water quality improvements projects statewide, including stormwater, nonpoint source pollution control and estuary projects.

2.8. Oregon Watershed Enhancement Board

The Oregon Watershed Enhancement Board is a state agency that provides grants to help Oregonians take care of local streams, rivers, wetlands, and natural areas. Community members and landowners use scientific criteria to decide jointly what needs to be done to conserve and improve rivers and natural habitat in the places where they live. OWEB grants are funded from the Oregon Lottery, federal dollars, and salmon license plate revenue, along with other funding sources. The agency is led by an 18-member citizen board drawn from the public at large, tribes, state natural resource agency boards and commissions, and federal agencies.

OWEB offers a variety of grant types and programs:

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

The OWEB mission of helping to protect and restore healthy watersheds and natural habitats that support thriving communities and strong economies implicitly recognizes that specific goals for improvement will vary between watersheds. OWEB grants fund a variety of activities that local partners have identified as priorities in watershed assessments, action plans, or regional plans such as ESA Recovery Plans, Groundwater Management Areas, or TMDLs. Restoration actions address watershed process and functions necessary to support natural processes that are indicative of healthy watersheds. This includes, but is not limited to improving water quality, water quantity, habitat complexity, flood plain interaction, vegetation structure, and species diversity. Examples of OWEB grant programs and initiatives that support voluntary actions helping to address nonpoint source pollution include, but are not limited to:

- ***Coordinated Streamside Management and Strategic Implementation Areas*** -- Under the interagency, collaborative approach titled Coordinated Streamside Management, OWEB is collaborating with Oregon Department of Agriculture (ODA) to provide grants to local partnerships in Strategic Implementation Areas (SIAs) for technical assistance that will design projects to restore riparian function, improve watershed health and increase water quality. SIAs are identified through ODA's Agriculture Water Quality Program as areas with water-quality concerns. SIAs result in an implementation plan outlining a set of coordinated restoration actions that address such limiting factors as poor streamside vegetation and/or increased temperature, sediment, and nutrients. An important companion to the technical design work is watershed-scale effectiveness monitoring to track the cumulative effectiveness of coordinated projects that will be implemented. This monitoring is being led by an interagency partnership of OWEB, ODA, DEQ and Oregon Department of Fish and Wildlife (ODFW).
- ***Conservation Reserve Enhancement Program (CREP)*** -- Riparian habitat protection via CREP continues to be a focus through OWEB's partnership investments. This program is a partnership between the U.S. Department of Agriculture and the State of Oregon designed to protect and improve riparian habitat, primarily on agricultural lands, to benefit aquatic species, water quality and streamside habitat. Conservation practices implemented through CREP contracts (typically 10-15 years in length) are cost-shared by OWEB, which provides 20% of the project costs using state funds. OWEB recently completed an effectiveness monitoring study of CREP and is using findings of this study to support adaptive management of the program.
- ***Conservation Effectiveness Partnership (CEP)*** -- CEP brings together technical staff from OWEB, DEQ, ODA, the Natural Resources Conservation Service (NRCS) and ODFW to evaluate the effects of conservation and restoration investments on agricultural water quality and overall watershed health. DEQ, ODA, NRCS, and OWEB formed the partnership in 2010. Through a Memorandum of Understanding, the agencies have committed to participate in CEP

through 2020. In 2016, ODFW joined the CEP as a technical advisor to help the team consider questions about the connections between water quality and fish species and habitats.

- ***Restoration Priority Activities.*** Including projects that address or involve: altered watershed functions affecting water quality, water flow, and the production capacity for fish; removal or remediation of structures such as roads, culverts, and channels to improve water quality and/or fish habitat; land management practices to address the causes of chronic disturbances to the watershed; direct evidence of collaboration between stakeholders and agencies over single-party projects and upslope and upstream treatments.

3. Nonpoint Source Activities and Accomplishments in 2019

This section provides a description of Oregon's administration and implementation of the nonpoint source management plan, description of the Performance Partnership Agreement (PPA), use of Section 319 funds, and identification of annual project implementation activities for various programs and projects.

As outlined in Figure 1, Oregon's nonpoint source program includes a broad spectrum of related program activities. The 2014 update to the Oregon Nonpoint Source Management Program Plan (the 2014 Plan) provides focus and direction to the program through identification of current and planned goals, priorities, actions and timeframe milestones for the years from 2014 to 2019. The 2018-2020 Performance Partnership Agreement (PPA) between DEQ and EPA also clarifies how DEQ will use federal funds to implement programs, including the nonpoint source program in 2019. The goals and priorities outlined in the 2014 Plan and the PPA address a broad spectrum of activities ranging from Section 319 grant administration, TMDL development and implementation, to working with partners in various land use sectors such as urban, forestry, and agriculture.

This Nonpoint Source Program Annual Report provides the basis for tracking annual progress under the 2014 Plan and the PPA. The following sections describe the nonpoint source related activities and reported outputs accomplished in 2019 for each program area identified in the 2014 Plan and the PPA.

3.1. Water Quality Standards

DEQ has identified nine water quality standards related action items (Table 1) in the 2018-2020 Performance Partnership Agreement. The following sections describe progress on these action items in 2019.

Table 1. Description of water quality standards actions or outputs identified in the 2018-2020 Performance Partnership Agreement and the status in 2019.

PPA Element	Action	Time Frame	2019 Status
PPA - 1.1	Temperature Cold Water Refuge Plan for the lower 50 miles of the Willamette River. The purpose of the plan is to interpret the narrative Cold Water Refuge criterion and allow for implementation of the criterion through DEQ's Clean Water Act authorities.	November 2018 - May 2019	In progress Expected in March 2020 See Section 3.1.1
PPA - 1.2	Track, provide input, and comment on EPA's aluminum criteria promulgation for Oregon. Participate in the Endangered Species Act (ESA) consultation as appropriate.	Ongoing through 2020	In progress See Section 3.1.2

PPA Element	Action	Time Frame	2019 Status
PPA - 1.3	Conduct a review and prepare for rulemaking to revise Oregon's temperature water quality standard in anticipation of TMDL remedy decision and other outstanding needs. Determine how to address natural thermal regimes and variability for temperature.	Ongoing through 2020	Delayed, Schedule uncertain See Section 3.1.3
PPA - 1.4	Address water quality standards-related action needs (e.g., variances, site-specific background pollutant criteria, UAAs and/or SSC) arising from implementation of revised human health criteria or the remaining effective portion of Oregon's temperature standard.	Ongoing	Ongoing See Section 3.1.4
PPA - 1.5	Conduct rulemaking to update Oregon's aquatic life use designations based on updated data, including clarifying application of resident trout spawning-related standards. In response to the July 2015 USFWS Biological Opinion, DEQ will revise bull trout use designations.	June 2020	Delayed, In progress See Section 3.1.5
PPA - 1.6	Amend Oregon's rules to clarify the definitions for cool and cold water species to address inconsistency with definitions used in dissolved oxygen standard.	June 2020	Delayed, In progress See Section 3.1.6
PPA - 1.7	Issue individual variances for 4 municipal wastewater treatment facilities for the human health methylmercury criterion.	Submit to EPA January 2019	Discontinued See Section 3.1.7
PPA - 1.8	Develop and conduct a rulemaking to adopt a multiple discharger variance for methylmercury for the Willamette Basin.	Submit to EPA January 2019	Completed January 2020 See Section 3.1.8
PPA - 1.9	Evaluate concurrence memo from NMFS regarding the need for an additional numeric temperature criterion for the lower John Day River to protect steelhead smoltification, and work with EPA to determine next steps.	November 2018	Completed

3.1.1. Cold Water Refuge Plans

In late 2017, DEQ began work on a Cold Water Refuge plan for the lower Willamette River. This is a Triennial Review recommended task and a requirement to satisfy a reasonable and prudent alternative for the 2015 NOAA's National Marine Fisheries Service (NMFS)'s Biological Opinion on Oregon's Temperature Standard. DEQ convened an expert scientific review panel in May 2019. A draft report was

presented to the public and the final draft report was completed and sent to NOAA's NMFS and EPA in March 2020.

3.1.2. Aluminum Criteria Promulgation

EPA received an extension of their deadline to finalize the federal promulgation of aluminum criteria for Oregon by March 2020. In 2013, EPA disapproved Oregon's freshwater aluminum aquatic life criteria, which was adopted by DEQ in 2004. DEQ has provided comments to the EPA. Once EPA's criteria are finalized, DEQ will consider adopting aluminum criteria into state rule during a future update of the state's aquatic life criteria.

3.1.3. Rulemaking related to Oregon's temperature water quality standard

DEQ is developing strategies to potentially update the water temperature standard. This follows the invalidation of Oregon's natural conditions criterion (NCC) for temperature by a federal court in 2012. These strategies for a new temperature water quality standard could be important for effective implementation of the Water Quality Program. The schedule and scope of a temperature standard rulemaking are not yet decided.

3.1.4. Water quality standards-related action needs – variances

DEQ began considering possible approaches to a temperature variance, such as what justification factors could be appropriate, what information would be needed, and how the Highest Attainable Condition (HAC) would be defined. DEQ also began screening permits coming up for renewal in the next 1-2 years to identify which facilities may have difficulties meeting numeric effluent limits based on the currently effective temperature standard.

3.1.5. Rulemaking related to Oregon's aquatic life use designations

DEQ is developing a project plan for rulemaking to update the state's aquatic life use designations based on new data and information. The project was delayed from the original estimated start date and is now expected to be completed by mid-2022.

3.1.6. Rulemaking related to Oregon's dissolved oxygen standard

This is a narrow rulemaking to revise terms in the definition section of the water quality standards rules in order to correct an inconsistency in the way the terms are used in different rules within OAR 340-041. The rulemaking will be conducted together with the aquatic life use update rulemaking discussed above.

3.1.7. Individual variances for wastewater treatment facilities for the human health methylmercury criterion

In July 2017, Clean Water Services applied for variances from Oregon's methylmercury water quality standard for their four wastewater treatment facilities that discharge to the Tualatin River in the Willamette Basin. The variance application is based on the fact that the human health criterion for methylmercury cannot be met due to manmade sources of methylmercury that cannot be remedied or would cause more environmental harm to remove than to keep in place.

DEQ reviewed the variance applications, determined appropriate permit requirements related to the variance and coordinated with CWS and EPA to ensure that federal variance requirements adopted in 2015 would be met, including development of appropriate permit limits and implementation of a mercury

minimization plan that will result in progress toward the human health criterion for methylmercury. However, due to the timing of the need to renew the CWS permit and the Multiple Discharger Variance (MDV) for mercury, DEQ decided not to finalize the individual variances and rely on the MDV.

3.1.8. Rulemaking to adopt a multiple discharger variance for methylmercury for the Willamette Basin

DEQ adopted a rule that establishes a variance for methylmercury for point source dischargers in the Willamette Basin. The variance is a temporary change in the water quality standard that applies to permitted wastewater dischargers. A variance is needed because there is no current technology that dischargers can use to achieve the current standard.

Wastewater dischargers who receive coverage under the variance will have a permit limit based on the mercury level the permittee can feasibly achieve in their effluent. In addition, the facilities will be required to develop and implement a plan to reduce mercury.

3.2. Monitoring and Assessment

DEQ has identified eighteen monitoring and assessment related action items (Table 2) in the 2018-2020 Performance Partnership Agreement. The following sections describe progress on these action items in 2019.

Table 2. Description of monitoring and assessment actions or outputs identified in the 2018-2020 Performance Partnership Agreement and the status in 2019.

PPA Element	Action	Time Frame	2019 Status
PPA - 1.10	DEQ will update Oregon's 2012 Integrated Report and 303(d) list websites and databases following EPA's approval and final action. DEQ will communicate the final 2012 303(d) list for agency and public use.	Summer 2018	Completed EPA approved and finalized in December 2018.
PPA - 1.11	DEQ will assist EPA to identify relevant data elements and georeferenced Integrated Report information to contribute to EPA's national water quality summaries and performance measure and 303(d) Vision tracking and analysis.	Ongoing	Completed georeferenced IR information in July 2019. See Section 3.2.5
PPA - 1.12	Implementation of planned Integrated Report Improvements, including: - Assessment process, methods, and procedure improvements - Assessment data system and processing improvements DEQ will implement these	Draft Assessment: October 2018	In progress Draft 2018/2020 Integrated Report released for public comment in September 2019;

PPA Element	Action	Time Frame	2019 Status
	improvements to prepare assessment information and compile Oregon's next Integrated Report and 303(d) list.	Final 303(d) list: July 2019	Final approved 303(d) list: April 2020. See Section 3.2.5
PPA - 1.13	DEQ's 2018/2020 Integrated Report and 303(d) list will be submitted into EPA's ATTAINS data system.	Ongoing DEQ work with EPA ATTAINS and Water Quality Framework design team. Submittal July 2019.	In progress Submittal April 2020. See Section 3.2.5
PPA - 1.14	DEQ's 2018 Integrated Report and 303(d) list will include a crosswalk section that addresses discrepancies between past and present listings, based on changes (improvements) to the assessment methodology.	Ongoing DEQ work with EPA. Submittal July 2019.	In progress Submittal April 2020. See Section 3.2.5
PPA - 4.1	Implement the Lower Umatilla Basin Groundwater Management Area Action Plan by focusing on agricultural residential, commercial, industrial, municipal, and public water supply activities that will prevent and reduce nitrate contamination in ground water. Enhance engagement with Oregon Department of Agriculture, wastewater permit holders and the recent and ongoing public-private irrigation water development program, targeting reversal of the increasing groundwater nitrate concentration trend in the LUB GWMA.	Ongoing or as scheduled	Ongoing See Section 3.2.3
PPA - 4.2	Implement the Northern Malheur County Groundwater Management Area Action Plan by focusing on agricultural residential, commercial, industrial, municipal and public water supply activities that will prevent and reduce nitrate contamination in groundwater.	Ongoing or as scheduled	Ongoing See Section 3.2.3

PPA Element	Action	Time Frame	2019 Status
PPA - 4.3	Implement the Southern Willamette Valley Groundwater Management Area Action Plan by focusing on agricultural residential, commercial, industrial, municipal and public water supply activities that will prevent and reduce nitrate contamination in groundwater.	Ongoing or as scheduled	Ongoing See Section 3.2.3
PPA - 4.4	Each year, one geographic area will be identified for groundwater monitoring activities with complete coverage of the state over time. Groundwater monitoring locations and timing will be prioritized to complement other internal and external monitoring objectives.	Ongoing	Ongoing See Section 3.2.3
PPA - 4.5	Complete federal and state groundwater reporting requirements.	Ongoing or as scheduled	Ongoing See Section 3.2.3
PPA - 4.6	Participate in EPA - sponsored annual groundwater meetings and conferences as workload and resources allow.	As scheduled	Ongoing See Section 3.2.3
PPA - 7.1	Ambient Monitoring Network -DEQ will continue to monitor approximately 130 ambient water quality station 6 times annually throughout Oregon. These stations provide status and trends data for understanding water quality.	Ongoing	Ongoing See Section 3.2.1
PPA - 7.2	Collect water quality data to support TMDL development.	Ongoing	Ongoing See Section 3.2.1
PPA - 7.3	Statewide statistical survey of rivers and streams.	10/1/2019	Completed October 2019 See Section 3.2.2
PPA - 7.4	Select reference sites east of the Cascade Range in Oregon and establish revised thresholds for chemical and habitat stressors and biological metrics statewide.	10/1/2020	In progress See Section 3.2.2

PPA Element	Action	Time Frame	2019 Status
PPA - 7.5	Reporting of biological, chemical and habitat data at reference and study locations in Western Oregon, at statewide trends sites, and in the Deschutes Basin.	October 2018	Re-scheduled to complete in the next PPA period based on the conversations with EPA Region 10 Monitoring Coordinator.
PPA - 7.6	Identify business requirements for migrating DEQ water quality, biology and habitat data into WQX.	June 2018	In progress See Section 3.2.4
PPA - 7.7	DEQ will collaborate with EPA, as resources allow, on EPA monitoring projects conducted in Oregon.	As scheduled by EPA	Ongoing

In 2019 the Water Quality Monitoring section collected over 5700 water samples representing over 40,000 analyses. Monitoring efforts in 2019 focused on:

- Ongoing, long-term, ambient water quality monitoring
- Monitoring for the development of TMDLs
- Cyanotoxin monitoring of vulnerable public water facilities
- Adaptive management of pesticide use in targeted watersheds
- Data collection to support the issuance of beach bacteria and harmful algae bloom advisories
- Characterization of groundwater quality in vulnerable aquifers
- Data collection for trend analysis in Groundwater Management Areas
- Biomonitoring at random statewide location and targeted sites of potential concern
- Technical support for volunteer organizations.

Highlights of the Monitoring and Assessment program for 2019 include:

- Cyanotoxin source-water monitoring at 57 vulnerable public water bi-weekly;
- Assessed the status and trends of Oregon's surface waters through the Ambient Monitoring Network - DEQ monitored approximately 160 ambient water quality stations six times annually in order to provide aggregate water quality information to local, state, and federal partners as well as members of the state legislature;
- Pesticide Stewardship Partnership (PSP) collected and analyzed over 1000 water samples across nine PSP watersheds;
- Monitored over 90 wells in Harney County to evaluate potential nitrate, arsenic, and pesticide contamination issues;
- Monitoring for temperature and bacteria to support TMDL development and implementation and status and trends in the following basins with high priority water quality issues: Necanicum, Nehalem, Nestucca, Alsea, Beaver, Clackamas, and Sandy River watersheds;

- Continuous dissolved oxygen, temperature, pH, conductivity, instantaneous flow, and other grab samples of field nutrient parameters in North Fork Beaver Creek, South Fork Beaver Creek, mainstem Beaver Creek, Alsea River, North and South Fork Alsea Rivers, Five Rivers, and Fall Creek to support development of the dissolved oxygen and pH TMDLs in the Mid-Coast. Effective shade and canopy cover measurements were collected in the Powder River, and North Fork Powder River to support the Powder dissolved oxygen, pH, and Temperature TMDLs;
- Provided resources and technical assistance to volunteer organizations to collect and assess data in their own watersheds through the volunteer monitoring program;
- Monitored 70 locations at 18 beaches along the Oregon Coast for bacteria to inform the Beach Action Value (BAV) that triggers beach advisories.

3.2.1. Surface Water Quality Monitoring

Ongoing, long-term, ambient water quality monitoring of conventional water quality parameters and pollutants (e.g., temperature, dissolved oxygen, pH, bacteria, nutrients, turbidity, and conductivity) at fixed stations around the state continues to provide valuable insights into long-term statewide trends in water quality. Data from this program are used for permit and TMDL development in addition to providing important data for water quality standards development. In addition to its internal use at DEQ, long-term ambient data is used to calculate water quality status and trends, which is used to support review and comment on agricultural water quality management area plans and rules (see [Section 3.10.2](#)) and the Oregon Water Quality Index.

DEQ laboratory staff coordinated cyanotoxin monitoring of vulnerable public water facilities from May through November 2019 (Figure 2). Over 800 samples were collected, analyzed, and evaluated using EPA Health Advisory Levels for microcystin and cylindrospermopsin as follows:

- 58 drinking water facilities were deemed to be at risk for harmful algae blooms by OHA and DEQ
- 57 facilities participated in the DEQ/OHA monitoring program
- Largest facility: Hillsboro and Joint Water Commission: 398,000 people
- Smallest facility: U.S. Forest Service Steamboat Work Center: 20 people
- Drinking water for 1,510,000 people, 35% of Oregonians
- 819 samples
- 1625 analyses
- 35 samples over the total microcystins action level for vulnerable people
- 0 samples over the cylindrospermopsin action level for vulnerable people
- 6 facilities had total microcystins detections over the action levels
- 0 facilities had a detection over the cylindrospermopsin action level
- 3 sources of HABs:
 - 5 Lake Selmac (Rogue basin)
 - 16 North Santiam River (Willamette basin)
 - 3 Santiam River (Willamette Basin)

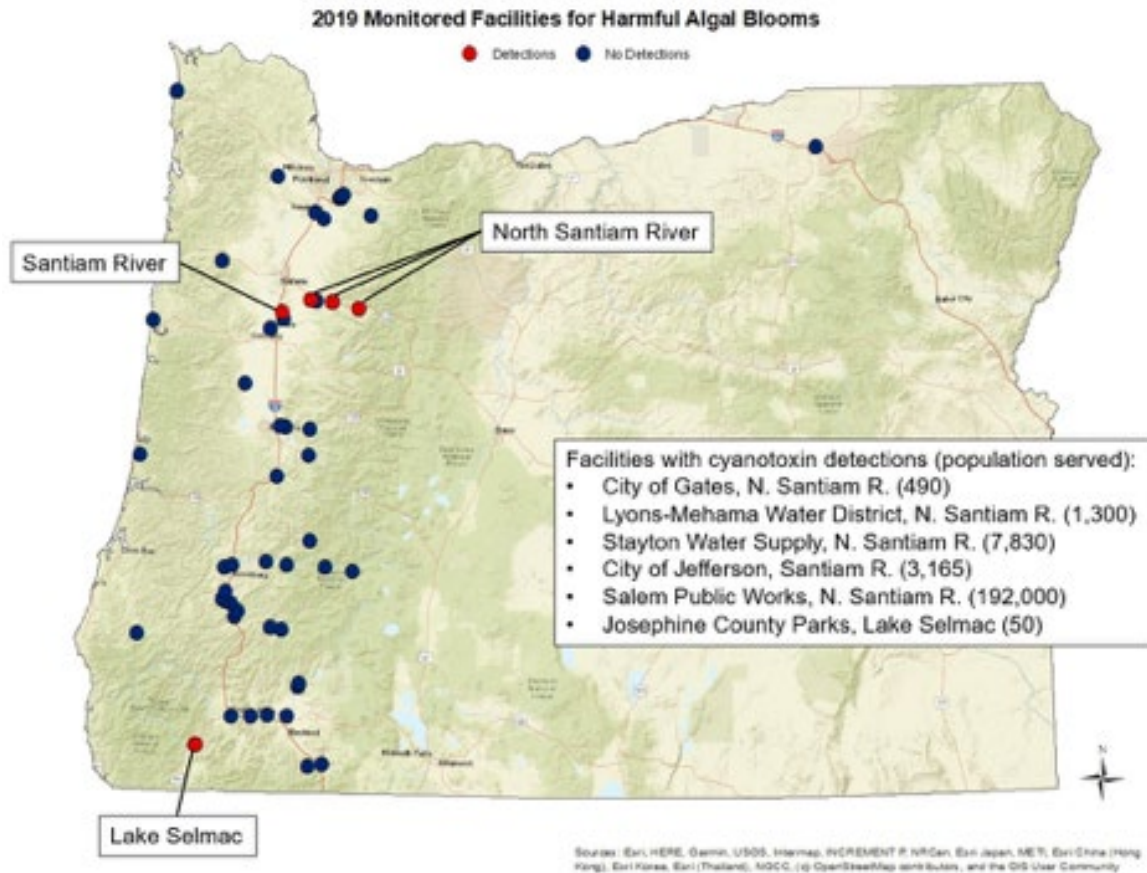


Figure 2. Monitored public water facilities for harmful algal bloom detections.

TMDL monitoring activities in 2019 focused on data collection in priority watersheds. Water quality parameters and data collection efforts were specifically planned for use in the development or refinement of water quality models used to assign waste load and load allocations to designated management agencies.

3.2.2. Biomonitoring Program

The Biomonitoring Program collected macroinvertebrates and zooplankton samples at approximately 25 randomly selected rivers and streams in Oregon to characterize the biological condition of flowing waters statewide. Macroinvertebrates were also collected at 13 statewide reference sites. Macroinvertebrates and other aquatic communities like zooplankton and fish are indicators of water quality, habitat and other environmental conditions. As organisms live and adapt to the chemical and physical changes that occur daily, seasonally and over longer timeframes, aquatic communities come to represent the waterbody conditions. By looking at the relative abundance of individual organisms within a community, their unique requirements and tolerances depict the overall conditions of the water they live in and suggest some of the potential causes, if any, of impairments to the system. In addition, in most cases aquatic communities are a direct measure of the beneficial use the water quality standards are designed to protect.

3.2.3. Groundwater Monitoring Program

Groundwater is an essential Oregon resource. It makes up 95 percent of Oregon's available fresh water. More than 70 percent of Oregon residents get their drinking water from groundwater, and over 90 percent of the state's public water systems get their drinking water from groundwater. To protect this valuable resource, Oregon passed laws to prevent groundwater contamination, conserve and restore groundwater, and maintain the high quality of Oregon's groundwater resource. DEQ implements Oregon's groundwater protection program to monitor, assess, protect and restore Oregon's groundwater resources. Because sources of groundwater contamination and consumers of groundwater cross many boundaries, DEQ also works with other government entities (federal, state and local), as well as private and public organizations and individuals to improve and protect groundwater. A more complete summary of Oregon's multiple groundwater programs is provided in the Groundwater Legislative report at:

<https://www.oregon.gov/deq/Data-and-Reports/Pages/Reports-to-Legislature.aspx>.

As outlined in the legislative report and in addition to surface water monitoring, the Statewide Groundwater Monitoring Program conducts regional groundwater studies throughout Oregon. The study area was selected based on a variety of data including past studies and nitrate data collected during real estate transactions. DEQ began a regional groundwater study in 2019 in the Klamath Basin. The study will include two sampling events in fall 2019 and spring 2020 to look into seasonal and climatic differences in groundwater quality. The sample locations included a variety of domestic, irrigation, livestock, and dedicated monitoring wells. DEQ is analyzing the data which will be made available in late 2020.

The Harney County Study data and report was made available in 2019. The Walla Walla Basin Study data and the Mid-Willamette Basin Study data was made publicly available in 2018. This data will be used to create Summary Reports in 2019 and 2020. Several presentations on the findings of the Mid-Rogue Groundwater study conducted in 2015 and the North Coast Groundwater study in 2015-2016 were provided to local stakeholder groups. Full reports on regional groundwater studies can be accessed here:

<https://www.oregon.gov/deq/wq/programs/Pages/GWP.aspx>.

The DEQ Groundwater Technical Advisory Team met in early in 2019 and decided to select the Klamath Basin as the groundwater monitoring study area for 2019 and 2020. The sampling began in fall of 2019. Sampling of the three existing Groundwater Management Areas also continued in 2019. The Lower Umatilla Basin Groundwater Management Area (GWMA) was sampled quarterly as in previous years. The Northern Malheur County GWMA was only sampled once in 2019, as opposed to quarterly, as a result of permanent reductions in the 2017-19 budget. Sampling in the Southern Willamette Valley GWMA was also reduced. The full well network in the Southern Willamette Valley GWMA was sampled once, and a sub-set of twelve wells was sampled quarterly.

3.2.4. Environmental Monitoring Database

DEQ acquired and launched the Ambient Water Quality Monitoring System (AWQMS) at <https://orwater.deq.state.or.us/> to manage DEQ's environmental monitoring data. This system manages data generated at DEQ's laboratory as well as third-party data. In 2019, the raw continuous data was added in 2019. In addition, DEQ uses the system to upload data to the EPA WQX database. AWQMS now contains over 30,000 stations with information dating back to 1949, including a majority of the backlog of volunteer monitoring data (grab and continuous) from the past 10 years and raw continuous data 1995 through 2019. DEQ continues to migrate biological and habitat data and metrics into the AWQMS system and then provide the data to the EPA WQX database.

3.2.5. Integrated Report - Section 303(d) and 305(b) Assessments

DEQ is required to submit a biennial water quality assessment report to EPA on the condition of Oregon's waters. The Integrated Report is a database report that combines reporting information for the Clean Water Act Section 305(b) assessment of all water bodies and the Section 303(d) list of water bodies that do not meet water quality standards. The draft 2018/2020 Integrated Report was released for public comment from September 30, 2019 through January 6, 2020. For the first time, DEQ released the report as an interactive map tool, story map, and online database. During the public comment period, Water Quality Assessment staff provided six informational sessions across the state to demonstrate the functionality of the new tools and recorded an online webinar.

The 2018/2020 Integrated Report was based on a significantly improved robust methodology, and it created a framework and foundation for future assessments. This was the first time that DEQ conducted a statewide data call since the 2004/2006 Integrated Report. DEQ assessed 10 years of data provided by over 70 organizations, totaling over 26,000 assessments using the updated and revised methodology.

DEQ intends to submit its final report to EPA for approval in April 2020. Submittal of the report will align with EPA's new ATTAINS reporting system.

3.3. Drinking Water Protection Program

In 2019, approximately \$750,000 from the Drinking Water Revolving Loan Fund Program (DWRLF) was used to fund five FTE at DEQ to help implement the Drinking Water Source Protection program, a portion of which is nonpoint source related. Nonpoint source drinking water projects and accomplishments for 2019 include:

- As of June 30, 2019, 316 community water systems (35 percent of Oregon's community water systems) have "substantially implemented" a strategy to protect their drinking water. These water systems include many of Oregon's larger communities and serve approximately 2.96 million Oregonians, which accounts for 85% of Oregonians served by community water systems.
- Completed the remaining 98 "Updated Source Water Assessments" for public water systems using surface water so 100% of the 168 USWAs for Community and Non-Transient Non-Community surface water systems are now complete, transmitted to water systems, and available on DEQ's Source Water Assessment web site. In addition, DEQ has developed code to assist OHA in completing assessments for the remaining 500 public water systems using groundwater. Updated Source Water Assessments give public water systems information on geographic setting, and point and nonpoint pollution risks to drinking water supply. Public water systems and local communities can use the information in the assessments to voluntarily develop place-based plans and implement drinking water protection strategies.
- NRCS currently has five National Water Quality Initiative Source Water Protection Pilot projects that are undergoing a "readiness" phase where local partners are preparing detailed watershed assessments and outreach strategies to address agricultural-related impacts to source water quality. DEQ assisted Oregon conservation partners as they gathered data for the watershed assessments and has been assisting with the technical advisory team in several of these areas. In addition, DEQ assisted NRCS in submitting an additional five additional proposals for FY2020 funding under the NWQI SWP program. The readiness phase for these five drinking water source areas will be initiated in 2020. Following the readiness phase, these SWPAs will then be eligible to receive Federal Farm Bill funding to implement the measures identified in their plans specific to agricultural impacts. (See [Section 4.1.1](#))

- Promoted the use of the Drinking Water Source Protection Fund for loans and grants primarily addressing nonpoint sources of pollution within drinking water areas. Ten drinking water protection projects were recommended for funding with funding awards totaling \$274,500. Projects recommended for funding included activities such as: forest road stabilization and culvert removal to reduce sediment erosion and turbidity; riparian zone repair and revegetation projects; security improvements for riparian area net to an intake; invasive plant removal for wildfire suppression; watershed acquisition due diligence; source water protection planning and ; and underground fuel storage tank surveys and mitigation planning. Specific project details are discussed in the Basin Reports in Appendices A-R.
- Collaborated with federal partners on the Pacific Northwest Drinking Water Providers Partnership which includes USDA Forest Service, BLM, EPA Oregon Ops, Washington Department of Health, WildEarth Guardians, Freshwater Trust and the Geos Institute to develop concepts for watershed restoration and improvement projects within municipal watersheds. All projects enhance habitat for listed species and improve water quality for the communities that rely on streams and rivers for drinking water. In 2019, a total of \$292,000 was awarded in Oregon supporting projects to remove invasive species, construct large instream wood complexes, plant native riparian vegetation, remove and restabilize road segments, re-establish off-channel habitat, and replace culverts. Specific project details are discussed in the Basin Reports in Appendices A-R.
- Provided input and managed grant agreements for Nonpoint Source program 319 grant funding proposals/projects with a drinking water nexus.
- Collaborated with EPA and others to host two additional workshops in 2019 to bring together drinking water operators, land managers, funders, and restoration practitioners to discuss shared goals. The Rogue Basin and Columbia Basin Workshops were focused on wildfire risks and emergency preparedness. The December 2018 workshop for the Mid- and North Coast resulted in increased requests for assistance by water systems and their communities. Two notable examples are DEQ's assistance to Oceanside Water District on industrial forestry issues and Arch Cape Water District on community forest acquisition strategies and funding.
- Provided technical support and raw water sampling for fire retardant byproducts, turbidity and nutrients at the City of Canyonville's intake following a wildfire that burned approximately 45% of the drinking water source area.
- Provided technical support to Oregon Health Authority on Harmful Algal Blooms (HABs) in drinking water during the 2019 sampling season including tracking HAB monitoring results and recreational advisories and initiating development of methods for early detection of HABs that may impact public water systems.
- Contacted surface water systems with known or suspected turbidity issues to request raw water turbidity data for use in identifying waters that do not meet state water quality standards.
- Steering committee work for "Trees to Tap", a project funded by the Oregon Forest Resources Institute and conducted by OSU's Institute for Natural Resources to develop a science-based summary of the effects of forest management on drinking water sources. Work in 2019 included review and providing detailed comments on all draft chapters including providing supporting references, analytical suggestions, graphics and tables as well as information on regulations and state government efforts around drinking water source protection. The report is currently scheduled to be finalized in 2020.
- Oregon State University Extension Phase I Pesticide Assessment for groundwater sources of drinking water: Under a 319 NPS grant, an OSU Extension toxicologist and supervised scientists are evaluating groundwater infiltration and transport of pesticides used in agriculture and forestry that

may affect groundwater quality. The project is designed to evaluate pesticide movement potential, compile the information into a database and GIS format, and create tools for educating and assisting landowners in pesticide choice and use to reduce groundwater contamination. Work in 2019 included hiring of project staff and compilation and analysis of pesticide chemical characteristics information for likelihood of transport through various soil types.

- Provided data on drinking water sources, drinking water quality issues, potential contaminant sources, and recommendations for action for Agricultural Water Quality Management Plans.
- Assisted multiple public water systems in various subbasins to encourage protection strategies on a watershed scale basis. This includes coordinating with surface water providers in the Rogue, Willamette, Umpqua, Siletz, McKenzie, North Coast, Mid-Coast, South Coast, and Clackamas subbasins.
- Participated in Southern Willamette Valley Groundwater Management Area events.
- Continued to work with other state and federal agencies to raise the profile of the need for drinking water protection in Oregon, including the Department of Agriculture, Department of Forestry, USDA Forest Service, BLM, and NRCS. Source Water Assessment data is provided as needed to other agencies to facilitate incorporation of protection strategies into their respective programs. Furthermore, this coordination has identified new opportunities for DEQ and OHA to enhance the depth and quality of technical assistance provided to public water systems.

3.4. Clean Water State Revolving Fund (CWSRF)

In 2019, the Clean Water State Revolving Fund loan program obligated \$19,166,528 toward 11 nonpoint source pollution control projects. The loan has increased for two consecutive years since 2017, which indicates an increasing trend of active nonpoint source pollution control projects funded by the CWSRF program the past two years. Table 3 summarizes the active projects funded during 2019, which includes some of the same projects in 2018 as many projects have long-term, multi-phased construction schedules. More information about these projects including reported accomplishments in 2019 are in the Basin Reports in Appendices A-R.

Table 3. CWSRF projects active or funded in 2019, shown in descending order of budget values.

Admin Basin	Project Name	Project Implementer	Budget
Rogue	Riparian Restoration in Bear Creek Watershed (In progress)	City of Ashland	\$4,829,000
Mid-coast	Bay Moore Stormwater Project (Completed)	City of Newport	\$4,128,454
Hood	Reservoir Enhancement Project: Outlet Replacement and Dam Raise (In progress)	Farmers Irrigation District	\$3,071,574
Mid Coast	Smith Rock and Kingway Irrigation District Piping Project (In progress)	Central Oregon Irrigation District	\$2,000,000
Deschutes	Tumalo Feed Canal Piping Project (Completed)	Tumalo Irrigation District	\$2,000,000

Admin Basin	Project Name	Project Implementer	Budget
Deschutes	Watson and McKenzie Main Canal Pipeline Project (In progress)	Three Sisters Irrigation District	\$1,080,500
Hood	Dee Irrigation District System Pressurization Project (In progress)	Dee Irrigation District	\$1,000,000
Clackamas	Nonpoint Source Loan Program (In progress)	Clackamas Soil and Water Conservation District	\$542,000
Clackamas	Septic System Loan Program (In progress)	Clackamas Soil and Water Conservation District	\$250,000
South Coast	2 nd Street Green Street and Parking Lots and Brownfields Remediation and Land Revitalization (In progress)	City of Coos Bay	\$165,000
South Coast	S. 4 th Street Green Parking Lot (In progress)	City of Coos Bay	\$100,000

3.5. Nonpoint Source Program Plans

DEQ has identified six nonpoint source (NPS) program plan related action items (Table 4) in the 2014 Nonpoint Source Management Program Plan and the 2018-2020 Performance Partnership Agreement. The following sections describe progress on these action items in 2019.

Table 4. Description of specific nonpoint source program plan actions or outputs identified in the 2014 Nonpoint Source Management Program Plan with changes to the timeframe and the 2018-2020 Performance Partnership Agreement, and the status in 2019.

Goal #	Goal Topic	Action	Time Frame	2019 Status
NPS - 1	Update the Nonpoint Source Management Plan every 5 years	Update Oregon's Nonpoint Source Management Plan that describes how the state's Nonpoint Source management program achieves water quality standards and TMDL load allocations through restoration and protection.	2014 to 2019	In progress See Section 3.5.1
NPS - 2	Implement NPS MP	Implement the NPS Management Plan to achieve the NPS Program goals and priorities.	Ongoing	Ongoing See this report
NPS - 3 and PPA - 8.3	Issue NPS Annual Report	The NPS Annual Report describes the progress in implementing the NPS MP and achieving the NPS Program goals and objectives.	Ongoing	Ongoing; Completed for 2019 See Section 3.5.2

Goal #	Goal Topic	Action	Time Frame	2019 Status
NPS - 4 and PPA - 8.8	Complete the Coastal Nonpoint Pollution Control Program	Submit to EPA and NOAA a plan for achieving <ul style="list-style-type: none"> Additional Management Measures for Forestry, as needed, in response to federal comments on the state's strategy 	Ongoing	Ongoing See Section 3.5.3

3.5.1. Oregon's Nonpoint Source Program Management Plan

Oregon's nonpoint source program management plan describes how the state's NPS management program achieves water quality standards and TMDL load allocations. This annual report describes annual progress implementing the management plan. The current 2014 plan approved by EPA on June 15, 2015 is due to be updated and submitted to EPA in 2020. In 2019 there was substantial work on updating the plan. Most of the work was focused on developing the short-term actions and milestones.

3.5.2. Oregon's Nonpoint Source Program Annual Report

Each year DEQ prepares a nonpoint source program annual report describing the annual progress implementing the management plan. This report serves as the annual report.

Starting in 2016, the report was reorganized to be more succinct in response to EPA's recommendations. The 2016 revision included a summary of nonpoint source accomplishments and a more in-depth look at nonpoint source implementation activities occurring statewide. The 2017 revision documented additional information and achievements, including project outputs from 319 Grant program, Oregon Watershed Enhancement Board, Drinking Water, non-grant related TMDL implementation actions by Designated Management Agencies, and Clean Water State Revolving loan nonpoint source projects or activities. This version also included the status of TMDL implementation plan annual reports submitted by Designated Management Agencies and reviewed by DEQ. The 2018 and 2019 reports maintained consistent reporting structure of the 2017 report. In addition, the 2019 report was improved its reporting efficiency through the creation of a new staff time tracking system (see [Section 3.6.1](#)).

3.5.3. Coastal Nonpoint Pollution Control Plan

Under the Coastal Zone Act Reauthorization Amendments states and territories are required to develop Coastal Nonpoint Pollution Control Plan (CNPCP). In its program, a state or territory describes how it will implement nonpoint source pollution controls, known as management measures. This program is administered jointly with the National Oceanic and Atmospheric Administration (NOAA). The state of Oregon has not yet gained full approval and has committed to address the outstanding management measures.

DEQ and Department of Land Conservation and Development (DLCD) work with the other State of Oregon agencies for submittal to EPA and NOAA. In 2016, the state submitted a CNPCP plan to EPA and NOAA describing the state's plan to achieve the additional management measures for forestry.

Oregon has not fully addressed the gaps identified by EPA and NOAA in the CNPCP plan for private forest water quality protections for: riparian protections for small and medium sized fish bearing streams; legacy roads; or harvest activities on shallow landslide prone areas. No activity by DEQ occurred in 2019 on revising or submitting a new CNPCP plan. Discussions between EPA and the state on how to move

forward to obtain full approval of the program have been very limited. Staff who would be working on this effort were focused on completing TMDLs with court ordered deadlines.

3.6. 319 Grant Program and Project Implementation

DEQ has identified eleven 319 Grant program related action items (Table 5 and Table 6) in the 2014 Nonpoint Source Management Program Plan and the 2018-2020 Performance Partnership Agreement. The following sections describe progress on these action items in 2019.

Table 5. Description of 319 Grant program actions or outputs identified in the 2014 Nonpoint Source Management Program Plan with changes to the timeframe and the status in 2019.

Goal #	Goal Topic	Actions	Time Frame	2019 Status
319 - 1	319 Grant Funding DEQ NPS Program	DEQ uses 319 Grant funds to implement DEQ activities that achieve the NPS Program goals and priorities.	Ongoing	Ongoing See Section 3.6.1
319 - 2	319 Grant Funding for pass through grants	319 Grant funding of projects that address Oregon's NPS Program priorities.	Ongoing	Ongoing See Section 3.6.2
319 - 3	Priority projects to receive 319 Grant Funding for pass through grants	Region and HQ staff identifies and rank projects to receive pass through 319 grant funds for addressing NPS Program priorities.	Ongoing	Ongoing See Section 3.6.3
319 - 4	319 Grant RFPs	Continue process improvement of 319 Grant RFPs for timely and efficient issuance. Provide training to DEQ NPS and TMDL staff to increase efficiency and timeliness.	Ongoing	Ongoing See Section 3.6.4
319 - 5	319 Grant Administration	Provide guidance to DEQ staff and grant recipients for grant administration. Guidance includes planning, contracting, invoicing and reporting.	2015	Ongoing See Section 3.6.4

Goal #	Goal Topic	Actions	Time Frame	2019 Status
319 - 6	GRTS	Continue to report 319 grant data into GRTS; Meet annual reporting deadlines.	Ongoing	Ongoing; Completed for 2019 See Section 3.6.5 and Section 3.6.6
319 - 7	NPS Implementation	Collect information from NRCS, USFS, BLM and OWEB on annual NPS project implementation activities including 319 Grant projects.	Ongoing	Ongoing; Completed for 2019 See Basin Reports Appendices A-R
319 - 8	DEQ's NPS Program Website	Update DEQ's NPS Program Website as needed	Ongoing	Ongoing See Section 3.6.7

Table 6. Description of 319 Grant program actions or outputs identified in the 2018-2020 Performance Partnership Agreement and the status in 2019.

PPA Element	Actions	Time Frame	2019 Status
PPA - 8.1	Distribute 319 grants to fund project proposals to Oregon's priority basins based on TMDL development and implementation, drinking water source areas and GWMA's.	May 2019 and May 2020	Completed See Section 3.6.2
PPA - 8.2	DEQ implements an approach where 319 grant-funded DEQ NPS staff time is used to implement TMDLs, WQMPs, IPs that have been determined to be Watershed Based Plans and that time can be used for leverage exemption from the 50/50 319 Grant Program requirements.	2018-2020	Completed See Section 3.6.1
PPA - 8.5	Enter GRTS 319 mandated elements to 319 project tracking data by national deadlines, including load reductions as available.	February 2019, February 2020 load reduction, other GRTS data (National GRTS reporting deadlines)	Completed February 2019 See Section 3.6.5 and Section 3.6.6

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, the 319 grant funding is divided between Performance Partnership Grant funds that fund nonpoint source staff positions and pass through funds that support priority projects that are funded through the Nonpoint Source Grant Program. After starting the calendar year 2015, EPA has withheld 30% of DEQ's 319 funds as a penalty for not having an approvable Coastal Zone NPS Management Program plan because of the gaps identified by EPA and NOAA due to private forest management (see [Section 3.5.3](#) and Table 7). Because of the 319 funding levels to DEQ for nonpoint source work, DEQ anticipates that we will continue to be challenged to ensure adequate staffing to meet the nonpoint source program needs.

Table 7. Oregon total 319 grant funds 2014 to 2019.

Year	DEQ Staff	Projects (Pass Through)	Total
2019	\$1,426,939	\$244,061	\$1,671,000
2018	\$1,435,755	\$257,145	\$1,692,900
2017	\$1,383,959	\$327,041	\$1,711,000
2016	\$1,384,049	\$333,501	\$1,717,550
2015	\$1,370,949	\$80,851	\$1,451,800
2014	\$1,200,000	\$905,000	\$2,105,000
Totals	\$8,201,651	\$2,147,599	\$10,349,250

3.6.1. Funding the Nonpoint Source Program at DEQ

DEQ uses 319 grant funds to implement DEQ activities that work toward achieving the nonpoint source program goals and priorities.

In 2019, the Federal Section 319 program appropriation funded a total of 9.23 full-time equivalent positions within DEQ's performance partnership grant. These positions support the implementation of the Nonpoint Source Program and Section 319 funded activities such as: management of nonpoint sources of pollution, water quality standards and assessment, TMDLs, DEQ's groundwater program, and water quality data analysis, management and monitoring (Table 8).

Temporary staff were hired using funding for permanent staff until there was clarity on the budget for funding positions. These positions worked on high priority water quality status and trends analysis to evaluate water quality outcomes in relation to nonpoint sources.

Table 8. Oregon's 2019 319 Grant funded positions for nonpoint source program activities.

Nonpoint Source Program Activity	FTE
Regional Nonpoint Source Implementation and Nonpoint Source TMDL Development and Implementation	3.335
Nonpoint Source Policy Development, Collaboration and Provision of Technical assistance with Stakeholders and other Local, State, and Federal Agencies	2.000
Nonpoint Source TMDL Modeling	1.887
Prorates and Management and Administrative Support	1.006
319 Grant Administration and Provision of Technical Assistance with Applicants, DEQ Staff and Coordination with Other Funding Agencies	1.000
Total	9.23

Clean Water Act Section 319(h) National Program Guidance suggests states use at least 50 percent of the Section 319(h) funds to implement nonpoint source watershed projects guided by a watershed based plan (including TMDLs). States may use watershed project funds to support staff time spent implementing a watershed based plan. Eligible staff activities include:

- Implementing a local cost share program to fund BMPs in critical areas described in the watershed based plan or acceptable alternative plan.
- Providing one-on-one technical assistance to confirm landowner participation in watershed project(s) and to determine which suite of BMPs are most appropriate to achieve water quality targets articulated in a watershed based plan or acceptable alternative plan.
- Providing technical expertise with siting and designing BMPs.
- Tracking implementation efforts in the watershed to evaluate progress towards the water quality targets in the watershed based plan or acceptable alternative plan.
- Providing coordination support among key partners in addressing NPS pollution within the watershed.
- Leveraging and targeting other state, private, and non-Section 319 federal funds in the watershed.
- Conducting targeted local education/outreach events (such as technology transfer workshops) that promote the voluntary implementation of BMPs.
- Providing technical assistance to support the implementation of a watershed restoration or watershed protection project. Sub-grantee time spent managing project work plans, deliverables, reimbursements, modifications, and reporting for watershed project(s).
- Water quality results monitoring to assess the effectiveness of on-the-ground activities to improve water quality as part of the implementation of a completed watershed based plan or acceptable alternative plan, regardless of the entity conducting this monitoring.

In 2019, \$1,005,475 of Section 319 funds were used to support DEQ staff implementing eligible activities. Combined with pass through grants that directly funded watershed based projects identified in Table 9, the total sum of 319 funds spent on watershed based projects and eligible activities by DEQ staff was \$1,249,536. Therefore, DEQ used about 75% of the total 2019 appropriation (\$1,671,000) for

implementing watershed projects and exceeding the minimum requirement in EPA guidance that states must use at least 50% of the annual appropriation of Section 319 funds for watershed project implementation.

The dollar amount of DEQ staff eligible activities was summarized based on DEQ's timekeeping QTIME system and associated expenditure tables. Within QTIME, DEQ tracks staff time spent working on various activities or projects. Certain activities and projects have unique QTIME codes that staff enter into the system as they work. QTIME maps hours spent on activities and projects and the leave allocable to those activities to appropriate funds and accounting codes for upload into the state payroll system. Each basin has a unique QTIME code to track time spent on TMDL and nonpoint source implementation activities in that basin. The TMDL implementation codes track staff time spent on TMDL implementation activities and the nonpoint source implementation codes track staff time spent on nonpoint source pollution control activities for impairments that are not addressed by a TMDL. After review and input by EPA, it was determined that most of the activities associated with these codes are eligible activities described in EPA guidance. Ineligible activities include 319 grant administration, general statewide nonpoint source coordination, and TMDL development activities. Prior to August 2019, the ineligible activity expenditure was manually removed through a staff survey in which staff provided the proportion of their time spent on ineligible activities. DEQ created a set of new QTIME codes to uniquely track eligible activities for both TMDL implementation and nonpoint source implementation, which were effective August 1, 2019. In the 2019 report, the eligible activity expenditure was summarized through the staff survey for January 2019 to July 2019 and from the new QTIME codes for eligible activity expenditure from August 2019 to December 2019.

3.6.2. Funding Community or Partner Projects

DEQ uses a portion of 319 grant funds as "pass through" watershed project funds to support community or partner projects that address Oregon's nonpoint source program priorities. In 2019, DEQ recommended funding eight stakeholder projects with \$244,061 in Section 319 grant funds (Table 9).

Table 9. List of projects recommended for 2019 319 grant funding, showing in descending order of budget values.

Proposal Title	Organization	Basin	Type of project	Budget
Little Butte / Lower Antelope Creeks	Jackson County SWCD	Little Butte Creek Watershed/Lower Antelope Creek	BMP Implementation, Irrigation conversion flood-sprinkler	\$47,275
Backyard Planting Program 2019	Tillamook Estuary Partnership	Tillamook	Riparian enhancement	\$31,379
Tillamook SWCD 2019 Stream Enhancement & Restoration	Tillamook County SWCD	Tillamook	Riparian exclusion fencing	\$31,379
Community GW Protection Education to Domestic Water Well Users Promoting Land Management	Oregon State University	Southern Willamette Valley Groundwater Management Area	Education/WQ integration land stewardship	\$31,173

Proposal Title	Organization	Basin	Type of project	Budget
Hood River SWCD's Phelps Creek pipeline project (2018 unfunded project)	Gilliam SWCD	Hood River	BMP implementation	\$29,470
John Day Basin UAV Vegetation Monitoring	North Fork John Day Watershed Council	John Day River	Riparian veg. cover monitoring, UAV	\$25,010
Northwest Oregon Restoration Partnership 2019	Tillamook Estuary Partnership	Tillamook	Riparian enhancement	\$24,406
Upper S. Fork John Day Bioassessment	South Fork John Day Watershed Council	John Day	Bio-monitoring, riparian conditions	\$23,969
Total Budget				\$244,061

3.6.3. Prioritizing Projects

Every year, DEQ regional and headquarter staff identify and rank projects to receive pass through 319 grant funds that are intended to address the nonpoint source program priorities. Funding priorities were identified in the 2019 319 Request for Proposals (RFPs) as regional and statewide project priorities. Those priorities as presented in the RFPs can be reviewed in Appendix S. Funded project types and the amount requested from EPA are presented in Table 10 and Figure 3.

Although federal 319 funds have decreased since 2014, Oregon continues to fund priority projects that target nonpoint source pollution (Table 9). DEQ targets nonpoint source grants for the following projects: TMDL implementation plans, surface and ground water quality monitoring, data analysis and modeling, demonstration of innovative best management practices, technical assistance to landowners for conservation planning, public outreach based education, implementation, development of EPA's nine-element watershed plans, and monitoring activities to determine the effectiveness of specific pollution prevention methods. The 2019 319 Grant was funded for the following projects areas: riparian restoration in priority waters, best management practice implementation, bio-monitoring/watershed assessment, and drinking water outreach and education (Table 10, Figure 3).

Table 10. Oregon 2019 319 grant funding priorities with corresponding amounts as presented to EPA.

2019 Type of Project	Amount Requested	% of Total Request
Riparian restoration in priority waters	\$87,164	35.7%
BMP implementation	\$84,244	34.5%
Bio-monitoring/Watershed assessment	\$41,480	17.0%
Drinking water, outreach/stewardship	\$31,173	12.8%
Total Request	\$244,061	100%

2019 319 Grant Fund Distribution

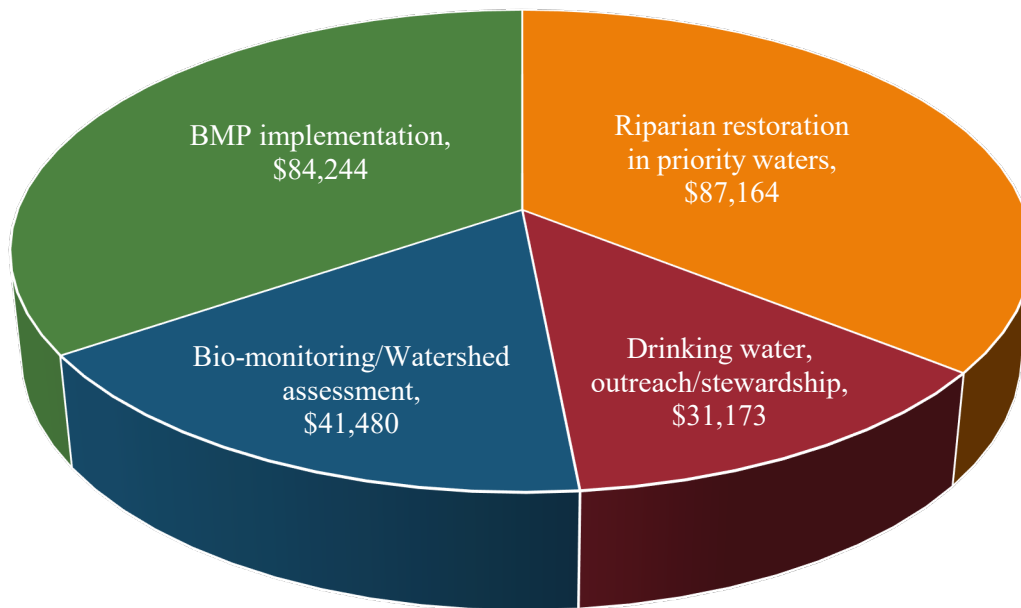


Figure 3. 2019 319 Grant Fund Distribution and Project Types (Total Budget \$244,061).

3.6.4. 319 Grant RFP and Administration

DEQ is committed to improving the 319 Grant process to ensure timely and efficient issuance of 319 Grant RFPs by training staff to increase efficiency and timeliness. DEQ is also committed to providing guidance to DEQ staff and grant recipients for grant administration, planning, contracting, invoicing and reporting.

A team has been in place to meet these goals. The 319 process improvement team includes staff from TMDL and nonpoint source programs from all three regions, as well as individuals from DEQ's business office. The team has monthly conference calls to identify and prioritize program areas in need of increased efficiency and streamlining.

Some of the accomplishments of the process improvement team during 2019 include:

- Reviewed and updated the 2019 Request for Proposals;
- Assisted with boilerplate edits for drafting 319 grant agreements with stakeholders;
- Planned and provided training for 319 staff;
- Updated 319 related milestone schedule; and
- Completed revisions of the 319 grant administration guidance.

3.6.5. Reporting to EPA

All states, including Oregon, are required to report to EPA the details of projects funded under Section 319 of the Clean Water Act and the projects which match Federal Section 319 funds, using EPA's Grants Reporting and Tracking System (GRTS).

As an on-going task, DEQ keeps the GRTS database updated with the following information:

- Drafted and approved agreements implementing approved work plans
- Amendments and completed projects
- Implementation work-plans and final reports
- Estimated load reductions

For the year 2019, load reduction estimates for projects completed during 2019 were entered into GRTS by the new EPA deadline of February 28th, 2019. The table of the load reductions entered into GRTS can be found in Section 3.6.6.

3.6.6. Estimates of Load Reductions from 319 Projects

Section 319 (h) (11) requires states to "report annually on what their nonpoint source programs are accomplishing, including available information on load reductions and actual water quality improvements." Annual load reduction estimates are completed for projects funded through the 319 program (Table 11).

EPA requires that DEQ complete nonpoint source pollutant load reductions using EPA's Section 319 Grants Reporting and Tracking System (GRTS). To estimate nutrients, sediment and biological oxygen demand DEQ used the EPA Region V load reduction model, "Spreadsheet Tool for Estimating Pollutant Load, STEPL". Load reduction estimates were included in GRTS.

Currently EPA provides tools to estimate reduction in BOD, nitrogen, phosphorus and sedimentation loading, but not for other pollutants. The lack of a tool to estimate other pollutants has caused Oregon to chronically underreport water quality improvements as DEQ cannot accurately capture all the work being done to address these other TMDL allocations. DEQ is exploring the use of the status and trends information as one way to describe the change in pollutants across various waterbodies.

Table 11. Total 2019 load reduction estimates by pollutant for five 319 funded projects. These were projects where it was appropriate to estimate load reductions.

Project Number	Project Title, Watershed (HUC)	Funding Year	Project Recipient	319 Budget	BOD lbs/Yr	Nutrients* lbs/Yr		Sed T/Yr
						N	P	
W15602	Upper Nehalem Riparian Restoration, Fishhawk (171002020204)	2015	Upper Nehalem Watershed Council	\$4,000	439	249	89	67
W16650	Upper Nehalem Riparian	2016	Upper Nehalem	\$13,970	89	357		43

Project Number	Project Title, Watershed (HUC)	Funding Year	Project Recipient	319 Budget	BOD lbs/Yr	Nutrients* lbs/Yr		Sed T/Yr
						N	P	
	Restoration, Fishhawk (171002020204)		Watershed Council					
W16651	Tillamook SWCD 2016 Stream Enhancement and Restoration, Upper Nehalem (171002020501)	2016	Tillamook Soil and Water Conservation District	\$14,980	344	3.1	1.2	54
W16656	Backyard Program Planting, Farmer Creek (17100203209), Nestucca Bay (171002030210), Powder Creek (171002030206)	2016	Tillamook Estuary Program	\$14,980	1113	223		1260
W17707	Nestucca Nekowin Sand Lake Riparian Restoration, Nestucca Bay (171002030210), Powder Creek (171002030206)	2017	Nestucca Neskowin Watershed Council	\$11,000	7	19	16	78

* Where data is available, nitrogen and phosphorus estimates are listed separately; otherwise, estimate values are for total combined nutrients.

3.6.7. Updating the Nonpoint Source Program Website

DEQ committed to update the nonpoint source program website at least annually to reflect current information.

The current URL for the nonpoint source program is <http://www.oregon.gov/deq/wq/programs/Pages/Nonpoint.aspx>.

In 2019 the nonpoint source program website was updated with the following information:

- A link to the current 319 Grant RFP
- A downloadable grant application
- Background information on the 319 Grant program
- Links to multiple water quality status and trends reports used for biennial reviews of the agricultural water quality management area rules and plans (see [Section 3.10.2](#))

3.7. Watershed Reports

DEQ has committed to five watershed report action items (Table 12 and Table 13) in the 2014 Nonpoint Source Management Program Plan and the 2018-2020 Performance Partnership Agreement. The following sections describe progress on these action items in 2019.

Table 12. Description of watershed approach and basin report actions or outputs identified in the 2014 Nonpoint Source Management Program Plan with changes to the timeframe and the status in 2019.

Goal #	Goal Topic	Action	Time Frame	2019 Status
WBP - 1	Watershed Basin Status and Action Plans	Develop a template for Watershed Basin Status and Action Plans. DEQ provides training to DEQ NPS and TMDL staff on its use.	2015	Completed See Section 3.7.1
WBP - 2	Watershed Basin Status and Action Plans	Develop Watershed Basin Status and Action Plans within identified priority watersheds that identify priority problems and waters.	Ongoing	Ongoing See Section 3.7.1
WBP - 3	EPA's Nine Key Elements	Report on how TMDL Implementation Plans and Watershed Basin Status and Action Plans meet EPA's Nine Key Elements.	Ongoing	Ongoing See Section 3.7.2
WBP - 4	Volunteer Monitoring	Volunteer Monitoring Watersheds Sample Plans Are Developed.	Ongoing	Ongoing See Section 3.7.3

Table 13. Description of watershed approach and basin report actions or outputs identified in the 2018-2020 Performance Partnership Agreement and the status in 2019.

PPA Element	Action	Time Frame	2019 Status
PPA - 8.6	Implement an approach for Watershed Based Plans that in part relies on TMDLs and other basin plans for meeting EPA's Nine Key Element watershed-based planning guidance.	June 2018-2020	Ongoing See Section 3.7.2

3.7.1. Watershed Basin Status and Action Plan Development

To help protect, improve and enhance the quality of Oregon waterways, DEQ conducts in-depth assessments of the state's basins. These assessments take the form of local water quality status and action

plans, which describe water quality conditions and include recommendations for actions that DEQ and others who are interested in these basins can take to improve water quality.

Between 2011 and 2014, DEQ produced six plans, including the plans for the North Coast, South Coast, Deschutes, Rogue, Powder and Umpqua Basins. The plans can be found at the following URL: <https://www.oregon.gov/deq/wq/Pages/watershed.aspx>.

Since 2016 DEQ divested its resources from developing additional watershed basin status and action plans, although some of the elements that were to be included in the action plans continue to be developed. For example, water quality status and trends are being assessed statewide. In addition, TMDL implementation activities and implementation related project outputs are included in the Basin Reports in Appendices A-R of this annual report.

3.7.2. Nine Key Elements of Watershed Based Plans

Through the annual 319 funding agreement, EPA requires DEQ ensure a watershed-based plan or acceptable alternative plan, which includes all of the information in key elements (a)-(i) as presented in Section 319 Grant guidelines, be completed prior to beginning to implement any on-the-ground project with Section 319 watershed project funds.

During 2019 DEQ staff worked to comply with the 9-key element approach requirement and accomplished the following

- A “9-Key Elements checklist” was prepared to document how each TMDL, WQMP, associated TMDL Implementation plans, and any other plans address the nine key elements. The checklist identifies all the relevant watershed plan documents, the hydrologic codes and watershed names where they apply, the pollutants addressed, and the location in the plans (i.e. section, chapter, page number) where the information for each element may be found. DEQ was notified by EPA Region 10 that a complete checklist will be considered a sufficient watershed-based plan documentation strategy.
- Seven sets of watershed based plans were prepared using the “9-Key Elements Checklist” (Table 14). As referenced above, the plans were then included in the 2019 319 RFP as watersheds eligible for 319 funding. Note that in 2018 DEQ approved checklists for the Tillamook Bay Watersheds. In 2019 these checklists were revised and expanded to include the Nehalem and Nestucca subbasins.

EPA Region 10 has communicated to Oregon DEQ their intent to review at least one (1) watershed plan per year.

Table 14. List of watersheds for which a 9-Key Element checklist was prepared and approved by DEQ in 2019.

DEQ Region	Watershed (HUC)	Pollutant	Eligible Projects Areas that meet all Nine Elements.
Eastern	Imnaha Subbasin (17060102), Lower Grande Ronde Subbasin (17060106), Wallowa Subbasin (17060105)	Temperature (Heat)	Private agricultural lands and within the City of Enterprise

DEQ Region	Watershed (HUC)	Pollutant	Eligible Projects Areas that meet all Nine Elements.
Eastern	Eightmile Creek Watershed (1707010502), Fifteenmile Creek Watershed (1707010503), Mill Creek-Columbia River Watershed (1707010504), Mosier Creek-Columbia River Watershed (1707010511)	Temperature (Heat)	Private agricultural lands
Eastern	Umatilla Subbasin (17070103)	Temperature (Heat)	Entire watershed
Eastern	Walla Walla Subbasin (17070102)	Temperature (Heat)	Private agricultural lands
Eastern	Willow Creek Subbasin (17070104)	Temperature (Heat)	Private agricultural lands and in Willow Creek Reservoir
Northwest	Lower Johnson Creek Watershed (170900120103) Upper Johnson Creek Watershed (170900120101)	Temperature (Heat)	Private agricultural lands and within the City of Portland and City of Gresham
Northwest	Nehalem River Subbasin (17100202) Wilson/Trask/Nestucca Subbasin (17100203)	Bacteria, Temperature (Heat)	Entire watershed

3.7.3. Volunteer Monitoring Sample Plans

In 2019 DEQ conducted outreach and education activities and provided technical assistance to support volunteer monitoring in watersheds throughout Oregon. Staff reviewed and assisted in the development or amendment of seven sampling plans for organizations and worked with additional organizations to refine monitoring strategies or goals outside of the sampling plan process. Volunteer program staff expanded the impact of the program on the ability of the state to assess NPS pollution by connecting or re-connecting with additional community based organizations. These connections will lead to an increase in data submissions from scientifically sound water quality monitoring efforts. These contributions in turn help to bolster NPS pollution assessments.

Volunteer sampling plans reviewed by the program included:

- Clackamas River Basin Council Macroinvertebrate Sampling and Channel Characteristic Assessment Sampling Analysis Plan;
- Columbia SWCD Water Quality Trend Monitoring Program Sampling Analysis Plan;

- Coos Watershed Association Hydrological, Meteorological, and Water Quality, Quality Assurance Project Plan;
- Curry Watersheds Partnership Elk River Temperature Monitoring 2019 Sampling Analysis Plan;
- Malheur Watershed Council Gettin' With The Flow: Monitoring The Owyhee And The Malheur Rivers Sample Analysis Plan;
- Walla Walla Basin Watershed Council 2019 Walla Walla River Heat Source Modeling Project Field Data Collection; and
- Water Quality Monitoring: Ni-les'tun Tidal Wetland Restoration WQMP Sampling Analysis Plan.

In 2019, DEQ staff provided water quality testing equipment or supplies to 17 different organizations. There are approximately 40 active organizations with equipment around the state working on over 24 separate monitoring projects. Staff provided technical assistance on equipment and protocols over the phone and conducted training in water quality monitoring techniques.

Additionally, volunteer program staff continued to improve the data management system for water quality data generated by partner organizations. Volunteer staff continue to make great progress in the effort to get submitted volunteer data available on EPA's WQX via DEQ's AWQMS database. AWQMS is a system that provides assessment and summary of data collected by organizations and stores the data in a format consistent with EPA STORET/WQX data requirements.

3.8. TMDLs and TMDL Implementation

DEQ has identified thirteen TMDL and TMDL implementation related action items (Table 15 and Table 16) in the 2014 Nonpoint Source Management Program Plan and the 2018-2020 Performance Partnership Agreement. The following sections describe progress on these action items in 2019.

Table 15. Description of TMDL and TMDL implementation program actions or outputs identified in the 2014 Nonpoint Source Management Program Plan with changes to the timeframe and the status in 2019.

Goal #	Goal Topic	Action	Time Frame	2019 Status
WQP - 1	TMDL Guidance or IMD	Develop TMDL Guidance or IMD on how to produce work plans that identify data needs and how to design a monitoring study.	2015	Completed in 2017
WQP - 2	Technical Assistance	DEQ headquarters and region staff will provide technical assistance to DMAs, DEQ staff, other local, state, and federal staff on TMDL development and TMDL implementation efforts.	Ongoing	Ongoing See Section 3.8.2
WQP - 3	TMDL Implementation Plans	Work with DMAs to develop and implement TMDL Implementation Plans (including annual reports) as described in the TMDL/WQMP.	Ongoing	Ongoing See Section 3.8.3

Goal #	Goal Topic	Action	Time Frame	2019 Status
WQP - 4	TMDL Implementation Plans	DEQ reviews TMDL Implementation Plan annual reports.	Ongoing	Ongoing See Section 3.8.3
WQP - 5	TMDL Implementation Guidance	Develop a process for DEQ staff to review TMDLs and TMDL Implementation Plans every 5 Years.	2015	Completed in 2014
WQP - 6	TMDL & NPS Implementation	Develop a spreadsheet and process for DEQ to track and report on landscape condition for achieving TMDL implementation timelines and milestones including water quality status and trends.	2014	Ongoing See Section 3.8.3 , 3.10.1 , and 3.10.2
WQP - 7	Reasonable Assurance	Conduct analysis during TMDL/WQMP development to provide reasonable assurance and guide implementation for TMDLs.	Ongoing	Ongoing See Section 3.8.4

Table 16. Description of TMDL and TMDL implementation program actions or outputs identified in the 2018-2020 Performance Partnership Agreement and the status in 2019.

PPA Element	Action	Time Frame	2019 Status
PPA - 2.1	Develop TMDLs and WQMPs in accordance with 303(d) list schedule.	Ongoing till 2020 depending on TMDLs	DEQ issued the Upper Klamath and Lost Subbasins Temperature TMDL in September 2019 and the Willamette Basin Mercury TMDL revision in November 2019. Other TMDLs are in progress See Section 3.8.1
PPA - 2.3	Implement issued TMDLs. Work with watershed councils, local governments, and other DMAs to develop appropriate management practices and plans for meeting TMDL allocations. Work with USDA agencies to leverage Farm Bill resources to implement priority best management practices in critical areas.	Ongoing	Ongoing See Section 3.8.3 and the Willamette Basin Report in Appendix R.
PPA - 2.4	Include robust Reasonable Assurance documentation in the TMDL and WQMP to implement TMDLs for Nonpoint	Ongoing	Ongoing See Section 3.8.4

PPA Element	Action	Time Frame	2019 Status
	Sources in subbasins where TMDLs/WQMPs have been completed or are being completed. Work with watershed councils, local governments and other DMAs to develop appropriate management practices and plans for controlling pollutants. Work with USDA agencies to leverage Farm Bill resources to implement priority best management practices in critical areas.		
PPA - 2.5	Implementation of load allocations or require TMDL implementation plans for all sources assigned load allocations.	Ongoing	Ongoing See Section 3.8.3 and the Basin Reports in Appendices A-R
PPA - 2.6	Develop and implement TMDL/WQMP/IP as one of the approaches to address the deficiencies in the CZARA Coastal Nonpoint Control Plan additional management measures for forestry identified by EPA and NOAA (7/28/2015) as described in the Governor's Natural Resource Office letter (2/10/2016). Incorporate New Development guidelines and Onsite Sewage Disposal Systems (OSDS) actions in TMDL/WQMP as described in CZARA management measures.	At issuance of TMDLs	Ongoing Occurred as TMDLs are developed. See Section 3.8.1
PPA - 2.7	Work with EPA on 303(d) Vision timelines for prioritization, assessment, protection, alternatives, engagement, and integration.	Ongoing	Ongoing See Section 3.8.4

3.8.1. TMDL Development

Several TMDLs were under development or issued in 2019:

Coquille River Subbasin TMDLs: TMDLs for the Coquille River Subbasin are being developed to address dissolved oxygen, chlorophyll a, temperature, and bacteria. Modeling of the North, Middle, and South Fork Coquille River has been completed with draft allocations developed for point and nonpoint sources within the Coquille Subbasin. The draft Water Quality Management Plan to support the Coquille TMDL was updated in 2019 that includes more recent language and format changes. In 2019, the focus of work was on completing loose ends for the dissolved oxygen TMDL, drafting narrative for the TMDL and preparing for public outreach. The Coquille River Subbasin TMDL is now expected to be submitted to the EPA for approval in late 2020.

Upper Klamath and Lost Subbasins TMDLs: Public comment was held on a revision to the nutrient TMDLs for the Upper Klamath and Lost Rivers from July 27, 2018 through August 10, 2018. The revised TMDL was issued by DEQ and submitted to EPA in January 2019. EPA approved the TMDL in March of 2019. This set of TMDLs addressed dissolved oxygen, pH, ammonia toxicity, and chlorophyll a impairments and was originally issued in December 2010 when it also included temperature TMDLs. The nutrient part of the TMDL was reissued by DEQ in December 2017. Three entities in the Klamath Basin requested reconsideration, which was granted by the Director of DEQ in early 2018. The TMDLs were updated to include new information as it pertained to the Water Management Districts and their responsibilities for TMDL implementation planning.

DEQ also issued and EPA approved the Upper Klamath and Lost Subbasins Temperature TMDL in September 2019. Source of excessive heat identified in the TMDL include solar radiation due to the removal or reduction in streamside vegetation; discharge from discrete nonpoint sources (canals and ditches), channel modifications, dam and reservoir operations, diversions for irrigation, and discharge from wastewater treatment plants and industrial operations. The Upper Klamath and Lost Subbasins Temperature TMDL is a crucial step for improving the health of these rivers by reducing river temperatures that are too warm for fish. Meeting the temperature water quality standard is critical for protecting fish and other aquatic life in these rivers, including endangered suckers.

Willamette Basin Mercury TMDL: DEQ issued the Revised Willamette Basin Mercury TMDL on Nov. 22, 2019. On November 29, 2019, EPA disapproved the TMDL and established a new TMDL as required under the Clean Water Act and implementing federal regulations. EPA's TMDL incorporated by reference many sections of DEQ's issued TMDL, but there are significant differences for some allocations.

DEQ and EPA revised the TMDL to meet Oregon's current water quality criterion for methylmercury in fish tissue, which is eight times more stringent than the target that was used to develop the TMDL in 2006. The TMDL found that the greatest source of mercury in the basin is from atmospheric deposition, which originates mainly from national and global sources including industrial and coal burning power plant emissions. Once mercury is deposited on the landscape, the major pathways to streams are erosion of sediment-bound mercury and surface runoff. Therefore, management actions to reduce mercury to waterbodies will largely focus on implementing nonpoint source BMPs and strategies to reduce erosion and runoff from urban, rural and forested lands.

Mid-Coast watershed TMDLs: TMDLs for multiple waterbodies in the Mid-Coast are being developed to address impairments for bacteria, temperature, and dissolved oxygen.

The dissolved oxygen, and bacteria TMDL for the Upper Yaquina is expected in the fourth quarter of 2020. During 2019, final model calibration, model sensitivity analyses, and determination of loading capacity were completed.

TMDLs addressing dissolved oxygen impairments in the Siletz River watersheds are scheduled for issuance in the fourth quarter of 2021. During 2019 the Siletz River watersheds HSPF calibration was completed and setup of the Siletz River QUAL2Kw calibration model occurred. These efforts resulted in several draft documents circulated for stakeholder review.

Temperature TMDLs in the Siletz River, Yaquina, and the Yachats River Watersheds are scheduled to be developed following completion of the dissolved oxygen and bacteria TMDLs. Work is estimated to resume on these TMDLs in 2021. Some work has already been completed but has been paused for a number of years due to litigation which required DEQ to shift staff resources to other TMDLs with court

mandated timelines. Temperature, bacteria, biocriteria, and sediment TMDLs for other Mid-Coast waterbodies have also been paused. It is uncertain at this time when those TMDLs will resume.

Powder River Basin TMDLs: Currently DEQ is working on TMDLs that will address impairments for bacteria, dissolved oxygen, and chlorophyll a in the Powder River, Burnt River, and Brownlee Reservoir Subbasins. Riparian areas and channel widths have been delineated via GIS for use in model for dissolved oxygen and pH impairments in the Powder River. In 2019, riparian delineation and effective shade estimates for the Powder River were completed. Bacteria allocations were also calculated through the use of load duration curves. Modeling work was delayed by court-ordered deadlines and responses to harmful algal blooms across the state. The target date for completion of the TMDLs is the fourth quarter of 2021.

Upper Deschutes Subbasin TMDLs: Currently DEQ is working on data collection and preliminary analysis of nutrient sources for TMDLs in the Upper Deschutes Subbasin that will address impairments for dissolved oxygen, temperature, and pH. In 2019 data collection for nutrients sources to the Upper and Little Deschutes River was completed.

3.8.2. Technical Assistance

DEQ headquarters and regional staff provide technical assistance to DMAs, DEQ staff, other local, state, and federal staff on TMDL development and TMDL implementation efforts.

In 2019 technical assistance for TMDL development was focused on:

- Coquille Subbasin dissolved oxygen, pH, and bacteria, and temperature TMDLs
- Middle Siletz Subbasin dissolved oxygen and temperature TMDLs
- Powder and Burnt Subbasins bacteria, pH, and dissolved oxygen TMDLs
- Upper Klamath and Lost Subbasins temperature TMDLs
- Upper Yaquina Subbasin bacteria, dissolved oxygen, and temperature TMDLs;
- Willamette Basin Mercury TMDLs

Technical assistance for TMDL implementation efforts was focused on:

- Assistance to Designated Management Agencies on development or revision of TMDL implementation plans, primarily in the Willamette but also in the Rogue, North Coast, and Sandy (see [Section 3.8.3](#));
- Review of Designated Management Agencies TMDL implementation annual reports (see [Section 3.8.3](#));
- Implementation of management strategies and BMPs and monitoring assessments in the North Coast, South Coast, Willamette, Rogue, Klamath, John Day, Grande Ronde, Hood, Umpqua and Malheur Basins;
- Production of the 2019 statewide quality status and trends reports (see [Section 3.10.2](#));
- Review and comment on agricultural water quality rules and area plans (see [Section 3.10.2](#)).

The revised Willamette Basin Mercury TMDL Water Quality Management Plan identifies ODF as a designated management agency. ODF was involved in the stakeholder committees for this, and the Water Quality Management Plan includes specific evaluation measures and measurable objectives for private and state forestlands (ODF as the DMA), as well as federal forestlands. As a DMA, ODF is required to identify specific actions to reduce sedimentation from non-federal forest lands, including both voluntary

and regulatory actions. In addition, ODF will identify specific measurable objectives and timelines that address runoff and erosion. This creates a TMDL-related mechanism for connecting ODF's outcome-based sediment and erosion rules to implementation of sediment-related TMDL load allocations and surrogate measures.

3.8.3. DMA Implementation Plans and Annual Report Reviews

DEQ regularly works with DMAs to develop and implement TMDL implementation plans. As in previous years, most DMAs continue to implement their TMDL implementation plans. A sampling of DMA implementation activities reported to DEQ in 2019 are described in the Basin Reports in Appendices A-R. DEQ also supports DMAs as they develop or revise TMDL implementation plans and submit their TMDL implementation plan annual reports.

DEQ staff regularly receive and review TMDL implementation plans. For TMDLs issued, DEQ has:

- Required approximately 164 implementation plans to be submitted;
- Received 126 implementation plans (77% of those required); and
- Reviewed or took action on 93 (74%) of the received implementation plans.

DEQ uses the ACES database to systematically track TMDL enforcement and reporting requirements and their status. The ACES system tracks DMA annual report due dates, five-year review due dates, TMDL implementation plans or plan revision due dates, the dates of report acceptance, review, and the approval by DEQ, as well as enforcement actions.

In 2019, DEQ improved the DMA identification process by automating DMA mapping. This method uses a combination of ownership, zoning, city limits, public land management, transportation, tribal boundary and land cover GIS data to assign a DMA to each tax lot in Oregon. These maps will improve the tracking of TMDL implementation activities.

3.8.4. Reasonable Assurance

OAR 340-042-0030(9) defines Reasonable Assurance as “a demonstration that a TMDL will be implemented by federal, state or local governments or individuals through regulatory or voluntary actions including management strategies or other controls.” OAR 340-042- 0040(4)(I)(J) requires a description of reasonable assurance that management strategies and sector-specific or source-specific implementation plans will be carried out through regulatory or voluntary actions.

The Clean Water Act Section 303(d) requires that a TMDL be “established at a level necessary to implement the applicable water quality standard.” Federal regulations define a TMDL as “the sum of the individual wasteload allocations for point sources and load allocations for nonpoint sources and natural background” [40 CFR 130.2(i)].

When a TMDL is developed for waters impaired by point sources only, the existence of the NPDES regulatory program and the issuance of NPDES permits provide the reasonable assurance that the wasteload allocations in the TMDL will be achieved. That is because federal regulations implementing the Clean Water Act require that water quality-based effluent limits in permits be consistent with “the assumptions and requirements of any available [wasteload allocation]” in an approved TMDL [40 CFR 122.44(d)(1)(vii)(B)].

Where a TMDL is developed for waters impaired by both point and nonpoint sources, it is the state's and EPA's best professional judgment as to reasonable assurance that the TMDL's load allocations will be achieved. EPA past practice directs that these determinations include consideration of whether practices capable of reducing the specified pollutant load: (1) exist; (2) are technically feasible at a level required to meet allocations; and (3) have a high likelihood of implementation. Where there is a demonstration that nonpoint source load reductions can and will be achieved, a determination that reasonable assurance exists and, on the basis of that reasonable assurance, allocation of greater loads to point sources is appropriate. Without a demonstration of reasonable assurance that relied-upon nonpoint source reductions will occur, greater reductions to point sources wasteload allocations are needed.

Reasonable assurance that needed load reductions will be achieved for nonpoint sources is based primarily on an accountability framework incorporated into the WQMP, together with the implementation plans of DMAs and responsible persons. In 2019 DEQ and EPA continued working on developing recommendations to improve the clarity and documentation of reasonable assurance for implementation of Total Maximum Daily Loads and Water Quality Management Plans (WQMP). These components were documented in either the TMDL, WQMP, TMDL implementation plans, or DMA annual reports. The reasonable assurance and accountability framework includes the following elements:

- Identification of the management strategies and specific implementation actions needed to achieve the identified pollutant reductions in the WQMP;
- Timelines for implementing management strategies including schedules for revising permits, achieving appropriate incremental and measurable water quality targets, and completion of other measurable milestones;
- Identification of persons, including DMAs, responsible for implementing the WQMP management strategies and for developing or revising an implementation plan (if the one in the WQMP is not used);
- Direction to DEQ to evaluate new or revised DMA implementation plans in order to determine they are at least as effective as the strategy set out in the TMDL and WQMP;
- Commitment by DEQ to track the management strategies being implemented and evaluate achievements against established timelines and milestones;
- Commitment by DEQ to take appropriate action if the DMAs or responsible persons fail to develop or effectively implement their implementation plan or fulfill milestones; and
- Commitment by DEQ to track water quality status and trends concurrently as management strategies are implemented.

Beginning with the Klamath and Lost Subbasins temperature TMDL and continuing with the Willamette Basin Mercury TMDL that were issued in 2019, DEQ began developing an Assessment and Monitoring Strategy to support the TMDLs reasonable assurance and adaptive management strategy of the TMDL and WQMP. The monitoring and assessment strategy is oriented toward adaptive management and focuses on evaluating administrative objectives as well as water quality objectives and lays out monitoring design guidance that may be incorporated by DMAs or a subset of DMAs. The strategies are working documents subject to change over time as DEQ expects to meet with Designated Management Agencies (DMAs) and stakeholders to gain input on monitoring.

3.9. Toxics

In order to make progress on the nonpoint source program goals related to toxic chemicals, DEQ has committed to three action items (Table 17 and Table 18) in the 2014 Nonpoint Source Management Program Plan and the 2018-2020 Performance Partnership Agreement. The following sections describe progress on these action items in 2019.

Table 17. Description of the toxics program actions or outputs identified in the 2014 Nonpoint Source Management Program Plan with changes to the timeframe and the status in 2019.

Goal #	Goal Topic	Action	Time Frame	2019 Status
TOX - 1	Water Quality Pesticide Management Team and Pesticide Stewardship Partnerships (PSPs)	Continue to work with the WQ-PMT and implement programs to address water quality pesticide issues including the PSP projects.	Ongoing	Ongoing See Section 3.9.1 and 3.9.3
TOX - 2	Public Water System (PWS)	Continue developing contaminant-specific reduction strategies for public water system use, such as for nitrates and pesticides from urban and rural residential lands.	Ongoing	Ongoing See Section 3.9.2

Table 18. Description of toxic program actions or outputs identified in the 2018-2020 Performance Partnership Agreement and the status in 2019.

PPA Element	Action	Time Frame	2019 Status
PPA - 8.7	Implement Agency Toxics Reduction Strategy	Ongoing	Ongoing See Section 3.9.3

3.9.1. Water Quality Pesticides Issues

DEQ works with the Water Quality Pesticide Management Team (WQPMT) and implements programs to address water quality pesticide issues. The NPS management program plan identified in the nonpoint source program will reduce, where needed, instream pesticide concentrations. Each subsection below identifies progress made on this goal.

3.9.1.1. Water Quality Pesticide Management Team Activities

Several state agencies are responsible for the development and implementation of water quality policies in Oregon. The Water Quality Pesticide Management Team, an interagency team comprised of representatives from the Oregon Department of Agriculture, DEQ, Oregon Health Authority, Oregon Department of Forestry, Oregon Watershed Enhancement Board and Oregon State University (technical consultant) was formed to address pesticide contamination issues in waters across the state.

The team seeks to reduce concentrations and frequencies of pesticide detections in waters of the state through facilitation and coordination of water quality related activities such as monitoring, data analysis and communication, prioritizing program activities, review and implementation of programs and policies.

<http://www.oregon.gov/ODA/programs/Pesticides/Water/Pages/AboutWaterPesticides.aspx>

The Water Quality Pesticide Management Team is guiding the expansion and enhancement of the Pesticide Stewardship Partnership Program. In 2019, the WQPMT selected the Middle Deschutes Watershed as the newest full scale Pesticide Stewardship Partnership (PSP) project after conducting periodic stream monitoring since 2014. Those initial monitoring results showed a broad range of agricultural pesticides in two streams in the watershed. In one particular stream, several of these pesticides exceeded EPA aquatic life benchmarks. A second phase of pilot monitoring occurred between 2017 and spring 2019, which included an additional stream in the watershed. Two other stream sampling locations with few detections were dropped from the monitoring program. The WQPMT presented the results of the two phases of pilot monitoring to the Jefferson Soil and Water Conservation Board of Directors in July of 2019, and they voted unanimously in support of the recommendation to move forward with a full scale PSP in the Middle Deschutes Watershed.

In addition, the Water Quality Pesticide Management Team worked with local partners to conduct a second phase of targeted pilot monitoring in the South Umpqua Watershed from 2017 through the spring of 2019, based on an evaluation of data from 2014 and 2015. The 2017-19 South Umpqua data results were generally consistent with the 2014-15 results. However, in 2014-15 there were two herbicides detected at least once at levels between 20-40% of the lowest EPA aquatic life benchmark, whereas no pesticide detections in the watershed exceeded 10% of a benchmark during the 2017-19 monitoring period. Only one pesticide, atrazine, was designated as a pesticide of “moderate concern” based on the WQPMT’s prioritization criteria. No pesticides met the “high concern” criteria in the watershed. Atrazine detection frequency during 2017-19 was at approximately 60% across all monitoring sites, but the concentrations were low relative to EPA benchmarks. Several of the detected herbicides are associated with industrial forest land use, however, they can also be used for rights-of-way and other applications.

The Water Quality Pesticide Management Team met with local partners and stakeholder in June 2019 to present the results of the two phases of pilot monitoring and to determine whether to move forward with a longer term Pesticide Stewardship Partnership (PSP). Although there wasn’t a consensus recommendation from the meeting, many partners questioned whether the data demonstrated sufficient water quality impacts to continue the project. The WQPMT agencies conducted further review of watershed data and pesticide application information in the fall of 2019, and then consulted with the new PSP Stakeholder Advisory Group in early 2020 on a decision to suspend or continue monitoring. Based on the discussions with the advisory group and local partners, the WQPMT made the decision to suspend monitoring in the South Umpqua. The recommendations from the team also included a proposal to conduct a pesticide water quality training for landowners and commercial and institutional applicators in the watershed, with credits available for maintaining applicator licenses through ODA. This training would focus on atrazine, as well as other herbicides detected in the watershed. The WQPMT will also evaluate follow up monitoring opportunities with local partners after the training, with possible deployment of passive samplers (POCIS) in area streams.

In 2019 the Water Quality Pesticide Management Team coordinated and conducted three agricultural and commercial pesticide waste collection events. These events removed 33,288 pounds of unusable and “legacy” pesticides from Oregon watersheds that were brought in by 49 growers or other applicators. Since 2014, when stable funding was allocated by the Oregon Legislature, over 424,000 pounds of pesticide waste has been collected from 668 growers and other commercial and institutional pesticide applicators.

The WQPMT also reviewed and evaluated the sampling and technical assistance needs for each PSP watershed, and allocated funding to local partners according to those needs. Some funding was dedicated to the development of strategic plans for specific watersheds. The purpose of these plans is to ensure that local teams are focused on the highest priority pesticides and have detailed plans and commitments for reducing those pesticides through outreach and technical assistance activities. In addition, the WQPMT allocated funds to Oregon State University's Pesticide Safety and Education Program to enhance general outreach and training presentation content for the PSP program. This content will focus on water quality impacts of pesticides and general approaches for reducing the "off-target movement" of pesticides into Oregon waters.

In 2019, a Pesticide Stewardship Partnership external stakeholder advisory group (SAG) was formed and held its first meeting. The members of this advisory group include those representing agricultural landowners, commercial forestry, watershed councils, local government, tribal governments, environmental and public health advocacy organizations and environmental justice groups. Agencies representing the Water Quality Pesticide Management Team participate in these meetings to provide technical and programmatic information. The SAG is tasked with providing input and insights on various elements of the PSP program, including metrics for assessing program effectiveness and the scope of monitoring and technical assistance activities at both a statewide and watershed scale.

3.9.1.2. Watershed Pesticide Stewardship Partnership Projects

Established in 2000 in the Hood River Watershed, the Pesticide Stewardship Partnership (PSP) Program uses local expertise with water quality sampling results to encourage and focus voluntary changes in pesticide use and practices. Through 2012, the program was supported primarily by nonpoint source grants and in-kind contributions. The 2013 Oregon Legislature provided the Oregon Department of Agriculture and DEQ with stable state funding for the program, and this financial support has continued through the 2019 Legislative Session. The program has expanded to encompass nine long-term watershed projects. In addition, the pesticide collection events and stewardship technical assistance grant program, referenced in [Section 3.9.1.1](#), are now largely supported by state funding.

Since 2017, the surface water monitoring conducted in PSP watersheds was enhanced to include stream flow monitoring. The flow data allows DEQ and ODA to calculate pesticide loading changes over time, rather than just focusing on in-water concentrations. Given wide fluctuations in precipitation from year-to-year at some monitoring locations, as well as variations caused by changing water withdrawals and discharges, concentrations may not accurately reflect improvements in best practices that could result in reductions in total pesticide loading to streams. Having both pesticide concentration and mass loading data provides more insights into water quality issues in PSP watersheds, as well as impacts from pesticide stewardship activities. In 2019, watershed partners helped DEQ collect over 550 grab water samples across all PSP watersheds, which were analyzed for over 130 pesticide ingredients and degradates. DEQ, ODA and other partners communicate the data results to pesticide applicators and community groups prior to spring pesticide applications.

With regard to PSP successes, in the Hood River Watershed there have been no exceedances of state water quality criteria or EPA aquatic life benchmarks since 2017. Also, in 2019 the total number of pesticide detections in the Hood River area streams fell to the lowest level since 2009, when there was a five-fold increase in the number of pesticides analyzed by DEQ's laboratory. Historically, the primary pesticide of concern in the Hood and other watersheds had been the insecticide chlorpyrifos that were detected at concentrations exceeding aquatic life criteria. Although chlorpyrifos is still used for insect control in multiple agricultural commodities throughout Oregon, it has not been detected in the Hood Watershed since 2014 (Figure 4) or Wasco PSP watersheds since 2015 (Figure 5). A combination of improved integrated pest management practices, drift reduction technologies and lower toxicity pre-bloom insect control chemistries have resulted in reductions in chlorpyrifos in surface waters within those

watersheds over time. Chlorpyrifos is still detected somewhat frequently in particular streams within more complex watersheds in Western Oregon.

Monitoring on Fifteenmile Creek in the Wasco PSP area has shown a sustained reduction in the levels and occurrence of the herbicides diuron and simazine since monitoring began in 2010. Information received from partners in the watershed indicated that the use of diuron in rights-of-way applications in this watershed was reduced significantly over time. The specific reasons for the simazine decline aren't known, but some agricultural landowners in the county have transitioned to alternative chemistries for weed and vegetation control. Neither simazine nor diuron have been detected in Fifteenmile Creek since 2015 (Figure 6).

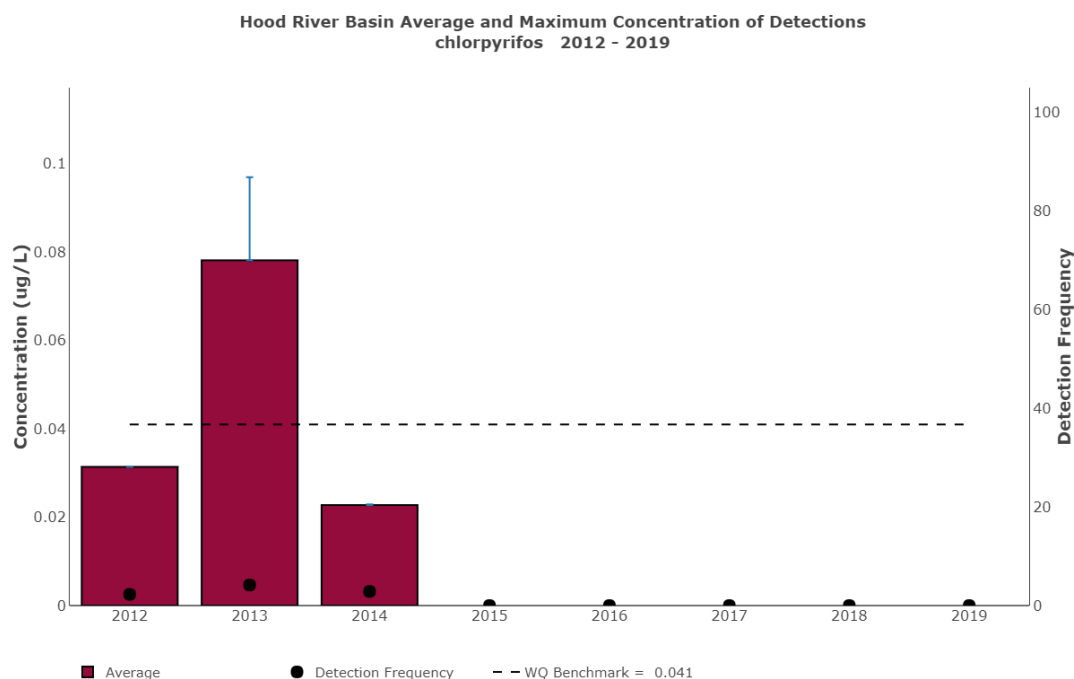


Figure 4. Hood River Watershed Pesticide Stewardship Partnership Project: average and maximum concentrations of detections of chlorpyrifos, 2012-2019.

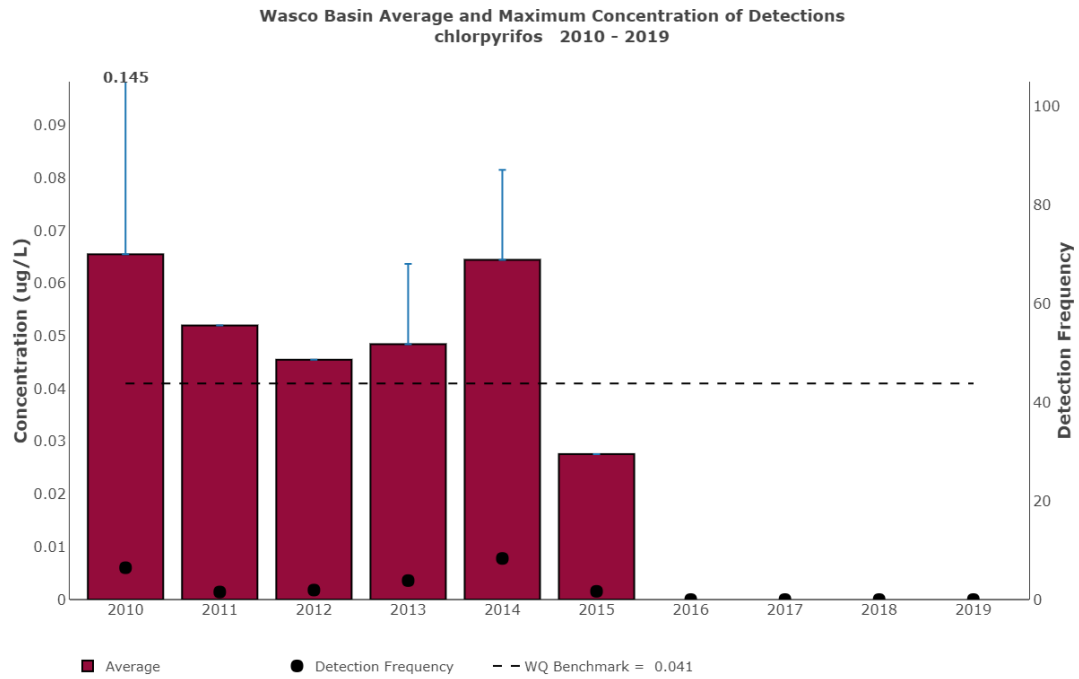


Figure 5. Wasco Watersheds Pesticide Stewardship Partnership Project: average and maximum concentrations of detections of chlorpyrifos, 2010-2019.

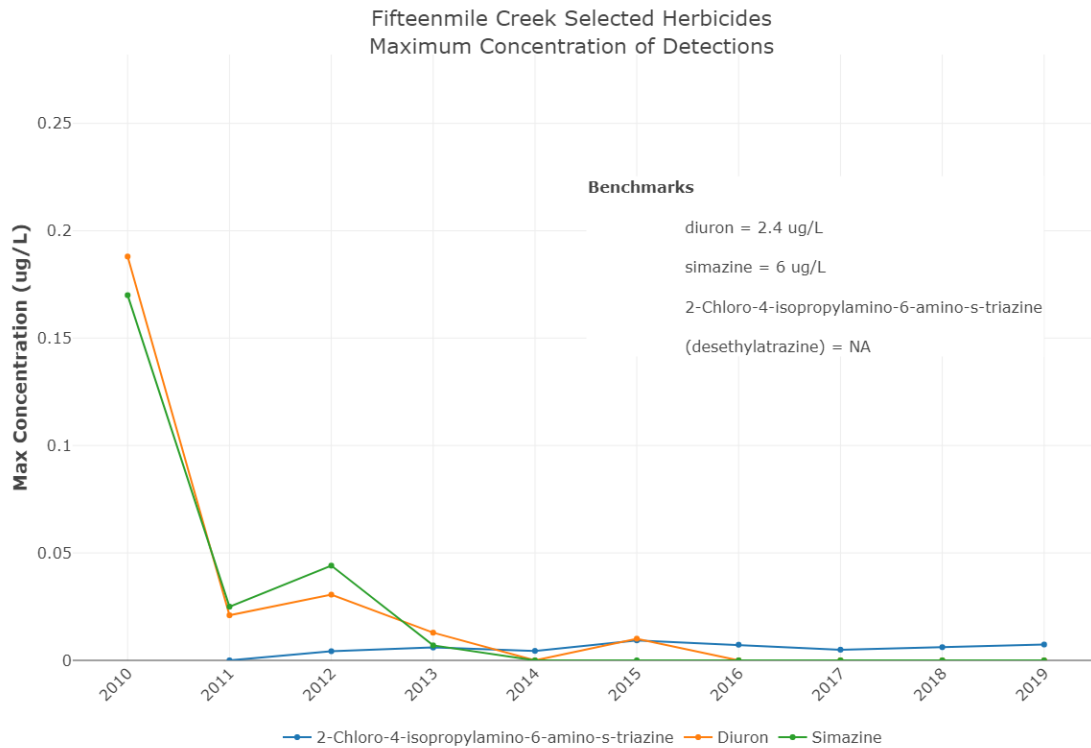


Figure 6. Fifteenmile Creek maximum concentrations of herbicides, 2010-2019.

In the North Willamette watersheds with active PSP projects – Yamhill, Pudding and Clackamas - most of the benchmark exceedances have occurred in small agricultural sub-watersheds where landowners with a diverse array of crop types use pesticides with high toxicity to aquatic life. Most of these exceedances are related to insecticides, including chlorpyrifos, diazinon, bifenthrin, and imidacloprid. In addition, periodic detections of the herbicides diuron and dimethenamid-p have exceeded benchmarks in these watersheds. Although used for some agricultural crops, diuron use in rights-of-way and other non-crop applications within these agricultural areas are likely contributors to the total concentrations observed because of high application rates (pounds per acre). The Amazon PSP in the southern Willamette Valley encompasses a mix of urban and agricultural land uses. Very few benchmark exceedances have been observed in the Amazon, but the total number of pesticides and detection frequencies for some remain relatively high. The watershed strategic plans that are starting to be developed will address pesticides of concern in critical areas of each PSP watersheds. This will entail gaining more commitments to implement best practices from grower and applicator groups, as well as technical assistance providers (including pesticide product distributors).

The streams in the Middle Deschutes with benchmark exceedances are surrounded by less diverse agricultural crop types than those in the North Willamette watersheds, but a wide variety of insecticides, herbicides and fungicides are registered for use on the specialty crops that are grown in that watershed. As noted in [Section 3.9.1.1](#), recent data from one Middle Deschutes stream (with two monitoring locations) has shown multiple pesticides exceeding benchmarks. DEQ, ODA and local partners began collaboration in 2019 on evaluating the water quality impact linkages between irrigation, soil management and pesticide use practices. The objective is to find solutions that address multiple water quality concerns.

Below is a summary of 2019 monitoring data results for each PSP watershed (Table 19 and Figure 7).

Table 19. Summary of 2019 pesticide detections and exceedances per watershed.

PSP Area	# of Sample Analyses	Detections	Benchmark or Criteria Exceedances
Amazon*	7478	244	5
Clackamas*	6189	242	12
Hood River	5223	88	0
Middle Deschutes	4205	238	21
Middle Rogue	8796	118	6
Pudding	4728	214	5
South Umpqua	3425	44	0
Walla Walla	5789	41	3
Wasco	7129	47	2
Yamhill*	7281	704	38

* Lab analytical results from a single Fall 2019 sampling event in these watersheds have not been released.

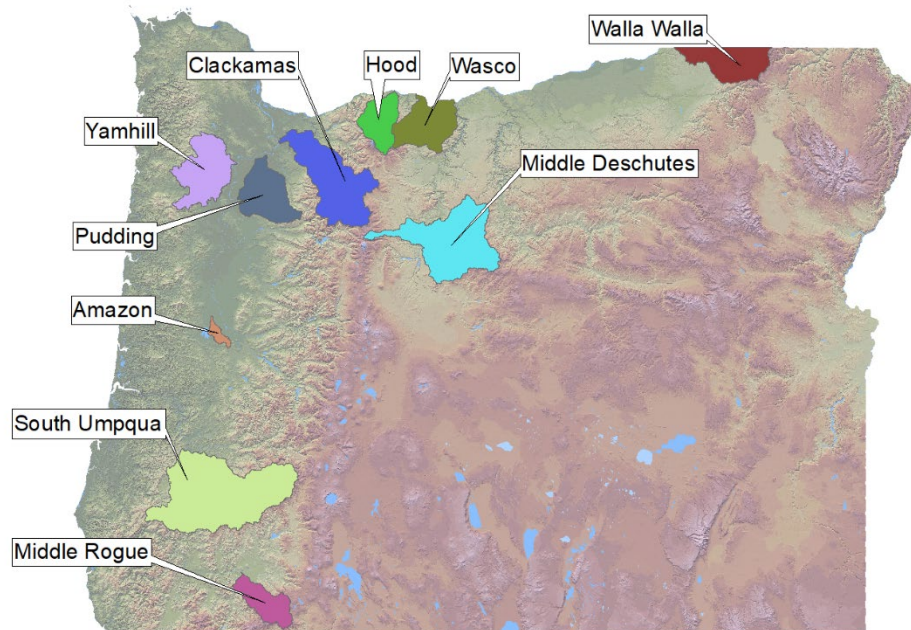


Figure 7. 2019 Pesticide Stewardship Partnership Watersheds.

3.9.2. Public Water System Reduction Strategies

DEQ, public water systems, and restoration partners continue to use the statewide “Resource Guides” for both groundwater and surface water sources which were developed in 2017 to provide contaminant specific reduction strategies for public water systems to use, such as for reducing nitrates and pesticides from urban and rural residential lands. These strategies are being evaluated and implemented throughout Oregon. Many of the projects implemented reduce the risk from nonpoint source activities in municipal watersheds. For example, coastal water providers continue to evaluate methods to minimize pesticide and turbidity inputs in the source area upstream of their intakes. Multiple water providers who all obtain drinking water from the Rogue River are working together to identify and address the highest priority risks from urban and rural lands including wildfire risk, stormwater inputs, and agriculture/forestry land uses. Partners in the Lincoln City (Schooner Creek), Cave Junction (Illinois River), Langlois (Floras Creek), Arch Cape (North Coast), and Glide (North Umpqua) watersheds are decommissioning roads and restoring riparian vegetation to reduce turbidity in their watershed. There are also several water systems improving sensitive riparian areas by removing invasive plants like South Coast Water District.

DEQ’s Drinking Water Program and Toxics programs have been coordinating with OHA’s Drinking Water Services on per- and polyfluoroalkyl substances (PFAS) monitoring and data review. In 2019, DEQ began collecting available GIS Mapping data to evaluate potential sources of PFAS environmental contamination to assist local public water systems in conducting source water protection plans and actions. DEQ is tracking the efforts of EPA and other states to develop drinking water standards (maximum contaminant levels, or MCLs) for individual compounds as proposed in the EPA’s PFAS Action Plan, as well as any new proposed public water system monitoring requirements.

3.9.3. Agency Integrated Toxics Reduction Strategy

DEQ completed a Toxics Reduction Strategy in 2012 to complement and support DEQ's on-going Water, Air and Land Quality toxics reduction and assessment efforts through improved integration across agency programs, and by filling gaps in existing programs. In 2018, DEQ completed an update to the Toxics Reduction Strategy and presented it to the Environmental Quality Commission in January 2019. The strategy includes 14 toxic reduction and assessment actions that are organized into activities ready for implementation, and those needing evaluation and research to identify the best path(s) forward.

DEQ developed guiding principles to assist with implementation of the strategy actions. These principles include an enhanced focus on environmental justice and recommendations for engaging communities who may experience disproportionate impacts from toxics in the environment. Other principles are enhancing collaboration between DEQ programs and external partners, developing and using metrics to measure and report on progress, and building on the advances made through the 2012 strategy actions.

In 2019, DEQ developed implementation plans for most of the 14 strategy actions, many of which focus on preventing nonpoint sources of toxics pollution from consumer products or other substances used widely by diffuse sources. Below is a brief summary of these actions:

Implementation-Ready Actions

1. Update DEQ's "Toxics Focus List" of priority chemicals: The focus list identifies the highest priority chemicals or classes of chemicals to protect public health and the environment.
2. Monitor for priority toxics in all environmental media: After the focus list is updated, DEQ's Laboratory and Environmental Assessment Program will work on adding chemicals missing from its current air, water and land monitoring activities.
3. Reduce environmental and human exposure to toxics in the built environment: A wide array of toxic chemicals are used in building materials. DEQ aims to minimize these toxics in the design, construction, use and demolition of buildings in partnership with interested stakeholders.
4. Build demand for clean diesel vehicles and equipment in public works projects: DEQ partners are building a marketplace demand for clean diesel equipment and engines. DEQ will share and build technical expertise related to emissions reduction technologies.
5. Partner with product manufacturers, vendors, and users to more fully evaluate, disclose, and/or label toxic ingredients to reduce toxics: Providing consumers with complete and transparent information on toxic ingredients allows them to make informed purchasing decisions, and serves as an incentive to manufacturers to reduce the number and quantity of toxic chemicals in products.
6. Expand government procurement of low toxicity products and materials: In 2012, the Governor's Executive Order 12-05 aimed to increase government procurement of low toxicity products to stimulate market demand for products with safer chemical ingredients. DEQ will explore accelerating these state and local government procurement efforts and broadening the range of products and materials.
7. Accelerate safer chemical alternatives assessments: Collaborate with other states and regional research entities to advance safer chemistry. State agencies, including DEQ, now have more

opportunities to increase research and training activities to help businesses and consumers make informed choices for safer alternatives.

8. Develop and implement a metals manufacturing, coating, and finishing outreach pollution prevention program: Metals manufacturing, finishing and coating businesses use toxic materials that can generate pollutants in populated areas. These are mostly small and medium sized businesses and may need additional resources for comprehensively assessing and implementing toxics pollution prevention measures.

Program Evaluation and Research Actions

1. Assess fate and transport of priority toxics from consumer products: Knowing how toxic chemicals in consumer products enter the environment can help DEQ and others effectively conduct outreach and pollution prevention actions. Identifying and addressing data gaps for wastewater and solid waste pathways is a key step in this process.
2. Assess and characterize diesel emissions impacts: Diesel is a source of many priority toxic pollutants in air that adversely affect public health and contribute to land and water contamination. A long-term strategy for evaluating the range of diesel impacts will support effective reduction efforts.
3. Evaluate effectiveness of existing mercury reduction programs in Oregon to determine gaps and opportunities: Several regulatory and non-regulatory mercury reduction initiatives have been implemented over the past 25 years in DEQ's water, land and air programs. The evaluation will determine their effectiveness and any gaps that should be addressed.
4. Evaluate DEQ's toxics use regulation and program: Evaluate Oregon's Toxic Use and Hazardous Waste Reduction Act and program to identify opportunities to further reduce toxics use and modernize the program. The Materials Management in Oregon: 2050 Vision and Framework serves as the guiding framework for future recommendations.
5. Enhance the pesticide stewardship partnership program to include environmental justice communities: The Pesticide Stewardship Partnership Program has successfully used water monitoring data to drive voluntary actions to improve water quality. DEQ will expand the program to include monitoring, stewardship technical assistance, and waste collection in areas with disproportionately impacted populations and deliver services directly to those communities.
6. Provide toxics reduction technical assistance to all DEQ programs: Identify and formalize a cross-program, technical assistance team to provide toxics information, support, tools, training and other resources to DEQ programs and partners.

In 2019, DEQ's internal cross-program toxics team worked to update the agency-wide "Focus List" of priority toxic chemicals, which was finalized in early 2020 (Table 20). The Focus List is informed by existing and new program chemical and pollutant priority lists, including several water quality priority lists. The updated Focus List includes 14 new chemicals or classes of chemicals, while 5 chemicals were removed from the original 2012 list. These removals were driven largely by reduced detection frequency in the environment. Below is the updated toxics Focus List (with additions and removals highlighted).

Table 20. Oregon DEQ updated Toxics Focus List (2019-2020) *

Updated Toxics Focus List Chemicals					
Combustion and Petroleum By-Products	Polycyclic Aromatic Hydrocarbons (PAHs)	Dioxins & Furans	Napthalenes		
Consumer Product Constituents	Phthalates	Triclosan	4-Nonyphenol (& Nonyphenol Ethoxylates)	Bisphenol A	DEET
	Per- & Polyfluoroalkyl Substances (PFAS)	Phenol	Octylphenol, 4-tert-	Ethinylestradiol, 17a-	Vinyl Chloride
Current-Use Pesticides	Diazinon	Chlorpyrifos	Atrazine	Trifluralin	Chlorothalonil
	Malathion	Permethrin	Cabaryl	Pentachlorophenol	Diuron
	Glyphosate	2,4-D	Propoxur (Baygon)	Pendimethalin	
Flame Retardants & Industrial Intermediates	Polybrominated Diphenyl Ethers (PBDEs)	Polychlorinated Biphenyls (PCBs)	Tris (2-chloroethyl) Phosphate (TCEP)	Tris (dichloroisopropyl) Phosphate (TDCP)	Ammonia
Legacy Pesticides	Dieldrin	DDT (and metabolites)	Chlordane (and metabolites)	Aldrin	Methoxychlor
	Heptachlor (& Heptachlor epoxide)	Hexachlorobenzene	Hexachlorocyclohexane, alpha- (alpha-BHC), beta- (beta-BHC), gamma- (Lindane)		
Metals	Mercury (& methylmercury)	Copper	Cadmium	Chromium	Arsenic
	Lead	Nickel	Manganese	Silver	Beryllium
	Cobalt	Bis (tributyltin) Oxide	Zinc		
Volatile Organic Compounds (VOCs)	Tetrachloroethylene (Perc)	Benzene	Ethylbenzene	Trichloroethylene	Dichlorobenzene, 1,4- (Dichlorobenzene p)
	Toluene	Formaldehyde	Acetaldehyde	Styrene	Xylenes

* Changes were made to the original 2012 Focus List: the strikethroughs indicate removals from the list and the red bolded chemicals are newly added.

In 2019, DEQ continued active participation in regional and interstate activities to advance green chemistry and safer chemical alternatives assessment (see Action #7 above), including using government purchasing programs to increase market demand for such alternatives (see Action #6 above). These activities include the Interstate Chemicals Clearinghouse (IC2), Northwest Green Chemistry, and a West Coast States' collaboration. DEQ coordinated with the Washington Department of Ecology and other entities to offer multiple chemical hazard and alternatives assessment trainings for businesses and governments. An EPA Pollution Prevention grant obtained by DEQ supported these trainings. In 2019 DEQ, in partnership with the Oregon Health Authority, increased its work to assess and reduce per- and polyfluoroalkyl substances (PFAS). These substances are a growing concern for water quality due to their toxicity, persistence, and presence in a range of consumer and business products. DEQ is engaged in a number of interstate and EPA workgroups and forums focused on reducing environmental impacts of PFAS, including groundwater and surface water contamination. A web page and fact sheet on how Oregon is addressing PFAS were developed in 2019: <https://www.oregon.gov/deq/Hazards-and-Cleanup/ToxicReduction/Pages/PFAS-in-Oregon.aspx>.

This grant also supported work with Northwest Green Chemistry to develop a report evaluating and recommending priority industrial air toxics for green chemistry and pollution prevention opportunities. In addition, a series of technical assistance fact sheets were developed for selected priority chemical pollutants identified in the report. These chemical pollutants adversely affect air, water and land environments.

3.10. Agriculture

In order to further the goal that agricultural lands attain TMDL load allocations and water quality standards, DEQ has committed to six action items (Table 21) in the 2014 Nonpoint Source Management Program Plan. The following sections describe progress on these action items in 2019.

Table 21. Description of agriculture related DEQ actions or outputs identified in the 2014 Nonpoint Source Management Program Plan with changes to the timeframe and the status in 2019.

Goal #	Goal Topic	Action	Time Frame	2019 Status
AG - 1	Landscape Condition for TMDLs and WQS	Document definition of system potential and site capable vegetation.	2014	Completed See Section 3.10.1
AG - 2	Landscape Condition for TMDLs and WQS	Conduct effective shade assessments for evaluating implementation to achieve TMDL/WQS goals under area rules and plan.	2014	Completed See Section 3.10.1
AG - 3 and PPA - 8.9	Biennial Review of Area Rule and Plan	Participate in ODA's biennial review process by providing water quality status and trends and landscape condition in priority areas.	Ongoing	Ongoing See Section 3.10.2 and Basin Reports Appendices A-R
AG - 4	Update DEQ Guidance for Biennial Reviews	Collaborate with ODA for updating DEQ guidance for providing comment during ODA's Biennial review Process.	2015	Completed with additional work ongoing. See Section 3.10.3
AG - 5	Grant Funding	Participate in local grant funding process to direct resources to high priority agricultural issues.	Ongoing	Ongoing DEQ has ongoing coordination with ODA on grant funding process through CEP, 319, and NWQI.
AG - 6	ODA Area Rule Compliance	Work with ODA to prioritize and help develop assessment methodologies for addressing temperature, sediment and sedimentation, bacteria, nutrients, and pesticides.	Ongoing	Ongoing See Section 3.10.4 and Section 4.1

3.10.1. Landscape Condition Assessments

During 2019, DEQ actively evaluated new methods to conduct future landscape condition assessments. One of the limiting factors in conducting these assessments using current methods is the resources

required to acquire the necessary remote sensing data and complete the analysis. Scaling the method up to the entire state is resource intensive. To evaluate alternative approaches DEQ funded a PSU master's student to evaluate empirical methods intended to estimate effective shade using freely available remote sensing data. These methods can potentially be scaled up to large geographic areas in order to deliver assessments on the timelines required for each biennial review. The results of this evaluation supported using freely available remote sensing data to estimate effective shade along the Middle Fork Coquille River and were published in a Master of Environmental Management Thesis in 2018.

During 2019, DEQ continued to evaluate new methods to conduct future landscape condition assessments. One of the limiting factors in conducting these assessments using current methods is the resources required to acquire the necessary remote sensing data and complete the analysis. In particular, DEQ pursued a new method for estimating effective shade using freely available remote sensing data. This method uses a combination of satellite and aerial imagery to model riparian vegetation height and canopy cover. This model can be scaled to large geographic areas and can be updated whenever new aerial imagery is acquired, which is about every two years. If successful, this method would allow DEQ to assess the status and trends of shade across the state on a consistent and cost effective basis. In 2020, DEQ would like to develop this model further and collect field data for model calibration and verification.

3.10.2. Review of Area Rules and Plans

Oregon statute and administrative rules require Oregon Department of Agriculture (ODA) to consult DEQ during review of Agricultural Water Quality Management Area Rules and Plans (Oregon Revised Statute 568.930). DEQ Basin coordinators participate in ODA's biennial review process for agricultural water quality management area rules and plans by providing comment and recommendations on any changes or additions necessary to achieve water quality standards and TMDL agricultural load allocations. As part of this process DEQ develops water quality status and trends reports. The reports present an analysis of water quality data readily accessible from public databases and available in sufficient quantity to indicate status and trends. DEQ, ODA and the ODA Local Advisory Committees use this information during the biennial reviews.

In 2019, DEQ prepared water quality status and trend reports and evaluated dissolved oxygen, pH, total phosphorus, temperature, total suspended solids, *Escherichia coli*, *enterococcus* and fecal coliform over a twenty year period from 1999 to 2018. Across 1872 stations statewide with available data to assess water quality status, 40% (744 stations) attained water quality standards or TMDL targets and 60% (1128 stations) showed that the water quality standards were not attained. In the assessment of water quality trends for 750 stations statewide with sufficient data, 52% (392 stations) showed improving or maintaining water quality while 48% (358 stations) showed degradation in water quality.

Prior to 2019, the water quality status and trends report were agriculture focused with reports generated for each agriculture water quality management area. The 2019 Report significantly improved report usability for a broader range of users by producing a single statewide report, which focuses on methods and provides a high level summary of results in the body of the report. Results for each station and assessment unit are presented in tabular format as appendices. The 2019 Report adopted the Integrated Report methodology for status assessment of conventional water quality parameters that are most often addressed by TMDLs in addition to an assessment of total suspended solids and total phosphorus concentrations against TMDL targets. The 2019 Report also summarized the quantity of best management practices implemented and reported to OWEB-OWRI. An interactive web map was also produced in association with the report, which allows exploration of the tabular results and plots, and allows users to download data of interest. The 2019 statewide water quality status and trends report and interactive web map can be found at <https://www.oregon.gov/deq/wq/programs/Pages/wqstatustrends.aspx>.

In 2019, DEQ provided comments or recommendations to ODA for biennial reviews in the following sixteen agricultural management areas:

- Clackamas
- Inland Rogue
- Klamath
- Lower Deschutes
- Lower John Day
- Malheur
- Mid-Coast
- North and Middle Fork John Day
- Owyhee
- Sandy
- South Santiam
- South Willamette
- Upper Grande Ronde
- Upper Middle and South Fork John Day
- Willow Creek
- Yamhill

Under goal AG -3 DEQ committed to provide information about landscape condition in the status and trends reports. DEQ did not include information on landscape condition in the status and trends report issued in 2019 due to insufficient data and resources to complete the characterizations. However, DEQ worked on the Walla Walla Subbasin Temperature TMDL effective shade and channel width assessment.

The Walla Walla assessment evaluates changes to effective shade and channel width conditions along the Walla Walla River and South Fork Walla Walla river comparing conditions at the time the Walla Walla Subbasin Temperature TMDL was developed and again in 2017. Preliminary results suggest that effective shade increased between 1995 and 2017 for all five study reaches. Channel width also improved (decreased width) in three out of five stream reaches and now achieves (or nearly achieves) the channel width targets established in the TMDL. It is anticipated that the results will be incorporated into the Walla Walla Agricultural Water Quality Area Plan. See [Section 3.10.1](#) for more information on 2019 activities related to landscape condition assessments.

3.10.3. DEQ Biennial Review Guidance

DEQ committed to collaborate with ODA while updating DEQ's guidance for providing comment during ODA's biennial review process. DEQ updated the biennial review guidance in coordination with ODA in 2015. DEQ has ongoing coordination with ODA on biennial review guidance but did not make any updates in 2019. DEQ is working with ODA to update the biennial review guidance.

3.10.4. Coordinated Streamside Management - Strategic Implementation Areas

The Coordinated Streamside Management (CSM) - Strategic Implementation Areas (SIA) are a multiagency effort that includes the SWCDs, Watershed Councils (WC), Oregon Watershed Enhancement Board (OWEB), Oregon Department of Environmental Quality (DEQ), Oregon Department of Agriculture (ODA), Oregon Department of Fish and Wildlife (ODFW) and other local partners working toward similar water quality objectives.

The SIA initiative concentrates technical and financial resources to agricultural areas to address water quality concerns and includes four key components:

1. Documenting compliance with Oregon's agricultural water quality regulations.
2. Voluntary, incentive-based conservation.
3. Monitoring to track water quality and landscape conditions.
4. Collaborative partnerships.

Individual SIAs are selected based on ODA's statewide prioritization of watersheds (12-digit Hydrologic Unit Codes - HUC) containing agricultural lands (Figure 8). The prioritization criteria include:

- Water quality parameters: temperature, bacteria, nutrients, and sediment (data from DEQ).
- ODFW identified priorities for native fish recovery.
- Input from stakeholders.

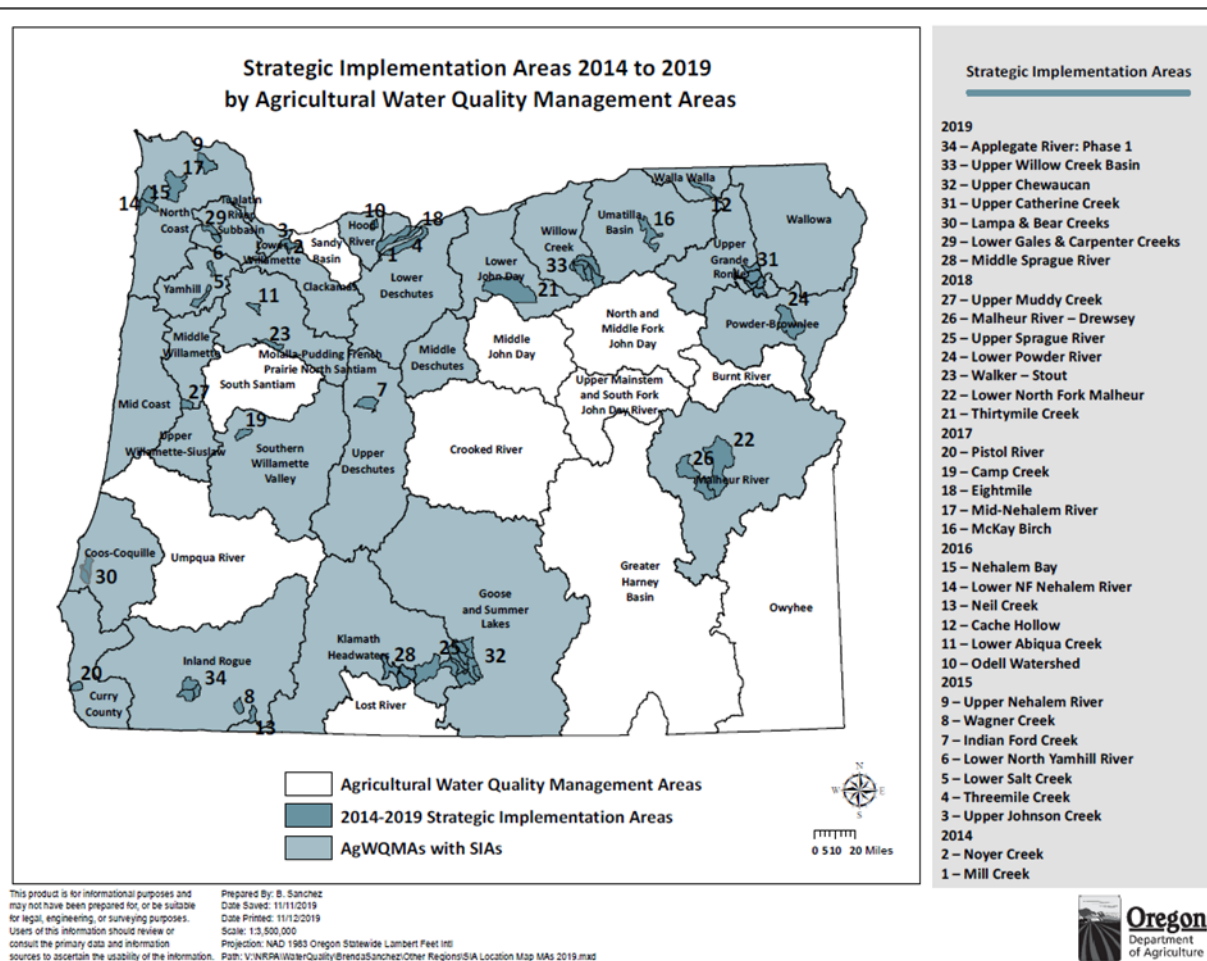


Figure 8. Strategic Implementation Areas (2014-2019) by Agricultural Water Quality Management Area.

SIA Process Overview:

1. ODA convenes a local Pre-Project Planning meeting with the project lead and local partners.
2. ODA conducts a Remote and Field Evaluation of agricultural lands.
3. Project Lead applies for OWEB funding to support SIA activities.
4. ODA, with the Project Lead, conducts a Partner Meeting to engage and inform local partners.
5. Project Lead convenes a Monitoring Workgroup.
6. ODA conducts an Open House to engage and inform landowners.
7. ODA ensures compliance through Phase I and Phase II.

Between January 2014 and December 2019 ODA initiated a total of 34 SIAs consisting of 11,897 agricultural tax lots in 82 sub-watersheds. A high percentage (96%) of tax lots were evaluated at the lowest concern levels; indicating that these lands are in compliance with agricultural water quality regulations and landowners most often are putting into practice voluntary conservation measures.

3.11. Private and State Forestry

To further the goal that private and state forestlands attain TMDL load allocations and water quality standards, DEQ has committed to three action items (Table 22) in the 2014 Nonpoint Source Management Program Plan. The following sections describe progress on these action items in 2019.

Table 22. Description of the private and state forestry related DEQ actions or outputs identified in the 2014 Nonpoint Source Management Program Plan with changes to the timeframe and the status in 2019.

Goal #	Goal Topic	Action	Time Frame	2019 Status
FOR - 1	FPA Evaluation	Participate with ODF to jointly develop evaluation methods and study designs (with funding sources) to address unanswered monitoring questions from the Private Forests Monitoring Program Strategic Plan http://www.oregon.gov/odf/privateforests/docs/monitoringstrategicplan.pdf	2015	Ongoing See Section 3.11.1
FOR - 2	Forest Practices Act Rules	Participate in Forest Practices Act rule analysis and concept development for water quality issues and revisions to management plans for state forests.	2014	In progress See Section 3.11.2
FOR - 3	ODF/DEQ MOA	Participate with ODF on revising the current MOA between ODF and DEQ.	2015	In progress See Section 3.11.3

3.11.1. Forest Practices Act Evaluation

DEQ committed to participate with Oregon Department of Forestry (ODF) to jointly develop methods and study designs with funding sources to address unanswered monitoring questions from the Private Forests Monitoring Program Strategic Plan. Proper evaluation of the ability of forest practice rules to meet water quality standards and protect beneficial uses requires monitoring of both compliance with existing rules and the effectiveness of those rules for meeting standards.

DEQ staff serve on the external review committee for ODF's Forest Practices Act (FPA) implementation study to evaluate landowner/operator compliance with existing forest practice rules. DEQ has served in this capacity since 2012. The rule sets evaluated from 2013-2018 included riparian, harvest, and road rules. There was action to add reforestation and pesticide use, but these rule compliance evaluations are on hold (see below). Data show that compliance rates are generally high (>90%) with compliance with some riparian rules (e.g., protection of small Type-N streams and small wetlands) lower and in need of improvement. These data allow ODF to target internal and external education and training. There is discussion about the appropriateness of using some statistical methods in the previous study design to calculate compliance rates. Also, ODF does not have statutory authority to enter private landowners' properties to assess compliance rates, and therefore relies on their voluntary participation in the study. Because of this reliance on voluntary participation, ODF cannot ascertain how representative their sample is of compliance rates - there could be a bias towards from sites with good rule compliance. For these reasons, this compliance/implementation evaluation work was suspended in 2019 while ODF re-examines how to improve study design and analysis.

In 2016, the Board of Forestry identified a need to evaluate the efficacy of streamside protection rules and policy in ODF's Siskiyou and Eastern Oregon geographic regions. ODF surveyed stakeholders to find out their opinions on the methods (e.g., literature reviews, field studies, GIS analysis) and priorities for developing potential monitoring questions (e.g., stream temperature, fish habitat, large wood recruitment, or riparian stand conditions and associated wildlife habitat). DEQ staff participated in this survey and had related discussions with ODF staff and management. In 2018, ODF drafted a report which DEQ reviewed. ODF submitted a final report on stakeholder opinions and evaluation approaches to the Board of Forestry. The Board then directed ODF to perform a literature review of desired future conditions for riparian management and temperature/shade effects in the Siskiyou georegion. ODF presented this information (note that there were very few publications that were relevant to the study questions) to the Board, which then directed ODF to expand their geographic area for studies relevant to the study questions, and to work with DEQ to incorporate information from TMDLs in the Siskiyou georegion. This evaluation is now ongoing in collaboration with DEQ. However, environmental and timber stakeholders are working on a Governor Brown-initiated MOU to revise the FPA to better protect aquatic species and water quality. These stakeholders therefore formally requested that the Board suspend this Siskiyou work and pass a temporary rule extending riparian rules for Salmon, Steelhead, and Bull Trout to the Siskiyou region, and the Board agreed to make a decision regarding this request at their June 3, 2020 meeting.

3.11.2. Forest Practices Act Rules

DEQ committed to participate in FPA rule review and concept development for water quality issues and revisions to management plans for state forests.

In 2002, ODF initiated the "RipStream" riparian study to evaluate if the FPA rules were effectively meeting water quality standards for temperature. RipStream showed that riparian protections on small and medium fish-bearing streams do not ensure achievement, to the maximum extent practicable, of the protecting cold water criterion of the temperature standard west of the crest of the Cascades. During 2018 ODF performed a literature review and sought contextual information for evaluating effectiveness of rules

meeting DEQ's water quality standards for stream temperature for small and medium fish streams in the Siskiyou region. This information was presented to the Oregon Board of Forestry (Board), who wanted more information before making a recommendation on sufficiency of riparian rules. At the Board's September 2019 meeting, ODF was directed by the Board to widen the geographic scope of their evaluation methods (see above). The evaluation described above should result in evaluation of the sufficiency of existing rules for at least a subset of streams in the Siskiyou georegion, barring preemption by legislative action (see below).

ODF has finished their analysis of temperature based on RipStream results and are now working on analyzing riparian stands and large wood recruitment for compliance with the Desired Future Condition policy in the FPA. ODF is additionally working on developing a modeling approach using RipStream data and data from other published scientific literature. Generally speaking, the long term goal is for riparian management areas to be structurally similar to mid- to late-seral forests.

ODF's State Forests Division is engaged in planning for Habitat Conservation Plans (HCP) for terrestrial (e.g., spotted owls, marbled murrelets) and aquatic (e.g., salmonids, amphibians) species in the western Oregon state forests (e.g., Tillamook and Clatsop State Forests). DEQ Watershed Management staff representing the Nonpoint Source and Drinking Water Protection programs sit on the Scoping Team, while the agency's Deputy Director sits on the Steering Committee. The Scoping Team is tasked with creating the BMPs and Management Directions for aquatic and riparian areas (with regard to aquatic systems and water quality standards). The Scoping Team and Steering Committee met throughout 2019, making progress on an HCP for State Forests.

3.11.3. ODF/DEQ MOA Revision

DEQ committed to participate with ODF on revising the MOA between ODF and DEQ, and this work is ongoing. The MOA was last revised in 1998. No revisions were made in 2019.

3.12. Urban and Rural Residential

In the 2014 Nonpoint Source Program Management Plan, DEQ has identified that the development of guidance (Table 23) to improve and establish consistent coordination between TMDL and stormwater programs as the highest priority in order to improve program implementation and effectively address nonpoint sources on urban and rural residential lands.

Table 23. Description of the urban and rural residential related DEQ actions or outputs identified in the 2014 Nonpoint Source Management Program Plan and the status in 2019.

Goal #	Goal Topic	Action	Time Frame	2019 Status
STW - 1	TMDL and Stormwater	Development of DEQ guidance to improve and establish consistent coordination between TMDL and stormwater programs.	2014 - 2018 (Ongoing)	Guidance - Completed Training - Ongoing See this section

The DEQ Stormwater Integration Group (SWIG) was formed in January 2015 and is made up of staff from the TMDL, Municipal Separate Stormwater Sewer System, Clean Water State Revolving Fund, 401 Water Quality Program, Underground Injection Control, and Industrial Construction programs. It is

tasked with providing internal coordination and problem-solving for DEQ's program areas that have policy, regulatory, technical and/or outreach components involving stormwater. The SWIG Charter was developed and finalized in May 2015. The charter outlined the mission and desired goals and objectives of the group. The group's mission is to develop a clear, consistent, cross-program vision of DEQ's stormwater policy, procedures and requirements, identify problems and issues and develop solutions. The group works to enhance external and internal communication on stormwater issues and topics of interest.

DEQ staff completed a survey in 2015 which identified five major stormwater priorities:

- Develop a Statewide Stormwater Manual;
- Identify stormwater subprograms that share parallel requirements and identify topics and tasks where internal coordination will create clear and consistent messages, regulatory requirements and permit conditions;
- Evaluate and identify technical resources and priorities for stormwater data management and analysis, best management practices and engineering concepts review, and subsequent best management practices approval and compliance assurance among subprograms;
- Develop a plan for internal and external communication on stormwater topics and a mechanism to deliver the information to the respective stakeholders; and
- Develop tools and resources aimed at small communities (with populations of 10,000 or fewer residents) for developing and implementing stormwater requirements.

Accomplishments include:

1. Development of the Template for LID Stormwater Manual for Western Oregon (Cahill et al 2016) <https://www.oregon.gov/deq/wq/tmdls/Pages/TMDLs-LID.aspx>
2. DEQ held a series of LID Guidance Template Training workshops for DEQ staff, DMAs and local partners:
 - February 17, 2016 - Tillamook LID Guidance Template Training
 - March 1, 2016 - Rogue Valley LID Guidance Template Training
 - March 9, 2016 - Albany LID Guidance Template Training
 - March 17, 2016 - Coos Bay LID Guidance Template Training

Current/ongoing activities (2018-present) include:

Urban stormwater management strategies and actions for DMAs that are non-permitted MS4s (primarily local government entities) are being addressed through (a) the individual TMDL implementation plan process (annual reports are submitted and reviewed by DEQ; Plans are updated following 5-year review) and (b) using the PCSW Guidance*. During that process, DEQ provides guidance and training to DMAs on urban stormwater management strategies and actions to protect and improve water quality from land use and development and other activities within their jurisdiction.

Permitted MS4 entities are required to implement urban stormwater management through their NPDES permit requirements. The main distinction is that the Phase II entities are transitioning to the "new" MS4 Phase II NPDES general permit (issued Nov. 30, 2018) and therefore some entities may have permit requirements which now intersect or overlap with their existing TMDL implementation plans. For Phase I permittees, the permit is their urban stormwater TMDL implementation plan.

In 2019 DEQ basin coordinators have continued new and ongoing urban and rural residential DMA stormwater outreach and efforts in each basin with TMDLs. For example, DEQ's Willamette Basin Coordinators hosted two TMDL implementation workshops and provided education and training for TMDL urban/rural nonpoint source implementation in 2019. Specific project details are discussed in the Basin Reports in Appendices A-R.

*See Implementation Development Tools: TMDL Implementation Plan Guidance for Including Post-Construction Elements in TMDL Implementation Plans:

<https://www.oregon.gov/deq/wq/tmdls/Pages/TMDLs-Implementation.aspx>.

3.13. Federal Lands

In order to further the goal that federal lands attain TMDL load allocations and water quality standards, DEQ has committed to nine action items (Table 24) in the 2014 Nonpoint Source Management Program Plan. The following sections describe progress on these action items in 2019.

Table 24. Description of the federal lands related DEQ actions or outputs identified in the 2014 Nonpoint Source Management Program Plan with changes to the timeframe and the status in 2019.

Goal #	Goal Topic	Action	Time Frame	2019 Status
FED - 1	USFS Annual Status Report	The USFS will submit to DEQ a Statewide Annual Status Report to meet the MOU and any DEQ TMDL reporting requirements.	Ongoing	Revised to mid-term status report. Next report due in 2021. See Section 3.13.1
FED - 2	USFS/DEQ 5-Year Progress Report	The 2013 USFS/DEQ MOU requires the preparation of a USFS/ DEQ 5-Year MOU Progress Report. USFS-DEQ MOU updated and renewed for 4 years, effective 2019.	2018	Revised to complete in 2023 based on the renewed MOU. See Section 3.13.2
FED - 3	BLM Annual Status Report	The BLM will submit to DEQ a Statewide Annual Status Report to meet the MOU and any DEQ TMDL reporting requirements.	Annually 2014 - 2018. Revised to every 2.5 years.	In progress. Revised to mid-term status report. Next report due in 2020. See Section 3.13.3
FED - 4	BLM 5-Year Progress Report	The 2011 BLM/DEQ MOU requires the preparation of a BLM/ DEQ 5-Year MOU Progress Report.	2016	In progress. Revised to be completed in 2022 based on the renewed MOU in 2017.

Goal #	Goal Topic	Action	Time Frame	2019 Status
				See Section 3.13.4
FED - 5	Coordination of USFS and BLM with DEQ	The USFS and BLM will coordinate with DEQ for establishing priorities, strategies, and funding using a watershed approach to protect and restore water quality on BLM and USFS administered lands, this will include WQRPs.	Ongoing	Ongoing See Section 3.13.5
FED - 6	USFS BMPs	As needed, USFS will develop Oregon specific land use activity BMPs and monitor implementation and effectiveness of BMPs following the USDA National Best Management Practices for Water Quality national protocols. http://www.fs.fed.us/biology/resources/pubs/watershed/index.html .	2014 - 2018	Completed See Section 3.13.6
FED - 7	BLM BMPs	BLM develops Oregon specific land use activity BMPs, monitors implementation and effectiveness of BMPs, and submits to DEQ for review and comment.	Ongoing	Ongoing See Section 3.13.6
FED - 8	Pre-TMDLs and Post-TMDL	The USFS and BLM will use the Forest Service and Bureau of Land Management Protocol for Addressing Clean Water Act Section 303(d) Listed Waters, May 1999, Version 2.0.	Ongoing	Ongoing See Section 3.13.7
FED - 9	Agricultural Activities	The USFS and BLM will develop and implement a programmatic strategy to address agricultural activities on federal lands, such as grazing.	Ongoing	Ongoing See Section 3.13.8

3.13.1. USFS Mid-Term Status Report

DEQ and USFS agreed to transition away from Annual Status Reports to a Mid-Term report (2.5 years) and a five year progress report. As a result, no annual report was submitted in 2019. USFS did submit other monitoring and implementation reports, and the agencies met to discuss priorities and negotiated and signed a new MOU.

3.13.2. USFS Five-year Progress Report

The next five-year progress report for USFS was scheduled to be completed in 2018 but was not received by DEQ. An amendment to the MOU extended the MOU and the time frame for the 5-year Report for one more year. After discussion between the USFS and DEQ, it was determined that both agencies would forego the 5-year report in 2019 for the then current MOU because of staff turnover and limitations. DEQ

and USFS agreed upon an updated version of the MOU, which was signed in 2019 for a four year period ending in 2023. In 2024, a five year report should be prepared.

3.13.3. BLM Mid-term Status Report

The MOU between DEQ and BLM includes a reporting requirement for a mid-term (2.5 year) status report and final (5 year) progress report. The next mid-term report is scheduled to be completed in 2020.

3.13.4. BLM Five-year Progress Report

BLM committed to submitting a progress report to DEQ every five years. The last five year progress report, due in 2015, was not submitted to DEQ. The next five-year progress report is due in 2022.

3.13.5. Coordination with USFS and BLM

DEQ did not hold formal annual meetings with BLM in 2019. DEQ did hold formal annual meeting with the USFS. Progress towards restoration activities and land management changes to improve watershed health is ongoing. DEQ remains aware of and involved with land management planning on USFS and BLM managed lands in the State of Oregon. USFS and BLM had active input and involvement in DEQ water quality-related efforts, including TMDL development (e.g. Willamette Mercury TMDL) and implementation.

USFS is engaged in a planning process for Oregon's National Forests. A Science Synthesis is done, showing that current efforts are benefitting water quality and aquatic ecosystems. The compiled scientific information will guide changes to Forest Plans. The USFS does not expect major changes to riparian and aquatic protections, and the planning process will likely take several years.

The Drinking Water Provider program is coordinating with USFS and BLM on the Drinking Water Providers Partnership to allocate grant funds in Oregon and Washington. In 2019, a total of \$292,000 was awarded in Oregon. Specific project details are discussed in the Basin Reports in Appendices A-R - most of these projects reduce the risk from nonpoint source activities in municipal watersheds.

3.13.6. USFS and BLM Best Management Practices

As needed, USFS and BLM will develop Oregon specific land use activity BMPs. Both agencies monitor implementation and effectiveness of BMPs following the USDA National BMP's for water quality protocols. In 2016, the USFS completed their first multi-year regional scale analysis of the implementation and effectiveness of water quality BMPs. USFS is monitoring suites of BMPs for both implementation and effectiveness using a rotating panel approach between road, vegetation, and recreation management. There are defined protocols for groups of BMPs (i.e. Aquatic Ecosystems, Chemical, Facility, Fire, Mineral, Range, Recreation, Road, Vegetation, and Water Uses). Based on the results reported to DEQ, USFS completed 636 BMP evaluations in Oregon from 2014 to 2018. In each monitoring protocol, BMPs are rated as "fully implemented", "mostly implemented", "marginally implemented", or "not implemented" on the Implementation scale and "effective", "mostly effective", "marginally effective", or "not effective" on the Effectiveness scale. Implementation and effectiveness varied, with results indicating that on average, corrective action was needed on 27% of the project sites monitored.

PIBO (Eastern Oregon) and AREMP (Western Oregon) trend monitoring of aquatic systems also continues. Reports are based on specific study areas for PIBO, and the AREMP programs creates annual

monitoring reports and summary reports over larger timeframes. Generally, the Science Synthesis and reports on watershed progress indicates improvement of aquatic system health over time.

3.13.7. Addressing Impaired Waters

The USFS and BLM address Clean Water Act Section 303(d)-listed waters through water quality assessments, providing data, validating listings, and by working with DEQ and other state and local tribes to implement watershed improvement work. USFS and BLM develop Water Quality Restoration Plans (WQRPs). WQRPs describe what the USFS and BLM plans to do to meet water quality standards and TMDLs. The USFS was an active partner during the development of the Willamette Mercury and other TMDLs. As noted above, monitoring indicates generally improving water quality and aquatic system conditions in National Forests. USFS continues to utilize the Aquatic Conservation Strategy in western Oregon and riparian and aquatic protection requirements in eastern Oregon Forest Plans to meet water quality standards and implement temperature and other TMDLs. As TMDLs are updated in response to court mandates, USFS will adapt WQRPs as needed.

3.13.8. USFS/BLM Agricultural Programmatic Strategy

The USFS and BLM implement a programmatic strategy to address agricultural activities on federal lands, such as grazing. The USFS and BLM address agricultural activities through district management plans and revisions to their grazing and riparian rules. In 2019 DEQ and BLM briefly discussed agriculture activities (grazing) on BLM managed land. DEQ and USFS did discuss grazing activity and determined that BMPs are in place and being evaluated under USFS monitoring programs (see [Section 3.13.6](#)).

4. Nonpoint Source Studies and Multi-Agency Partnerships

Building partnerships with multiple agencies and communicating regularly is necessary to implement actions to meet the goals and objectives identified in the 2014 Nonpoint Source Management Program Plan. DEQ engages in a number of collaborative efforts to improve efficiencies around water quality monitoring and evaluation of the effects of conservation and restoration investments.

DEQ has ongoing coordination between, and effective implementation of, the TMDL/NPS Programs and Agricultural Management Water Quality Program. DEQ participates in local grant funding process and direct resources to high priority agricultural issues through Conservation Effectiveness Partnership, 319 Grant projects, and National Water Quality Initiative. DEQ committed to one action item (Table 25) in the 2014 Nonpoint Source Management Program Plan. The following sections describe progress on this action item in 2019.

Table 25. Description of NWQI related DEQ actions or outputs identified in the 2014 Nonpoint Source Management Program Plan with changes to the timeframe and the status in 2019.

Goal #	Goal Topic	Action	Time Frame	2019 Status
AG - 5	Grant Funding	Participate in local grant funding process to direct resources to high priority agricultural issues.	Ongoing	Ongoing See Section 4.1 and Section 4.2

4.1. National Water Quality Initiative (NWQI)

The 2013 Nonpoint Source Program and Grants Guidelines for States and Territories directs DEQ to devote sufficient Section 319 resources to coordinate with the Natural Resources Conservation Service (NRCS). In Oregon, the NRCS has partnered with DEQ, Oregon Department of Agriculture, U.S. Fish and Wildlife Service and others to identify National Water Quality Initiative (NWQI) watersheds and monitoring projects with clear goals and objectives, approved methods, strong local partnerships and the availability of prior monitoring data. In addition to on-the-ground implementation of conservation practices, 319 funds are also being used to conduct effectiveness monitoring in NWQI watersheds.

4.1.1 NRCS NWQI Source Water Protection Projects

In 2018, NRCS expanded the scope of NWQI to include source water protection, including both surface and ground water public water systems. A total \$492,420 in Conservation Technical Assistance dollars in FY2019 was provided to the communities to complete a “readiness” phase, which involves developing a detailed watershed assessment and an outreach strategy to address agricultural-related impacts to source water quality. Five source water protection pilot projects selected in Oregon that are undergoing the readiness phase include:

- Molalla River: serving Cities of Canby and Molalla
- North Fork Coquille River: serving City of Myrtle Point

- Multiple watersheds in the Powder Basin: serving Cities of Baker City and Sumpter
- McKenzie River: Serving City of Eugene / Eugene Water & Electric Board
- South Umpqua River, Lookingglass Creek Sub-Watershed: serving Cities of Winston and Dillard

In addition, DEQ assisted NRCS in submitting an additional five additional proposals for FY2020 funding under the NWQI Source Water Protection program, which are:

- Clackamas River watershed serving multiple water systems in the Clackamas River Water Providers
- Long Tom River: serving City of Monroe
- Rogue River: serving the City of Medford and other water providers in the Rogue basin
- Santiam River: Serving Cities of Albany, Jefferson, Lebanon, Salem and Stayton
- Tualatin River: serving partners in the Joint Water Commission

Following the readiness phase, these source water protection areas would then be eligible to receive Federal Farm Bill funding to implement the measures identified in their plans specific to agricultural impacts. Oregon's strong partnerships between NRCS, Oregon Watershed Enhancement Board, and the Departments of Agriculture and Environmental Quality help better connect Federal Farm Bill programs with state drinking water agencies and utilities that can benefit from investments in Oregon communities.

4.1.2 Willow Creek NWQI

Malheur Watershed Council worked with DEQ and Idaho Power to install a real-time flow gage with temperature measurement capability near the mouth of Willow Creek in order to improve water quality monitoring program by collecting continuous flow data. The project was supported with \$13,900 of the 319 grant funds and \$10,852 in-kind matching from other sources. The gage was installed in May 2018 and has been collecting data since the summer of 2018. The flow measurements were made at the gage in 2019. The flow data is accessible to the public and project partners.

4.2. Conservation Effectiveness Partnerships

The Conservation Effectiveness Partnership (CEP) is a collaborative effort between the Natural Resources Conservation Service, the Oregon Watershed Enhancement Board, Oregon Department of Agriculture, Oregon Department of Fish and Wildlife, and DEQ. The CEP has a mission to describe the effectiveness of cumulative conservation and restoration actions in achieving ecological outcomes through collaborative monitoring, evaluation, and reporting. The CEP partners have agreed on goals and objectives for the partnership, with an emphasis on water quality and watershed health. The agencies intend to describe the effectiveness of cumulative conservation and restoration actions in achieving natural resource outcomes through collaborative monitoring, evaluation and reporting. The goals of the partnership are to:

- Build an understanding of the extent of the investment in watershed improvement and the watershed response through the agencies' collective grant programs.
- Develop a clearer understanding of how local organizations are utilizing the agencies respective grant programs, in concert.

- Evaluate the effects of conservation and restoration investments on water quality and watershed condition.
- Design tools and methods for reporting results of investments.

CEP identifies watersheds with significant agency investment and with specific water quality issues, and then engages with on-the-ground partners to identify specific questions about the effects of restoration investments on ecological outcomes. Please see a story map overview of how the statewide partnership works with local partners to “tell the story”: <https://www.oregon.gov/oweb/resources/Pages/CEP.aspx>.

4.3. EPA Success Stories, WQ-10, SP-12

In order to document where state restoration efforts have resulted in water quality improvements in NPS-impaired water bodies, DEQ will work with EPA to develop “Success Stories”. The following section describe the action item identified in the 2018-2020 Performance Partnership Agreement (Table 26) and the progress on the action item in 2019.

Table 26. Description of nonpoint source success stories action identified in the 2018-2020 Performance Partnership Agreement and the status in 2019.

Goal #	Action	Time Frame	2019 Status
PPA - 8.4	Determine with EPA available NPS Success Stories documenting either water quality progress or full restoration under PAM.	September 2018 and September 2019	Ongoing See this section

The Section 319 Nonpoint Source success stories website features stories about primarily nonpoint source-impaired waterbodies where restoration efforts have led to water quality improvements. Waterbodies are separated into three categories, depending on the type of water quality improvement achieved:

- Partially or fully restored waterbodies
- Progress toward achieving water quality goals
- Ecological restoration

The Nonpoint Source Success Stories serve two main purposes. First, they offer an opportunity for states to highlight where their restoration efforts have resulted in water quality improvements in nonpoint source-impaired waterbodies. Second, they allow EPA to track the number of nonpoint source-impaired waterbodies that are partially or fully restored - which is a key measure in the effort to document how nonpoint source restoration efforts are improving water quality across the nation. These measures show Congress why 319 funds are needed and document the success of these funds towards improving water quality.

All previous Oregon's Watershed Measures and Waterbody Restoration Stories (i.e., “Success Stories”) were developed by DEQ staff with assistance from EPA’s contractor Tetra Tech. Previous success stories can be found at: <https://www.epa.gov/nps/success-stories-about-restoring-water-bodies-impaired-nonpoint-source-pollution#or>.

Due to lack of resources, nonpoint source success stories were not developed in 2019, however several sampling sites in watersheds across Oregon are demonstrating measurable improvements in water quality

(see the referenced status and trends reports described in [Section 3.10.2](#)). In addition, DEQ will work with EPA and other Conservation Effectiveness Partnership agencies in leveraging efforts that are part of these programs to determine if these could be used for EPA success stories.

4.4 Lower Owyhee and Fletcher Gulch Focus Area

The Owyhee River is one of the major tributaries to the Snake River. The Snake River is listed on the 303(d) as water quality limited for numerous parameters, including bacteria, dissolved oxygen, algae, pH, sedimentation, temperature, DDT, and Dieldrin. The Snake River - Hells Canyon TMDL was developed to address these listings. To address the sedimentation listing, the TMDL established a total suspended solids (TSS) target of no more than 50 mg/L as a monthly mean and less than or equal to 80 mg/L TSS for no more than 14 days during storm events. For the nutrient listings, the TMDL established a total phosphorus target of 0.07 mg/L from May 1 to September 30. The targets apply to the tributaries of the Snake River, including the Owyhee River.

A majority of the land in the Owyhee is public, managed mainly by the Bureau of Land Management and the State of Oregon. Rangeland is the dominant use in the basin along with irrigated private agricultural land concentrated near the Snake River. The majority of the cropland is irrigated with furrow-irrigation (or flood irrigation) through a series of old concrete and earth ditches. This type of irrigation system results in low on-farm irrigation efficiencies and high erosion rates. The Natural Resources Conservation Service (NRCS) estimates that furrow irrigation results in annual erosion of about 34 tons per acre per year.

In 2008, ODA and watershed partners established The Fletcher Gulch Focus Area (Figure 9) out of concern about irrigation-induced erosion resulting from furrow flood irrigation. Over half of the irrigated acreage in Fletcher Gulch exceeds a slope of 1.5 percent and many of the long furrow runs traversed these steep slopes. ODA establishes focus areas in small agricultural watersheds with water quality concerns. Through the focus area process, the Soil and Water Conservation District (SWCD) delivers systematic, concentrated outreach and technical assistance. A key component of the focus area approach is measuring conditions before and after implementation to document the progress made.

ODA's 2019 Owyhee Agricultural Water Quality Management Area Plan reports that Fletcher Gulch is a 6.5-mile ephemeral drainage that flows into the Old Owyhee Ditch. The drainage water moves along the Old Owyhee Ditch to downstream water users and eventually to the Owyhee River. Sediments and nutrients that wash off fields in the Fletcher Gulch watershed are passed downstream. In addition, the water flowing out of Fletcher Gulch contains sediment eroded from canal banks maintained by the Owyhee Irrigation District.

Efforts to improve water quality in the Owyhee have mainly focused on improving irrigation efficiency and minimizing irrigation-induced erosion, along with improvements to riparian vegetation conditions through improved farm and livestock management. In 2011, the NRCS selected Fletcher Gulch for a Conservation Implementation Strategy and in 2019 developed a [YouTube video](#) and [additional information](#) about the Fletcher Gulch project.

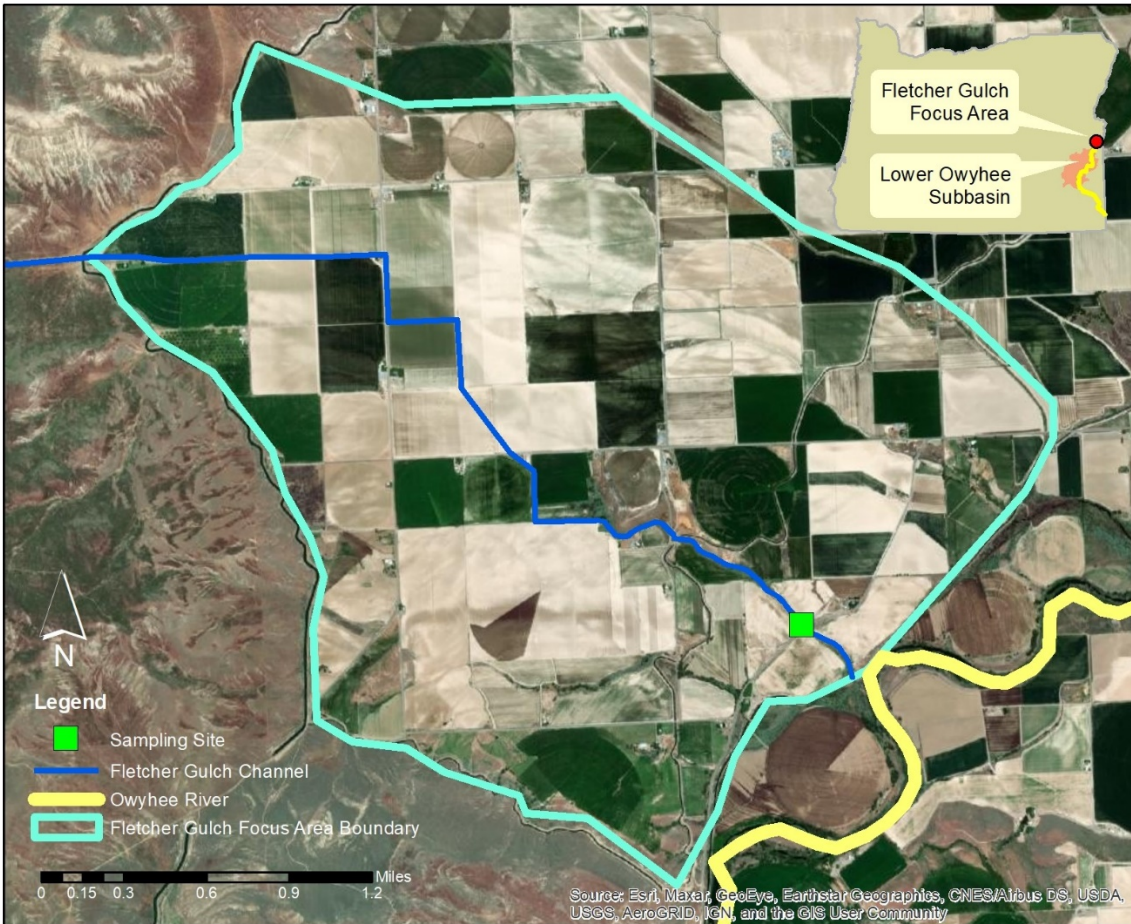


Figure 9. Fletcher Gulch Focus Area in the Lower Owyhee Subbasin and the monitoring site.

Between 2008 and 2019, the Malheur County SWCD, Owyhee Watershed Council, NRCS, the Owyhee Irrigation District, landowners, and other partners implemented the following in the Fletcher Gulch Focus Area:

- Converted 739 acres from furrow flood irrigation to sprinkler. This included installation of five pivots, a linear sprinkler, and two-wheel lines.
- Piping of 2.67 miles of laterals.
- Flow and water quality monitoring for TSS, total phosphorus, orthophosphate, and *E. coli* over a ten year period.
- Annual assessment and classification of irrigated cropland based on the potential for sediment runoff.

Funding sources for the Focus Area projects included OWEB (\$1,388,437), Owyhee Irrigation District (\$434,897), NRCS (\$385,324), and other local and private funds. DEQ funded some of the efforts in Fletcher Gulch and Lower Owyhee using 319 grant watershed funds, which included additional state and local matching funds (Table 27).

Table 27. Fletcher Gulch Project funded through the Owyhee River Improvement Project funds.

Project Number	Project Title	319(h) Funds	State and Local Funds	Total
W09704	Owyhee River Improvement Project Phase 2	\$35,000	\$23,333	\$58,333
W12644	Owyhee River Improvement Project Phase 3	\$36,359	\$24,253	\$60,612
W14755	Owyhee River Improvement Project Phase 4	\$48,877	\$32,585	\$81,462

Through the focus area monitoring process, the Malheur SWCD developed a classification for the irrigated fields in the focus area as follows (Table 28):

Class 1: least potential for pollution

Class 2: moderate potential

Class 3: most potential

Table 28. The Malheur SWCD classifications of irrigated cropland based on potential for pollution from sediment in the Fletcher Gulch Focus Area.

Class	Characteristics to evaluate		
	Visible signs of field irrigation-induced erosion	Irrigation water leaving the control of the landowner and/or entering commingled water	Notes
Class 1	None or minimal	None	
Class 2	Yes	Clear or none	
	None	Dirty	Water entering filed from neighbor
Class 3	Yes	Dirty	

ODA's Area plan set a milestone that by July 1, 2021, 75% of the agricultural lands in the focus area be in Class 1 land condition. To track progress towards meeting this milestone, the land classification was repeated about every two years from 2008 to 2019. The change over time is illustrated in Table 29, Figure 10 and Figure 11. In 2019, the milestone was achieved with 76% of the irrigated acres in Class 1.

Table 29. The land conditions based on the irrigated field classification from 2008 to 2019 in the Fletcher Gulch Focus Area.

Class	Land Condition: % of acreage (3351 acres)						
	2008	2011	2013	2015	2017	2018	2019
Class 1	16	24	41	52	62	73	76
Class 2	22	21	15	15	11	7	8
Class 3	62	55	44	33	27	20	16

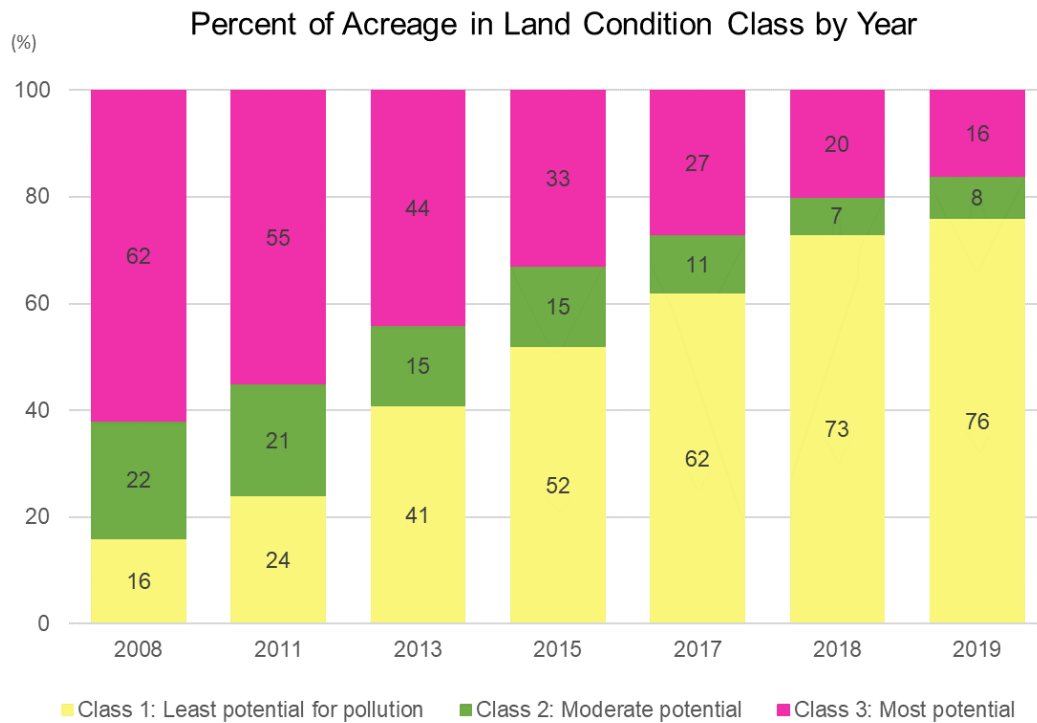


Figure 10. The percent of acreage in land condition classes from 2008 to 2019 in the Fletcher Gulch Focus Area.

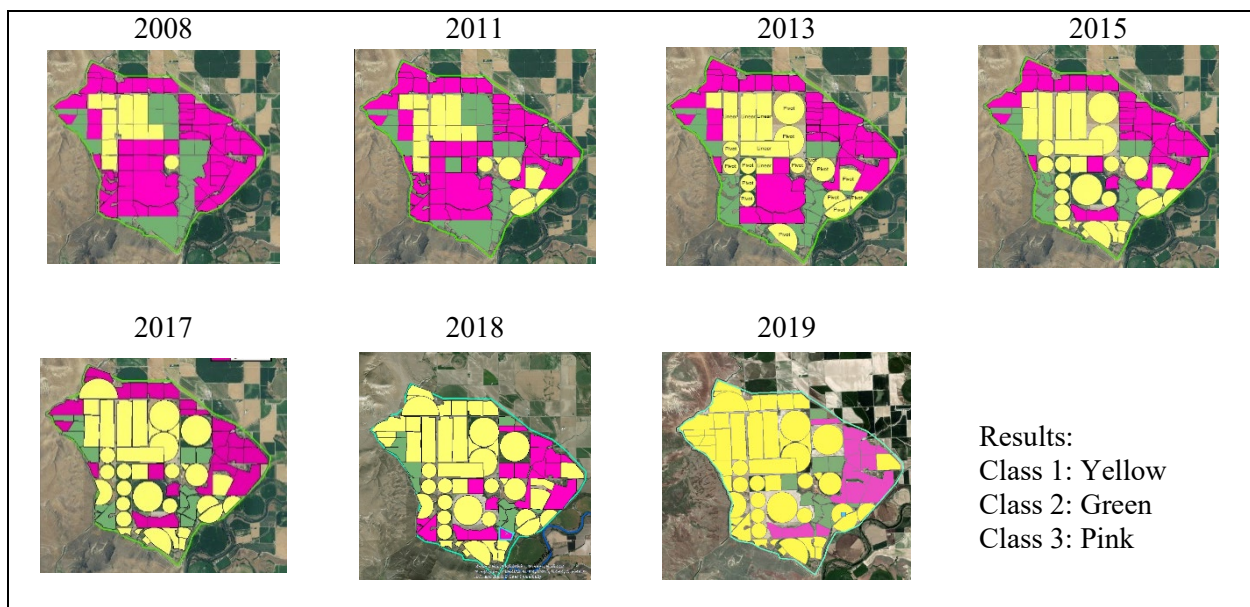


Figure 11. The land condition class based on the irrigated field classification from 2008 to 2019 in the Fletcher Gulch Focus Area.

The Malheur SWCD sampled the mouth of Fletcher Gulch one to two times per month from April through November since 2008. ODA's 2019 Owyhee Area Plan reported that conversion from flood to sprinkler irrigation appears to be working, based on the following reductions from 2008 to 2017:

- Mean return flows by 81% (from 8.3 cfs to 1.6 cfs);
- Mean TSS loads by 99% (from 71,458 lbs/day to 348 lbs/day), and mean concentrations by 90% (from 1,717 mg/L to 47 mg/L);
- Mean total phosphorus loads by 85% (from 14.9 lbs/day to 2.2 lbs/day), and mean concentrations by 23% (from 0.35 mg/L to 0.27 mg/L);
- Mean ortho-phosphorus loads by 89% (from 12.3 lbs/day to 1.3 lbs/day), and mean concentrations by 50% (from 0.30 mg/l to 0.15 mg/L).

In the Owyhee River, TSS and total phosphorus monitoring show similar results. DEQ's 2018 Owyhee Water Quality Status and Trends Report and the Statewide 2019 Water Quality Status and Trends Report both show statistically significant reductions in monthly mean TSS concentrations over a twenty-year assessment period at two sites in the Lower Owyhee River downstream of Fletcher Gulch. The two sites are Owyhee River at Highway 201 Bridge (ID: 10729-ORDEQ) and Owyhee River 0.5 miles above confluence with Snake River (ID: OWY110). Site 10729-ORDEQ shows that since 2018 the monthly mean TSS concentrations are in compliance with the Snake River - Hells Canyon TMDL target of 50 mg/L (Figure 12). Site 10729-ORDEQ also shows significant reductions in total phosphorus concentrations (Figure 13).

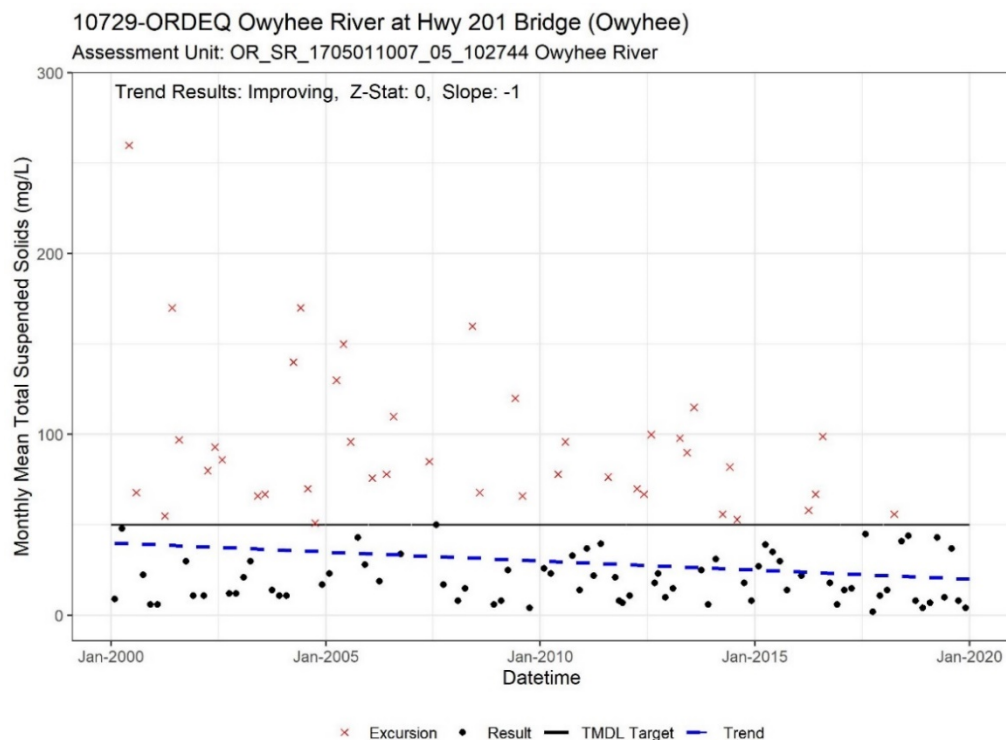


Figure 12. Total Suspended Solids status and trend at the station 17029-ORDEQ Owyhee River at Highway 201 Bridge.

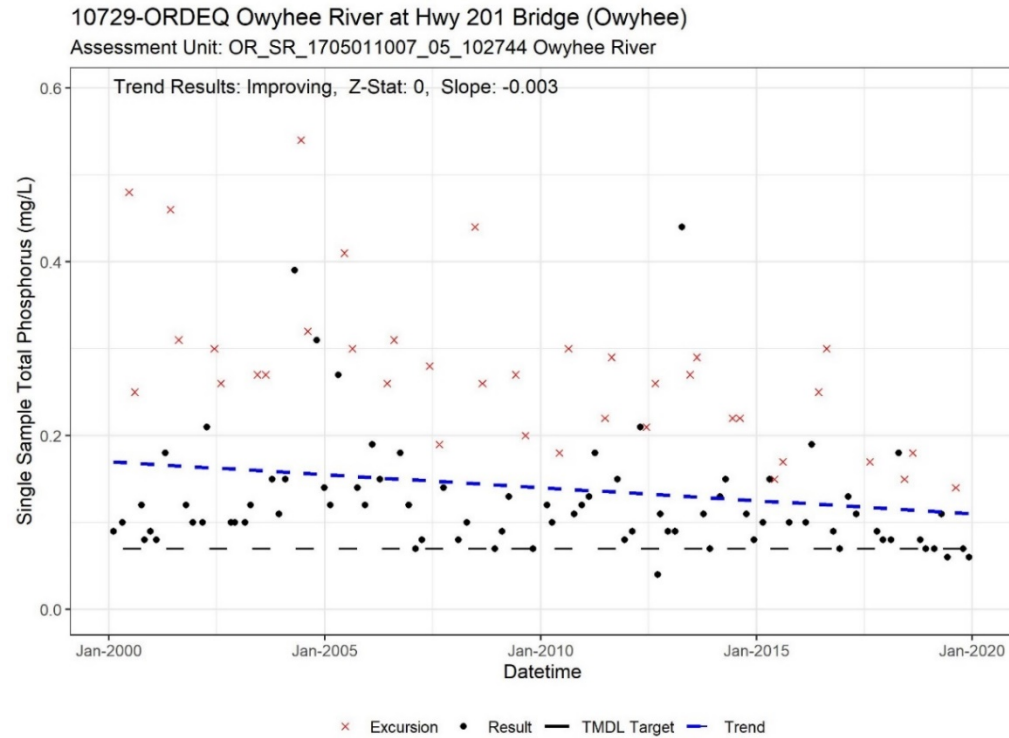


Figure 13. Total phosphorus status and trend at the station 17029-ORDEQ Owyhee River at Highway 201 Bridge.

5. Nonpoint Source Basin Level Achievements in 2019

Implementation of the Nonpoint Source Program has been summarized for each Oregon administrative basin excluding the Columbia and Snake Rivers in Appendices A - R. The basin reports provide summaries of basin characteristics, impairments, TMDLs, and nonpoint source related implementation efforts reported to DEQ.

DEQ identified the basin specific action item (Table 30) in the 2014 Nonpoint Source Management Program Plan. The Appendices A - R describe progress on this action item in 2019.

Table 30. Description of nonpoint source basin specific actions or outputs identified in the 2014 Nonpoint Source Management Program Plan with changes to the timeframe.

Goal #	Goal Topic	Action	Time Frame	2019 Status
BSA -1	Basin specific activities	Basin specific activities and projects will be prioritized through the various TMDL/NPS Program processes.	Ongoing	Ongoing See Basin Reports Appendices A-R

Appendix A

Deschutes Basin Report

1. Basin Description

The Deschutes Basin is the second largest watershed in Oregon, covering 10,759 square miles (more than 6.8 million acres) in the north-central part of the state. The basin extends west to the crest of the Cascade Mountains, south to lava plateaus, east into the Ochoco Mountains and to the plateau between the Deschutes and John Day Rivers, and north to its confluence with the Columbia River. Much of the geography of the basin has been shaped by volcanic activity, from the young cinder cones and pumice deposits of the Cascades to the massive Columbia River basalts in the canyons of the lower river.

The headwaters of the Deschutes River and most major tributaries receive large amounts of precipitation, but much of the subbasin lies in the rain shadow of the Cascade Mountains and is sheltered from western Oregon's heavy rainfall. Average annual precipitation amounts to more than 100 inches on the eastern slopes of the Cascades, mostly as snow, but drops to only 40 inches in the Ochoco Mountains and 10 inches at lower central locations. Consequently, while the Metolius drainage receives up to 50 inches of precipitation annually, the Bakeoven drainage receives only 10-12 inches.

The climate in much of the basin is considered continental, with low precipitation and humidity, large daily temperature fluctuations throughout the year, and high evaporation rates. Cold winters and hot, dry summers are common. Temperatures in the Crooked River watershed, for example, can exceed 100 degrees Fahrenheit in the summer and drop below 30 below Fahrenheit in the winter. The City of The Dalles, located near the basin's mouth on the Columbia River, is often the warmest location in the state.

Parts or all of nine Oregon counties are situated in the Deschutes watershed. These counties include Crook, Deschutes, Harney, Hood River, Jefferson, Klamath, Lake, Sherman and Wasco. Five of these counties — Crook, Deschutes, Jefferson, Sherman and Wasco — comprise most of the watershed. Larger population centers in the subbasin include Bend, Redmond, Madras and Prineville.

Land ownership in the Deschutes Basin is approximately 51 percent public, 7 percent tribal and 42 percent private. The federal government owns and manages most public land in the basin, including three National Forests, one National Grassland and one Bureau of Land Management District. Lands of the Warm Springs Tribal Reservation extend over approximately 641,000 acres and lie mostly in the Lower Deschutes Subbasin.

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

Subbasin	Watershed Area (km2)	% Urban/Roads	% Forest	% Cultivated	% Range/Forest Disturbance	%Other
Beaver - South Fork	3963.510	0.4	7.5	1.0	89.9	1.3
Little Deschutes	2727.086	1.9	61.9	0.4	32.4	3.3
Lower Crooked	4787.028	2.7	20.8	6.0	70.0	0.5
Lower Deschutes	5945.972	1.5	28.1	6.7	62.6	1.2
Trout	1792.740	1.0	11.2	3.6	84.2	0.0

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 2019 Oregon Nonpoint Source Pollution Program Annual Report

Subbasin	Watershed Area (km2)	% Urban/Roads	% Forest	% Cultivated	% Range/Forest Disturbance	%Other
Upper Crooked	2993.911	0.2	28.4	0.9	68.5	2.0
Upper Deschutes	5579.652	4.2	57.3	2.5	30.0	6.1

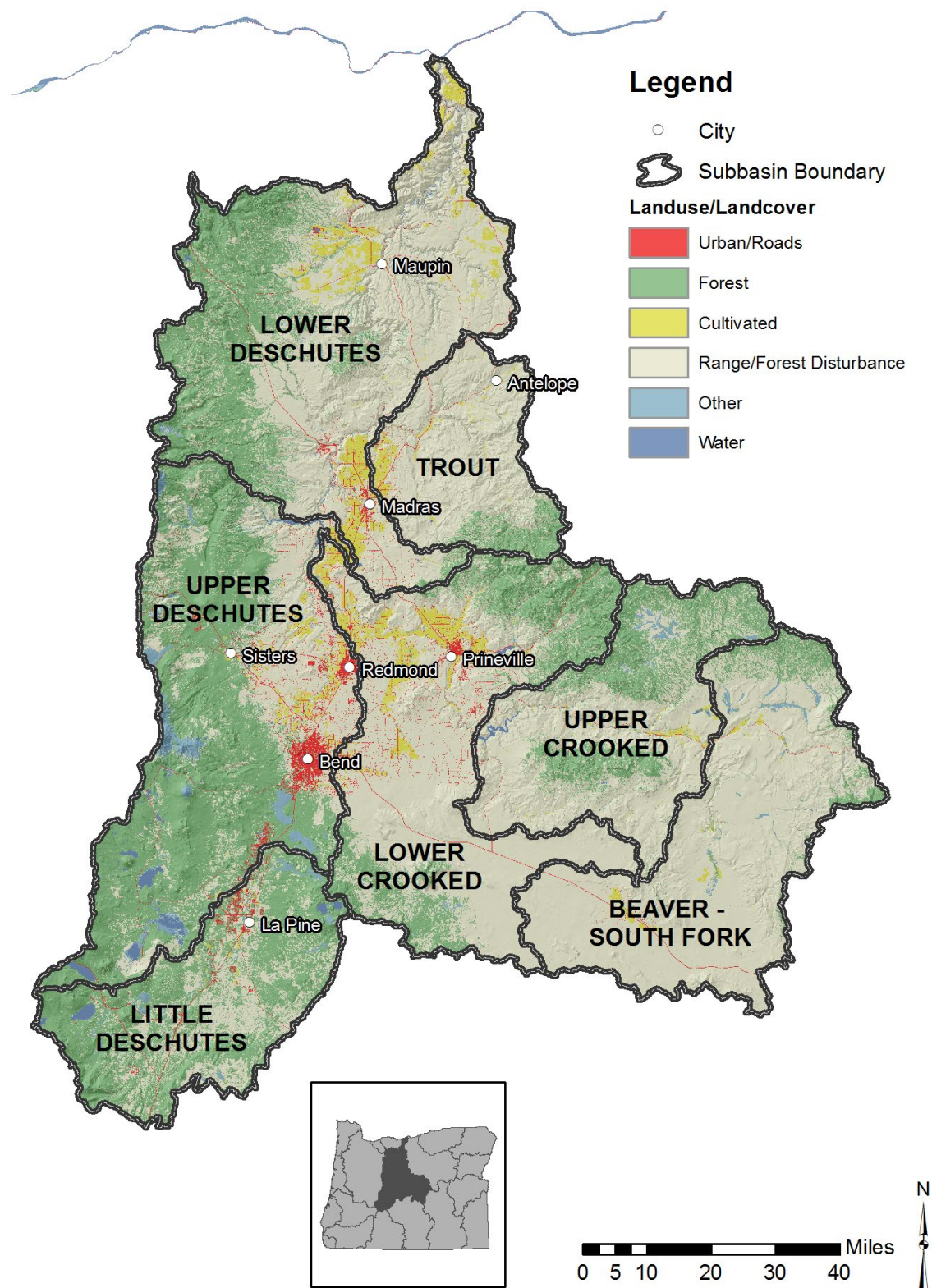


Figure A-1: Land use in the Deschutes administrative basin.

1.1 Basin Contacts

Table A-2: Oregon DEQ basin contact.

Administrative Area	DEQ Basin Coordinator
Deschutes Basin	Smita Mehta: 541-633-2022: mehta.smita@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 A-3 identifies the number of Deschutes Basin waterbody segments impaired by parameter from the 2012 Integrated Report and the number of segments with approved TMDLs. Sources: [ODEQ](#), [USEPA](#)

Table A-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	1	0
Aquatic Weeds Or Algae	5	0
Arsenic	1	0
Biological Criteria	17	0
Chlorophyll a	6	0
Dieldrin	1	0
Dissolved Oxygen	19	0
E. Coli	11	0
Fish tissue, Mercury	3	0
Iron	2	0
Mercury	2	0
pH	30	0
Sedimentation	12	0
Temperature	101	0
Total Dissolved Gas	1	0
Total Phosphorus	9	0

Parameter	Segments without a TMDL	Segments with a TMDL
Turbidity	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.

- **Currently there are no TMDLs in the Deschutes Basin.**

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 was one 319 project active that reported project outputs and accomplishments to DEQ. Combined the projects have a total grant budget of \$15,206. Table A-4 describes the project and the reported outputs.

Table A-4: Project outputs reported in 2019 for Section 319 pass through grants.

Project Name	Grantee	Project Description	Reported Outputs
Sherman County	Sherman County Soil	The project aims to enhance local education on	This grant was closed 12/31/2019 and had provided a positive

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Project Name	Grantee	Project Description	Reported Outputs
Conservation Awareness Program (CAP) Phase II	and Water Conservation District	salmonids and water quality in general and increase community engagement through class-room presentations, tree planting, tree sales, farm field days, meetings, surveys, and soil quality programs.	outcome for the Sherman County SWCD to improve outreach and education to the local communities and to participate as a part of basin-wide partnerships and assist with outreach and planning. In 2018 and 2019, the SWCD has conducted many school programs, including field trips and the Salmon and Trout Education Program, hosted annual meetings on diverse topics related to the local environment and local crops with 40-60 attendees each year, and conducted annual tree sale and helped educate community members on planting. The SWCD worked with Oregon State Park to host Arbor Day tree planting; partnered with the North Central Livestock Association Bull Tour, the Sherman County Crop Hop, and the OSU Extension Field Day to showcase effective livestock and crop practices and new ideas in the county; and partnered with the Lower Deschutes Cooperative Weed Management Area at Maupin Daze in May 2019 and the CWMA partner raft trip down the Deschutes in August 2019. These programs were incredibly educational for partners and the community about noxious weeds, noxious weed treatment, and noxious weed prevention. The SWCD also had a large booth at the Sherman County fair both years and provided information about the programs and educational materials about conservation issues and fire issues in the county.

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 three 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 \$5,080,500. Table A-5 describes the projects and the reported outputs.

Table A-5: Nonpoint source related Clean Water State Revolving Fund project outputs reported in 2019.

Project Name	Grantee	Project Description	Reported Outputs
Smith Rock and Kingway Irrigation District Piping Project	Central Oregon Irrigation District	The project will conserve water/reduce water loss, restore instream flow to the Deschutes River, improve aquatic habitat and water quality, and potentially reduce stream temperature.	In progress - planning and design
Watson and McKenzie Main Canal Pipeline Project	Three Sisters Irrigation District	The project will conserve water/reduce water loss, restore instream flow to the Whychus Creek, improve aquatic habitat, and reduce temperature.	In progress - construction continues, with project approximately 90% completed.
Tumalo Feed Canal Piping Project	Tumalo Irrigation District	The project will conserve water/reduce water loss, restore instream flow to the Tumalo Creek, improve aquatic habitat, and reduce temperature.	Completed - initiation of operations of irrigation system improvements



Figure A-2: Construction of the Tumalo Feed Canal Piping Project.

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 \$57,170. Table A-6 describes the projects and the reported outputs.

Table A-6: Nonpoint source Drinking Water Source Protection program projects and outputs for 2019.

Project Name	Grantee	Project Description	Reported Outputs
One Watershed Shared by Many: Bend Municipal Watershed	Bend Water Department (00100)	Conduct public outreach campaign, in collaboration with the USFS Deschutes National Forest, in the Tumalo Creek watershed. This area is a popular recreation destination as well as the City of Bend's drinking	Contract was signed in 2019 which included a collection agreement between USFS and City of Bend that will serve as a template for other projects with USFS to ensure that state

Project Name	Grantee	Project Description	Reported Outputs
Entry and Education Sign Project		water source. Bend and the USFS will design, fabricate, and install watershed protection/education signs to increase visitors' awareness of watershed and drinking water values.	and federal procurement and contracting requirements are addressed and met. Project implementation will occur in 2020.
Purchase sensitive land above spring, install security fencing insensitive area.	City of Maupin (00510)	Protection of City of Maupin's drinking water source area by purchase sensitive land above spring (\$20,000 Loan) and installing security fencing in sensitive area (10,000 grant).	2019 work includes further discussions with local governments to determine best course of action for spring source area protection. After discussions with Wasco County, Maupin is now considering a land swap instead of land purchase. Contract is extended to conduct further evaluation.

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 no active Drinking Water Providers Partnership projects with reported outputs in the Deschutes.

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 16 OWEB funded projects completed in 2018 with a total cash and in-kind budget of \$7,188,745. The tables below summarize reported outputs for different project activities in each Deschutes subbasin.

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

Table A-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	New fish screens installed on diversions (where no screen had existed previously) (Number of treatments)	Fish Passage Non-crossing improvement (Number of treatments)
Upper Deschutes	1	1
Lower Deschutes	NA	1

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

Subbasin	Main stream channel modified / created (Feet)	Main stream channel modified / created (Number of treatments)
Upper Deschutes	6600	4

Table A-9: 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)	Off-channel habitat created, protected, or reconnected (Feet)	Off-channel habitat created, protected, or reconnected (Number of treatments)
Upper Deschutes	1350	7000	20

Table A-10: 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 (Length of treatment)	Riparian fencing (Stream sides treated)
Lower Crooked	6	NA	2
Upper Crooked	NA	0.4	NA

Table A-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 vegetation planting (Area treated)	Riparian vegetation planting (Length of treatment)
Lower Deschutes	2	NA
Upper Deschutes	NA	1.2

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

Subbasin	Irrigation system improvement (Acre)	Water/sediment control basins (Acre)	Water/sediment control basins (Number of treatments)
Lower Deschutes	70	1.4	3
Trout	15	NA	NA

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

Subbasin	Off-channel livestock or wildlife watering (Number of treatments)	Upland fencing (Acre)	Upland fencing (Mile)
Lower Crooked	1	NA	NA
Lower Deschutes	2	2121.5	3.0
Upper Crooked	NA	548.0	0.6

Table A-14: Summary of OWEB grant funded upland projects completed in 2018, the most recent year data is available in the OWEB OWRI database.

Subbasin	Upland vegetation management (Area treated)	Upland vegetation planting (Area treated)
Lower Deschutes	120	269
Trout	78	NA

Appendix B

Goose & Summer Lakes Basin Report

1. Basin Description

The Goose and Summer Lakes Basin, located in south-central Oregon, includes four closed subbasins (Summer Lake, Lake Abert, Goose Lake, and Warner Lake), and encompasses approximately 7,700 square miles including the communities of Fort Rock, Christmas Valley, Silver Lake, Summer Lake, Paisley, Valley Falls, Lakeview, Plush, and Adel. The Basin is located mostly in Lake County, but extends into small portions of Harney, Klamath and Deschutes County.

With a total population of approximately 7,500 people, the Basin is very sparsely populated, with less than one person per square mile. Lumber, government, and agriculture form the economic base. Agriculture is primarily hay, forage and small grain, along with cattle and horses. Less than one quarter of the Basin is privately owned. Nearly three quarters of the land is managed by the federal government (Bureau of Land Management, US Forest Service and US Fish and Wildlife Service), and the state of Oregon owns 74,000 acres, some of which comprise the Summer Lake Wildlife Management Area.

Almost three-quarters of the basin is classified as rangeland. Native vegetation consists primarily of low sagebrush, big sagebrush, blue bunch wheatgrass, and Sandberg bluegrass. Some areas of higher elevation support Ponderosa pine and white fir, lodge pole pine, quaking aspen, antelope bitterbrush, and Idaho fescue. Less than four percent of the land is cultivated.

Elevations in the Basin range from 4,147' at Summer Lake to 8,456' on Crane Mountain east of Lakeview. The Basin is semiarid with average annual precipitation ranging from 5" in some of the eastern valleys to over 30" at higher elevations, most of which falls during the winter as snow. During the summer season, an average of 2" of rain falls annually at lower elevations. Freezing temperatures can occur at any time during the year, and maximum temperatures can exceed 100°F for a few weeks during the summer.

The two largest rivers in the Basin are the Ana River and the Chewacan River. These rivers have numerous smaller tributary streams that support Redband trout, a rainbow trout adapted to arid forest and desert environments.

Local geology in the Basin is characterized by ancient deposits from large Pleistocene lakes that filled the Summer, Goose, Warner, and Fort Rock valleys. As time passed, most of the lakes evaporated and the present-day lakes and playas are all that remain. With no surface outlets, saline concentrations have risen until now most lake waters in the basin are alkaline and saline, too salty for domestic or irrigation use. The lakes in the Basin are predominantly closed drainages with no defined outlet. Lakes in the Basin include Silver, Summer, Goose, Crump, Alkali, Hart, Flagstaff, Campbell and Bluejoint Lakes and Lake Abert, and Drews Reservoir (some are dry playas in the summer and during drought seasons). The southern end of Goose Lake is the only point at which surface water historically flowed out of the Basin. Groundwater may flow north from the Fort Rock area into the Deschutes River Basin.

The major water use in the basin is irrigation. The oldest water rights date back to 1867. There are rights to irrigate over 183,000 acres. Prior to 1960, most of the irrigation in the Basin was from surface water. Since then, the use of groundwater for irrigation has expanded dramatically. Flood irrigation, using high spring flows is a common practice in the Basin. Much of the high flow not used for flood irrigation enters the large shallow lakes and some is lost to evaporation.

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Table B-1: 2011 Land use and land cover for each subbasin in the Goose & Summer Lakes.

Subbasin	Watershed Area (km2)	% Urban/Roads	% Forest	% Cultivated	% Range/Forest Disturbance	%Other
Goose Lake	1876.279	1.1	42.7	12.1	33.5	10.6
Lake Abert	2670.779	0.6	25.1	1.5	63.7	8.9
Summer Lake	10708.533	1.0	14.2	2.7	74.2	7.9
Warner Lakes	4443.738	0.3	9.2	0.6	81.6	8.3

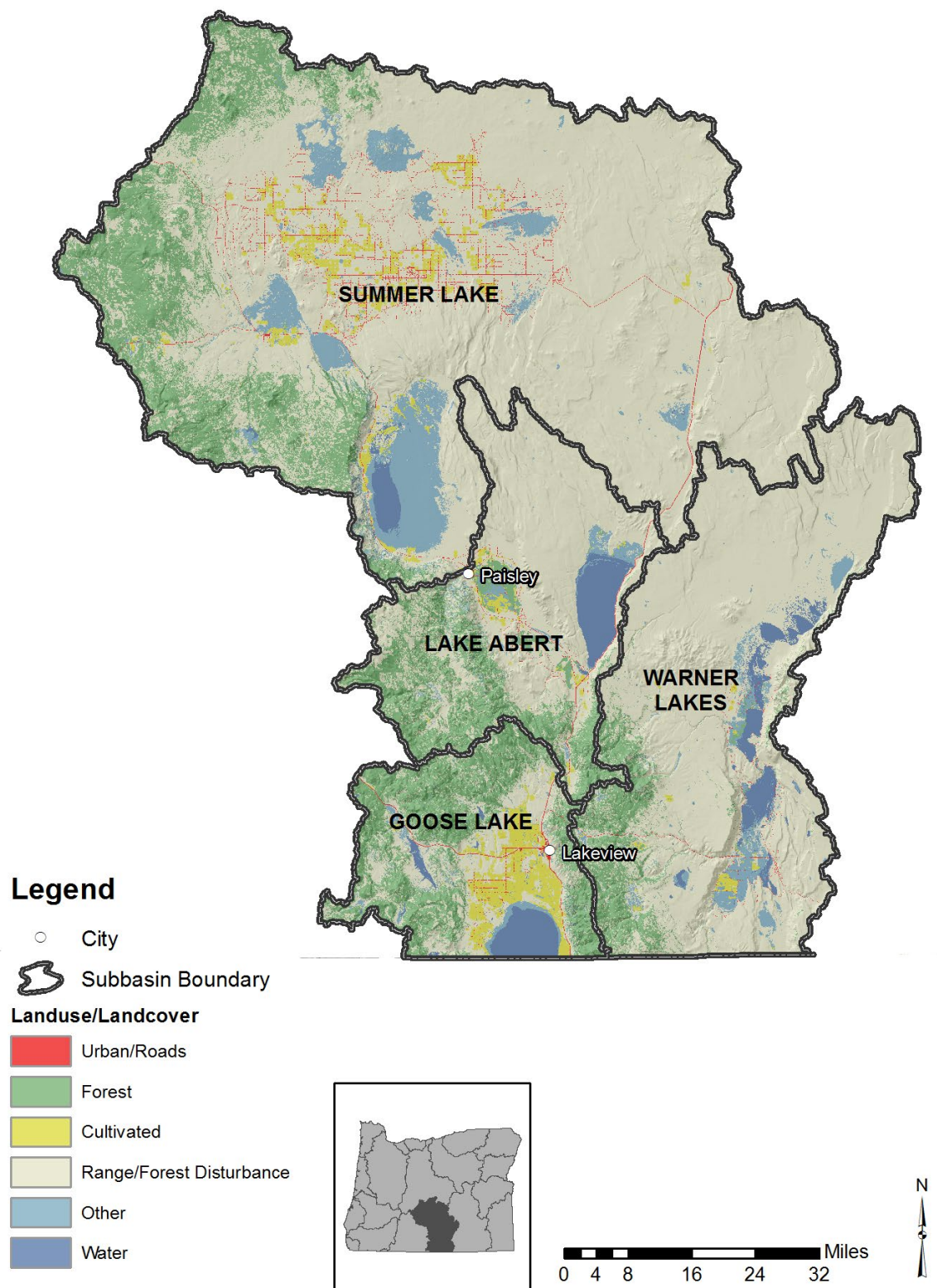


Figure B-1: Land use in the Goose & Summer Lakes administrative basin.

1.1 Basin Contacts

Table B-2: Oregon DEQ basin contact.

Administrative Area	DEQ Basin Coordinator
Goodse and Summer Lakes Basin	John Dadoly: 541-278-4616: dadoly.john@deq.state.or.us
Goodse and Summer Lakes Basin	Mike Hiatt: 541-273-7002: hiatt.mike@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 B-3 identifies the number of Goose & Summer Lakes Basin waterbody segments impaired by parameter from the 2012 Integrated Report and the number of segments with approved TMDLs. Sources: [ODEQ](#), [USEPA](#)

Table B-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
Arsenic	3	0
Biological Criteria	4	0
Dissolved Oxygen	3	0
E. Coli	1	0
Iron	2	0
pH	1	0
Silver	4	0
Temperature	42	0
Thallium	3	0
Total Phosphorus	1	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.

- **Currently there are no TMDLs in the Goose & Summer Lakes Basin.**

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 Goose & Summer Lakes.

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 Goose & Summer Lakes.

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 was one nonpoint source related Drinking Water Source Protection program project active that reported project outputs and accomplishments to DEQ. Combined the projects have a total budget of \$30,000. Table B-4 describes the project and the reported outputs.

Table B-4: Nonpoint source Drinking Water Source Protection program projects and outputs for 2019.

Project Name	Grantee	Project Description	Reported Outputs
Underground Storage Tank Survey and Mitigation Planning	City of Lakeview (00464)	Prevent or remediate groundwater contamination from underground storages tanks by identifying current and historic locations then evaluating potential for contamination. Project will include public outreach and education, tank location mapping, resistivity studies, data analysis, and developing mitigation/remediation plans for any identified contamination.	Mapping of buried tanks completed, all identified buried tanks were outside Lakeview's drinking water source area.

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 no active Drinking Water Providers Partnership projects with reported outputs in the Goose & Summer Lakes.

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 eight OWEB funded projects completed in 2018 with a total cash and in-kind budget of \$1,365,428. The tables below summarize reported outputs for different project activities in each Goose & Summer Lakes subbasin.

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

Table B-5: Summary of OWEB grant funded fish passage projects completed in 2018, the most recent year data is available in the OWEB OWRI database.

Subbasin	Existing fish screens replaced, repaired, or modified (Number of treatments)	Fish Passage Crossing improvement (Number of treatments)	Fish Passage Non-crossing improvement (Number of treatments)
Lake Abert	1	NA	NA
Goose Lake	NA	NA	3
Warner Lakes	NA	2	1

Table B-6: 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)
Goose Lake	0.2	2640	1	16
Lake Abert	0.2	NA	NA	NA

Table B-7: 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 (Length of treatment)
Goose Lake	2

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

Subbasin	Grazing management (Acre)	Off-channel livestock or wildlife watering (Number of treatments)	Upland fencing (Acre)
Goose Lake	NA	1	1
Warner Lakes	50	4	NA

Table B-9: 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 management (Area treated)
Goose Lake	NA	208
Warner Lakes	2088	5224

Appendix C

Grande Ronde Basin Report

1. Basin Description

The Grande Ronde River drains an area of approximately 5,300 square miles in north-eastern Oregon, southeastern Washington and eastern Idaho. It flows 183 miles from its headwaters in the Blue and Wallowa Mountains, across the Columbia Plateau through the Grande Ronde Valley and into a series of steep, deep canyons before discharging into the Snake River near Rogersburg, WA. The Grande Ronde Basin is divided into two subbasins: Upper Grande Ronde and Lower Grande Ronde. The upper subbasin includes all of the lands that drain to Grande Ronde River upstream of the confluence with the Wallowa River at Rondowa. The lower subbasin is divided into three large watersheds: the Wallowa River, Imnaha River, and Lower Grande Ronde River. The Wallowa River flows to the Lower Grande Ronde River, which along with the Imnaha River, flows into the Snake River. The Lower Grande Ronde Subbasin extends over the state boundary into Washington and Idaho. The Basin incorporates portions of seven counties: Garfield (OR), Wallowa (OR), Umatilla (OR), Union (OR), Asotin (WA), Columbia (WA), and Nez Perce (ID). The Grande Ronde River supports populations of spring chinook salmon, summer steelhead, bull trout, mountain whitefish, as well as other species. The river has a sport steelhead fishery and has some tribal fishing for spring chinook.

Elevations within the Basin range from nearly 10,000 feet in the Elkhorn Mountain Range to 830 feet at the mouth where the Grande Ronde flows into the Snake River. Lower elevations generally receive 8 to 12 inches of precipitation annually. Higher elevations commonly receive between 50 to 80 inches of precipitation, most of which is received as snowfall. The largest rivers in the Basin are the Grande Ronde, Wallowa, Imnaha and Wenaha Rivers, and Catherine, Meadow and Joseph Creeks. Lands to the south of the Wallowa River are supplied with much more water than those to the north. Groundwater is relatively high in the Wallowa River Valley, with the southern slopes receiving a continual charge from the mountains. The lands to the north are drier and have no high mountains to accumulate snowpack.

Land ownership in the Grande Ronde Basin is almost equally divided between private and federal land, with small tracts of land owned/managed by the State of Oregon and the Confederated Tribes of the Umatilla Indian Reservation (CTUIR). The Nez Perce Tribe has treaty rights to much of the public lands within the Basin. The federally managed land is largely within the Wallowa-Whitman National Forest, Hell's Canyon National Recreation Area, and Umatilla National Forest. There are several incorporated cities (La Grande, Elgin, Enterprise, Joseph, Wallowa, and Lostine) in the Basin and several smaller communities (Troy, Imnaha, and Minam). Total population within the Basin is less than 7,000 residents.

Land use in the Basin is dominated by forest lands, grasslands and scrub/shrub, with significant acreage of agricultural land and some rural residential development. Much of the high elevation forest lands are managed as wilderness areas and as National Recreation Areas by US Forest Service. Agriculture, crops and livestock, plays an important economic role in the area, as does forestry.

In the early 19th century, the Basin was inhabited by Nez Perce, Umatilla, Walla Walla, and Cayuse tribes of Native Americans. Numerous archaeological sites have been identified throughout the Basin. The Grande Ronde River was named around 1821 by French Canadian trappers. Grande Ronde is a French name meaning "great round". A portion Grande Ronde and its valley were part of the Oregon Trail.

In 1988, the United States Congress designated about 44 miles of the river, from its confluence with the Wallowa River to the Oregon–Washington border, as the Grande Ronde Wild and Scenic River. The river today is a popular destination for hunting, especially for game animals such as mule deer, elk, black bear,

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cougar, and bighorn sheep. Fishing, rafting and hiking are also popular along the designated Wild and Scenic portion of the river. Most of the middle reaches of the river are inaccessible to motor vehicles.

Table C-1: 2011 Land use and land cover for each subbasin in the Grande Ronde.

Subbasin	Watershed Area (km2)	% Urban/Roads	% Forest	% Cultivated	% Range/Forest Disturbance	%Other
Imnaha	2203.096	0.4	49.1	0.1	48.8	1.7
Lower Grande Ronde	3048.836	0.1	53.1	1.9	44.7	0.2
Upper Grande Ronde	4238.057	1.7	57.8	14.6	25.6	0.3
Wallowa	2471.343	1.0	51.3	8.0	34.1	5.5

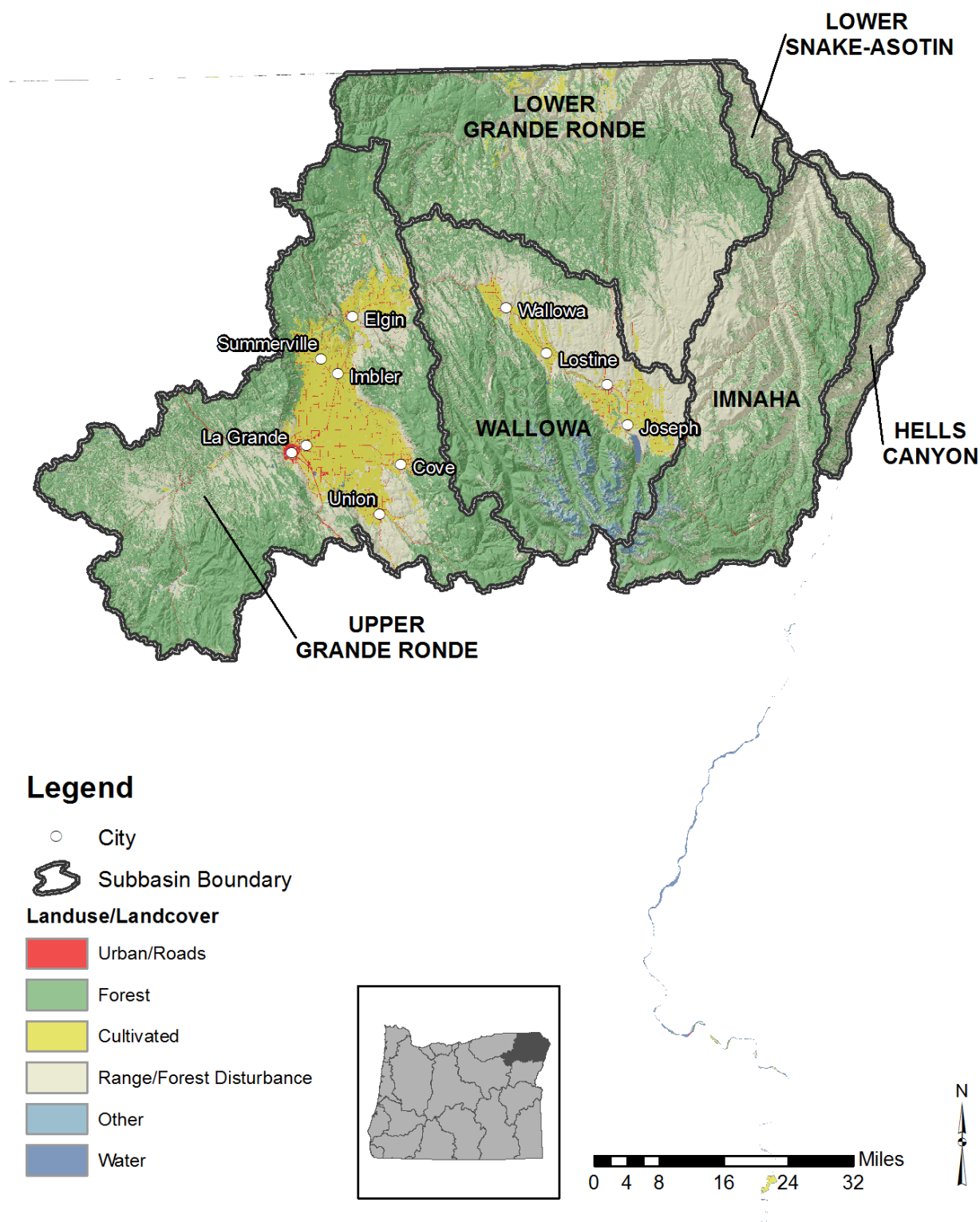


Figure C-1: Land use in the Grande Ronde administrative basin.

1.1 Basin Contacts

Table C-2: Oregon DEQ basin contact.

Administrative Area	DEQ Basin Coordinator
Grand Ronde Basin	Don Butcher: 541-278-4603: butcher.don@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 C-3 identifies the number of Grande Ronde Basin waterbody segments impaired by parameter from the 2012 Integrated Report and the number of segments with approved TMDLs. Sources: [ODEQ](#), [USEPA](#)

Table C-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
Aquatic Weeds Or Algae	0	3
Biological Criteria	9	0
Copper	1	0
Dissolved Oxygen	5	4
E. Coli	3	3
Fecal Coliform	0	3
Iron	1	0
pH	1	5
Phosphorus	0	3
Sedimentation	9	22
Temperature	0	117
Total Phosphorus	1	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 C-4 lists the TMDLs that have been approved in the Grande Ronde Basin.

Table C-4: Approved TMDLs in the Grande Ronde Basin and the impairments addressed by those TMDLs.

TMDL Document Name	Impairments Addressed
<u>Lower Grande Ronde Subbasins TMDLS</u>	Bacteria (water contact recreation), Temperature
<u>Upper Grande Ronde River Subbasins TMDL</u>	Dissolved Oxygen, pH, Sedimentation, 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 Grande Ronde.

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 Grande Ronde.

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 no nonpoint source related Drinking Water Source Protection program projects with reported outputs in the Grande Ronde.

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 no active Drinking Water Providers Partnership projects with reported outputs in the Grande Ronde.

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 nine OWEB funded projects completed in 2018 with a total cash and in-kind budget of \$1,313,212. The tables below summarize reported outputs for different project activities in each Grande Ronde subbasin.

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

Table C-5: Summary of OWEB grant funded fish passage projects completed in 2018, the most recent year data is available in the OWEB OWRI database.

Subbasin	New fish screens installed on diversions (where no screen had existed previously) (Number of treatments)	Fish Passage Crossing improvement (Number of treatments)
Wallowa	1	NA
Upper Grande Ronde	NA	1

Table C-6: 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)	Off-channel habitat created, protected, or reconnected (Feet)	Off-channel habitat created, protected, or reconnected (Number of treatments)
Upper Grande Ronde	696	197	7

Table C-7: 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)
Lower Grande Ronde	3.4	2

Table C-8: 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 (Stream sides treated)	Riparian vegetation management (Stream sides treated)
Imnaha	26	1	NA
Upper Grande Ronde	NA	NA	2

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

Subbasin	Irrigation system improvement (Acre)	Irrigation system improvement (Feet)	Water/sediment control basins (Acre)	Water/sediment control basins (Number of treatments)
Wallowa	671	25390	0.1	1

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

Subbasin	Off-channel livestock or wildlife watering (Number of treatments)
Lower Grande Ronde	4
Upper Grande Ronde	3

Table C-11: 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 management (Area treated)	Upland vegetation planting (Area treated)
Imnaha	494.0	NA	NA
Lower Grande Ronde	1.0	493.3	0.2
Upper Grande Ronde	89.5	NA	NA

Table C-12: 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)
Lower Grande Ronde	1

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 C-13: TMDL implementation activities reported in 2019 by Designated Management Agencies or third parties.

TMDL	DMA	Reported Actions
Lower Grande Ronde Subbasins TMDL	City of Joseph	Began TMDL implementation planning.
Lower Grande Ronde Subbasins TMDL	City of Wallowa	Began TMDL implementation planning.
Lower Grande Ronde Subbasins TMDL	City of Lostine	Began TMDL implementation planning.
Lower Grande Ronde Subbasins TMDL	Wallowa County	Began TMDL implementation planning.
Lower Grande Ronde Subbasins TMDL	Umatilla National Forest	Began TMDL implementation planning.
Lower Grande Ronde Subbasins TMDL	Wallowa-Whitman National Forest	Began TMDL implementation planning.

Appendix D

Hood Basin Report

1. Basin Description

The Middle Columbia-Hood Basin is in the north-central part of Oregon occupying approximately 1,140 square miles. The basin is a collection of rivers and creeks which are tributaries to the Columbia River and enter the river roughly between the cities of Cascade Locks to the west and The Dalles to the east. The basin can be split into two geographic regions that generally follow county lines: Hood River County in the western half of the basin (including the Hood River Watershed) and Wasco County in the eastern half (including the Mosier Creek, Mill Creek and Fifteenmile Creek Watersheds). Projects and active partnerships generally follow the county lines. The entire basin contains lands ceded to the Confederated Tribes of the Warm Springs Reservation of Oregon.

Hood River County Streams in the basin's western half originate on the eastern slope of the Cascade Range largely in conifer forests and flow north from Mt. Hood. The Hood River and a number of its upper tributaries are fed by glacial sources and can transport large amounts of bedload and sediment. This portion supports a wide range of native fish, including bull trout, spring Chinook salmon, summer and winter steelhead, rainbow and cutthroat trout, and lesser numbers of fall Chinook and Coho salmon. In 1998, steelhead and bull trout in the Hood River were listed as threatened under the Endangered Species Act.

In this western half of the basin, approximately 85 percent of the land is forestland, with more than two-thirds of this managed by the Mt. Hood National Forest. Agriculture, primarily fruit production, is the second largest land use, accounting for over 7 percent of the land area. Agriculture is the leading industry, followed by tourism, outdoor recreation and forestry. Approximately 4 percent of the land area has urban and/or residential development. The population in the county is dispersed, with almost 70 percent of county residents living outside urban growth boundaries. There are four small urban centers in the county: Hood River, Cascade Locks, Odell and Parkdale.

Major human disturbances that have affected hydrology, aquatic life and water quality in the area include:

- * Diminishment or depletion of stream flows at irrigation, hydropower and municipal water diversions
- * Fish migration barriers at dams, diversions and road crossings
- * Loss of large woody debris recruitment and reduced riparian-floodplain interactions caused by historic timber practices
- * Channel confinement and interference with stream and riparian processes by roads and other land use
- * Water quality alteration by sediment inputs from roads and irrigation networks, pesticide and nutrient contamination from agricultural and other non-point sources, temperature increases from flow modification, reservoir discharge, or riparian vegetation removal

Wasco County Streams in this eastern half of the basin originate on the forested eastern slopes of the Hood River Range, a north-south range starting approximately nine miles east of Mt. Hood and running north to the Columbia River. The Cascade Mountains produce a rain-shadow effect, drastically reducing the total precipitation to the east. Average annual precipitation varies from 65-80 inches in the higher elevation headwaters in the west to 10-11 inches on the eastern border of the basin. Only 5-10 percent of the moisture falls from June through August. Because of both the seasonality of moisture and the total low precipitation, tributaries originating at lower elevations are usually not perennial. The watershed is home to a variety of fish species, including Pacific lamprey, resident Redband trout and coastal cutthroat trout.

The economy of the eastern half of the basin is based on agriculture, recreation and grazing, with a smaller component of forest production. Approximately 84 percent of the land is privately owned and is

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largely dominated by cropland and rangeland. Of the cropland, the vast majority is non-irrigated and is almost exclusively in wheat or other grain production. Less than 5 percent is irrigated orchards and vineyards. Approximately 4 percent of the land area has urban and/or residential development.

Major human disturbances that have affected hydrology, aquatic life and water quality in the area include:
* Changes to land cover that affect wildlife habitat, hydrologic regimes and erosion rates * Alteration of instream and riparian conditions through channelization of streams, road-building, removal of large woody debris, and historic logging patterns * Pesticide and fertilizer use * Groundwater overdraft

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

Subbasin	Watershed Area (km2)	% Urban/Roads	% Forest	% Cultivated	% Range/Forest Disturbance	%Other
Middle Columbia-Hood	2958.793	3.9	37.9	20.7	36.1	1.5

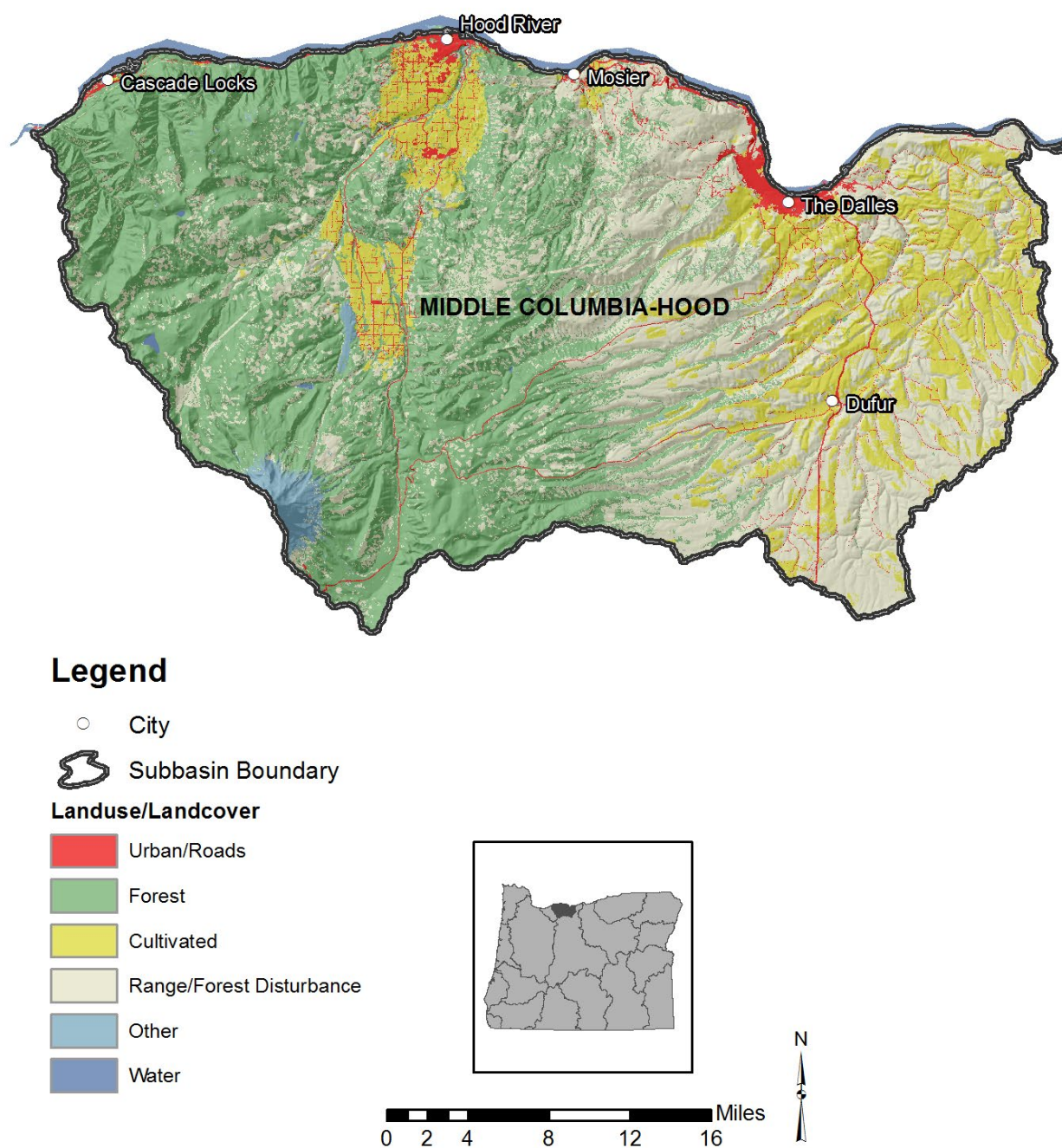


Figure D-1: Land use in the Hood administrative basin.

1.1 Basin Contacts

Table D-2: Oregon DEQ basin contact.

Administrative Area	DEQ Basin Coordinator
Middle Columbia - Hood Basin	Smita Mehta: 541-633-2022: mehta.smita@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 D-3 identifies the number of Hood Basin waterbody segments impaired by parameter from the 2012 Integrated Report and the number of segments with approved TMDLs. Sources: [ODEQ](#), [USEPA](#)

Table D-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'-DDD	4	0
4,4'-DDE	6	0
4,4'-DDT	4	0
Arsenic	2	0
Biological Criteria	10	0
Chlorpyrifos	6	0
Copper	3	0
Dieldrin	4	0
Dioxin (2,3,7,8-TCDD)	0	4
Dissolved Oxygen	3	0
E. Coli	4	0
Guthion	4	0
Heptachlor epoxide	2	0
Iron	6	0
Lead	1	0
Malathion	2	0
Mercury	1	0

Parameter	Segments without a TMDL	Segments with a TMDL
pH	3	0
Polychlorinated Biphenyls (PCBs)	1	0
Sedimentation	6	0
Silver	2	0
Temperature	1	74
Thallium	3	0
Total Dissolved Gas	0	2
Zinc	1	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 D-4 lists the TMDLs that have been approved in the Hood Basin.

Table D-4: Approved TMDLs in the Hood Basin and the impairments addressed by those TMDLs.

TMDL Document Name	Impairments Addressed
Middle Columbia-Hood (Miles Creeks) Subbasin TMDL and WQMP	Temperature
Western Hood Subbasin Temperature TMDL	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 Hood.

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 \$4,071,574. Table D-5 describes the projects and the reported outputs.

Table D-5: Nonpoint source related Clean Water State Revolving Fund project outputs reported in 2019.

Project Name	Grantee	Project Description	Reported Outputs
Dee Irrigation District Distribution System Pressurization Project	Dee Irrigation District	The project will conserve water/reduce water loss, increase energy efficiency, improve water quality, increase instream flow to the West Fork Hood River, improve aquatic habitat and access to spawning and rearing for ESA-listed species and provide temperature benefits for the West Fork Hood River TMDL.	In progress - construction of irrigation system improvements expected to begin any day; waiting for County permits
Reservoir Enhancement Project: Outlet Replacement and Dam Raise	Farmers Irrigation District	The project will upgrade micro hydroelectric systems, replace open ditches and irrigation canals. The project will improve water efficiency, water quality, increase instream flow to Hood River and subbasin tributaries including Indian Creek, improve aquatic habitat for ESA listed fish species and provide temperature benefits for the Hood River TMDL.	In progress - planning for reservoir and pipe enhancement, working on completing the Army Corp and DSL permitting and environmental review processes.

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 no nonpoint source related Drinking Water Source Protection program projects with reported outputs in the Hood.

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 no active Drinking Water Providers Partnership projects with reported outputs in the Hood.

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 eight OWEB funded projects completed in 2018 with a total cash and in-kind budget of \$343,497. The tables below summarize reported outputs for different project activities in each Hood subbasin.

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

Table D-6: 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 Non-crossing improvement (Number of treatments)
Middle Columbia-Hood	2

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

Subbasin	Engineered structures installed (Number of treatments)
Middle Columbia-Hood	6

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

Subbasin	Irrigation system improvement (Acre)
Middle Columbia-Hood	83.1

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

Subbasin	Upland tree planting (Area treated)	Upland vegetation planting (Area treated)
Middle Columbia-Hood	458.5	148.2

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 D-10: TMDL implementation activities reported in 2019 by Designated Management Agencies or third parties.

TMDL	DMA	Reported Actions
Miles Creeks Temperature TMDL	City of Dufur	Met with DEQ and began TMDL implementation planning
Miles Creeks Temperature TMDL	Cit of Mosier	Met with DEQ and began TMDL implementation planning
Miles Creeks Temperature TMDL	City of The Dalles	Met with DEQ, began TMDL implementation planning, and submitted plan
Miles Creeks Temperature TMDL	Northern Wasco County Parks and Recreation District	Met with DEQ, began TMDL implementation planning, and submitted plan draft
Miles Creeks Temperature TMDL	Wasco County	Met with DEQ, began TMDL implementation planning, and submitted plan
Miles Creeks Temperature TMDL	Mt. Hood NF	Met with DEQ and restarted TMDL implementation planning
Western Hood Temperature TMDL	City of Hood River	Met with DEQ and began 5 year planning review
Western Hood Temperature TMDL	Hood River County	Met with DEQ and began 5 year planning review

Appendix E

John Day Basin Report

1. Basin Description

The John Day Basin, located in north-central Oregon, includes four subbasins (North Fork, South Fork, Middle Fork and Lower John Day), and drains approximately 8,100 square miles; making it the fourth-largest river basin in Oregon. The John Day is the third longest free-flowing river in the contiguous United States and the longest containing entirely un-supplemented runs of anadromous fish. The Basin incorporates portions of eleven counties. Originating in the Strawberry Mountains near Prairie City, the John Day River flows 284 miles in a northwesterly direction, entering the Columbia River approximately four miles upstream of the John Day dam. Absent of dams, the John Day River provides unparalleled habitat for wild runs of spring Chinook salmon and summer steelhead, Pacific lamprey, westslope cutthroat, redband and bull trout.

Nearly 40 percent of the basin is public land. Ponderosa pine forests in the Ochoco and Blue mountains dominate the John Day River headwaters. The north and middle forks of the John Day meander through open meadows and prairie ranchland. Mid and lower-elevation grasslands are primarily in private ownership and livestock grazing is the predominant land use here. Livestock are primarily cattle. Irrigated agriculture is undertaken on many floodplain meadows throughout the Basin, and dry land farming is present to varying degrees. Large wheat farms are common in the lower subbasin and dry land hay is grown in scattered areas throughout the Basin. Recreation is an increasing use on private lands.

The Basin population is small and widely dispersed. The Basin boundary overlaps ten rural counties, the largest and most populated of which is Grant County. There are seventeen incorporated cities in the Basin, all with population under 2000. John Day and Prairie City are the largest; county seats include Canyon City (Grant County), Fossil (Wheeler County), Moro (Sherman County) and Condon (Gilliam County).

Elevations within the Basin range from the Blue, Strawberry, Aldrich and Ochoco Mountains, at just over 9,000 feet to the Columbia River just above the John Day Dam at about 380 feet. The largest rivers in the Basin are the John Day River, and the North, Middle and South Forks (in order of volume). Climate in the Basin ranges from sub-humid in the upper Basin to semi-arid in the lower subbasin. Most precipitation falls between November and March. Upper elevations receive up to 50 inches of precipitation annually, mostly in the form of snow; lower elevations typically receive 12 inches or less of annual precipitation. Across the Basin, air temperature varies from sub-zero during winter months to over 100°F during the summer.

The John Day Basin is home to the famous John Day Fossil Beds National Monument, managed by the National Park Service. The park is known for its well-preserved layers of fossil plants and mammals that lived in the region between the late Eocene, about 45 million years ago, and the late Miocene, about 5 million years ago. The monument consists of three geographically separate units: Sheep Rock, Painted Hills, and Clarno, covering over 13,900 acres. About 250,000 people visit the park annually. The fossil record includes animals (horses, camels, rhinoceroses, bears, pronghorn, deer, weasels, raccoons, cats, dogs, lions, sloths and others), plants (oak, sycamore, maple, ginkgo, and elm trees). Two fossilized teeth found recently near Dayville are the earliest record of beaver (*Castor californicus*), in North America, dating to about 7 million years old.

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Table E-1: 2011 Land use and land cover for each subbasin in the John Day.

Subbasin	Watershed Area (km2)	% Urban/Roads	% Forest	% Cultivated	% Range/Forest Disturbance	%Other
Lower John Day	8155.474	1.1	10.9	12.7	74.7	0.6
Middle Fork John Day	2051.845	0.6	54.6	0.2	44.2	0.4
North Fork John Day	4787.384	0.7	58.6	0.4	39.7	0.6
Upper John Day	5540.189	1.1	44.3	0.5	52.7	1.4



Figure E-1: Land use in the John Day administrative basin.

1.1 Basin Contacts

Table E-2: Oregon DEQ basin contact.

Administrative Area	DEQ Basin Coordinator
John Day Basin	Don Butcher: 541-278-4603: butcher.don@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 E-3 identifies the number of John Day Basin waterbody segments impaired by parameter from the 2012 Integrated Report and the number of segments with approved TMDLs. Sources: [ODEQ](#), [USEPA](#)

Table E-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
Biological Criteria	31	3
Copper	1	0
Dissolved Oxygen	21	1*
E. Coli	0	1
Fecal Coliform	0	1
Fish tissue, Mercury	1	0
Iron	2	0
Lead	1	0
pH	4	0
Sedimentation	29	0
Temperature	0	254

* The TMDL targets a dissolved oxygen concentration of 6.5 mg/l.

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 E-4 lists the TMDLs that have been approved in the John Day Basin.

Table E-4: Approved TMDLs in the John Day Basin and the impairments addressed by those TMDLs.

TMDL Document Name	Impairments Addressed
John Day River Basin TMDL and WQMP	Bacteria (water contact recreation), Dissolved Oxygen, 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 three 319 projects active that reported project outputs and accomplishments to DEQ. Combined the projects have a total grant budget of \$53,441. Table E-5 describes the projects and the reported outputs.

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

Project Name	Grantee	Project Description	Reported Outputs
Lower John Day UAV Protocol Development	Gilliam County Soil and Water Conservation District	This project will develop a procedure for continuous monitoring of the riparian vegetation using an UAV equipped with appropriate sensors and develop a protocol for the use of UAVs in monitoring riparian vegetation (including protocols for both planning the flight mission and image processing). The data for the comparison of data quality from UAV and plane-based imagery (LiDAR) will be collected in Ferry Canyon, near Condon, Oregon. The Ferry Canyon Watershed covers approximately 81,000 acres and features 10.5 miles of priority native spawning habitat (steelhead and chinook). Over 800 acres of floodplain will be flown with UAVs. The collected data will be processed to make digital ortho-mosaics, a Digital Terrain Model (DTM), and a Digital Surface Model. These models will be used to help identify areas of concern and reduce the cost of selecting restoration opportunity areas. The protocols developed will be made available in an open forum to all interested natural resource professionals throughout the region and are expected to be implemented by several organizations from eastern Oregon such as Gilliam-East John Day Watershed Council, Mid John Day Bridge Creek Watershed Council, Sherman County Watershed Council, Sherman SWCD, and Wheeler SWCD.	The project was just getting started in 2019. There are no project outputs to report at this time.
Ballace and Lick Creek Riparian Improvements	Grant County Soil and Water Conservation District	The recipient will work with project partners to install a minimum of 2,400 feet of riparian fence on Ballance and Lick Creeks	Landowner/community outreach as well as project site selection has been completed. Materials have been

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Project Name	Grantee	Project Description	Reported Outputs
		and install a minimum of eight (8) livestock watering troughs in pastures associated with Ballance and Lick Creeks. The 319 Grant funds will be used to purchase riparian fencing materials and livestock watering troughs. Partner funding and in-kind services will be used to purchase additional materials, hire a contractor to install the stockwater system (including design and construction oversight), and conduct noxious weed treatment.	purchased, and the in-kind match is ready. Actual construction has not yet taken place due to weather and wildfire concerns.
Sherman County Conservation Awareness Program (CAP) Phase II	Sherman County Soil and Water Conservation District	The project aims to enhance local education on salmonids and water quality in general and increase community engagement through class-room presentations, tree planting, tree sales, farm field days, meetings, surveys, and soil quality programs.	This grant was closed 12/31/2019 and had provided a positive outcome for the Sherman County SWCD to improve outreach and education to the local communities and to participate as a part of basin-wide partnerships and assist with outreach and planning. In 2018 and 2019, the SWCD has conducted many school programs, including field trips and the Salmon and Trout Education Program, hosted annual meetings on diverse topics related to the local environment and local crops with 40-60 attendees each year, and conducted annual tree sale and helped educate community members on planting. The SWCD worked with Oregon State Park to host Arbor Day tree planting; partnered with the North Central Livestock Association Bull Tour, the Sherman County Crop Hop, and the OSU Extension Field Day to showcase effective livestock and crop practices and new ideas in the county; and

Project Name	Grantee	Project Description	Reported Outputs
			partnered with the Lower Deschutes Cooperative Weed Management Area at Maupin Daze in May 2019 and the CWMA partner raft trip down the Deschutes in August 2019. These programs were incredibly educational for partners and the community about noxious weeds, noxious weed treatment, and noxious weed prevention. The SWCD also had a large booth at the Sherman County fair both years and provided information about the programs and educational materials about conservation issues and fire issues in the county.

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 John Day.

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 no nonpoint source related Drinking Water Source Protection program projects with reported outputs in the John Day.

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 no active Drinking Water Providers Partnership projects with reported outputs in the John Day.

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 22 OWEB funded projects completed in 2018 with a total cash and in-kind budget of \$4,583,161. The tables below summarize reported outputs for different project activities in each John Day subbasin.

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

Table E-6: 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)	Fish Passage Non-crossing improvement (Number of treatments)
Lower John Day	NA	1
Middle Fork John Day	2	1
North Fork John Day	1	NA
Upper John Day	1	1

Table E-7: 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)	Engineered structures installed (Number of treatments)
Middle Fork John Day	3.0	7
North Fork John Day	0.1	NA

Table E-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: Large wood placement (Number of treatments)	Instream habitat: Structure placement (Number of treatments)
Lower John Day	153	5
Middle Fork John Day	200	15
North Fork John Day	581	12
Upper John Day	21	NA

Table E-9: 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)
Middle Fork John Day	5.0	2
Upper John Day	34.3	3

Table E-10: 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 (Stream sides treated)	Riparian vegetation planting (Area treated)	Riparian vegetation planting (Length of treatment)	Riparian vegetation planting (Stream sides treated)
Middle Fork John Day	NA	18	NA	2
North Fork John Day	1	NA	0.8	NA

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

Subbasin	Road decommission (1 station or 100 Feet)
North Fork John Day	161.7

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

Sub-basin	Irrigation system improvement (Acre)	Irrigation system improvement (Feet)	Terracing (Acre)	Terracing (Feet)	Terracing (Number of treatments)	Water/sediment control basins (Acre)	Water/sediment control basins (Number of treatments)
Lower John Day	84	4100	690	20149	23	257	2
Upper John Day	104	3860	NA	NA	NA	NA	NA

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

Subbasin	Off-channel livestock or wildlife watering (Number of treatments)	Upland fencing (Acre)	Upland fencing (Mile)
Lower John Day	5	30.9	0.7
North Fork John Day	NA	9.7	0.3
Upper John Day	7	37.7	NA

Table E-14: 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 management (Area treated)	Upland vegetation planting (Area treated)
Lower John Day	224.0	1378.0	390.0
North Fork John Day	14.8	NA	1.5
Upper John Day	6500.0	27.5	5421.0

Table E-15: 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)
North Fork John Day	9.7	6.9	6.9

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 E-16: TMDL implementation activities reported in 2019 by Designated Management Agencies or third parties.

TMDL	DMA	Reported Actions
John Day River TMDL	Gilliam County	Began TMDL implementation planning and submitted first implementation plan.
John Day River TMDL	Grant County	Began TMDL implementation planning and submitted first implementation plan.
John Day River TMDL	Jefferson County	Began TMDL implementation planning.
John Day River TMDL	Prairie City	Began TMDL implementation planning.
John Day River TMDL	Sherman County	Began TMDL implementation planning and submitted first implementation plan.
John Day River TMDL	Wasco County	Began TMDL implementation planning and submitted first implementation plan.
John Day River TMDL	Wheeler County	Began TMDL implementation planning and submitted first implementation plan.

Appendix F

Klamath Basin Report

1. Basin Description

The Klamath River originates in southern Oregon and flows through northern California entering the Pacific Ocean at Requa in Del Norte County, California. Forty-four percent of the 12,680 square mile watershed lies within the boundaries of Oregon while the remaining lies across the state line within the boundaries of California.

The Klamath River basin is of vital economic and cultural importance to the states of Oregon and California, as well as the Klamath Tribes in Oregon; the Hoopa, Karuk, and Yurok tribes in California; the Quartz Valley Indian Reservation in California, and the Resighini Rancheria in California. It provides fertile lands for a rich agricultural economy in the upper basin. Historically, the basin once supported vast spawning and rearing fishery habitat with cultural significance to the local Indian tribes. The watershed supports an active recreational industry, including activities that are specific to the Wild and Scenic portions of the river designated by both the states and federal governments in Oregon and California. The watershed continues to support what were once historically significant mining and timber industries.

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

Subbasin	Watershed Area (km2)	% Urban/Roads	% Forest	% Cultivated	% Range/Forest Disturbance	%Other
Butte	29.020	0.0	88.0	0.0	11.2	0.8
Lost	3378.159	3.3	31.2	23.9	38.8	2.8
Lower Klamath	.092	7.8	56.7	0.0	35.2	0.0
Sprague	4170.912	0.4	53.1	2.3	39.9	4.3
Upper Klamath	1479.907	1.2	65.1	0.1	32.1	1.5
Upper Klamath Lake	1875.152	1.8	55.2	13.0	8.2	21.8
Williamson	3725.826	0.8	63.2	1.7	24.7	9.6

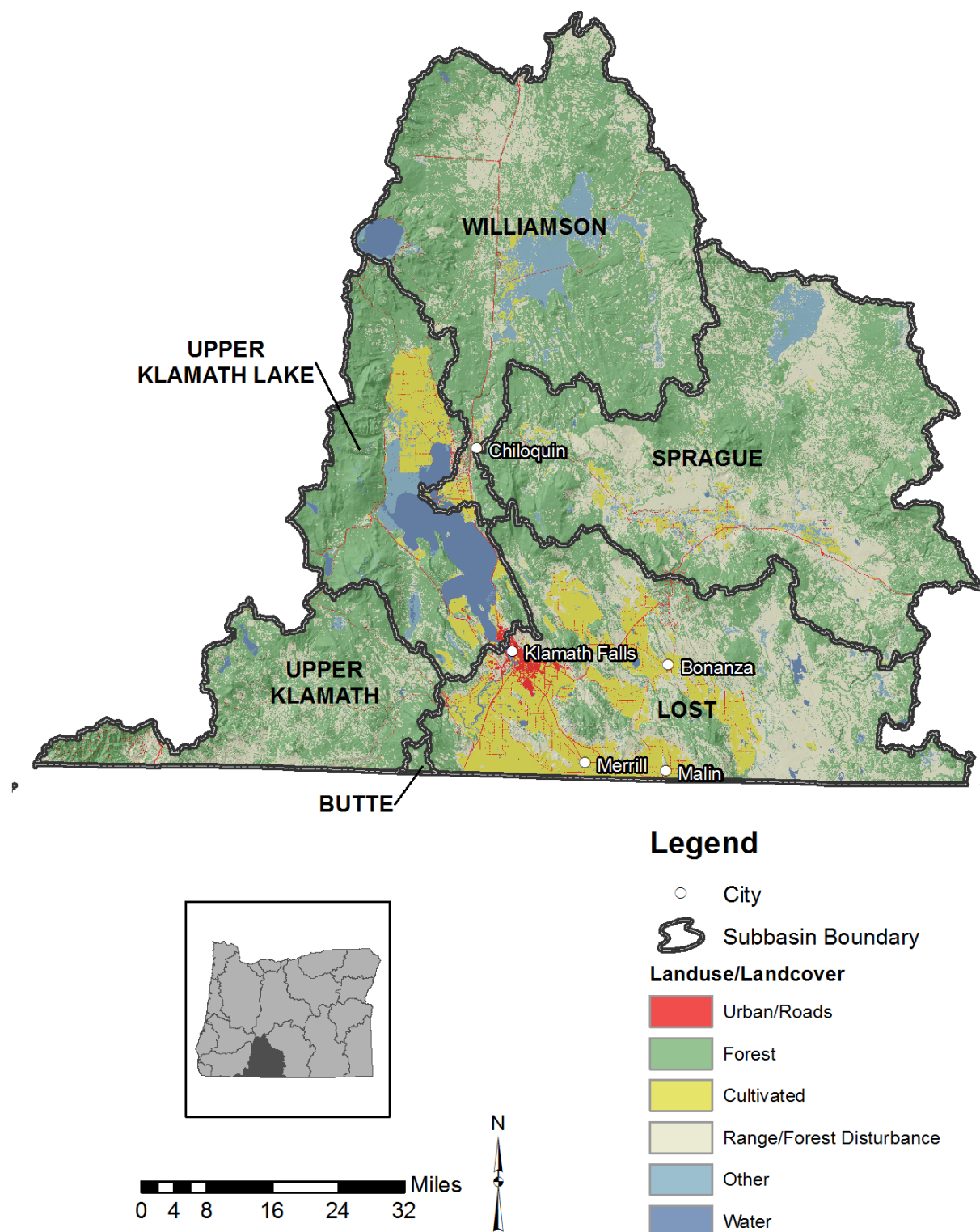


Figure F-1: Land use in the Klamath administrative basin.

1.1 Basin Contacts

Table F-2: Oregon DEQ basin contact.

Administrative Area	DEQ Basin Coordinator
Klamath Basin	Mike Hiatt: 541-273-7002: hiatt.mike@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 F-3 identifies the number of Klamath Basin waterbody segments impaired by parameter from the 2012 Integrated Report and the number of segments with approved TMDLs. Sources: [ODEQ](#), [USEPA](#)

Table F-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	6	0
Aquatic Weeds Or Algae	2	2
Arsenic	8	0
Biological Criteria	4	0
Chlorophyll a	5	2
Dissolved Oxygen	14	3
E. Coli	3	0
Fish tissue, Mercury	1	0
pH	13	3
Sedimentation	5	0
Temperature	27	25
Total Phosphorus	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 F-4 lists the TMDLs that have been approved in the Klamath Basin.

Table F-4: Approved TMDLs in the Klamath Basin and the impairments addressed by those TMDLs.

TMDL Document Name	Impairments Addressed
<u>Upper Klamath and Lost River Subbasin Nutrient TMDL and WQMP</u>	Ammonia, Chlorophyll a, Dissolved Oxygen, pH
<u>Upper Klamath and Lost Subbasins Temperature TMDL and WQMP</u>	Temperature
<u>Upper Klamath Lake Drainage TMDL and WQMP</u>	Chlorophyll a, 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 was one 319 project active that reported project outputs and accomplishments to DEQ. Combined the projects have a total grant budget of \$7,627. Table F-5 describes the project and the reported outputs.

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

Project Name	Grantee	Project Description	Reported Outputs
Upper Klamath Basin Non-point source education Project	Klamath Watershed Partnership	The project aims to enhance education and outreach with local communities. The recipient will distribute comprehensive information pamphlet describing NPS pollution targeting stormwater pollution to the doors and in the educational events; organize and coordinate community volunteers in storm drain stenciling activities; provide indoor and outdoor interactive displays and field trip to wetlands, museums and other venues. The recipient will continue NPS educations to working group members, civic organizations and local schools in media articles, one-on-one landowner meetings and other similar groups within the local communities in the Sprague, Williamson, Lost and Wood River Watersheds.	This project completed in June 2019 and achieved its project goal. In early 2019, the recipient conducted a campaign of transition from plastic bags to reusable bags with 4 local grocery stores in Klamath Falls. Additional volunteer stenciling projects were conducted with the help of youth volunteers from Youth Rising and YMCA in March 2019. The overall storm drain stenciling effort exceeded the original goal with several events completed over the course of the 2 year grant. The recipient promoted public awareness of NPS pollution prevention through various education and public outreach activities, including providing and displaying NPS pollution information flyers in many locations in Klamath County and participating meetings and events, such as Winter Wings Festival (February 2019, approximate 1000 attendees), Chamber of Commerce office display (more than 3000 attendees), Sustanapalooza 2019, Link River Festival (May 2019, 400 attendees), World Migratory Bird Day (May 2019, 500 attendees), and summer events sponsored by the Great Outdoor Alliance.

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 Klamath.

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 no nonpoint source related Drinking Water Source Protection program projects with reported outputs in the Klamath.

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 no active Drinking Water Providers Partnership projects with reported outputs in the Klamath.

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 nine OWEB funded projects completed in 2018 with a total cash and in-kind budget of \$1,655,622. The tables below summarize reported outputs for different project activities in each Klamath subbasin.

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

Table F-6: Summary of OWEB grant funded fish passage projects completed in 2018, the most recent year data is available in the OWEB OWRI database.

Subbasin	New fish screens installed on diversions (where no screen had existed previously) (Number of treatments)	Fish Passage Crossing improvement (Number of treatments)	Fish Passage Non-crossing improvement (Number of treatments)
Upper Klamath Lake	1	NA	1
Sprague	NA	1	NA

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

Subbasin	Spawning gravel placed (Cubic Yard)
Williamson	50

Table F-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: Large wood placement (Number of treatments)
Williamson	275

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

Subbasin	Irrigation system improvement (Acre)	Irrigation system improvement (Feet)
Upper Klamath	2.8	2906

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

Subbasin	Upland fencing (Acre)
Upper Klamath	2

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

Subbasin	Upland vegetation management (Area treated)	Upland vegetation planting (Area treated)
Lost	35	35

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.

Appendix F: Klamath Basin Report
2019 Oregon Nonpoint Source Pollution Program Annual Report

Table F-12: TMDL implementation activities reported in 2019 by Designated Management Agencies or third parties.

TMDL	DMA	Reported Actions
Upper Klamath Lake Drainage TMDL	ODA	ODA has partnered with DEQ, USFWS, the Klamath Tribes, the SWCD, Trout Unlimited, and the Klamath Watershed Partnership on an extensive study around the lake. The study is based on agricultural operation that flood irrigate through the winter and discharge water back into Upper Klamath Lake in the spring. This is an ongoing study and will be conducted through 2021.

Appendix G

Malheur River Basin Report

1. Basin Description

The Malheur River is a tributary of the Snake River located in Eastern Oregon along the border with Idaho. The Malheur River Basin is approximately 4,700 square miles and the main channel of the river is approximately 190 miles long. The Malheur River Basin is divided into four subbasins: Upper Malheur, Lower Malheur, Willow Creek and Bully Creek.

A majority of the land in the Malheur River Basin is public, managed mainly by the Bureau of Land Management, U.S. Forest Service and the State of Oregon. Rangeland is the dominant use in the basin along with some forested lands in the northwest portion of the basin, and irrigated agricultural land concentrated in the lower valleys to the east near Idaho. The climate is semi-arid, and agriculture is very dependent on the use of water stored in reservoirs that are filled by streams draining the southern Blue Mountains. Efforts to improve water quality in the basin have mainly focused on improving irrigation efficiency and minimizing irrigation-induced erosion, along with improvements to riparian vegetation condition.

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

Subbasin	Watershed Area (km2)	% Urban/Roads	% Forest	% Cultivated	% Range/Forest Disturbance	%Other
Bully	1517.622	0.7	1.0	3.0	93.5	1.7
Lower Malheur	2456.621	1.5	0.3	8.8	88.9	0.5
Middle Snake-Payette	415.216	9.2	0.1	59.5	30.7	0.6
Upper Malheur	6289.276	0.2	18.8	0.6	79.0	1.4
Willow	1967.545	1.5	3.3	7.6	87.2	0.4

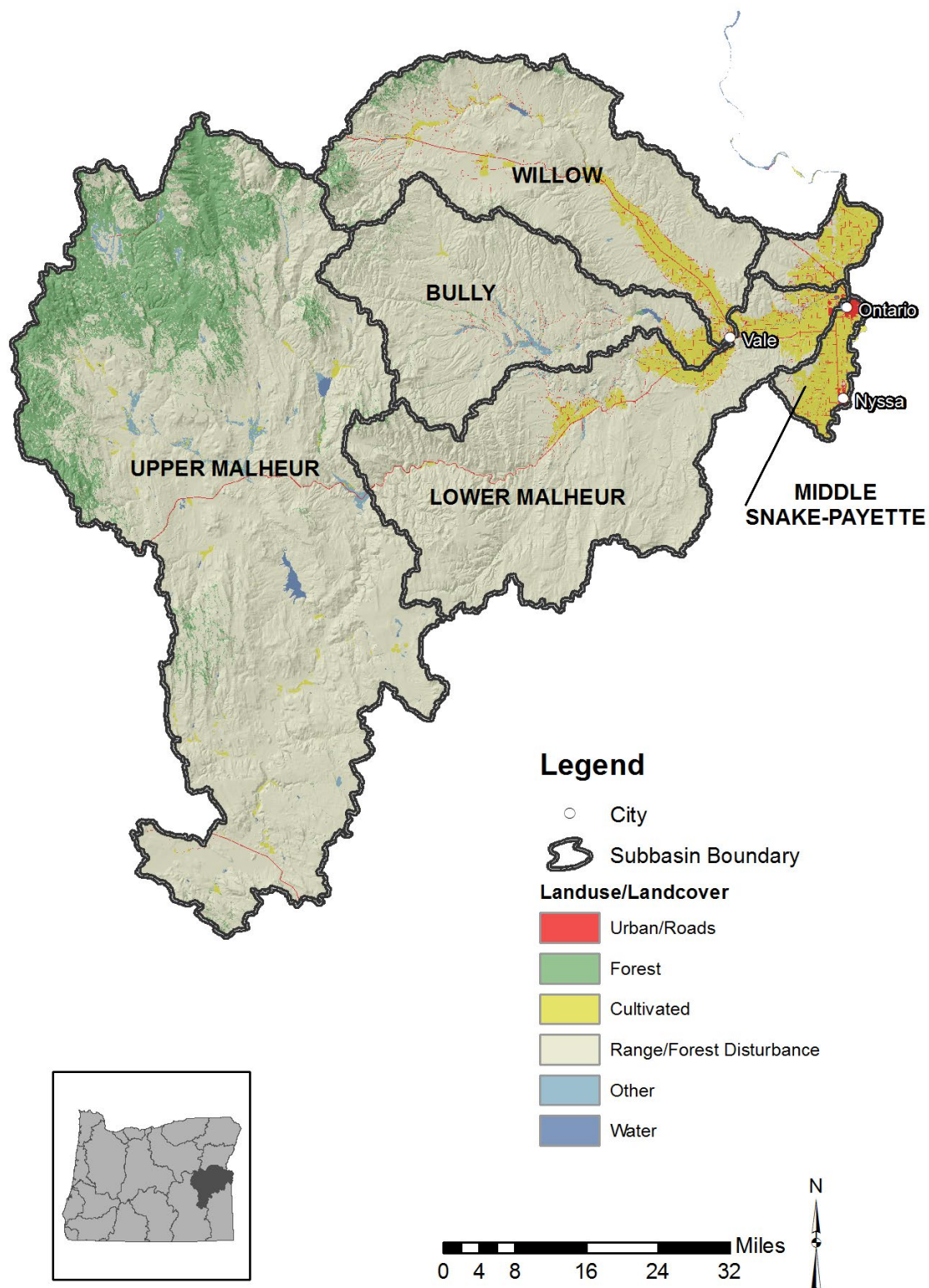


Figure G-1: Land use in the Malheur administrative basin.

1.1 Basin Contacts

Table G-2: Oregon DEQ basin contact.

Administrative Area	DEQ Basin Coordinator
Malheur River Basin	John Dadoly: 541-278-4616: dadoly.john@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 G-3 identifies the number of Malheur Basin waterbody segments impaired by parameter from the 2012 Integrated Report and the number of segments with approved TMDLs. Sources: [ODEQ](#), [USEPA](#)

Table G-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'-DDD	0	1
4,4'-DDE	0	1
4,4'-DDT	1	1
Arsenic	7	0
Biological Criteria	7	0
Chlorophyll a	1	4
Dieldrin	1	1
Dissolved Oxygen	7	1
E. Coli	0	5
Fecal Coliform	0	7
Fish tissue, Mercury	1	0
Iron	9	0
Lead	3	0
Mercury	1	0
Phosphorus	0	1
Sedimentation	0	1
Temperature	0	43
Total Phosphorus	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(1)). The TMDL and WQMP serve as a multi-sector plan and provides the blueprint for TMDL related implementation activities. Table G-4 lists the TMDLs that have been approved in the Malheur Basin.

Table G-4: Approved TMDLs in the Malheur Basin and the impairments addressed by those TMDLs.

TMDL Document Name	Impairments Addressed
Malheur River Basin TMDL and WQMP	Bacteria (water contact recreation), Chlorophyll a, 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 was one 319 project active that reported project outputs and accomplishments to DEQ. Combined the projects have a total grant budget of \$26,452. Table G-5 describes the project and the reported outputs.

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

Project Name	Grantee	Project Description	Reported Outputs
Getting the word out and making things happen in the Malheur River Basin - Phase II	Malheur Watershed Council	The Recipient will design and implement an outreach and education program that will increase public awareness of water quality issues and their solutions; and facilitate systems-wide, on-the-ground projects and changes in land management that result in long term, sustainable, and measureable improvements to water quality in the Malheur Basin. The Recipient will provide technical support to assist with grant writing, project development and management, and monitoring to the agricultural community within the Malheur Basin. The Recipient will also recruit technical experts from the fields of animal science, range management, weed science and riparian vegetation to discuss and help select management techniques that protect and improve riparian area vegetation while protecting economic viability with land managers.	This project completed in June 2019. Malheur Watershed Council has hosted a set of community meetings and events in 2019, including North Fork Malheur Landowner town hall meeting, two “Grants 101” outreach meetings featured a discussion of water quality and TMDL goals and objectives, guest speaker presentation at Council Meeting regarding Malheur River Riparian and Channel issues, and one-on-one meetings/landowner contacts and recruitment.

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 Malheur.

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 no nonpoint source related Drinking Water Source Protection program projects with reported outputs in the Malheur.

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 no active Drinking Water Providers Partnership projects with reported outputs in the Malheur.

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 11 OWEB funded projects completed in 2018 with a total cash and in-kind budget of \$1,648,413. The tables below summarize reported outputs for different project activities in each Malheur subbasin.

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

Table G-6: 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)	Engineered structures installed (Number of treatments)
Upper Malheur	0.2	26

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

Subbasin	Irrigation system improvement (Acre)	Irrigation system improvement (Feet)
Middle Snake-Payette	114	NA
Upper Malheur	166	3520
Willow	290	NA

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

Subbasin	Off-channel livestock or wildlife watering (Number of treatments)
Willow	2

Table G-9: 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 management (Area treated)
Bully	NA	1850
Upper Malheur	185	1342

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 G-10: TMDL implementation activities reported in 2019 by Designated Management Agencies or third parties.

TMDL	DMA	Reported Actions
Malheur River	ODFW	Began TMDL implementation planning
Malheur River/Snake River HC	Owyhee Irrigation District	Malheur SWCD, Owyhee Irrigation District and NRCS have been working to modernize and pipe the irrigation system in Fletcher Gulch Priority Area as well as other nearby areas. This work facilitates the conversion of irrigation systems from flood to sprinkler and eliminates irrigation induced erosion. Water quality monitoring has documented significant reductions of sediment and nutrient loading to the Old Owyhee Ditch which eventually drains to the Malheur River, a tributary of the Snake River. See the project details in the main document Section 4.4 and more information about this project at https://nrcs.maps.arcgis.com/apps/Cascade/index.html?appid=b7f126c6b7d146eb8958817b69037219 .

Appendix H

Malheur Lakes Basin Report

1. Basin Description

The Malheur Lakes Basin, located in south-central Oregon, includes seven closed subbasins (Donner und Blitzen, Guano, Harney-Malheur Lake, Alvord Lake, Silver, Silvies, and Thousand-Virgin). It is located mostly in Harney County but extends to a small extent into Grant, Lake, Crook and Malheur Counties in Oregon, and Humboldt and Washoe Counties in Nevada. The basin, one of the least populated areas of the contiguous United States, encompasses an area of approximately 10,400 square miles including the communities of Wagonville, Riley, Suntext, Burns, Hines, Seneca, Crane, Princeton, Diamond, Frenchglen, and Fields. The dominant land use is agriculture and dryland ranching forms the basis of the area's economy. Top commodities include cattle, alfalfa and other hay, horses and mules. Agriculture in the Basin depends heavily on water for irrigation. Very little non-irrigated cropland exists due to the low annual precipitation and the short growing season. Managed livestock grazing occurs throughout the Basin; hay production is common in many of the valley bottoms. Rangeland in the basin provides significant habitat for sage grouse leks and nesting.

Great Basin redband trout (*Oncorhynchus mykiss newberrii*) and Tui Chub (*Gila bicolor*), both special status species, are present in some streams in the sub-basins. The basin is spotted with playa lakes that rarely contain water for more than a year; and generally do not support fish populations. However, during wet cycles, populations of fish may temporarily live in the playa lakes, which are fed by fish-bearing streams.

Elevations in the basin range from 4,025' at Harney Lake on the desert floor to over 9,730' at the top of Steens Mountain. The lower elevations receive an average of 10 inches of precipitation per year, with the surrounding mountains receiving an average of 40 inches. Freezing temperatures can occur at any time during the year, and maximum temperatures can exceed 100°F for a few weeks during the summer. The basin is rich in thermal ground water and thermal spring activity.

A significant portion of the basin has wetland characteristics and seasonally flooded grass-sedge meadowland. The center of the basin is flat and contains Malheur and Harney Lakes. Malheur Lake is a freshwater lake, while Harney Lake is saline-alkaline. Both lakes cycle between open water in wetter years and marshes in drier years. The wetlands around Malheur Lake and Harney Lake provide habitat for many migratory bird species, including 2.5 million ducks each year.

The Malheur National Wildlife Refuge was established in 1908 as a refuge and breeding ground for migratory water birds. It currently occupies over 186,000 acres. The Refuge, flood-irrigated meadows and seasonal wetlands in the basin also support numerous breeding species of migratory birds such as Canada geese, cinnamon teal, greater sandhill cranes, longbilled curlews, snipe, willet, Wilson's phalarope, and yellow-headed and red-winged blackbirds. These birds often are present during migration in large numbers. Some examples of the species and number of birds in the basin are: Snow and Ross' goose (400,000+), Northern pintail (250,000), American widgeon (147,000+), Green-winged teal (65,000+), Lesser sandhill crane (10,000+), Greater sandhill crane (300+), White-faced ibis (2,500+ pairs), Long-billed curlew (1,500+) (numbers are from surveys conducted in the last 10 years by Refuge personnel).

Appendix H: Malheur Lakes Basin Report
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Table H-1: 2011 Land use and land cover for each subbasin in the Malheur Lakes.

Subbasin	Watershed Area (km2)	% Urban/Roads	% Forest	% Cultivated	% Range/Forest Disturbance	%Other
Alvord Lake	5164.502	0.3	1.0	0.9	90.3	7.5
Donner und Blitzen	2045.437	0.3	7.0	4.0	82.2	6.5
Guano	6626.915	0.2	0.4	0.1	92.9	6.3
Harney-Malheur Lakes	3761.909	1.6	5.9	15.6	67.2	9.7
Silver	4361.200	0.4	7.9	2.9	87.0	1.8
Silvies	3414.362	1.4	39.9	10.7	45.0	3.0
Thousand-Virgin	699.156	0.0	0.1	0.0	99.8	0.1

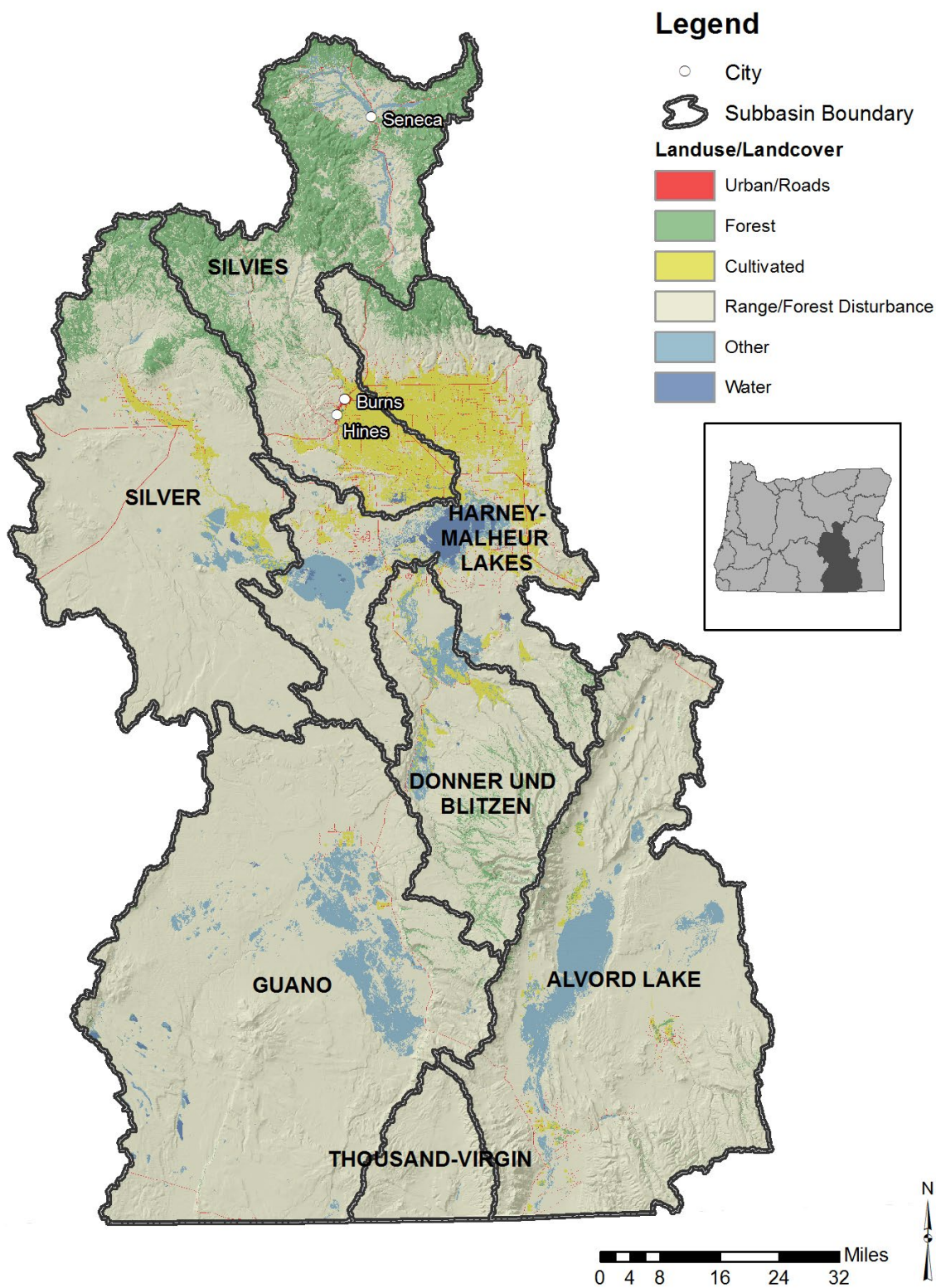


Figure H-1: Land use in the Malheur Lakes administrative basin.

1.1 Basin Contacts

Table H-2: Oregon DEQ basin contact.

Administrative Area	DEQ Basin Coordinator
Malheur Lakes	John Dadoly: 541-278-4616: dadoly.john@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 H-3 identifies the number of Malheur Lakes Basin waterbody segments impaired by parameter from the 2012 Integrated Report and the number of segments with approved TMDLs. Sources: [ODEQ](#), [USEPA](#)

Table H-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
Biological Criteria	8	0
Dissolved Oxygen	2	1
E. Coli	1	0
Iron	1	0
Temperature	36	6

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 H-4 lists the TMDLs that have been approved in the Malheur Lakes Basin.

Table H-4: Approved TMDLs in the Malheur Lakes Basin and the impairments addressed by those TMDLs.

TMDL Document Name	Impairments Addressed
Alvord Lake Subbasin TMDL	Dissolved Oxygen, 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 was one 319 project active that reported project outputs and accomplishments to DEQ. Combined the projects have a total grant budget of \$20,625. Table H-5 describes the project and the reported outputs.

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

Project Name	Grantee	Project Description	Reported Outputs
Harney County Water Quality Workplan	Harney County Watershed Council	The 319 grant funds were used to help organize and facilitate OWRD place-based water planning in the community, to compile and analyze available water quality data, and to provide water quality outreach and education in Harney County.	This project completed in May 2019. The 2019 outcomes of this project include finalizing water quality data reports. The reports characterized the basin's water resources and water challenges, which inform and include what will ultimately be a community-based water resource plan.

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 Malheur Lakes.

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 no nonpoint source related Drinking Water Source Protection program projects with reported outputs in the Malheur Lakes.

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 no active Drinking Water Providers Partnership projects with reported outputs in the Malheur Lakes.

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 five OWEB funded projects completed in 2018 with a total cash and in-kind budget of \$509,096. The tables below summarize reported outputs for different project activities in each Malheur Lakes subbasin.

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

Appendix H: Malheur Lakes Basin Report
 2019 Oregon Nonpoint Source Pollution Program Annual Report

Table H-6: Summary of OWEB grant funded upland projects completed in 2018, the most recent year data is available in the OWEB OWRI database.

Subbasin	Grazing management (Acre)	Off-channel livestock or wildlife watering (Number of treatments)
Silver	1200	NA
Silvies	NA	2

Table H-7: 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 management (Area treated)
Harney-Malheur Lakes	NA	444
Silver	2840	38

Appendix I

Mid Coast Basin Report

1. Basin Description

The Mid-Coast Basin encompasses four subbasins on Oregon's central coast: the Alsea, Siletz-Yaquina, Siltcoos and Siuslaw. This area contains a wide variety of ecosystems and habitats, including high elevation Coast Range temperate forests, low elevation valleys, coastal wetlands, shallow lakes, estuaries and beaches. Major land uses in the basin include private and federal forests, livestock grazing in valley pastures, rural residential development, with urban development concentrated along the Highway 101 corridor. The rivers, lakes and estuaries of the Mid-Coast Basin are historically rich in native fish and wildlife. Salmonids, including the Oregon Coast Coho, are key fish species which are culturally and economically important in Oregon's coastal basins. Certain salmonid populations are threatened or at risk due to factors documented elsewhere. Water quality in the Mid-Coast Basin affects native fish, other aquatic life and the beneficial uses of drinking water and water recreation. A large amount of the basin is forests exhibiting a wide range of seral stages, from recent clear cut harvest to mature forests. Off-shore commercial fishing is an important economic activity and tourism is also a vibrant industry along the coastal strip.

Table I-1: 2011 Land use and land cover for each subbasin in the Mid Coast.

Subbasin	Watershed Area (km2)	% Urban/Roads	% Forest	% Cultivated	% Range/Forest Disturbance	%Other
Alsea	1775.477	6.0	79.3	0.9	12.1	1.7
Siletz-Yaquina	1948.422	7.6	57.5	0.7	31.1	3.1
Siltcoos	336.084	4.9	53.4	0.2	25.4	16.2
Siuslaw	1993.411	5.4	72.1	1.4	19.6	1.5



Figure I-1: Land use in the Mid Coast administrative basin.

1.1 Basin Contacts

Table I-2: Oregon DEQ basin contact.

Administrative Area	DEQ Basin Coordinator
Mid-Coast Basin	David Waltz: 541-687-7345: waltz.david@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 I-3 identifies the number of Mid Coast Basin waterbody segments impaired by parameter from the 2012 Integrated Report and the number of segments with approved TMDLs. Sources: [ODEQ](#), [USEPA](#)

Table I-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
Aquatic Weeds Or Algae	7	0
Arsenic	1	0
Biocriteria	10	0
Biological Criteria	27	0
Chloride	1	0
Chlorophyll a	2	0
Dissolved Oxygen	36	0
E. Coli	21	0
Enterococcus	6	0
Fecal Coliform	14	0
Iron	1	0
pH	13	0
Phosphorus	0	2
Sedimentation	7	0
Temperature	89	0
Tissue - soft shell clam - arsenic	4	0
Turbidity	1	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 I-4 lists the TMDLs that have been approved in the Mid Coast Basin.

Table I-4: Approved TMDLs in the Mid Coast Basin and the impairments addressed by those TMDLs.

TMDL Document Name	Impairments Addressed
Clear Lake TMDL	Protection of high quality water, public water supply source

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 two 319 projects active that reported project outputs and accomplishments to DEQ. Combined the projects have a total grant budget of \$30,069. Table I-5 describes the projects and the reported outputs.

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

Project Name	Grantee	Project Description	Reported Outputs
Yachats Watershed Monitoring and Assessment	Lincoln Soil and Water Conservation District	The Project objectives include conducting site scale assessment of near-stream landscape conditions and agricultural practices to identify opportunities for development of on-the-ground nonpoint source reduction projects.	Monitoring sites were established and water temperature monitoring was conducted in coordination with ODA; these are envisioned as long-term Ag sites
Siuslaw Riparian Restoration and Continuous WQ Monitoring Phase IV	Siuslaw Watershed Council	This Project will utilize grant funds to perform monitoring and assessment to identify priority areas for BMPs implementation and develop specific projects to improve riparian conditions and function and reduce fine sediment and thermal loading in 303(d) listed streams and priority watersheds.	Recipient has entered into a landowner agreement to install livestock exclusion fencing as part of a joint riparian improvement project with Siuslaw SWCD



Figure I-2: Bear Creek - Riparian restoration livestock exclusion fencing

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 was one nonpoint source related Clean Water State Revolving Fund project active that reported project outputs and accomplishments to DEQ. Combined the projects have a total budget of \$4,128,454. Table I-6 describes the project and the reported outputs.

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

Project Name	Grantee	Project Description	Reported Outputs
Bay Moore Stormwater Project	City of Newport	Newport has a sponsorship option project which addressed stormwater issues such as upgrades to the storm sewer in the Bay-Moore basin, installation of a bio-retention facility at Sam Moore Creek and the design of a fish passage at the Big Creek reservoirs.	Completed - initiation of operations with affirmative certification of stormwater system improvements

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 three 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 \$103,457. Table I-7 describes the projects and the reported outputs.

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

Project Name	Grantee	Project Description	Reported Outputs
Turbidity-Sediment Monitoring and Erosion Control Projects for Source Protection and	City of Newport and Toledo	Water quality monitoring, landowner outreach to design and implement voluntary projects for bank stability, coordinate with	Lincoln SWCD staff continued to assist with turbidity monitoring equipment setup and sampling, as well as

Project Name	Grantee	Project Description	Reported Outputs
Planning in the Siletz Sub-basin - Phase II	Water Utilities	Mid-Coast place based planning effort.	providing technical assistance to landowners on best management practices in the Siletz Watershed. However, due to continuing staffing issues at the SWCD, the City requested a project extension to June 2020.
City of Yachats Source Water Protection Plan	City of Yachats (00966)	Address water quality and quantity issues by developing a drinking water protection plan including formation of a DWP team, enhancing the delineation and inventory of potential contaminant sources, providing public education and best management practice information, and report preparation.	City advertised project and prepared for hiring a consultant. All work will be performed by GSI in 2020.
Phase II - Implementing Schooner Creek Sediment Reduction	Lincoln City Water District (00483)	This is the state-funded portion of the larger DWPP Phase II project. Building on a Roads Risk Assessment conducted in 2018, Lincoln City and their partners including the Salmon Drift Creek Watershed Council, Lincoln County Public Works, and the Siuslaw National Forest are addressing the most significant sediment sources above the Lincoln City municipal water intake. Actions for 2019 will to reduce sediment include road drainage and surface improvements, and road segment stabilization.	Contract between watershed council and City of Lincoln City was finalized. Proposed work will occur in 2020.

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 no active Drinking Water Providers Partnership projects with reported outputs in the Mid Coast.

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 33 OWEB funded projects completed in 2018 with a total cash and in-kind budget of \$950,104. The tables below summarize reported outputs for different project activities in each Mid Coast subbasin.

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

Table I-8: 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)
Siletz-Yaquina	1
Siltcoos	1

Table I-9: 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)
Siltcoos	245

Table I-10: 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)
Siuslaw	17.1	6.5

Table I-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 fencing (Area treated)	Riparian fencing (Stream sides treated)
Siltcoos	6.6	2

Table I-12: 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 (Stream sides treated)
Siuslaw	3	2

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 2019 Oregon Nonpoint Source Pollution Program Annual Report

Table I-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 erosion control (Acre)
Siletz-Yaquina	0.1

Table I-14: 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)
Alsea	8	1

Appendix J

North Coast Basin Report

1. Basin Description

The North Coast Basin extends from the Columbia River to the southern Tillamook County line and consists of eight watersheds. Six watersheds drain to the Pacific Ocean: Necanicum, Nehalem, Tillamook Bay, Nestucca, Netarts/Sand Lake and Neskowin and two drain to the lower Columbia River: Lower Columbia and Lower Columbia-Clatskanie. The North Coast Basin includes most of Clatsop, Columbia and Tillamook counties and the major cities of Tillamook, Vernonia, Cannon Beach, Astoria and Rockaway Beach. The three largest bays of Tillamook, Nehalem and Netarts provide for economic and recreational opportunities in the region. Chief among them is commercial and recreational shellfishing with over 2.3 million pounds of oysters and clams harvested annually in Oregon. Other important aquatic resources include the freshwater streams that provide critical habitat for native salmon and drinking water for area residents. Finally, the beaches, lakes, streams and estuaries all provide numerous recreational (swimming, fishing, boating, etc.) opportunities throughout the region.

Forestry is the predominant land use in the subbasin covering nearly 95 percent of the landscape, with the Tillamook State Forest being the largest portion. Agricultural land use is a small portion of the basin with most of it occurring in the lower portions of the rivers and near the bays. The dairy industry makes up much of this use with dairies located in the lower Tillamook, Nestucca and Nehalem watersheds. Cities are generally located in the coastal plains, adjacent to rivers, bays or the ocean.

Table J-1: 2011 Land use and land cover for each subbasin in the North Coast.

Subbasin	Watershed Area (km2)	% Urban/Roads	% Forest	% Cultivated	% Range/Forest Disturbance	%Other
Lower Columbia	847.291	9.2	55.2	0.8	27.9	6.9
Lower Columbia-Clatskanie	771.314	8.0	58.3	5.7	23.6	4.4
Necanicum	354.954	13.0	52.1	0.0	31.4	3.6
Nehalem	2204.689	5.3	61.2	1.1	31.3	1.0
Wilson-Trask-Nestucca	2448.221	6.9	72.5	2.5	15.6	2.5

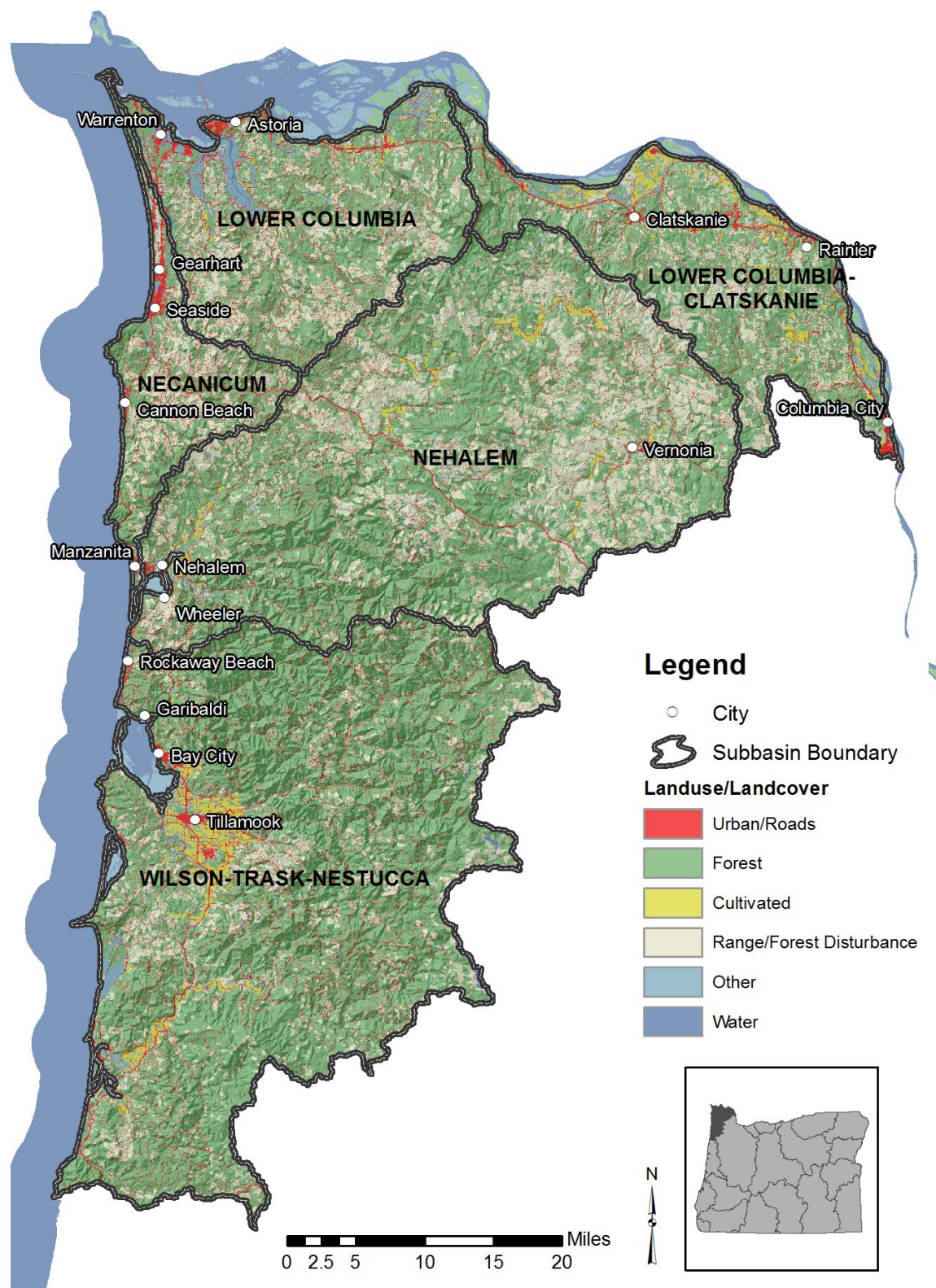


Figure J-1: Land use in the North Coast administrative basin.

1.1 Basin Contacts

Table J-2: Oregon DEQ basin contact.

Administrative Area	DEQ Basin Coordinator
North Coast - Lower Columbia Basin	York Johnson: 503-801-5092: johnson.york@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 J-3 identifies the number of North Coast Basin waterbody segments impaired by parameter from the 2012 Integrated Report and the number of segments with approved TMDLs. Sources: [ODEQ](#), [USEPA](#)

Table J-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	3	0
Aquatic Weeds Or Algae	4	0
Arsenic	6	0
Biocriteria	2	0
Biological Criteria	36	0
Chlorine	0	1
Chromium	1	0
Copper	1	0
Dioxin (2,3,7,8-TCDD)	0	6
Dissolved Oxygen	34	0
E. Coli	1	21
Enterococcus	4	0
Fecal Coliform	7	56
Iron	3	0
pH	2	0
Polychlorinated Biphenyls (PCBs)	3	0
Sedimentation	0	2

Parameter	Segments without a TMDL	Segments with a TMDL
Temperature	2	66
Tissue - soft shell clam - arsenic	3	0
Total Dissolved Gas	0	3
Turbidity	2	0
Zinc	1	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 J-4 lists the TMDLs that have been approved in the North Coast Basin.

Table J-4: Approved TMDLs in the North Coast Basin and the impairments addressed by those TMDLs.

TMDL Document Name	Impairments Addressed
Modifications to North Coast Basin Temperature Waste and Load Allocations (Nestucca Bay)	Bacteria (shellfish harvesting), Bacteria (water contact recreation), Sedimentation, Temperature
Modifications to North Coast Basin Temperature Waste and Load Allocations (North Coast)	Bacteria (shellfish harvesting), Bacteria (water contact recreation), Temperature
Modifications to North Coast Basin Temperature Waste and Load Allocations (Tillamook Bay)	Bacteria (shellfish harvesting), Bacteria (water contact recreation), Temperature
Nestucca Bay Watershed TMDL and WQMP	Bacteria (shellfish harvesting), Bacteria (water contact recreation), Sedimentation, Temperature
North Coast Subbasins TMDL and WQMP	Bacteria (shellfish harvesting), Bacteria (water contact recreation), Temperature
Tillamook Bay TMDL	Bacteria (shellfish harvesting), Bacteria (water contact recreation), 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 16 319 projects active that reported project outputs and accomplishments to DEQ. Combined the projects have a total grant budget of \$234,145. Table J-5 describes the projects and the reported outputs.

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

Project Name	Grantee	Project Description	Reported Outputs
Riparian Restoration	Nestucca-Neskowin Sandlake WC	Riparian Restoration	Open not reporting
Nestucca/Neskowin/Sandlake Riparian Improvement	Nestucca-Neskowin Sandlake WC	Riparian Restoration	Open not reporting
Nestucca, Neskowin and Sand Lake Basin Riparian Improvement Project	Nestucca-Neskowin Sandlake WC	Riparian Restoration	Open not reporting
Arch Cape Drinking Water Protection, Phase 2	Sustainable Northwest	Continuation of ongoing project. Arch Cape WD is pursuing purchase of formerly industrial forestland (through both fee title and conservation easements) within their drinking water source area. The goal of the project is purchase and management of a community forest with a governing board,	Community engagement and fund raising for purchase ongoing. Forest stands inventoried for structure, age, and future growth and management. Road conditions assessed for pollution risk and maintenance needs. Forest Legacy grant (USFS) applied for and process begun for securing CWSRF loan to partially fund purchase of land.

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Project Name	Grantee	Project Description	Reported Outputs
		community involvement and engagement, and management directed towards water quality protection and pollution prevention.	
2016 Stream Enhancement	Tillamook County SWCD	Riparian Restoration	Open not reporting
Tillamook SWCD 2017 Stream Enhancement	Tillamook County SWCD	Riparian Restoration	Open not reporting
Tillamook SWCD 2018 Stream Enhancement & Restoration	Tillamook County SWCD	Riparian Restoration	Open not reporting
Backyard Planting Program 2019	Tillamook Estuaries Partnership	Riparian Restoration	The BYPP implemented 3 new planting projects in 2019 which encompassed 0.5 miles and 3 acres and included the planting of approximately 1500 trees and shrubs and 1800 willow cuttings. The Schultz project encompassed over 2 acres and 0.3 miles along the north side of the Wilson River. The planting included 450 trees, 160 shrubs, and 1500 willow cuttings. The Baxter-Bandy planting project encompassed 0.6 acres along 500 ft. of the North fork Nehalem River. The planting included 125 trees, 150 shrubs, and 300 willow cuttings. The White Clover Grange planting encompassed 0.2 acres along 300 ft of the north side of a small unnamed tributary to the North fork Nehalem River. DEQ 319 funds were used to support the project and were pair with primary funding from

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2019 Oregon Nonpoint Source Pollution Program Annual Report

Project Name	Grantee	Project Description	Reported Outputs
			Oregon Watershed Enhancement Board and Tillamook County Creamery Association.
Northwest Oregon Restoration 2018	Tillamook Estuary Partnership	Riparian Plant Propagation	Open not reporting
Backyard Planting Program 2018	Tillamook Estuary Partnership	Riparian Restoration	Open not reporting
Backyard Planting Program	Tillamook Estuary Partnership	Riparian Restoration	Pending
Northwest Oregon Regional Partnershi (NORP)	Tillamook Estuary Partnership	Riparian Plant Propagation	Pending
Stream Enhancement and Restoration	Tillamook SWCD	Riparian Restoration	Pending
Riparian Restoration	Upper Nehalem Watershed Council	Riparian Restoration	In 2019, the Upper Nehalem Watershed Council (UNWC) completed three riparian planting projects with 319 funds. Two projects were coordinated with Oregon Department of Agriculture and took place in the Nehalem Strategic Implementation Area on Fishhawk Creek and Nehalem Rivers. UNWC installed native plants and conducted plant establishment to convert riparian areas from invasive vegetation. The three project supported the implementation and plant establishment on a 27 acre riparian restoration project also on the Nehalem River. Oregon Watershed Enhancement Board and Oregon Department of Agriculture provided

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Project Name	Grantee	Project Description	Reported Outputs
			additional funding for these projects.
UNWC Restoration	Upper Nehalem Watershed Council	Riparian Restoration	In 2019, the Upper Nehalem Watershed Council (UNWC) completed Phase II of the Younger riparian planting projects with 319 funds. The project was also funded by an Oregon Watershed Enhancement Board small grant and included plant establishment work on Fishhawk Creek, the Nehalem River and Beaver Creek, which all run through the property.
Upper Nehalem Riparian Restoration	Upper Nehalem Watershed Council	Riparian Restoration	Pending

Insert September 2021



Figure J-2: Post Planting at the Baxter Site 2019

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 North Coast.

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 five 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 \$131,500. Table J-6 describes the projects and the reported outputs.

Table J-6: Nonpoint source Drinking Water Source Protection program projects and outputs for 2019.

Project Name	Grantee	Project Description	Reported Outputs
Arch Cape Forest Watershed Plan	Arch Cape Water District (00802)	Planning activities to enable acquisition of the drinking water source area including contracting a planner/facilitator, conducting due diligence and appraisal, and developing forest management recommendations to maintain water quality and quantity.	Community engagement and fund raising for purchase ongoing. Forest stands inventoried for structure, age, and future growth and management. Road conditions assessed for pollution risk and maintenance needs. Forest Legacy grant (USFS) applied for and process begun for securing CWSRF loan to partially fund purchase of land.

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Project Name	Grantee	Project Description	Reported Outputs
Shark Creek Sediment Prevention Partnership	Arch Cape Water District (00802)	Reduce sediment and improve slope stability within Arch Cape Water District's drinking water source area by removing and relocating a forest road to a less sensitive location within watershed.	Project scope changed from a road re-route to decommission without replacement. Now, due to future forest management needs, the project scope is back to re-routing the road. Therefore, no work was accomplished on-the-ground in 2019. Road re-routing and slope restoration work is scheduled for August 2020.
Neskowin Regional Water District's Watershed Acquisition Due Diligence	Neskowin Regional Water District (00970)	Planning activities to enable acquisition of ~1,600 acres within Hawk Creek drinking water source area including contracting a property assessment, conducting due diligence and appraisal, and developing forest management recommendations to maintain water quality and quantity.	PWS signed contract and initiated work internally. Hired managing consultant and contacted consulting forester. No other objectives completed in 2019. Work expected to be completed in 2020.
Three year herbicide study of Short Creek water quality following herbicide applications on forest land.	Oceanside Water District (00585)	Monitoring of drinking water source at the intake for pesticides (herbicide) following routine spraying of roadside vegetation to control growth and reduce spread of problematic weedy plants.	Delay in roadside spraying by DWSA land owner (Stimson Lumber Company) continues to delay grant execution. Landowner indicates that spraying is likely to happen during summer of 2020, depending on finances. Monitoring would occur concurrently and following roadside herbicide application.
Henry Creek Source Water Protection Planning and Conservation Easement Evaluation	Rhododendron Water Association (00702)	Develop & acquire conservation easements within sensitive portion of watershed	Project has stalled and will likely be withdrawn due to unwilling private property landowners within the watershed. Water system has made multiple attempts to contact and engage private landowners.

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 no active Drinking Water Providers Partnership projects with reported outputs in the North Coast.

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 15 OWEB funded projects completed in 2018 with a total cash and in-kind budget of \$1,456,117. The tables below summarize reported outputs for different project activities in each North Coast subbasin.

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

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

Subbasin	Estuarine invasive plant control (Acres)	Estuarine vegetation planting (Acres)
Wilson-Trask-Nestucca	50	50

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

Subbasin	New fish screens installed on diversions (where no screen had existed previously) (Number of treatments)	Fish Passage Crossing improvement (Number of treatments)	Fish Passage Non-crossing improvement (Number of treatments)
Nehalem	1	6	1
Lower Columbia	NA	NA	1

Subbasin	New fish screens installed on diversions (where no screen had existed previously) (Number of treatments)	Fish Passage Crossing improvement (Number of treatments)	Fish Passage Non-crossing improvement (Number of treatments)
Lower Columbia-Clatskanie	NA	1	NA
Wilson-Trask-Nestucca	NA	1	NA

Table J-9: 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)
Nehalem	28

Table J-10: 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)
Wilson-Trask-Nestucca	1

Table J-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 (Area treated)	Riparian invasive plant control (Stream sides treated)	Riparian vegetation planting (Length of treatment)
Nehalem	0.7	1	0.2
Wilson-Trask-Nestucca	NA	1	NA

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

Subbasin	Road decommission (1 station or 100 Feet)	Road relocation (1 station or 100 Feet)	Surface drainage improvement (Number of treatments)
Nehalem	198	184	3

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 J-13: TMDL implementation activities reported in 2019 by Designated Management Agencies or third parties.

TMDL	DMA	Reported Actions
Nestucca Bay	NA	The Lower Jewell Creek culvert replacement project is located on Tillamook County owned Sandlake Road north of Pacific City. This culvert was the only remaining fish passage barrier in the Jewell Creek basin with the completion of two upstream culvert replacement projects on private lands in 2017 and 2018. In addition, DEQ 319 funds have been used for riparian restoration on both sides of Jewell Creek above and below the lower culvert. The culvert replacement compliments the past 319 investments and provides improved habitat to coho, fall Chinook, chum, steelhead, cutthroat, and lamprey, which are all present. US Forest Service, in cooperation with Tillamook County and Nestucca, Neskowin and Sand Lake Watersheds Council (NNSL) developed a design to replace this crossing with a bridge, and implemented the design in the summer of 2019. The crossing was replaced with a stream spanning bridge that complies with state and federal fish passage requirements. OWEB funds were used toward contracted construction services, project management and grant administration.
Tillamook Bay	NA	The Northwest Oregon Restoration Partnership (NORP), a Tillamook Estuaries Partnership (TEP) program, is an integral part of the conservation community in northwest Oregon. Locally adapted, genetically appropriate native plant materials are critical for ensuring success in watershed scale restoration projects. NORP supports 41 organizations by propagating and distributing 75,000 – 100,000 native plants annually, which would otherwise be unavailable to restoration partners. As a result of NORP’s efforts, landscape-scale watershed restoration projects are being implemented by partners on private and public lands in eight counties (Tillamook, Clatsop, Lincoln, Columbia, Washington, Yamhill, Polk, and Benton). Due to this unique partnership, every dollar invested in NORP has an exponential benefit in terms of on-the-ground watershed restoration accomplished.
North Coast Subbasins	NA	The Northwest Oregon Restoration Partnership (NORP), a Tillamook Estuaries Partnership (TEP) program, is an integral part of the conservation community in northwest Oregon. Locally adapted, genetically appropriate native plant materials are critical for ensuring success in watershed scale restoration projects. NORP supports 41 organizations by propagating and distributing 75,000 – 100,000 native plants annually, which would otherwise be unavailable to restoration partners. As a result of NORP’s efforts, landscape-scale watershed restoration projects are being implemented by partners on private and public lands in eight counties (Tillamook, Clatsop, Lincoln, Columbia, Washington, Yamhill, Polk, and Benton). Due to this unique partnership, every dollar invested in NORP has an exponential benefit in terms of on-the-ground watershed restoration accomplished.

Appendix K

Owyhee Basin Report

1. Basin Description








The Owyhee Basin encompasses 11,049 square miles of Southwestern Idaho, Southeastern Oregon and North Central Nevada. The Owyhee River originates in North Central Nevada and flows in a northwest direction through the southwest corner of Idaho and Southeast Oregon. It then turns north to empty into the Snake River near the town of Nyssa, Oregon. The total length of the mainstem is 280 miles. The major subbasins in Oregon are the Lower Owyhee, Middle Owyhee and Crooked/Rattlesnake. Smaller subbasins in Oregon are the Middle Snake-Succor, Jordan and East Little Owyhee/South Fork Owyhee.

A majority of the land in the Owyhee Basin is public, managed mainly by the Bureau of Land Management and the State of Oregon. Rangeland is the dominant use in the basin along with irrigated private agricultural land concentrated near the Snake River. The climate is arid to semi-arid, and agriculture is very dependent on the use of water stored in reservoirs. Owyhee Reservoir is formed behind the Owyhee Dam in the lower river. The reservoir extends along approximately 40 miles of the Owyhee River, and provides irrigation water to farms near the mouth of the Owyhee and along the Snake and Malheur Rivers. Efforts to improve water quality in the basin have mainly focused on improving irrigation efficiency and minimizing irrigation-induced erosion, along with improvements to riparian vegetation condition through improved farm and livestock management.

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

Subbasin	Watershed Area (km2)	% Urban/Roads	% Forest	% Cultivated	% Range/Forest Disturbance	%Other
Crooked-Rattlesnake	3443.013	0.3	0.0	0.2	99.4	0.1
East Little Owyhee	343.314	0.0	0.0	0.0	100.0	0.0
Jordan	1812.600	0.8	1.4	2.6	88.3	6.9
Lower Owyhee	5116.416	0.2	0.3	2.0	96.0	1.4
Middle Owyhee	3110.806	0.1	0.5	0.2	98.8	0.4
Middle Snake-Succor	835.923	1.1	0.3	10.4	86.0	2.2
South Fork Owyhee	21.926	0.0	0.0	0.0	100.0	0.0
Upper Quinn	1400.281	0.4	0.5	0.1	97.0	2.0

Legend

- City
-  Subbasin Boundary
- Landuse/Landcover**
 -  Urban/Roads
 -  Forest
 -  Cultivated
 -  Range
 -  Other
 -  Water

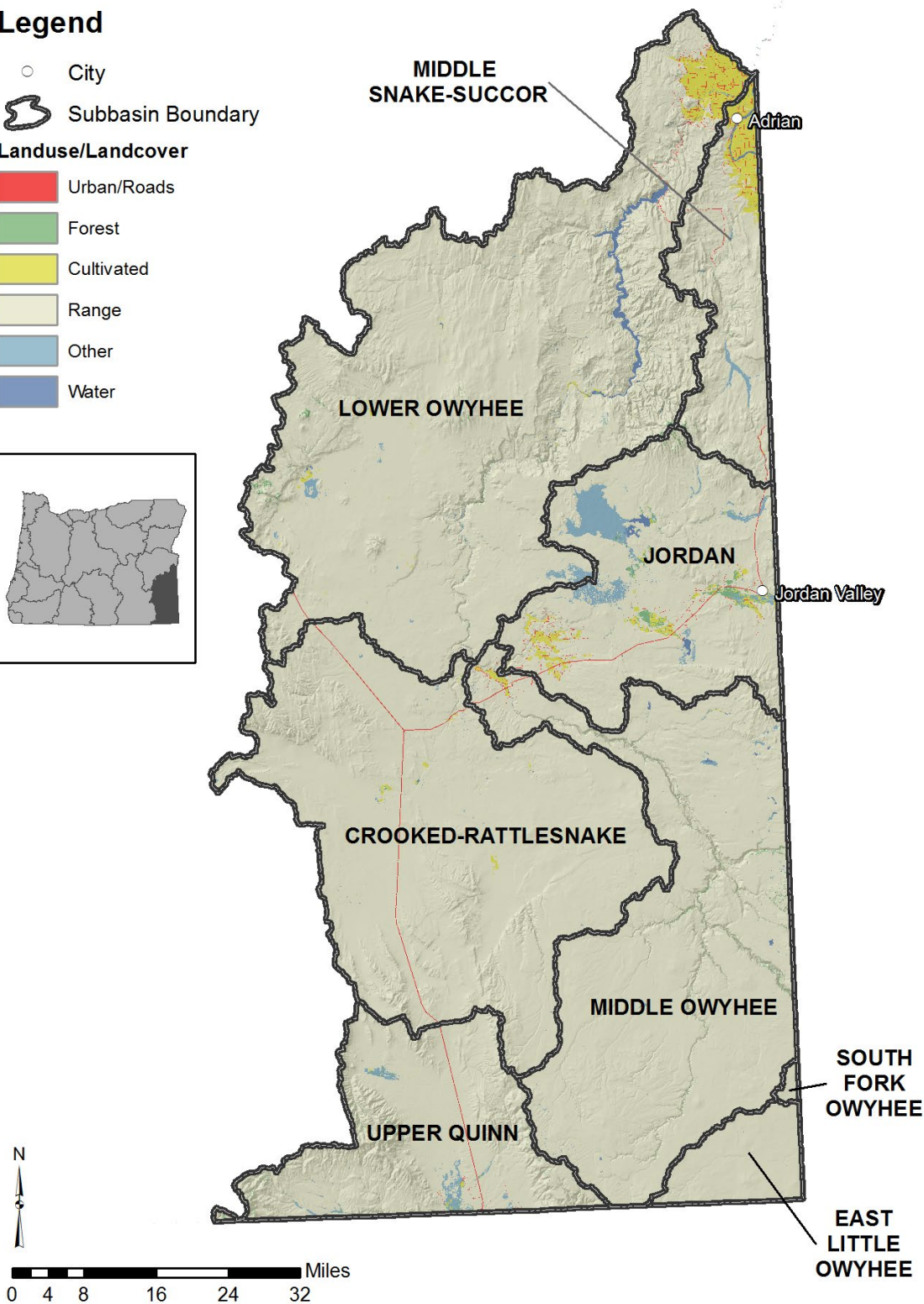


Figure K-1: Land use in the Owyhee administrative basin.

1.1 Basin Contacts

Table K-2: Oregon DEQ basin contact.

Administrative Area	DEQ Basin Coordinator
Owyhee River Basin	John Dadoly: 541-278-4616: dadoly.john@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 K-3 identifies the number of Owyhee Basin waterbody segments impaired by parameter from the 2012 Integrated Report and the number of segments with approved TMDLs. Sources: [ODEQ](#), [USEPA](#)

Table K-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'-DDD	0	1
4,4'-DDE	0	1
4,4'-DDT	1	1
Arsenic	8	0
Chlorophyll a	2	1
Copper	2	0
Dieldrin	1	1
Dissolved Oxygen	1	1
E. Coli	3	0
Fecal Coliform	1	0
Iron	3	0
Lead	3	0
Mercury	9	0
pH	1	0
Phosphorus	0	1
Sedimentation	0	1
Temperature	10	1

Parameter	Segments without a TMDL	Segments with a TMDL
Thallium	2	0
Total Phosphorus	1	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.

- **Currently there are no TMDLs in the Owyhee Basin.**

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 Owyhee.

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 Owyhee.

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 no nonpoint source related Drinking Water Source Protection program projects with reported outputs in the Owyhee.

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 no active Drinking Water Providers Partnership projects with reported outputs in the Owyhee.

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.

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2019 Oregon Nonpoint Source Pollution Program Annual Report

Based on the most recent data available in OWEB's Oregon Watershed Restoration Inventory (OWRI) database, there were eight OWEB funded projects completed in 2018 with a total cash and in-kind budget of \$1,231,095. The tables below summarize reported outputs for different project activities in each Owyhee subbasin.

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

Table K-4: Summary of OWEB grant funded upland projects completed in 2018, the most recent year data is available in the OWEB OWRI database.

Subbasin	Irrigation system improvement (Acre)	Irrigation system improvement (Feet)
Lower Owyhee	1984.2	21312
Middle Snake-Succor	158.2	3060

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 K-5: TMDL implementation activities reported in 2019 by Designated Management Agencies or third parties.

TMDL	DMA	Reported Actions
Malheur River/Snake River HC	Owyhee Irrigation District	Malheur SWCD, Owyhee Irrigation District and NRCS have been working to modernize and pipe the irrigation system in Fletcher Gulch Priority Area as well as other nearby areas. This work facilitates the conversion of irrigation systems from flood to sprinkler and eliminates irrigation induced erosion. Water quality monitoring has documented significant reductions of sediment and nutrient loading to the Old Owyhee Ditch which eventually drains to the Malheur River, a tributary of the Snake River. See the project details in the main document Section 4.4 and more information about this project at https://nrcs.maps.arcgis.com/apps/Cascade/index.html?appid=b7f126c6b7d146eb8958817b69037219 .

Appendix L

Powder Basin Report

1. Basin Description

The Powder River is a tributary of the Snake River located in east-central Oregon along the border with Idaho. The Powder River Basin is approximately 3,500 square miles in size, and the main channel of the Powder River is approximately 144 miles long. The Powder River Basin is divided into three subbasins: Burnt River, Powder River and Brownlee. All streams in these watersheds drain into the Snake River.

Approximately 50 percent of the land in the Powder River Basin is public, managed mainly by Bureau of Land Management and the U.S. Forest Service. Rangeland is the dominant use in the basin along with forested lands in the western and northeastern portions of the basin, and irrigated pasture and other agricultural land concentrated in the central Baker Valley, Burnt River, Keating and Lower Powder valleys to the south and east. The climate is semi-arid and agriculture is dependent on the use of water stored in reservoirs that are filled by streams draining the Blue Mountains and Wallowa Mountains. Efforts to improve water quality in the basin have mainly focused on improving irrigation efficiency and minimizing irrigation-induced erosion, limiting livestock access to streams and improvements to riparian vegetation condition and floodplain connection.

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

Subbasin	Watershed Area (km2)	% Urban/Roads	% Forest	% Cultivated	% Range/Forest Disturbance	%Other
Brownlee Reservoir	1630.993	1.1	29.9	5.5	63.0	0.5
Burnt	2847.495	1.0	28.0	2.1	68.0	0.9
Powder	4423.313	1.6	34.8	10.5	51.4	1.6

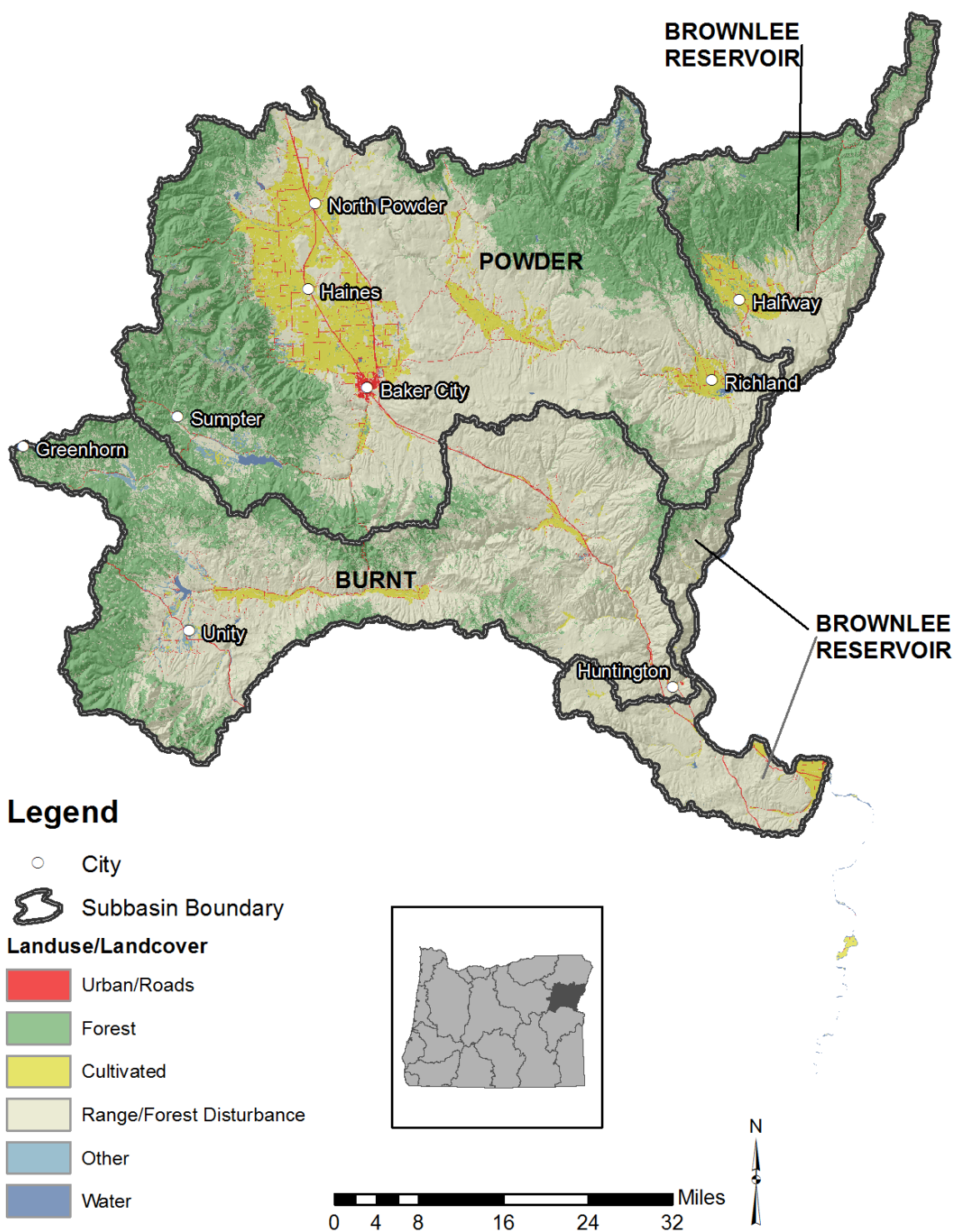


Figure L-1: Land use in the Powder administrative basin.

1.1 Basin Contacts

Table L-2: Oregon DEQ basin contact.

Administrative Area	DEQ Basin Coordinator
Powder River Basin	John Dadoly: 541-278-4616: dadoly.john@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 L-3 identifies the number of Powder Basin waterbody segments impaired by parameter from the 2012 Integrated Report and the number of segments with approved TMDLs. Sources: [ODEQ](#), [USEPA](#)

Table L-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'-DDD	0	1
4,4'-DDE	0	1
4,4'-DDT	0	1
Arsenic	2	0
Biological Criteria	2	0
Chlorophyll a	2	1
Dieldrin	0	1
Dissolved Oxygen	10	1
E. Coli	12	0
Fecal Coliform	2	0
Fish tissue, Mercury	2	0
Iron	2	0
Lead	2	0
Mercury	5	0
pH	1	0
Phosphorus	0	1
Sedimentation	6	1

Parameter	Segments without a TMDL	Segments with a TMDL
Temperature	39	3
Total Dissolved Gas	0	1
Total Phosphorus	1	0
Turbidity	1	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.

- **Currently there are no TMDLs in the Powder Basin.**

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 two 319 projects active that reported project outputs and accomplishments to DEQ. Combined the projects have a total grant budget of \$45,440. Table L-4 describes the projects and the reported outputs.

Table L-4: Project outputs reported in 2019 for Section 319 pass through grants.

Project Name	Grantee	Project Description	Reported Outputs
North Fork Burnt River and Deer Creek Stream Gages	Powder Basin Watershed Council	The project grant funds were used to support data collection at the two gage sites by WRD staff for 2018 and 2019.	This project completed in December 2019. Project outcomes included maintenance and operation of the North Fork Burnt River and Deer Creek stream gages. These gages had previously funded by OWRD and are located upstream of reservoirs that supply irrigation water for downstream communities. The data of flow and water temperature was collected at these sites, which will be used to examine the effects of ongoing forest management and climate change on these two respective watersheds. The data included instantaneous flow, mean daily flow, and water temperature for two full years ending in September 2019.
Powder Basin Macroinvertebrate Sampling	Powder Basin Watershed Council	The goal for this project is to fill in data gaps related to aquatic macroinvertebrate assemblages in lower elevations and valley bottoms that had not been addressed by previous sampling efforts. The grant funds will be used to collect samples in Powder River subbasins. PWC will write a QAPP, get trained in sampling methods, and then conduct field sampling in summer months. All data will be available to the public and agencies.	This project completed in June 2019. PWC were able to accomplish the project goal by working with the landowners from our existing network of water quality monitoring sites. This project had the added benefit of pairing aquatic macroinvertebrate data with water quality parameters that had been collected, in some cases, for the previous five years. This project will help in the development of future water quality monitoring plans within the Powder Basin. Even though the final report has not been released yet, the data has already been used to help justify conducting a fish habitat survey in order to identify limiting factors within a local fishery.

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 Powder.

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 no nonpoint source related Drinking Water Source Protection program projects with reported outputs in the Powder.

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 no active Drinking Water Providers Partnership projects with reported outputs in the Powder.

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 six OWEB funded projects completed in 2018 with a total cash and in-kind budget of \$349,762. The tables below summarize reported outputs for different project activities in each Powder subbasin.

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

Table L-5: 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 Non-crossing improvement (Number of treatments)
Brownlee Reservoir	1

Table L-6: Summary of OWEB grant funded upland projects completed in 2018, the most recent year data is available in the OWEB OWRI database.

Subbasin	Irrigation system improvement (Acre)	Irrigation system improvement (Feet)
Brownlee Reservoir	94.0	760
Powder	20.4	NA

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

Subbasin	Off-channel livestock or wildlife watering (Number of treatments)	Upland fencing (Acre)	Upland fencing (Mile)
Brownlee Reservoir	2	10.0	0.6
Burnt	1	NA	NA
Powder	7	0.3	NA

Appendix M

Rogue Basin Report

1. Basin Description

The Rogue Basin in southwestern Oregon consists of five subbasins that drain to the Pacific Ocean: Lower Rogue River, Middle Rogue River, Upper Rogue River, Illinois and Applegate. The subbasins are on the northeastern flank of the Siskiyou Mountains and the western flanks of the Cascade Mountains and total 3.3 million acres (5,156 square miles).

Streams in this watershed provide habitat for a wide variety of cold-water species including Coho salmon, spring Chinook salmon, fall Chinook salmon, summer and winter steelhead, multiple species of resident trout, amphibians and other fish including Pacific lamprey, green sturgeon, white sturgeon, Klamath small-scale sucker, speckled dace, prickly sculpin and others. The Rogue estuary provides important habitat for marine mammals, birds and a wide variety of fish. Shellfish harvesting is not a commercial resource in the Rogue River Estuary. Commercial and recreational fishing in the river, estuary and offshore has been an important economic resource for generations.

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

Subbasin	Watershed Area (km2)	% Urban/Roads	% Forest	% Cultivated	% Range/Forest Disturbance	%Other
Applegate	1760.286	4.5	64.9	3.5	26.3	0.8
Illinois	2412.024	3.1	73.0	1.0	22.3	0.5
Lower Rogue	2347.114	4.2	79.6	0.5	14.8	0.9
Middle Rogue	2284.512	11.4	44.7	12.1	31.2	0.7
Upper Rogue	4183.154	1.1	67.8	3.3	26.2	1.5

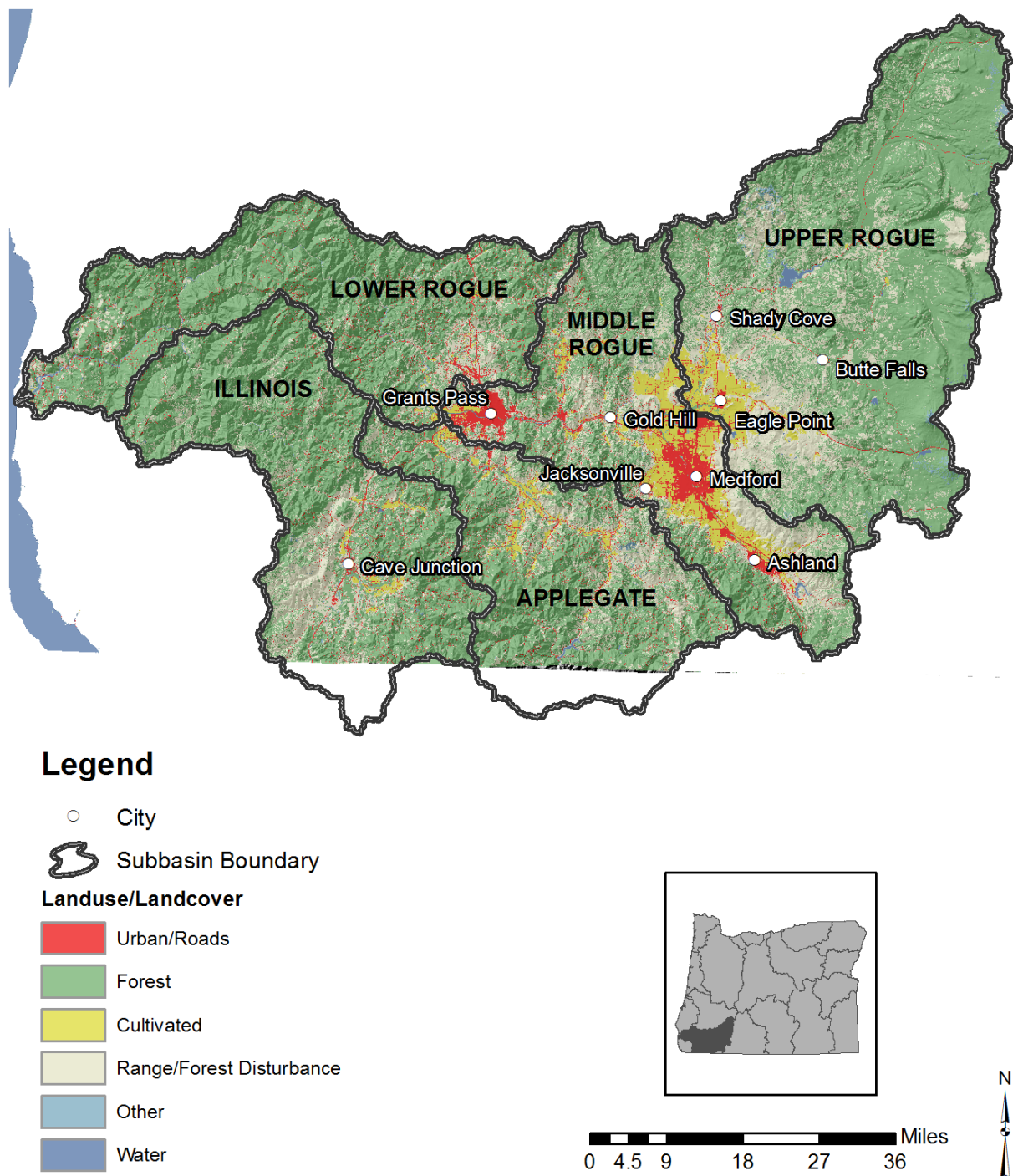


Figure M-1: Land use in the Rogue administrative basin.

1.1 Basin Contacts

Table M-2: Oregon DEQ basin contact.

Administrative Area	DEQ Basin Coordinator
Rogue Basin	Bill Meyers: 541-776-6272: meyers.bill@deq.state.or.us
Rogue 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 M-3 identifies the number of Rogue Basin waterbody segments impaired by parameter from the 2012 Integrated Report and the number of segments with approved TMDLs. Sources: [ODEQ](#), [USEPA](#)

Table M-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	6	1
Arsenic	1	0
Biocriteria	1	0
Biological Criteria	24	0
Chlorophyll a	1	0
Dissolved Oxygen	37	11
E. Coli	0	32
Fecal Coliform	1	17
Fish tissue, Mercury	1	0
Lead	1	0
Mercury	6	0
pH	11	4
Phosphorus	0	3
Sedimentation	6	2
Temperature	0	284

Parameter	Segments without a TMDL	Segments with a TMDL
Total Phosphorus	1	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 M-4 lists the TMDLs that have been approved in the Rogue Basin.

Table M-4: Approved TMDLs in the Rogue Basin and the impairments addressed by those TMDLs.

TMDL Document Name	Impairments Addressed
Applegate Subbasin TMDL and WQMP	Biological Criteria, Sedimentation, Temperature
Bear Creek Watershed TMDL	Dissolved Oxygen, pH
Bear Creek Watershed TMDL	Bacteria (water contact recreation), Sedimentation, Temperature
Lobster Creek Watershed TMDL	Temperature
Lower Sucker Creek TMDL and WQMP	Temperature
Rogue River Basin TMDL	Bacteria (water contact recreation), Temperature
Upper Sucker Creek TMDL and WQMP	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 was one 319 project active that reported project outputs and accomplishments to DEQ. Combined the projects have a total grant budget of \$23,100. Table M-5 describes the project and the reported outputs.

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

Project Name	Grantee	Project Description	Reported Outputs
Bear Creek TMDL Effectiveness Monitoring Analysis	Rogue Valley Council of Governments	The Bear Creek Valley has a robust water quality sampling program that begun in the early 1990s and is financially supported by the local designated management agencies (DMAs). The most recent Bear Creek dataset (2011-2017) will be analyzed through the ORISE fellowship program sponsored by EPA. This project will use the results of the ORISE statistical analysis of water quality data to develop information and provide outreach materials to assist with TMDL implementation by the DMAs in the Bear Creek Watershed.	In 2019 preliminary story map styles and contents were discussed. The ORISE fellow completed the statistical analysis on the water quality data for Bear Creek. The grantee has provided guidance and input into the process. Preliminary results have been shared at public meetings with the DMAs in the Bear Creek and greater Rogue Basin areas. All water quality data has been cleaned up and collated in preparation for submittal to DEQ.

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 was one nonpoint source related Clean Water State Revolving Fund project active that reported project outputs and accomplishments to DEQ. Combined the projects have a total budget of \$4,829,000. Table M-6 describes the project and the reported outputs.

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

Project Name	Grantee	Project Description	Reported Outputs
Riparian Restoration in Bear Creek Watershed	City of Ashland	Construct a riparian buffer along Bear Creek to reduced temperature as part of the City's Water Quality Trading Plan to meet its NPDES permit limits.	In progress - design

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 \$60,000. Table M-7 describes the projects and the reported outputs.

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

Project Name	Grantee	Project Description	Reported Outputs
Page Creek Aquatic Restoration Activities - Phase I	City of Cave Junction (00971)	Protect and restore Cave Junction's municipal water supply by reducing sediment and turbidity in Page Creek, a major tributary to Cave Junction's water supply. The project will add large wood to the stream, remove an impassable, perched, and undersized culvert, treat invasive species, and enhance riparian condition through planting native vegetation.	Limited planning and construction activities took place in 2019 due to difficulties obtaining funding and match funding within the in-water work window. Construction activities were suspended October 2019 at the end of the variance to the in-stream work window and are planned to resume again in August 2020. The project is planned for completion in September 2020.
Little Butte Creek Floodplain Rehabilitation Project	Medford Water Commission & City of Eagle Point (00513)	Improve water quality and enhance the quality and quantity of winter rearing habitat for juvenile salmon ids in mainstem Little Butte Creek by increasing floodplain and side channel connectivity, creating complex habitat, restoring riparian forest	The riparian planting and native grass seeding were completed in 2019. Maintenance will continue during 2020 and 2021 growing seasons to address regrowth of non-native species.

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Project Name	Grantee	Project Description	Reported Outputs
		<p>conditions, stabilizing severely eroding banks, and increasing public awareness of the biological and economic benefits of habitat restoration and clean water. Restore floodplain connectivity, re-contour steeply eroding banks and establish a floodplain forest to dissipate erosive forces and increase floodwater storage, reducing delivery of fine sediments to downstream areas, and lowering turbidity levels in the raw drinking water supply. Removal of noxious weeds and subsequent establishment of native plants will also reduce sediment input into Little Butte Creek.</p>	



Figure M-2: Site Revegetation for Little Butte Creek Floodplain Rehabilitation Project in Medford Water Commission's Drinking Water Source Area. Photo Credit: John Speece, Rogue River 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 \$80,000. Table M-8 describes the projects and the reported outputs.

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

Project Name	Grantee	Project Description	Reported Outputs
Page Creek Aquatic Restoration Activities - Phase 1	Illinois Valley Watershed Council	This project comprises the first phase of a larger multi-phase effort to implement measures that reduce the risk of contamination to Cave Junction's drinking water from forest management related practices (sediment, turbidity, other chemical changes) and sediment delivery during storms. By reducing sediment and turbidity in Page Creek, there will be a resulting decreased discharge of these contaminants into the East Fork Illinois River. The project will improve stream process and function along a 0.5 mile reach of Page Creek.	In 2019, partners increased channel complexity, stability and floodplain connection and improved riparian conditions. Work included: harvesting, hauling, and staging large wood for instream structures planned for construction during the 2020 instream work window; and removing a perched, undersized culvert that was a barrier to aquatic organisms at the upper portion of the project reach.
Little Butte Creek Floodplain Rehabilitation Project	Rogue River Watershed Council	The Rogue River Watershed Council is collaborating with the Cities of Eagle Point and Medford to restore a reach of Little Butte Creek as it flows through a 48-acre parcel of land that formerly served as a quarry and then the City's wastewater treatment facility. Design work was funded in 2016 by the DWPP and implementation will commence in 2018 with berm removal and re-connecting the Creek with an historic side channel. Large wood complexes will be added and riparian vegetation planted to also help stabilize the streambanks.	See OHA funded portion of this project for 2019 accomplishments. Federal monies spent in 2018.



Figure M-3: Moving large wood for later instream placement. Photo Credit: Kevin O'Brien, Illinois Valley Watershed Council.

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 22 OWEB funded projects completed in 2018 with a total cash and in-kind budget of \$2,384,055. The tables below summarize reported outputs for different project activities in each Rogue subbasin.

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

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Table M-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	Existing fish screens replaced, repaired, or modified (Number of treatments)	Fish Passage Non-crossing improvement (Number of treatments)
Applegate	1	3
Middle Rogue	NA	1

Table M-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)
Illinois	0.1
Upper Rogue	0.1

Table M-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: Boulder placement (Number of treatments)	Instream habitat: Large wood placement (Number of treatments)	Instream habitat: Structure placement (Number of treatments)
Applegate	12	87	NA
Lower Rogue	NA	25	NA
Upper Rogue	NA	97	8

Table M-12: 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 (Length of treatment)
Applegate	0.1

Table M-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 invasive plant control (Area treated)	Riparian invasive plant control (Length of treatment)	Riparian invasive plant control (Stream sides treated)	Riparian vegetation planting (Length of treatment)
Applegate	NA	0.2	NA	0.1
Middle Rogue	8	NA	2	0.6

Table M-14: Summary of OWEB grant funded road projects completed in 2018, the most recent year data is available in the OWEB OWRI database.

Subbasin	Surface drainage improvement (Number of treatments)
Lower Rogue	1

Table M-15: Summary of OWEB grant funded upland projects completed in 2018, the most recent year data is available in the OWEB OWRI database.

Subbasin	Irrigation system improvement (Acre)	Upland erosion control (Acre)	Upland erosion control (Feet)	Upland erosion control (Number of treatments)
Middle Rogue	111.2	0.3	0	1

Table M-16: 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)	Upland fencing (Acre)	Upland fencing (Mile)
Middle Rogue	0	1	0	0.2

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

Subbasin	Upland vegetation management (Area treated)
Middle Rogue	899

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 M-18: TMDL implementation activities reported in 2019 by Designated Management Agencies or third parties.

TMDL	DMA	Reported Actions
Rogue River Basin and Bear Creek Watershed	Cities, Counties and Irrigations Districts	The Rogue River Basin and Bear Creek Watershed TMDLs' DMAs continue to make progress in implementing TMDL and clean water protection projects across the Rogue Basin. In 2019 the DMAs collaborated in providing comments and guidance to the Bear Creek data analysis project that was conducted by EPA's contractors and an ORISE fellowship participant.
Bear Creek Watershed	City of Ashland	In 2019 the city focused on its riparian restoration initiative to the areas of high need. Stormwater treatment facilities and pet waste dispensers continue to be maintained. Rogue Valley Council of Governments (RVCOG) is retained to provide outreach in accordance with TMDL and MS4 program requirements.
Rogue River Basin	City of Butte Falls	In 2019 the city continues to collect water quality samples from Hukill Creek, Butte Creek and Ginger Creek to ensure that this small community is not a source of water quality impacts to local creeks. Water quality parameters tested includes total coliform, E-coli, pH, dissolved oxygen and chlorine residuals.

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TMDL	DMA	Reported Actions
Rogue River Basin	City of Cave Junction	The city has adopted a LID manual and implemented a stormwater fee program that will provide minimal funding to a stormwater program.
Bear Creek Watershed	City of Central Point	Highlights in 2019 for the city include: published 8 articles related about the stormwater information or education in the citywide Newsletter; planted 5 trees along Griffin Creek in Flannagan Park for the Tree City and Arbor Day Celebration; maintained 22 public Pet Waste Disposal Stations in city parks and restocked approximately 120,000 bags; swept approximately 6,289 miles of city streets and remove approximately 390 tons of sediment, debris, road salts and trace metals that would have otherwise gone into the storm drain system and more. The city currently has 10 construction projects underway that will be using green infrastructure to treat stormwater runoff incorporated in their designs.
Rogue River Basin	City of Eagle Point	A project was implemented to decrease sedimentation due to erosion on Little Butte Creek within Eagle Point. Plans were developed by Cascade Stream Solutions for the stabilization work. The project is a partnership between the city of Eagle Point, Rogue River Watershed Council (RRWC), Bureau of Land Management, Oregon Department of Fish and Wildlife, and Medford Watershed Council. A planting plan is being developed for the follow up project in 2020.
Rogue River Basin	City of Gold Beach	The city is responsible for protecting and maintaining the water quality for creeks within its jurisdictions that flow into the Rogue River. Dean Creek is the only named stream to feed into the Rogue River within the city's jurisdiction. The city continues to collaborate with the Lower Watershed Council and OSU Extension Service of Gold Beach to monitor and maintain water quality.
Rogue River Basin	City of Gold Hill	The city contracts with Oregon Department of Transportation (ODOT) for mechanical sweeping of streets with curb/gutter two times per year. The city has recently purchased its own street sweeper to keep the gutters and stormdrains clean. The quotes for mats that cover the stormdrains have been received and those mats will be purchased in the very near future.
Rogue River Basin	City of Grants pass	The city staff continues to contribute an estimated 100 hours to the TMDL program for meetings and implementation actions that include maintaining doggie bag stations, implementing stormwater programs, managing invasive species and planting natives plants, working with volunteers and schools, networking with other groups, participating in Stream Smart, reporting, and other activities. Other contributing resources include staff from the RRWC, ODFW, RBP, and other programs (e.g., Stream Smart). Meanwhile, the city partners on other funding opportunities for program implementation in conjunction with

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TMDL	DMA	Reported Actions
		RVCOG. A funding of \$5,000 from the Meyer Memorial Trust was used for a restoration project in managing invasive species (knotweed), planting native species along Rogue River, providing education, and coordinating volunteers. In addition, the city, as a member of the Salmon Watch Partner, helped leverage \$9,340 from the Gray Family Foundation. Program needs include additional funding for invasive species management and riparian restoration.
Bear Creek Watershed	City of Jacksonville	In 2019 the city purchased 60,000 ‘dog poop bags’ at a total cost of \$1,855. An additional 20,000 bags were ordered in July 2019 at a cost of \$606. The city continues to plant trees in Mountain Park, remove blackberries and plant native trees in additional areas as resources allow.
Bear Creek Watershed	City of Medford	The city planted more than 700 trees along Bear Creek in the area of the Expo Center. The city continues to maintain its pet waste stations and all stormwater treatment facilities.
Bear Creek Watershed	City of Phoenix	The city completed the “Wetland Park” project phase II and installed total of 1700 native and pollinator friendly plants. Rogue Valley Sewer Services (RVSS) completed a bioswale at Colver Road Park in early October 2019.
Rogue River Basin	City of Rogue River	The city has been working on adopting a riparian protection ordinance for some time and helped conduct several public meetings in 2019. The city anticipates having ordinance adopted in early 2020.
Rogue River Basin	City of Shady Cove	The city continues to promote streamside gardening to protect streams from erosion and inform and implement the Shady Cove riparian protection ordinance. Rogue River cleanup and dog station maintenance continues.
Bear Creek Watershed	City of Talent	In 2019 the city continues to enforce the Tree Preservation and Protection Ordinance adopted in 2016. One relevant code violation was resolved. A Tree Committee was recently formed to further refine existing City Tree ordinances, consider new policy ideas and identify potential project areas.
Rogue River Basin	Curry County	The County has increased the amount of information available at the public counter servicing Community Development customers. This includes SB 1010 handouts, Stream Smart handouts, Oregon Department of State Lands handouts and others.
Rogue River Basin	Eagle Point Irrigation District	EPID joined with the Middle Rogue Watershed Council and the Jackson County Watermaster to install and maintain water quality monitoring devices. Their participation in the TMDL program included cooperation, partnering, implementing, reporting, and attending meetings in 2019.
Rogue River Basin	Gold Hill Irrigation District	The district highlights include piping the canal through an area of high potential for animal fecal contamination as that property

Appendix M: Rogue Basin Report
2019 Oregon Nonpoint Source Pollution Program Annual Report

TMDL	DMA	Reported Actions
		converted to a vineyard. Other highlights include developing farm plans with irrigators.
Rogue River Basin	Grants Pass Irrigation District	The district maintains an open-door policy with patrons to discuss any issues including water quality. Ditchwalkers are also available to answer any questions patrons or the public may have.
Rogue River Basin	Jackson County	Most of the activities in 2019 focused on planting in the area near the Expo Center following the fire. Other planting projects included finishing the work on a section of Lazy Creek at Lazy Creek Drive and on the Larson Creek at the Larson Creek Drive for the city of Medford. Over 700 trees and shrubs (including willow stakes) were planted in the Bear Creek watershed by the DMAs working with the RVCOG. Other contributing groups included Lomakasti Restoration, the Rogue River Watershed Council, ODFW, the Freshwater Trust (TFT) and Oregon Stewardship. The goal to plant 500 trees was achieved. Bear Creek planting and invasive species removal activities have been planned for the next year.
Rogue River Basin	Josephine County	According to Daily Courier (dated on 5/27/19 and 10/14/19), Josephine County participated in both of the Rogue River Clean-Up Days, the events set to clean up garbage along Rogue River's banks.
Bear Creek Watershed	Medford Irrigation District	The district has focused efforts on the GIS mapping in the 2019 season. The district has partnered with the Farmers Conservation Alliance through their Irrigation Modernization Plan.
Bear Creek Watershed	Rogue River Valley Irrigation District	Highlights for RRVID in 2019 include that the District has received a Water Smart grant to be applied to piping a portion of the main canal, which work began in 2018 and 2019 and will continue in 2020. The district is also working with WISE and Farmers Conservation Alliance (FCA) to develop a Rogue Basin irrigation system improvement plan.
Bear Creek Watershed	Talent Irrigation District	TID's ultimate goal is to pipe and upgrade the canal system and improve the operations in the overall system. The district is working with WISE and Farmers Conservation Alliance (FCA) to develop a Rogue Basin irrigation system improvement plan in collaboration with the other irrigation districts in the valley. In 2019 LiDAR imagery was examined as part of this project.

Appendix N

Sandy Basin Report

1. Basin Description

The Sandy River Basin drains approximately 508 square miles (330,000 acres) in northwestern Oregon. The Sandy River originates from glaciers on the western slopes of Mt. Hood at an approximate elevation of 6200 feet above sea level and travels 56 miles before flowing into the Columbia River near the City of Troutdale. The Sandy River is the only major glacial river draining the western Cascades in Oregon. Glacially-derived fine particulate matter, known as “glacial flour”, gives the Sandy its distinctive milky-grey color during the summer. Major tributaries to the Sandy River include the Zigzag, Salmon, and Bull Run Rivers. The Little Sandy River is the largest tributary to the lower Bull Run River. Political jurisdictions include portions of Multnomah and Clackamas counties and several small, incorporated cities, including Rhododendron, Zigzag and Government Camp. Portions of the cities of Gresham, Troutdale and Sandy also lie within lower portion of the basin.

Approximately 70% of the basin is owned and managed by the U.S. Forest Service (USFS) – Mt Hood National Forest, 22% is in private ownership, 4% is owned by the Bureau of Land Management (BLM), 2% is owned by City of Portland and the remainder owned by State, local government or Portland General Electric (PGE). 19.5% is designated as Wilderness.

The Sandy is home to 19 native and 14 introduced fish species. The following fish species are listed by NOAA Fisheries: Chinook salmon (Threatened), Steelhead trout (Threatened) and Coho salmon (Candidate species).

Three river segments within the basin were given various National Wild and Scenic River designations by Congress in 1988:

- Sandy River from Dodge Park (RM 18.5) to Dabney State Park (RM 6)
- Sandy River from the headwaters to the National Forest boundary (12.5 miles)
- Salmon River from the headwaters to the confluence with the Sandy River (33.5 miles)

The Bull Run watershed is approximately 25% of the Sandy Basin (90,000 acres). Much of it is in the Bull Run Reserve, which was created by presidential proclamation in 1892 to protect Portland’s Water Supply. The Bull Run supply consists of two storage reservoirs (Dam Numbers 1 and 2) along with an outlet structure on Bull Run Lake, a natural water body near the headwaters. The water supply is an unfiltered water source that serves over 950,000 people in the Portland Metropolitan area.

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

Subbasin	Watershed Area (km2)	% Urban/Roads	% Forest	% Cultivated	% Range/Forest Disturbance	%Other
Lower Columbia-Sandy	1475.494	3.3	78.3	4	12.1	2.4

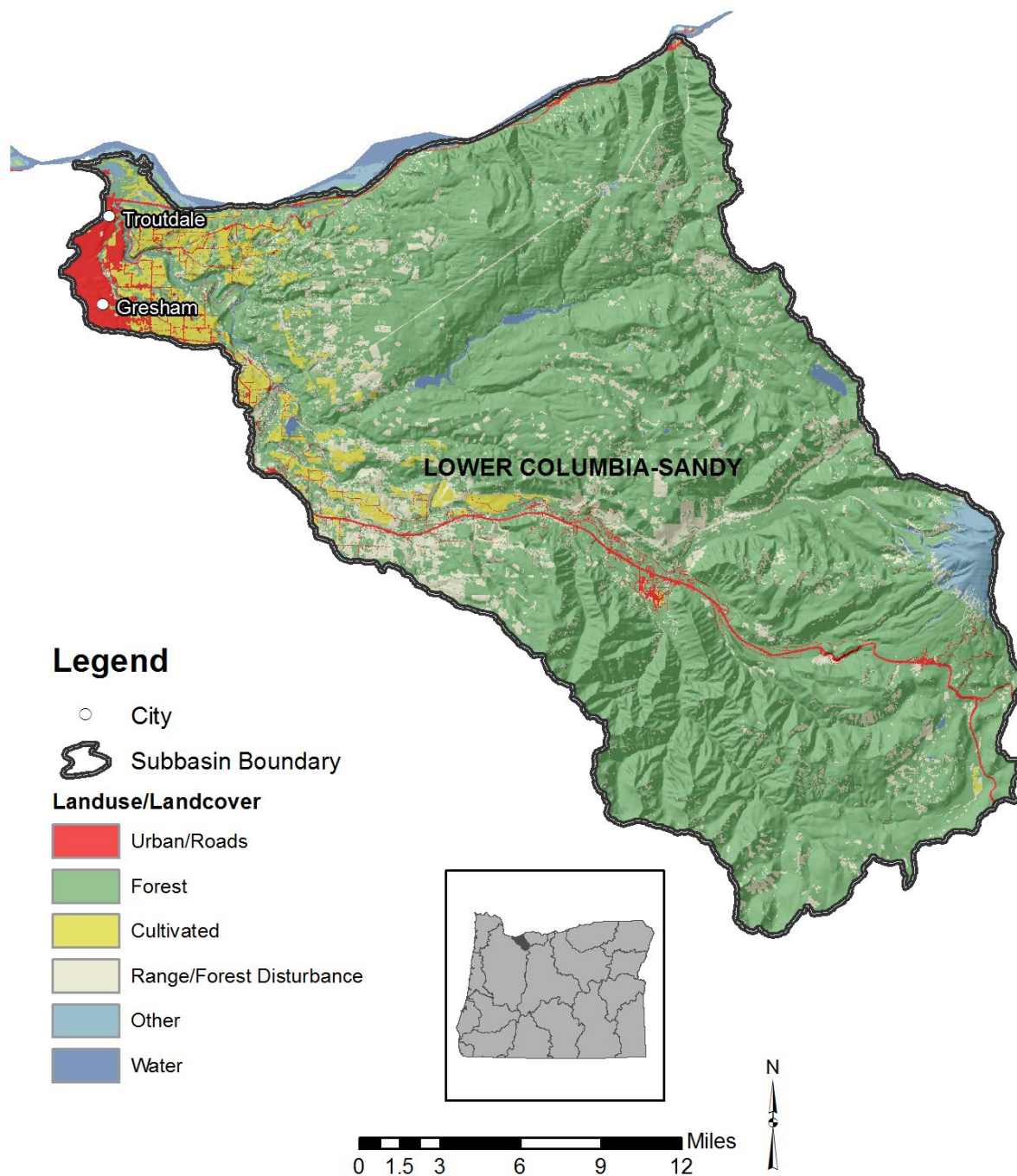


Figure N-1: Land use in the Sandy administrative basin.

1.1 Basin Contacts

Table N-2: Oregon DEQ basin contact.

Administrative Area	DEQ Basin Coordinator
Sandy Basin	Kristi Asplund: 503-229-6254: asplund.kristi@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 N-3 identifies the number of Sandy Basin waterbody segments impaired by parameter from the 2012 Integrated Report and the number of segments with approved TMDLs. Sources: [ODEQ](#), [USEPA](#)

Table N-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'-DDD	2	0
4,4'-DDE	3	0
4,4'-DDT	2	0
Biological Criteria	6	0
Chlordane	2	0
Dieldrin	2	0
Dioxin (2,3,7,8-TCDD)	0	2
Dissolved Oxygen	1	0
E. Coli	0	4
Heptachlor epoxide	2	0
Lead	1	0
pH	1	0
Polychlorinated Biphenyls (PCBs)	1	0
Polynuclear Aromatic Hydrocarbons	1	0
Temperature	1	23
Total Dissolved Gas	0	1

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 N-4 lists the TMDLs that have been approved in the Sandy Basin.

Table N-4: Approved TMDLs in the Sandy Basin and the impairments addressed by those TMDLs.

TMDL Document Name	Impairments Addressed
Sandy River Basin TMDL	Bacteria (water contact recreation), 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 was one 319 project active that reported project outputs and accomplishments to DEQ. Combined the projects have a total grant budget of \$13,874. Table N-5 describes the project and the reported outputs.

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

Project Name	Grantee	Project Description	Reported Outputs
Campus Creeks Clean Water Retrofit - Phase I Implementation	Sandy River Basin Watershed Council	The purpose of this project is to improve water quality and habitat in the Beaver Creek and Kelly creeks by installing green infrastructure features on the Mt. Hood Community College Campus.	2019 outputs included retrofitting parking lots at MHCC's main entrance with bioswales and naturescaping, employing green infrastructure practices to improve water quality, reduce volume, and pollutant load in campus runoff. Work completed in 2019 included installing bioswales and planters in lots G+H at the main entryway to MHCC and depaveing parking lot areas and installing drywells.



Figure N-2: MHCC Construction during depaving to employ green infrastructure

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 Sandy.

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 no nonpoint source related Drinking Water Source Protection program projects with reported outputs in the Sandy.

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 no active Drinking Water Providers Partnership projects with reported outputs in the Sandy.

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 five OWEB funded projects completed in 2018 with a total cash and in-kind budget of \$1,001,821. The tables below summarize reported outputs for different project activities in each Sandy subbasin.

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

Table N-6: 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)
Lower Columbia-Sandy	80	669

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

Subbasin	Irrigation system improvement (Acre)
Lower Columbia-Sandy	8.3

Table N-8: 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)
Lower Columbia-Sandy	0.2	0.2

Table N-9: 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)
Lower Columbia-Sandy	3.3	4

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 N-10: TMDL implementation activities reported in 2019 by Designated Management Agencies or third parties.

TMDL	DMA	Reported Actions
Sandy	City Portland - Water Bureau	PWB submitted their Habitat Conservation Plan (HCP) 2019 Annual Report. Completed the Oxbow Park Engineered Log Jam Placement Project. Performed effectiveness monitoring at the Sandy River and Cedar Creek for large wood and log jam placement. The City will provide funding to The Freshwater Trust to support construction of habitat restoration projects on the Salmon River and Lost Creek. The city's primary TMDL responsibilities are optimal management and monitoring of drinking water reservoirs and stream flow to meet temperature allocations in the Bull Run River.
Sandy	Multnomah County	Submitted 2019 Annual Report. Improved geographic reporting on stormwater regulation, inspection and complaint response; partnered with East Multnomah Soil and Water Conservation District to plant native plants in county rights of way in Beaver Creek watershed; participated in Regional Coalition of Clean Rivers with various public outreach initiatives; convenes several agency and non-profit partners to coordinate Beaver Creek monitoring, restoration and outreach activities.

Appendix O

South Coast Basin Report

1. Basin Description

The South Coast Basin is located in southwestern Oregon and consists of five subbasins: Coos, Coquille, Sixes, Chetco and a portion of the Smith. These subbasins are on the west side of the Siskiyou Mountains and contain over 1.9 million acres.

At the north end of the basin, the Coos and Coquille rivers headwater in the Coast Range and flow across relatively flat, low gradient, marine terraces to the Pacific Ocean. In the south portion, numerous coastal frontal streams headwater primarily in the Klamath Mountain Province and discharge directly to the ocean. Ports are maintained at Coos Bay, Bandon, Port Orford, Gold Beach and Brookings Harbor. Coos Bay provides deep draft access.

Habitats in the South Coast Basin are particularly diverse and include forest, grass and shrub lands, coastal redwood forest, and most of the world's habitat for Port Orford cedar. Flat, coastal terraces, extend from Bandon south to Cape Blanco and support unique shore pine forests, wetlands and cranberry bogs. Further south, the coastal headlands and off-shore rocks are among the most spectacular and pristine in Oregon.

Streams provide habitat for a wide variety of cold-water species including Coho and spring and fall Chinook salmon, summer and winter steelhead, multiple species of residential trout, amphibians, and other fish including Pacific lamprey, green sturgeon, white sturgeon, speckled dace and prickly sculpin. The basin's estuaries provide habitat for marine mammals, birds and a wide variety of fish.

The South Coast Basin contains several areas identified by the Oregon Department of Fish and Wildlife as core areas for the recovery of coastal Coho salmon and is comprised of two discrete evolutionarily significant units. The northern portion of the South Coast Basin is part of the Oregon Coast Coho Evolutionarily Significant Unit and the southern portion is part of the Southern Oregon/Northern California Evolutionarily Significant Unit. Coho salmon and green sturgeon are listed as threatened under the Endangered Species Act. Other species of concern include Pacific lamprey, steelhead, coastal cutthroat trout and Chinook salmon.

Forestry, ranching, agriculture, commercial and recreational fishing, and tourism drive the economy of communities in the basin. Flat marine terraces have largely been converted to cranberry or lily production. The Coos and Coquille valleys historically were large timber producers along with cattle and dairy industries. Commercial shellfish harvesting occurs in select South Coast Basin estuaries. Commercial and recreational fishing and boating have been an important economic resource for generations. The South Coast Basin also contains numerous lakes which provide fishing, boating, swimming and other recreational opportunities.

Table O-1: 2011 Land use and land cover for each subbasin in the South Coast.

Subbasin	Watershed Area (km2)	% Urban/Roads	% Forest	% Cultivated	% Range/Forest Disturbance	%Other
Chetco	1591.808	4.5	78.1	0.2	16.4	0.9
Coos	1864.833	6.6	58.7	0.8	27.7	6.1
Coquille	2737.364	5.1	58.4	3.8	30.2	2.5
Sixes	1214.349	4.4	64.1	1.9	25.4	4.2
Smith	235.132	1.3	62.0	0.0	36.7	0.0

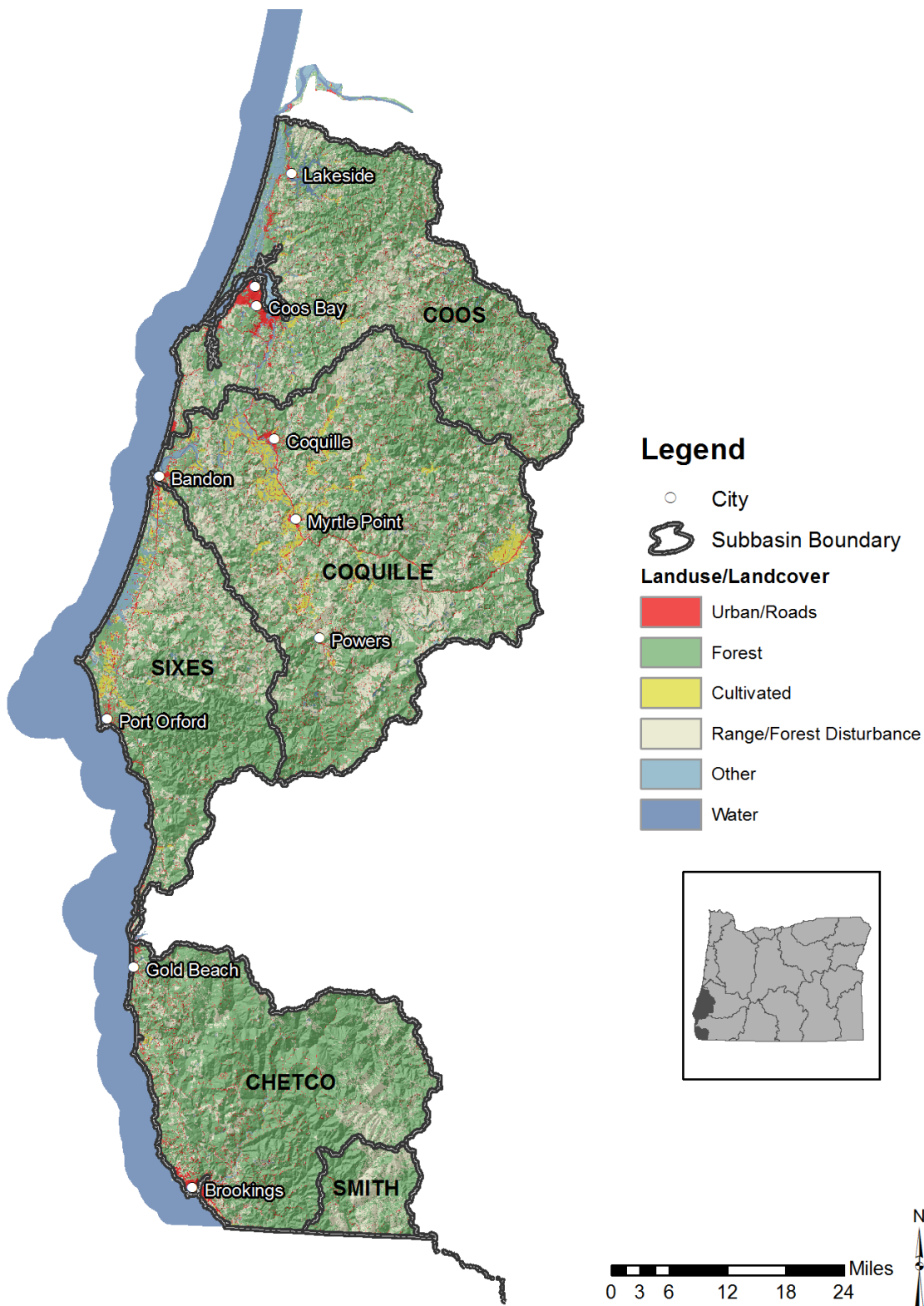


Figure O-1: Land use in the South Coast administrative basin.

1.1 Basin Contacts

Table O-2: Oregon DEQ basin contact.

Administrative Area	DEQ Basin Coordinator
South Coast Basin	Bryan Duggan: 541-269-2721 x234: duggan.bryan@deq.state.or.us
South Coast 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 O-3 identifies the number of South Coast Basin waterbody segments impaired by parameter from the 2012 Integrated Report and the number of segments with approved TMDLs. Sources: [ODEQ](#), [USEPA](#)

Table O-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
Aquatic Weeds Or Algae	2	3
Arsenic	4	0
Biocriteria	2	0
Biological Criteria	29	0
Chlorophyll a	3	2
Dieldrin	2	0
Dissolved Oxygen	36	1
E. Coli	28	0
Enterococcus	8	0
Fecal Coliform	50	0
Fish tissue, Mercury	2	0
Iron	4	0
pH	4	1
Phosphorus	0	1
Sedimentation	0	6
Temperature	115	4
Tissue - soft shell clam - arsenic	5	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 O-4 lists the TMDLs that have been approved in the South Coast Basin.

Table O-4: Approved TMDLs in the South Coast Basin and the impairments addressed by those TMDLs.

TMDL Document Name	Impairments Addressed
Coquille River & Estuary Water Quality Report TMDL	Dissolved Oxygen
Garrison Lake TMDL	Aesthetics and Algal Growth
Tenmile Lakes TMDL	Algae, Aquatic Weeds, Sedimentation
Upper South Fork Coquille TMDL and WQMP	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 five 319 projects active that reported project outputs and accomplishments to DEQ. Combined the projects have a total grant budget of \$67,081. Table O-5 describes the projects and the reported outputs.

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

Project Name	Grantee	Project Description	Reported Outputs
Coquille Stormwater Master Plan Update with Water Quality Implementation Plan	City of Coquille	City of Coquille TMDL WQIP development	The project was terminated in 2019 due to recipient's delaying action for additional funding. The grant funds for this project were re-assigned to the Coquille Mainstream Cold Water Refugia Monitoring Project and the South Fork Coquille River/Dement Creek Technical Assistance Project.
City of Mrytle Point TMDL Water Quality Implementation Plan	City of Mrytle Point	City of Mrytle Point TMDL WQIP development	The City has developed the RFP for contractor services in 2018, but has yet to hire a contractor to develop the WQIP document.
Coquille Mainstream Cold Water Refugia Monitoring Project	Coos Soil and Water Conservation District	Lower Coquille River tributary temperature monitoring	Coos SWCD made the project performance report available on 6/30/2019, which was compiled and processed the data collected in 2018. The SWCD has also amended the contract for additional funds of \$5,500 for 2020 monitoring.
North Fork Coquille Watershed Riparian Restoration and Knotweed Project	Coquille Watershed Association	Riparian Restoration Planning	Coquille Watershed Association has completed the grant requirements, conducted final outreach to partners and landowners, identified a local control strategy for knotweed in the NF Coquille, and continued to seek additional funding for riparian invasive species control and implementation.
South Fork Coquille River/Dement Creek Technical Assistance Project	Coquille Watershed Association	Watershed planning for Dement Creek through WQ and habitat assessment	Coquille Watershed Association continued landowner outreach and conducted watershed water quality field assessments and data analysis for Dement Creek project in SF Coquille River. The project received additional \$8,636 that was re-assigned 319 grant funds from the Coquille Stormwater Master Plan Update with Water Quality Implementation Plan.



Figure O-2: Coos SWCD's Caley Sowers checks on a temperature data logger in Alder Creek, Coquille River.



Figure O-3: Knotweed on steep slopes along middle Creek, NF Coquille River.



Figure O-4: New location of DEQ supported data logger in Dement Creek, South Fork Coquille River.

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 \$265,000. Table O-6 describes the projects and the reported outputs.

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

Project Name	Grantee	Project Description	Reported Outputs
2nd Street Green Street and Parking Lots and Brownfields	City of Coos Bay	The green parking lots project will implement low impact development with green infrastructure to improve management of stormwater runoff, improve water quality and reduce	In progress - loan signed for design only so that the city could bill for design and some loan requirements prior to

Project Name	Grantee	Project Description	Reported Outputs
Remediation and Land Revitalization		flooding downtown. The brownfield remediation of Engelwood School will reduce environmental contamination and safety risks, improve management of stormwater runoff, reduce floating debris during flooding events, improve water quality and protect waterways connected to Coos Bay.	construction. Loan will be amended to include construction at a later date.
South 4th Street Green Parking Lot	City of Coos Bay	The green parking lot project will implement low impact development with green infrastructure to improve management of stormwater runoff, improve water quality and reduce flooding downtown.	In progress - loan signed for design only so that the city could bill for design and some loan requirements prior to construction. Loan will be amended to include construction at a later date.

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 no nonpoint source related Drinking Water Source Protection program projects with reported outputs in the South Coast.

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.

Appendix O: South Coast Basin Report
2019 Oregon Nonpoint Source Pollution Program Annual Report

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 \$95,000. Table O-7 describes the projects and the reported outputs.

Table O-7: Drinking Water Providers Partnership projects and outputs for 2019.

Project Name	Grantee	Project Description	Reported Outputs
North Fork Coquille River - Woodward Creek	Coquille Watershed Association	The Coquille Watershed Association is working to protect and restore the municipal watershed of the City of Myrtle Point. The project will identify road segments on public and private lands for sediment reduction and invasive plant assessments within the Woodward Creek drainage. Through the inventory, they will identify and prioritize road improvement, drainage upgrades, road decommissioning, weed treatment, and riparian restoration projects. Funding will also be used to organize and lead coordination meetings between the partners and landowners to facilitate the future implementation of restoration projects identified this year.	In 2019 restoration work continued for three fish bearing streams. CWA held landowner meetings to plan out sediment proofing the bottom valley road (with the timber company and managers). In addition, boulder exclusion devices were installed and work continued on noxious weed and road surveys in the watershed (surveys will inform additional restoration actions). CWA also held several tours for partners in 2019. CWA applied for an OWEB grant for implementation (\$273k). Results expected 4/20.
Floras Creek Drinking Water Protection Project - Phase III	Curry Soil and Water Conservation District and the South Coast Watershed Council	The Floras Creek Drinking Water Protection Project is a multi-year partnership between the Curry Soil and Water Conservation District and the South Coast Watershed Council to protect and improve water quality and fisheries habitat within the water supply watershed of Langlois Water District. In 2019 DWPP funded the inventory of gullies and other sediment sources, the treatment of approximately 2.25 miles of high priority gullies, and surfacing of a road to decrease sediment delivery to the watershed.	This is an ongoing project that has received multiple years of funding from the DWPP. 2019 tasks included continued riparian enhancement through removal of invasives (e.g. English ivy on the mainstem of Floras Creek), site preparation and release; replacing section of non-functional riparian fence and preparation for interplanting; sediment abatement road inventory; and a small fish passage and sediment abatement road project. Work continued on developing project plans for restoration and abatement, and public outreach including a project tour.



Figure O-5: Restoration work in Langlois' drinking water source area included new riparian fence adjacent to Floras Creek. Photo Credit: Matt Swanson, Curry SWCD.



Figure O-6: Restoration site on Woodward Creek after Log Placement. Photo Credit: Melaney Dunn, Coquille Watershed Association.

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 19 OWEB funded projects completed in 2018 with a total cash and in-kind budget of \$2,041,743. The tables below summarize reported outputs for different project activities in each South Coast subbasin.

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

Table O-8: 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)	Fish Passage Non-crossing improvement (Number of treatments)
Coos	1	1
Sixes	2	NA

Table O-9: 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)
Coos	116
Coquille	28

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

Subbasin	Actual	Voluntary riparian tree retention (Acres)	Voluntary riparian tree retention (Miles)
Coquille		10.2	1.9

Table O-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 fencing (Length of treatment)
Coquille	0.1

Table O-12: 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)	Riparian vegetation planting (Area treated)	Riparian vegetation planting (Stream sides treated)
Coquille	NA	0.2	1
Sixes	0.3	2.6	2

Table O-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 erosion control (Acre)	Upland erosion control (Number of treatments)
Coos	0	NA
Sixes	68	39

Table O-14: 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)	Off-channel livestock or wildlife watering (Number of treatments)	Upland fencing (Acre)
Coos	3	NA	NA
Sixes	NA	1	0.2

Table O-15: Summary of OWEB grant funded upland projects completed in 2018, the most recent year data is available in the OWEB OWRI database.

Subbasin	Upland tree planting (Area treated)	Upland vegetation planting (Area treated)
Sixes	0.2	0.2

Table O-16: 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 vegetation planting (Area treated)
Chetco	2.5	2.5

Appendix P

Umatilla Basin Report

1. Basin Description

Three major river systems make up the Umatilla Basin: the Umatilla River (100 miles in length), the Walla Walla River (61 miles in length) and Willow Creek (79 miles in length). All three rivers flow from their headwaters in the Blue Mountains to the Columbia River. The Umatilla River drainage and the northern portion of the Walla Walla River drainage are mostly in Umatilla County. The southern portion of the Walla Walla River drainage is in Washington State. The Willow Creek drainage is mostly in Morrow County, the confluence with the Columbia River is in Gilliam County. These rivers support bull trout, Redband trout, Pacific lamprey, fall and spring Chinook salmon, Coho salmon and steelhead.

The Umatilla Basin is characterized by irrigated agriculture at lower elevations, with grazing and timber lands at higher elevations. Elevations within the basin range from less than 300 feet at the Columbia River, to above 6,000 feet at the highest peaks of the Blue Mountains. Agricultural land, both dryland and irrigated, comprise the major portion of the basin. Crops include onions, corn, dry and green peas, and potatoes. The basin also contains many fruit orchards (cherry, apple, peach, pear) and vineyards. In 1990 DEQ declared the Lower Umatilla Basin a Groundwater Management Area because nitrate-nitrogen concentrations in many area groundwater samples exceed the drinking water standards for nitrate (10 mg/l). The groundwater area covers the lower portions of the Umatilla and Willow Creek drainages.

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

Subbasin	Watershed Area (km2)	% Urban/Roads	% Forest	% Cultivated	% Range/Forest Disturbance	%Other
Middle Columbia-Lake Wallula	2032.952	5.2	0.2	49.5	44.2	1.0
Umatilla	6541.531	3.4	15.9	33.5	46.7	0.5
Walla Walla	1242.591	3.1	30.6	41.8	24.0	0.4
Willow	2246.543	2.0	5.6	27.9	63.8	0.7

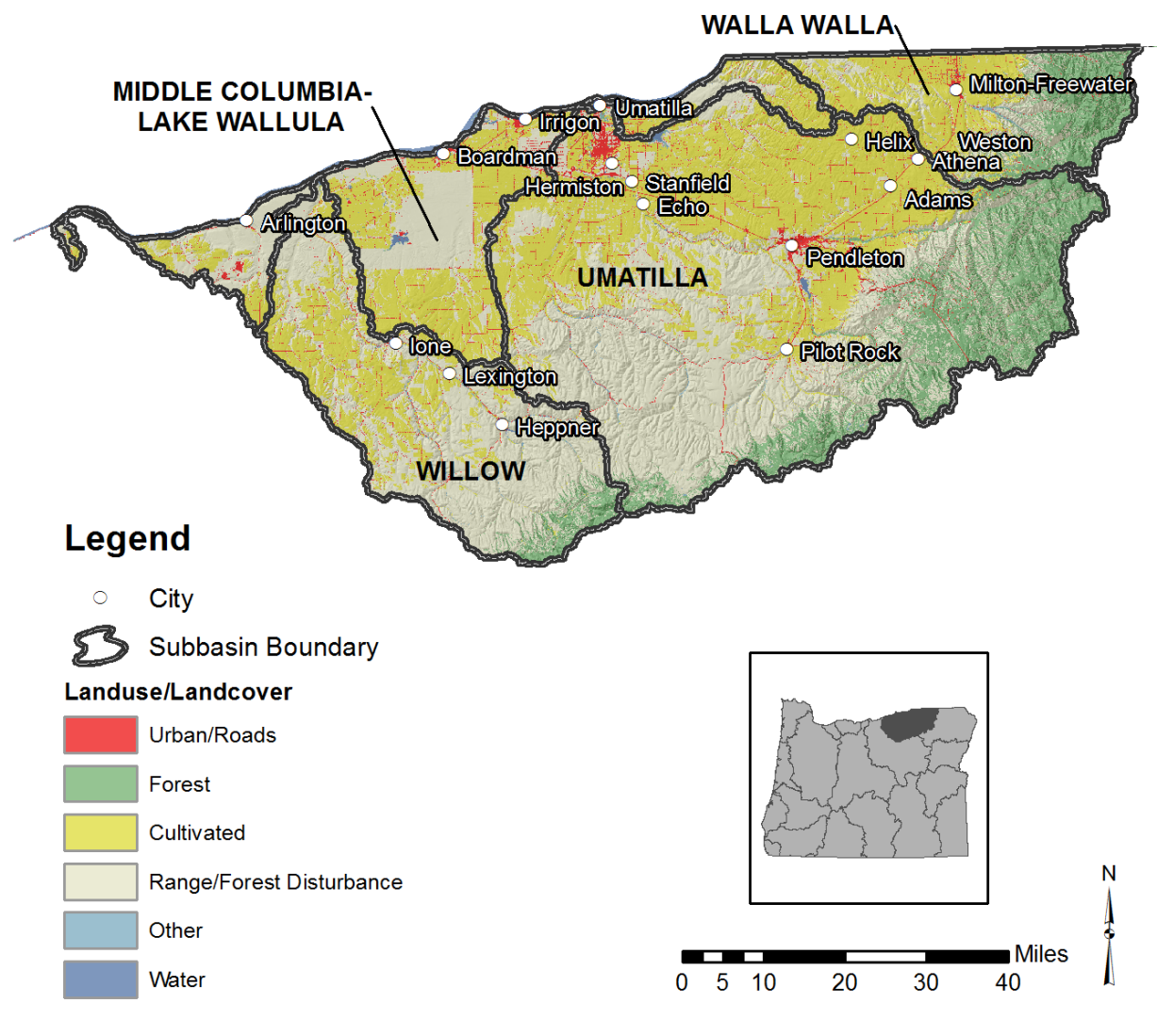


Figure P-1: Land use in the Umatilla administrative basin.

1.1 Basin Contacts

Table P-2: Oregon DEQ basin contact.

Administrative Area	DEQ Basin Coordinator
Umatilla Basin	Don Butcher: 541-278-4603: butcher.don@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 P-3 identifies the number of Umatilla Basin waterbody segments impaired by parameter from the 2012 Integrated Report and the number of segments with approved TMDLs. Sources: [ODEQ](#), [USEPA](#)

Table P-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	3
Aquatic Weeds Or Algae	1	3
Arsenic	1	0
Biological Criteria	2	0
Chlorpyrifos	5	0
Copper	1	0
Dioxin (2,3,7,8-TCDD)	0	6*
Dissolved Oxygen	10	0
E. Coli	3	0
Fecal Coliform	0	4
Fish tissue, Mercury	2	0
Guthion	2	0
Iron	10	0
Lead	2	0
Mercury	3	0
Nitrates	1	2
Parathion	1	0
pH	1	10
Polychlorinated Biphenyls (PCBs)	1*	0
Sedimentation	1	17
Temperature	1	28
Total Dissolved Gas	0	3*
Total Phosphorus	1	0
Turbidity	0	1

* Identified impairment only in Columbia River.

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 P-4 lists the TMDLs that have been approved in the Umatilla Basin.

Table P-4: Approved TMDLs in the Umatilla Basin and the impairments addressed by those TMDLs.

TMDL Document Name	Impairments Addressed
<u>Umatilla River Basin TMDL and WQMP</u>	Ammonia, Aquatic Weeds, Bacteria (water contact recreation), Nitrate, pH, Sedimentation, Temperature, Turbidity
<u>Walla Walla Subbasin Stream Temperature TMDL and WQMP</u>	Temperature
<u>Willow Creek Subbasin Temperature, pH and Bacteria TMDL and WQMP</u>	Bacteria (water contact recreation), 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.

Appendix P: Umatilla Basin Report
2019 Oregon Nonpoint Source Pollution Program Annual Report

In 2019, there were four 319 projects active that reported project outputs and accomplishments to DEQ. Combined the projects have a total grant budget of \$81,480. Table P-5 describes the projects and the reported outputs.

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

Project Name	Grantee	Project Description	Reported Outputs
Salmon Safe Certification in Peas/Wheat Agronomic Crop Rotation	OSU Extension Service - Umatilla	The Recipient will provide technical support for the dissemination and use of Salmon-Safe protocols for green peas and wheat in the Umatilla Basin, continue implementation of the information and education program designed to encourage participation in the Salmon-Safe IPM, and track enrollment and participation in the Salmon-Safe IPM.	This project completed in July 2019. Much of this project's work was completed prior to 2019. In 2019, the growers participating in the Salmon Safe project were audited. All five participants maintained their certification. The remaining project funding was distributed to collaborators for the adoption of the Salmon Safe program. Additionally, the pea list was appended in 2019.
Heat Source Water Temperature Modeling, Part 2	Walla Walla Basin Watershed Foundation	This project is a continuation of an earlier 319 project. The proposed Heat Source modelling project on the South Fork and Mainstem Walla Walla River will provide an updated watershed restoration and planning tool for the Walla Walla Subbasin. The Heat Source Model's ability to model the effect of various BMPs, vegetation types (shade and height), and stream complexity can be used to weight different restoration scenarios in cost/location vs. benefit analysis. The updated model will also have the direct benefit of providing a custom-fit, quantitative planning tool and will ensure that stream temperature and the TMDL compliance goals remain centerpiece to overall restoration planning in the Basin. Results from the updated model will be directly compared to the results produced from the original model scenarios from 2002 which will provide insight to the impacts of implemented projects post TMDL implementation.	The second part of this project (the current iteration) was just getting started in 2019. There are no project outputs to report at this time.
Water Quality Education and Outreach	Walla Walla Basin	The Recipient has been very active in education and outreach programs and activities in the Subbasin. In	In 2019, the WWBWC hosted a clean-up, a Wildlife Habitat Field Day for 5th grade

Appendix P: Umatilla Basin Report
2019 Oregon Nonpoint Source Pollution Program Annual Report

Project Name	Grantee	Project Description	Reported Outputs
	Watershed Foundation	order to continue to improve water quality in surface and ground waters in the Walla Walla Subbasin, continued support of this education and outreach is needed. This project will help to promote a greater local awareness of surface and groundwater issues, function, and how protection and restoration efforts can aid in restoring healthy hydrological and ecological systems is needed. Project work complements both the TMDL implementation and the PSP efforts. Grant funds will be used to develop new and continue existing educational and technical outreach programs promoting public awareness of water quality issues and their solutions within the Basin. Specific education and outreach activities may include Annual Council Projects Tours, Environmental Stewardship Volunteer Events, a place-based Environmental Education program (Milton-Freewater Unified School District), and Salmon in the classroom (Weston McEwen High School). Many of these educational activities address human-related stream heating associated with flow diminution and channel manipulation, including loss of riparian vegetation, and associated loading of sediment, nitrate, ammonia, bacteria, pesticides, and others. Both surface and groundwater resources will be addressed, along with the interconnectedness of these two water systems. It is projected that Project activities will reach more than 600 school-age students and more than 100 adults each year in the Umatilla and Walla Walla Basins. Activities will focus primarily in the Milton-Freewater area, but will also be implemented in	students, water quality sampling and hands-on salmon learning and stream release, and two Watershed Field Days where students planted riparian trees, built fences, and repaired roads to learn about nonpoint source pollution.

Appendix P: Umatilla Basin Report
2019 Oregon Nonpoint Source Pollution Program Annual Report

Project Name	Grantee	Project Description	Reported Outputs
		also other locations within the Subbasin.	
Couse Creek Watershed Assessment	Walla Walla Basin Watershed Foundation	<p>The Recipient will conduct a watershed hydrology assessment compiling available information on flow, water level(s), geology (as characterized by existing maps and well logs), geologic outcrop information (areas of visible bedrock), and other appropriate data. The Recipient will conduct instream habitat condition assessments/surveys on Couse Creek and appropriate tributary streams to identify reaches that have good instream components and identify potentials for protecting these areas. The Recipient will conduct upland condition surveys within the Couse Creek watershed to identify areas of possible sediment input using the Soil and Water Assessment Tool (SWAT to simulate the quality and quantity of surface and ground water and predict the environmental impact of land use, land management practices, and climate change. The Recipient will conduct a road condition/inventory for the Couse Creek Watershed using ArcGIS and the SWAT tool to model hillslope erosion. Road conditions and potential sediment delivery will be assessed using the Watershed Erosion Prediction Project model (WEPP:road) or similar process. The Recipient will conduct field surveys to document road conditions and verify GIS processes. The Recipient will investigate re-establishing floodplain connections either through restoration work or artificial means (e.g. managed aquifer recharge) where natural processes are not possible. The Recipient will compile a Draft Couse Creek Watershed Assessment and Action Plan Report for landowner, agency and partner review.</p>	<p>In 2019, water quality monitoring continued. WWBWC gathered historic flow and water level information, performed channel bed assessment, set up two continuous flow monitoring sites, and defined and surveyed the remaining habitat reaches.</p>

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 Umatilla.

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 no nonpoint source related Drinking Water Source Protection program projects with reported outputs in the Umatilla.

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 no active Drinking Water Providers Partnership projects with reported outputs in the Umatilla.

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 seven OWEB funded projects completed in 2018 with a total cash and in-kind budget of \$2,057,538. The tables below summarize reported outputs for different project activities in each Umatilla subbasin.

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

Table P-6: Summary of OWEB grant funded instream projects completed in 2018, the most recent year data is available in the OWEB OWRI database.

Subbasin	Engineered structures installed (Number of treatments)
Umatilla	15

Table P-7: 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)	Off-channel habitat created, protected, or reconnected (Feet)	Off-channel habitat created, protected, or reconnected (Number of treatments)
Umatilla	568	2776	4

Table P-8: 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 (Stream sides treated)
Umatilla	32.7	2

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

Subbasin	Irrigation system improvement (Acre)	Irrigation system improvement (Feet)
Umatilla	189	1640
Willow	290	NA

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

Subbasin	Off-channel livestock or wildlife watering (Number of treatments)
Umatilla	4
Willow	2

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

Subbasin	Wetland creation (Area treated)	Wetland restoration (Area treated)	Wetland vegetation planting (Area treated)
Umatilla	0	2.9	2.9

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 P-12: TMDL implementation activities reported in 2019 by Designated Management Agencies or third parties.

TMDL	DMA	Reported Actions
Willow Creek Subbasin TMDL	Umatilla National Forest	Began TMDL implementation planning.

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

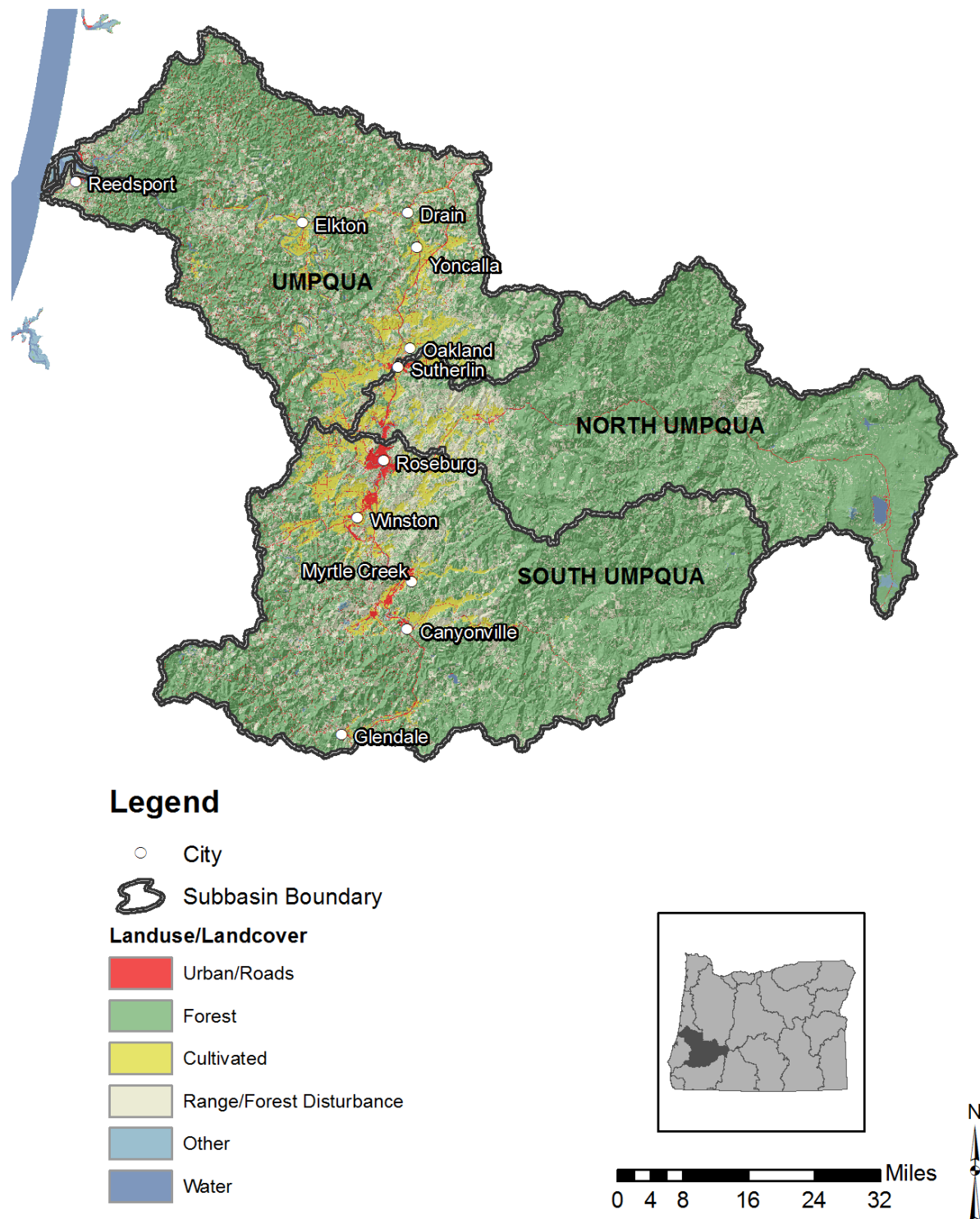


Figure Q-1: Land use in the Umpqua administrative basin.

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(l)). 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
		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.	report once the project is finished.
Steamboat Creek Roads: Sediment Abatement on Forest Roads. Phase II of Geomorphic Roads Analysis	Umpqua National Forest	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.	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.



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	Actual	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.

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 Willamette 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:

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- 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:

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- 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.

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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

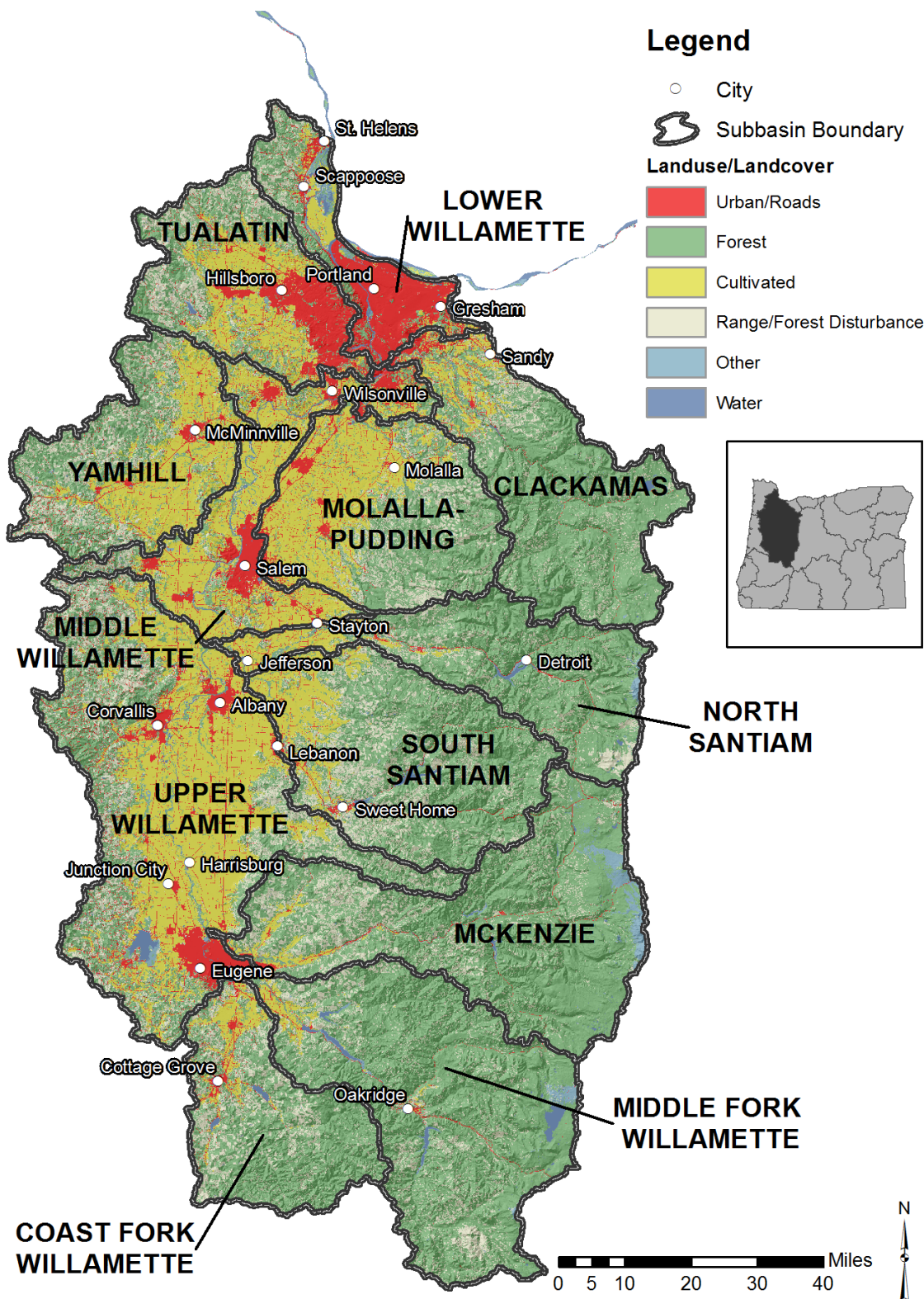


Figure R-1: Land use in the Willamette administrative basin.

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

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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(1)). 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.

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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 research 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

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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 geographic 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

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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

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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).

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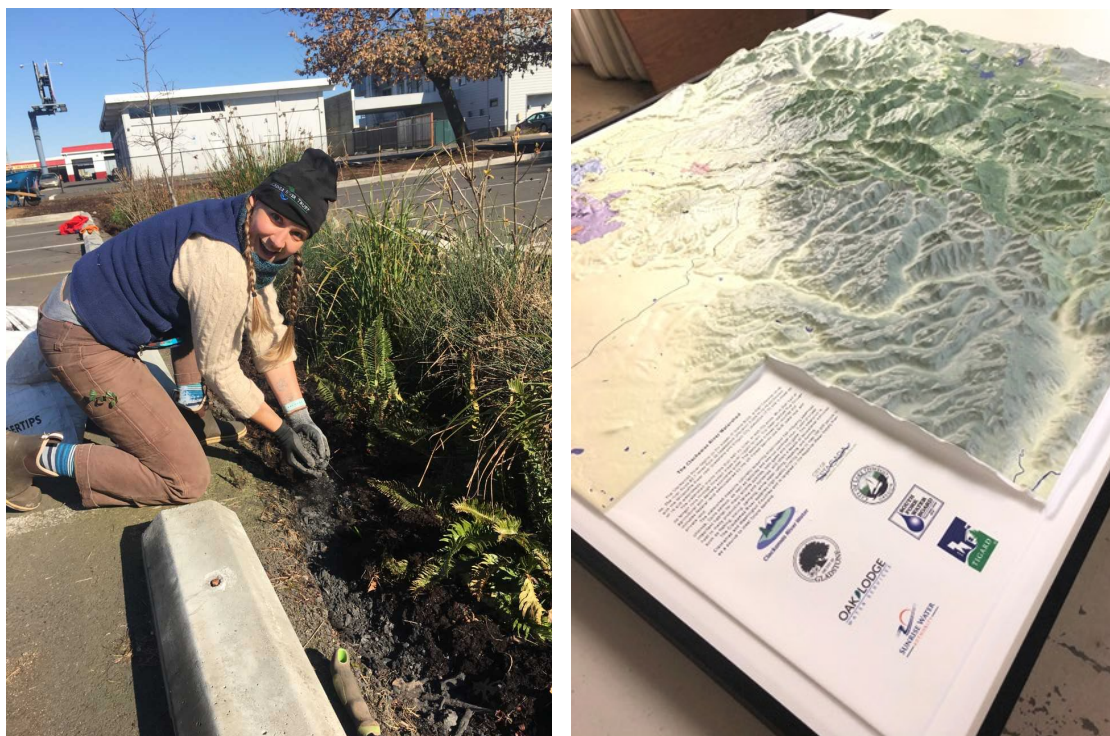


Figure R-4: (Left) Biochar is added to stormwater retrofit location involving removal of impervious area and treatment with new plantings. Photo Credit: Sarah Whitney, Long Tom Watershed Council. (Right) Custom relief map of the Clackamas drinking water source area for local education and outreach.

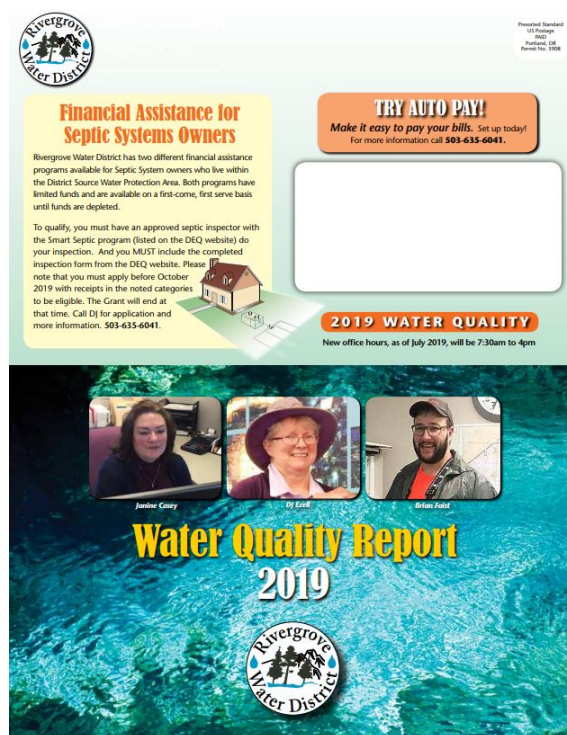


Figure R-5: Biochar is added to stormwater retrofit location involving removal of impervious area and treatment with new plantings. Photo Credit: Sarah Whitney, Long Tom Watershed Council.

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 conjunction 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)
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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-establish 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

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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.

Appendix R: Willamette Basin Report
2019 Oregon Nonpoint Source Pollution Program Annual Report

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

Appendix R: Willamette Basin Report
2019 Oregon Nonpoint Source Pollution Program Annual Report

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

Appendix R: Willamette Basin Report
 2019 Oregon Nonpoint Source Pollution Program Annual Report

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.

Appendix S.

2019 Proposal Project Priorities

Please Note: The identification of priority basins (as listed below) does not exclude the submission of proposals for work outside these basins. Exceptional proposals for projects that will enhance, restore and/or protect water quality may be considered.

Eastern Region Project Priorities: TMDLs/303(d) development and implementation and watershed approach implementation

Basin / Priority Activity	Specific Location	Status: TMDLs/ 303(d) and Watershed Approach	Water Quality Problem	Project Need
Eastern Region Improved water quality	Region Wide		All	Targeted projects are those that will support other state or federal water quality-related work in the area (agricultural strategic implementation area project work, place-based planning efforts, habitat restoration efforts, water quality and/or implementation monitoring, etc.)
Malheur River Basin Projects that will enhance, restore, protect water quality	Malheur River Basin	TMDLs completed for chlorophyll (total phosphorus load allocation), bacteria and temperature (2010)	All	<p>For all three priority basins (Malheur River Basin, Mid-Columbia/Hood River Basin, or Umatilla River Basin) projects that incorporate more of the following components will score higher:</p> <ul style="list-style-type: none"> • Will help to improve water quality (directly or indirectly) • Will effectively leverage other available partner funding • Are correlated with and/or adjacent to other water quality work (spatial continuity) • Will help to extend ongoing beneficial project work (temporal continuity) • Support other water quality-related work in the area (ie: agricultural strategic implementation area project work, place-based planning efforts, habitat restoration efforts, water quality, drinking water protection and/or implementation monitoring, etc.)
Mid-Columbia Hood River Basin Projects that will enhance, restore, protect water quality	Western Hood Subbasin, Miles Creeks Subbasin	TMDLs completed for temperature	All	
Umatilla River Basin Projects that will enhance, restore, protect	Umatilla, Walla Walla and Willow Subbasins	TMDLs completed for temperature, sediment, aquatic weeds, algae and pH, nitrate, ammonia and bacteria (Umatilla); temperature (Walla Walla); and temperature, pH, bacteria (Willow Creek)	All	

**Eastern Region Project Priorities:
TMDLs/303(d) development and implementation and watershed
approach implementation**

Basin / Priority Activity	Specific Location	Status: TMDLs/ 303(d) and Watershed Approach	Water Quality Problem	Project Need
water quality		Watershed Assessments in progress		

Eastern Region Project Priorities: Groundwater Management Areas

Basin / Priority Activity	Specific Location	Status: GWMA	Water Quality Problem	Project Need
Lower Umatilla Basin Ground Water Management Area (LUBGWMA) Action Plan Nitrate Reduction	Umatilla Subbasin Middle Columbia Basin	Lower Umatilla Basin GWMA established in 1990	Nitrate-Nitrogen	Targeted projects include: <ul style="list-style-type: none"> • Research and development of activities or products that will reduce nitrate and other pollutant loading to groundwater.
Northern Malheur County Ground Water Management Area (NMCGWMA) Nitrate Reduction	Lower Malheur River Subbasin	Northern Malheur County GWMA established in 1989	Nitrate-Nitrogen	Targeted projects include: <ul style="list-style-type: none"> • Research and development of activities or products that will reduce nitrate and other pollutant loading to groundwater.

Eastern Region Project Priorities: Drinking water source protection

Basin/Priority Activity	Specific Location	Status: DWSP	Water Quality Problem	Project Need
All ER Basins	Public water supply wells that have significant nitrate risks.	Source Water Assessment is complete.	Nitrate	Targeted projects for reducing nitrogen loading to groundwater within the 10-year time-of-travel recharge zone for public water supply wells that have significant nitrate risks. (> 50% safe drinking water MCL levels). Activities that supplement GWMA or other related implementation activities will be given priority.
All ER Basins: Public drinking water source areas (see http://www.oregon.gov/deq/wq/programs/Pages/DWP-Maps.aspx for locations)	Drinking water source areas with focus on riparian areas/sensitive areas affecting intakes and sensitive areas contributing to groundwater wells.	Updated source water assessments complete. GIS and other technical assistance available.	Sediment, bacteria, turbidity, nutrients, harmful algae blooms, pesticides, and other toxins.	Projects that address higher risk non-point pollution sources as documented in DEQ/OHA Source Water Assessments or public water system Drinking Water Protection Plans. Priority will be given to projects that include multiple stakeholders and address drinking water threats, as well as impairment of other beneficial uses.

Western Region Project Priorities: TMDLs/303(d) development and implementation

Western Region Basin/ Priority Activity	Specific Location	Status: TMDLs/303(d)	Water Quality Problem	Project Need
Rogue Basin	Upper Rogue Middle Rogue Lower Rogue Rogue Applegate Illinois, Bear Creek	TMDLs Adopted and 303(d) listings	Temperature Bacteria Nutrients and/or Sedimentation Mercury Cyanobacteria Bacteria-shellfish turbidity	<ul style="list-style-type: none"> • Implementation of efforts identified in Water Quality Implementation Plans (WQIP) or Water Quality Management Plans (WQMP) • TMDL implementation and effectiveness monitoring
Willamette River Basin	Middle and Upper Willamette, including subbasins in Table 3.	TMDL Development and Implementation, 303(d) listed, Drinking Water Source areas, Southern Willamette Valley GWMA	Beneficial use impairments due to: Bacteria Dissolved Oxygen Iron Pesticides(Legacy & Current) Mercury Nutrients: Phosphorous, and Nitrogen as Nitrate and Ammonia Temperature	<ul style="list-style-type: none"> • Partnerships within the same subbasin that coordinate to implement best management practices for improving the quality of stormwater runoff, and / or • Focus on reducing water quality problems to meet beneficial uses. • Priority will be given to projects that address both impaired surface waters and public drinking water source areas.
Mid-Coast Basin Assessment and Pollutant Source Characterization Agricultural BMP Implementation: Riparian Restoration, Nutrient Reduction, Fine Sediment Reduction	Siletz-Yaquina and Siuslaw subbasins	Section 303(d) listings or documented impairments; TMDLs being developed	Beneficial use impairments due to bacteria, elevated temperature, reduced dissolved oxygen levels & fine sediment or turbidity	<ul style="list-style-type: none"> • Water quality monitoring, land condition assessment (riparian, bank condition, upland and roads) and evaluation of current management practices to better quantify sources of nonpoint source (NPS) pollutant loading, characterize trends and assist with prioritization of sites for best management practices (BMP) implementation; • BMP implementation to improve riparian conditions towards and/or reduce nonpoint source pollution;

				<ul style="list-style-type: none"> • Development and implementation of fine sediment reduction projects to reduce turbidity and fine sediment delivery on 303(d) listed streams and tributaries and streams with evidence of impairments. <p>Projects within public drinking water source areas will receive higher priority.</p> <p>Projects coordinated with and/or adjacent to other NPS assessment or pollution reduction projects will be given priority.</p>
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Western Region Basin/ Priority Activity	Specific Location	Status: TMDLs/303(d)	Water Quality Problem	Project Need
South Coast Basin Coquille Subbasin Urban Water Quality Implementation Planning	Cities of Bandon, Coquille, Myrtle Point, and Powers.	TMDL and WQMP are near completion (2019) 303d listed Bacteria, temperature, dissolved oxygen, pH, chlorophyll a, algae (HABS), biological criteria.	Elevated bacteria, nutrient and thermal loads	DEQ seeks proposals from Coquille Subbasin cities to conduct Water Quality Implementation Planning. Upon approval of the Coquille TMDL in 2019, DEQ will identify Coquille Sub-basin cities as Designated Management Agencies. As DMAs these cities will be required to develop plans describing how properties and stormwater facilities will be managed to control bacteria, nutrient and thermal loading to surface waters. These plans must identify what strategies will be implemented, timelines for implementation, and measurable milestones. Stormwater management measures may include public education and involvement, illicit discharge control, construction and post construction runoff control and pollution prevention. WQIPs developed by these small coastal communities will serve as examples for other communities facing the same task. Cities are encouraged to partner during plan development as the required components will be common to all four cities.
South Coast Basin Coquille Subbasin Actions that lead to impairment pollutant load reductions.	AgWQMP focus areas, direct tributaries to the Coquille River and public drinking water source areas	TMDLs Adopted and 303(d) listings sedimentation, phosphorus and aquatic weeds		DEQ seeks proposals which implement or support the implementation of projects designed to reduce bacteria, nutrient and thermal loading. Projects in this category may involve action planning and project development and/or implementation.
South Coast Basin Tenmile Lakes Subbasin Actions that lead to impairment	Cities, Counties, and agricultural areas in the Tenmile Lakes subbasin		Elevated sediment and phosphorus loads	Implementation of efforts identified in Water Quality Implementation Plans (WQIP) or Water Quality Management Plans (WQMP) TMDL implementation planning and adaptive management activities, including code/ordinance review, particularly targeting post construction stormwater management and riparian buffers

pollutant load reductions and implementation of WQIP				Targeted projects that would: lead to reductions in sediment and nutrient load reductions, wetland protection and restoration, and riparian protection and restoration.
Umpqua Basin: Water Quality Implementation Plan (WQIP) Development & Revision	Land use under local government jurisdiction	TMDLs Issued	Temperature, bacteria, nutrients and dissolved oxygen impairments	Technical assistance to local government Designated Management Agencies (DMAs) - small municipalities and Douglas County - for WQIP development, revision and implementation for all impairments addressed in the Umpqua Basin TMDLs relevant to each DMA's jurisdiction. Projects involving multiple DMAs will receive higher priority. Planning areas within public drinking water source areas will receive higher priority.
Midcoast Basin South Coast Basin: Coquille Sub-basin Umpqua Basin: South Umpqua Sub-basin	Public drinking water source areas	Updated source water assessments complete. GIS and other technical assistance available.	Sediment, bacteria, turbidity, nutrients, harmful algae blooms, pesticides, and other toxins.	Projects that address higher risk non-point pollution sources as documented in DEQ/OHA Source Water Assessments or public water system Drinking Water Protection Plans. Priority will be given to projects that include multiple stakeholders and address drinking water threats, as well as impairment of other beneficial uses.

**Northwest Region Project Priorities:
TMDLs/303(d) development and implementation watershed approach
implementation**

Basin/ Priority Activity	Specific Location	Status: TMDLs/303(d)	Water Quality Problem	Project Need
Lower Willamette Subbasins/ TMDL Implemen- tation	Clackamas, Lower Willamette, Molalla, Tualatin and tributaries	TMDLs completed http://www.oregon.gov/deq/wq/tmdls/Pages/TMDLs-Willamette-Basin.aspx	Temperature Bacteria Mercury Dissolved Oxygen Nutrients (phosphorus) Toxics (including pesticides) Algae Biological criteria	Riparian and in-channel restoration (e.g. native planting, erosion control, large wood placement) Toxics (including pesticides) reduction Nutrient reduction , including reduction from septic systems Innovative stormwater planning, tools and projects Agriculture practices that reduce erosion, runoff, riparian degradation Surface and groundwater conservation projects TMDL implementation planning and adaptive management, including code/ordinance review, particularly stormwater management and riparian buffers Effectiveness monitoring of restoration/pollution reduction projects or TMDL implementation strategies Projects within public drinking water source areas may receive additional consideration for addressing this beneficial use
Sandy Basin		TMDLs completed http://www.oregon.gov/deq/wq/tmdls/Pages/TMDLs-Sandy-Basin.aspx	Temperature Bacteria Toxics Biological criteria	Riparian an in-channel restoration (e.g. native planting, erosion control, large wood placement) Toxics (including pesticides) reduction Nutrient reduction, including reduction from septic systems Innovative stormwater planning, tools and projects Agriculture practices that reduce erosion, runoff, riparian degradation TMDL implementation planning and adaptive management, including code/ordinance review, particularly targeting stormwater management and riparian buffers

Northwest Region Project Priorities: TMDLs/303(d) development and implementation watershed approach implementation

Basin/ Priority Activity	Specific Location	Status: TMDLs/303(d)	Water Quality Problem	Project Need
				Effectiveness of restoration/pollution reduction projects or TMDL implementation strategies Projects within public drinking water source areas may receive additional consideration for addressing this beneficial use
North Coast, Tillamook Bay/TMDL Implementation		TMDLs completed (temperature, bacteria) http://www.oregon.gov/deq/wq/tmdl/Pages/TMDLs-Basin-N-Coast.aspx TMDLs in progress (dissolved oxygen)	Temperature Bacteria Dissolved Oxygen	Riparian and in-channel restoration (e.g. native planting, erosion control, large wood placement). Agriculture BMPs (includes fencing & digester projects) Innovative stormwater planning, tools and projects Projects within public drinking water source areas may receive additional consideration for addressing this beneficial use

Northwest Region Project Priorities: Drinking water source protection

Basin/Priority Activity	Specific Location	Status: DWSP	Water Quality Problem	Project Need
All NWR Basins: Public drinking water source areas (see http://www.oregon.gov/deq/wq/programs/Pages/DWP-Maps.aspx for locations)	Drinking water source areas with focus on riparian areas/sensitive areas affecting intakes and sensitive areas contributing to groundwater wells.	Updated source water assessments complete. GIS and other technical assistance available	Sediment, bacteria, turbidity, nutrients, harmful algae blooms, pesticides, and other toxins.	Projects that address higher risk non-point pollution sources as documented in DEQ/OHA Source Water Assessments or public water system Drinking Water Protection Plans. Priority will be given to projects that include multiple stakeholders and address drinking water threats, as well as impairment of other beneficial uses.

Statewide project priorities

Basin / Priority Activity	Specific Location	Status: TMDLs/ 303(d) and Watershed Approach	Water Quality Problem	Project Need
Current and past National Water Quality Initiative Watersheds/ Monitoring	Brandy Creek (Willamette/ Molalla-Pudding), Willow Creek (Middle Snake-Boise/ Willow), Fifteenmile Creek (Middle Columbia/ Middle Columbia-Hood), and Lost River (Klamath/Lost)	Category 3 and 5 (303-d) for sedimentation in Middle Columbia – Hood, TMDLs developed for other parameters of interest in other NWQI watersheds.	Temperature, Bacteria, Dissolved Oxygen, Nutrients, Toxics, Algae, pH, Ammonia toxicity, Sedimentation	NRCS and EPA launched the NWQI (national water quality initiative) to reduce NPS pollution related to agriculture in high priority watersheds. DEQ is directed by EPA to assess the impact of conservation practices on water quality. Monitoring projects with clear goals and objectives with methods, as well as strong local partnerships will be given priority.

Basin / Priority Activity	Water Quality Problem	Project Need
Statewide Ground and canopy/surface elevation data collection		Targeted collection and production of high resolution surface elevation models using orthoimagery and Dense Image Matching (DIM), or Light Detection and Ranging (LiDAR) collected and produced consistent with the USGS 3DEP standards or those used by the Oregon LiDAR Consortium.
Lakes	Nutrients, Algae, Invasive weeds, pH	Invasive weed and algae prevention/education efforts Non-pesticide invasive weed control Water quality, phytoplankton, and plankton project effectiveness monitoring
Public drinking water source areas	Sediment, bacteria, turbidity, nutrients, harmful algae blooms, pesticides, and other toxins.	Projects that address higher risk non-point pollution sources as documented in DEQ/OHA Source Water Assessments or public water system Drinking Water Protection Plans. Priority will be given to projects that include multiple stakeholders and address drinking water threats, as well as impairment of other beneficial uses.