Oregon Nonpoint Source Pollution Program Annual Report for 2020

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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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Table of Contents

List of Tables

List of Figures

Executive Summary

The year 2020 saw many efforts in Oregon's watersheds focused on restoring and protecting water quality from nonpoint source impacts thanks to the funds provided by the Clean Water Act Section 319(h). 319 funds were critical in Oregon's work to improve pesticide management and ensure the implementation of best management practices on forest-, farm- and rangelands across the state while providing valuable education and data to all Oregonians.

The Oregon Nonpoint Source Pollution Program 2020 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 (EPA) 2014 Nonpoint Source Program and Grant Guidelines.

The report summarizes the nonpoint source activities implemented by the state during 2020 and highlights the progress Oregon is making toward meeting the challenges presented by nonpoint source impairments to water quality such as temperature increases, dissolved oxygen reductions, sedimentation and bacteria loadings, which account for approximately 3374 out of 5212 impairments (65%) of current impaired waters listings in the state. The report also includes updates on milestones, implementation targets and annual reporting requirements identified in the 2014 Oregon Nonpoint Source Management Program Plan and the 2020-2022 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 2020-2022 Performance Partnership Agreement have identified 88 nonpoint source program related actions. Sixty one of those actions or milestones were scheduled to be ongoing or completed in calendar year 2020. DEQ completed 55 (or 90%) of the 61 action milestones identified to be completed in 2020. Three of the milestones completed in 2020 were accomplished earlier than scheduled.

DEQ actions not fully meeting scheduled milestones include:

- 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. The plan is expected to be completed by the end of 2021.
- Develop TMDLs and WQMPs in accordance with 303(d) list schedule. Development is in progress.
- Revising the DEQ/Oregon Department of Forestry Memorandum Of Agreement. Revision is underway and expected in second half of 2021.
- Select reference sites east of the Cascade Range in Oregon and establish revised thresholds for chemical and habitat stressors and biological metrics statewide.
- Completion of the BLM and DEQ mid-term status report agreed upon in the DEQ/BLM MOU. The mid-term report was delayed due to workload and staff resources diverted to wildfire response. Staff will work to get the mid-term report done in 2021,
- 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; 7/16/2018) and as described in the Governor's Natural Resource Office letter (2/10/2016).

Due to limited program resources, some of DEQ's key vacancies continue to remain open in 2020. The 319 workload was redistributed to existing staff in order to meet deadlines in a more timely and efficient manner. Additionally, critical public health and wildfire events were significant factors in the distribution of workload and disruption of process during the year of 2020. Protocols had to be adjusted to maintain monitoring schedules, meeting formats, public outreach, emergency response, and many more important agency functions for the safety of state employees and the public.

DEQ's TMDL program dedicated significant resources in 2020 to revising multiple temperature TMDLs that were issued by DEQ and approved by EPA between 2004 and 2010. DEQ is under a court order to update and replace these temperature TMDLs to make them consistent with the current temperature standards. These TMDLs must be updated because they were based, in part on the Natural Conditions Criterion, a section of the temperature standard that was subject to litigation and has since been disapproved by EPA.

Some significant activities and actions accomplished in 2020 include:

- EPA promulgated a federal aluminum criterion for Oregon in December March 2020. The new criterion will become effective April 19, 2021.
- DEQ finalized reference (least disturbed by human activities) screening procedures that allow us to apply screening thresholds equally across the entire state. DEQ partnered with Utah State University's National Aquatic Monitoring Center to examine study sites from other major federal partners (USFS, BLM) and expand our coverage across the state. The final result of this work is a much improved reference network, with more than 300 reference sites statewide.
- DEQ migrated all macroinvertebrate assemblage data into our Agency-controlled AWQMS database. This was a large effort and represents a significant improvement in the security of our biological data, as well as providing the public access to an important component of our monitoring data.
- In March of 2020, DEQ completed the Cold Water Refuge plan for the lower Willamette River and submitted it to NOAA's National Marine Fisheries Service (NMFS) and EPA. This was 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 began work on this plan in late 2017.
- DEQ adopted a rule that establishes a multiple discharger variance for methylmercury for point source dischargers in the Willamette Basin in January 2020. 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.
- The 2018/2020 Integrated Report was submitted to EPA in April 2020 and approved by EPA in November 2020. For the first time, DEQ released the report as an interactive map tool, story map, and online database. 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 began improvements to its 2022 Assessment Methodology in the second quarter of 2020 and released its draft methodology for

public comment in December 2020. Water Quality Assessment staff anticipate finalizing the methodology in the second quarter of 2021.

- In 2020, DEQ finalized and published the 2019 Water Quality Status & Trends Report (WQS&T). 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.
- As of June 30, 2020, 319 community water systems (36 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 2.97 million Oregonians, which accounts for 85% of Oregonians served by community water systems.
- The Drinking Water Protection Program (DWPP) 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. In 2020, DEQ added additional information on erosion susceptibility to coastal water systems and developed code to assist OHA in completing assessments for the remaining 500 public water systems using groundwater. DEQ staff used the information from USWAs to assist small PWSs with planning and source water protection activities which often address non-point sources of pollution.
- DWPP responded to major wildfire events in 2020, particularly those fires that began or accelerated in September 2020 and provided technical and scientific support and geographic information system analyses to emergency responders, public water systems, DEQ staff and management, and other state agencies. DWPP provided information and analysis to Cultural and Natural Resources Recovery Task Force, co-convened by DEQ, Oregon Department of Forestry, and Oregon Watershed Enhancement Board. Staffed the federal and state Erosion Threat Assessment and Reduction Team for evaluating post-fire threats to drinking water sources and water quality, treatment plants, and distribution systems. Educated state and federal agencies and managers on content and implications of ETART Drinking Water report. Coordinated with and assisted state agencies, watershed councils, public water systems, and others on implementation of the report findings and recommendations and other watershed recovery efforts.
- DEQ Basin Coordinators responded to major wildfire events by providing field reconnaissance, on the ground surveys, assistance with grant applications, etc. to help local entities mitigate the effects and recover from the damage.
- In 2020, DEQ's Clean Water State Revolving Fund loan program obligated $16,345,423 toward 13 nonpoint source pollution control projects. The program completed one project, executed three

new loans for three new projects and funded one new project through an existing loan for a total of four new active projects in calendar year 2020. The fund increased the total number of active nonpoint source projects by two since 2019, which continues an increasing trend of the number of nonpoint source projects funded by the program annually over the past three years.

- 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 funding any on-the-ground project with Section 319 watershed project funds. To comply with the grant requirement a "9-Key Elements checklist" is 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 planning 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. During 2020 DEQ staff completed and approved the following 9-Key Elements checklists:
    - McKenzie Subbasin (17090004) for temperature
    - North Santiam Subbasin (17090005) for temperature
    - Pudding River Watersheds (17090005, 1709000903, 1709000905, 170900090108, 170900090109, 170900090110) for Dichlorodiphenyltrichloroethane (DDT), Dieldrin, Chlordane, and Total Suspended Solids
- In 2020, the dissolved oxygen and bacteria (E. coli) TMDLs for the Upper Yaquina River completed final QUAL-2kw model calibration, model sensitivity analyses, and determination of loading capacity. Wasteload and load allocations were developed and refined for the point source and NPS sectors. Load duration bacteria loading capacity and allocations are being revised based on extensive review of applicable criteria and analytical approaches. DEQ identified minor revisions to the spatial extent to address methodology used in the 2018/2020 Integrated Report. These TMDLs are scheduled to be released for public comment in the fourth quarter of calendar year 2021.
- During 2020, temperature TMDL replacement work was focused on development of modeling Quality Assurance Project Plans (QAPPs), completing a data solicitation, mapping of DMAs, and developing a series of tools that will streamline various TMDL tasks. Modeling QAPPs provide general descriptions of the technical work to be performed to support TMDLs. The QAPPs ensure that the technical approach is scientifically valid and defensible. Data received during the solicitation will be used for filling in key data gaps and supporting the TMDL analysis in a number of ways including characterizing the seasonal variation over both spatial and temporal scales; determining the number of excursions to the temperature water quality standards; the magnitude and duration of those excursions, calculating the TMDL excess load and required load reduction; and support updates to some of the temperature models.
- DEQ finalized its agency-wide "Focus List" of priority toxic chemicals. This 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.
- In 2020, DEQ programs began developing policies and guidance related to the assessment, cleanup and disposal of PFAS materials and waste. The Oregon Health Authority, in consultation with DEQ, developed draft oral reference dose concentrations and drinking water health advisory levels for 4 PFAS compounds. These numerical values will be finalized in 2021, and can be used for fish consumption advisories and cleanup action levels.

In 2020 Oregon remained committed to its work to restore and protect hydrologic systems from nonpoint source pollution while addressing the unique challenges of a global pandemic and severe wildfires. The Department of Environmental Quality continues this commitment by seeking innovation and cooperation where possible and supporting community-based methods to achieve program goals. To ensure the success of these efforts DEQ continues to develop and maintain its essential relationships and engagement with tribal nations and local and state partners on water quality protection, restoration, implementation of TMDLs, and monitoring of Oregon's waters. This collaboration allows the state to reach program goals by identifying emerging issues, understanding water quality status and trends, and informing management activities that will restore water quality and beneficial uses to water bodies across Oregon.

1. Introduction

This Oregon Nonpoint Source Pollution Program 2020 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 *and* provides a summary of activities implemented by the state during calendar year 2020 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 Oregon Nonpoint Source Management Program Plan and in the 2020-2022 Performance Partnership Agreement between Oregon DEQ and EPA. Note that the 2018-2020 Performance Partnership Agreement ended in June of 2020. All the actions in scheduled to occur in 2020 are also included in the 2020-2022 agreement. We are therefore reporting the status of these actions using the current Performance Partnership Agreement milestones and ID numbers. Prior to finalization of the next five-year Plan (2020-2024), DEQ has continued implementation on the Nonpoint Source Program in 2020 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 statues 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 in order 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 2014 Plan is also informed by the 2020-2022 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.

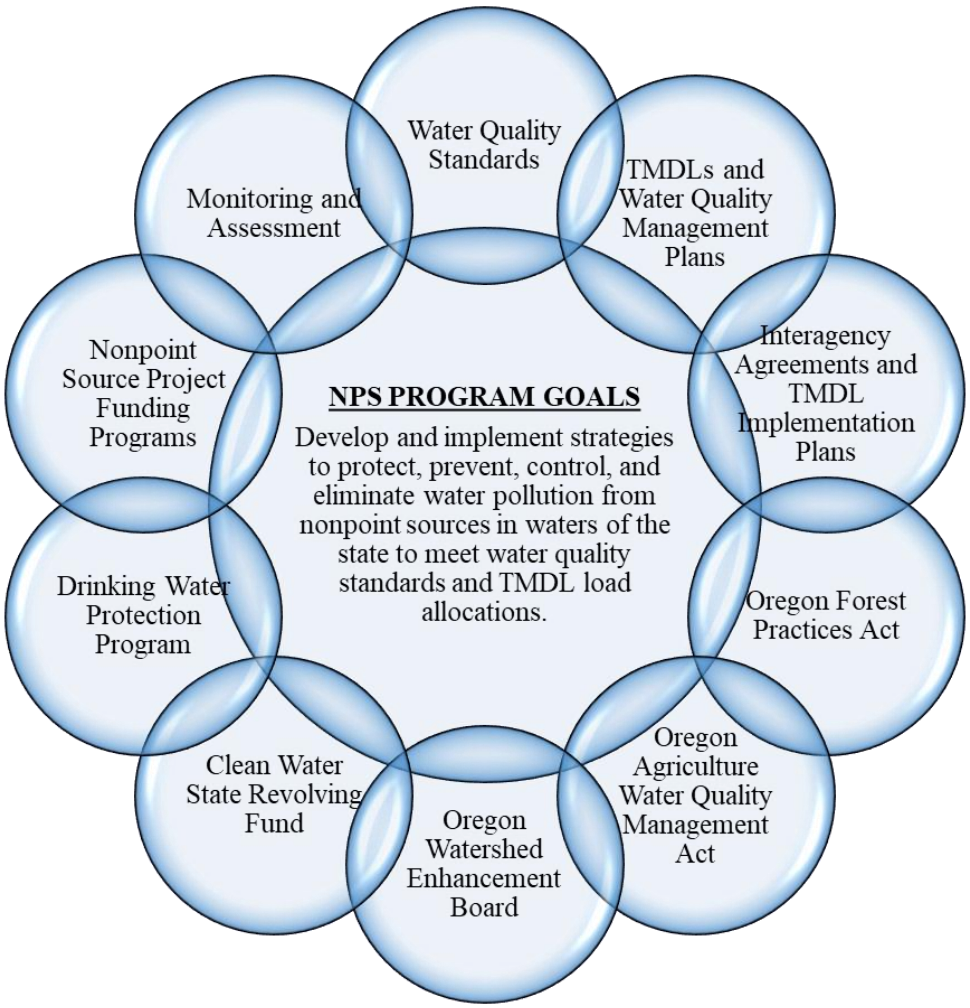

Figure 1. Representation of Oregon's Nonpoint Source Program as a diverse, interlined set of programs.

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 life, wildlife habitat, recreation and irrigation. This is accomplished by identifying the most sensitive beneficial use and establishing the water quality level or target for pollutants that is protective of that use. Establishing protective water quality standards for Oregon's waters 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. Monitoring and assessment is important for these Programs because they are water quality outcome based for the

restoration and protection of designated uses and achieve water quality standards. Oregon DEQ conducts both routine ambient monitoring and special studies such as toxics monitoring, groundwater monitoring, biological monitoring, and pesticide monitoring. In addition, DEQ's Volunteer Monitoring Program supports the collection of water quality monitoring data from third parties such as local watershed councils and Soil and Water Conservation Districts. This program provides technical guidance on monitoring and maintains a loan program for water quality monitoring equipment. From this assistance third parties can help identify and address the state's water quality problems. Besides being used to support local water quality awareness and management, data collected by third parties is submitted to DEQ and added to DEQ's monitoring dataset.

Monitoring data is used in the nonpoint source program tor understand statewide water quality trends in major rivers and streams, identify and characterize toxic contaminants in water, support the development of new or revised water quality standards, identify impaired beneficial uses and waterbodies, and respond 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 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 non-federal forestlands is administered by the Oregon Department of Forestry (ODF) through the Oregon Forest Practices Act (FPA). ODF has jurisdiction over nonpoint source water quality regulation on non-federal forestlands. Under ORS 468B.110(2), ORS 527.765, and ORS 527.770, the Board of Forestry establishes best management practices (BMP's) or other actions by rule that, to the maximum extent practicable, will ensure attainment and maintenance of water quality standards.

The FPA rules are periodically evaluated to ensure that forest practices do not impair the achievement and maintenance 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 described in the FPA is completed. Implementation of TMDLs is necessary under the CWA. For both water quality standards and TMDL targets, the EQC is responsible for determining the overall amount of pollution reduction needed on non-

federal forestlands (setting water quality targets), and the Board is responsible for determining how to achieve those reductions.

If the Environmental Quality Commission (EQC) determines the FPA rules are not adequate to implement TMDL load allocations or achieve water quality standards, the EQC is authorized to petition the Board for a review of part or all of Forest Practices Act rules (ORS 527.765(3); OAR 340-042-0080). The petition must allege with reasonable specificity that nonpoint source discharges of pollutants resulting from forest operations are a significant contributor to violations of such standards (ORS 527.765(3)(a).

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 action as quickly as practicable to prevent significant damage to beneficial uses" while the BMPs rules are being revised ORS 527.765(3)(f). The Board's exclusive enforcement authority 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."

2.5. Oregon Agricultural Water Quality Management Act

The Agricultural Water Quality Management Act (ORS 568.900 to 568.933) authorizes the 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 Drinking water protection program is implemented in Oregon through a partnership of DEQ and the Oregon Health Authority (OHA). The program serves the needs of over 2,500 public water systems serving approximately 75% of Oregon's citizens. Under an interagency agreement with OHA, the Drinking Water State Revolving Fund (DWSRF) supports 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 groundwater drinking water sources. When drinking water sources meet Clean Water Act water quality standards, then standard treatment technology should be sufficient to produce drinking water that meets Safe Drinking Water Act protection limits or maximum contaminant levels.

Staff from DEQ's Drinking Water Protection program and the NPS Management Program collaborate to help identify, prioritize, and increase implementation of best management practices for water quality improvements addressing harmful algae blooms, nutrients, turbidity, microbes, and toxics including pesticides. The objectives of the collaboration include optimizing agency resources by focusing on the highest priority pollutants in a coordinated way, implementing actions that reduce toxic pollutants at the source, and establishing partnerships with other agencies and organizations to increase the effective use of public and private resources. One of the key functions for DEQ is to connect public water systems and communities with local conservation partners like Soil and Water Conservation Districts (SWCDs) and watershed councils that may be able to assist with drinking water protection efforts for soil protection, water quality improvement, and ecosystem robustness and resilience.

Potential funding sources available only in drinking water source areas include the Oregon Health Authority's Drinking Water Source Protection Fund for grants and loans; the Drinking Water Providers Partnership; and focused funding from Natural Resource Conservation Service (NRCS). Grants from these funding sources are often applied towards projects that support NPS program efforts.

- OHA's Drinking Water Source Protection Grants (up to $30,000 per water system) fund source water protection activities, monitoring, and planning to minimize the risk to the source water before it reaches the surface water intake or groundwater well for a public drinking water system. Examples of source water protection activities are education and outreach, pesticide collection events, road and bank stabilization, and land acquisition planning. OHA also maintains the SRF loan fund for improving drinking water treatment, source water protection activities, or land acquisition in source areas.
- The Pacific Northwest Drinking Water Providers Partnership is a collaboration of the USDA Forest Service Region 6, the U.S. Bureau of Land Management OR/WA Office, EPA Region 10, Oregon DEQ, Washington Department of Health, 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 public drinking water source watersheds across the Northwest. 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 and to support local partnerships between drinking water providers, landowners, and restoration practitioners.
- NRCS's National Water Quality Initiative (NWQI) was expanded in 2018 to include source water protection for both surface and groundwater public water systems. NRCS has an annual solicitation for both readiness and implementation projects that address agricultural-related impacts to drinking source water quality. There are currently a total of 10 readiness phase projects in Oregon which include developing a detailed watershed assessment and an agricultural outreach strategy. Following completion of the Watershed Assessment, these areas will then be eligible to receive federal Farm Bill funding to implement the measures identified in their plans specific to agricultural impacts.

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; and
- 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 (PPL). The PPL is a list of projects prioritized by the state that is submitted annual for public comment and is included in the Intended Use Plan (IUP) that the state must submit to U.S. Environmental Protection Agency (EPA) for approval. 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 restore and protect 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 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. The Memorandum of Understanding is in the process of being updated to continue this work into the future. All parties are still involved in the process.
- ***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 2020

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 2020-2022 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 2020. 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 2020 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 2020-2022 Performance Partnership Agreement. The following sections describe progress on these action items in 2020.

Table 1. Description of water quality standards actions or outputs identified in the 2020-2022 Performance Partnership Agreement and the status in 2020.

PPA Element	Action	Time Frame	2020 Status
PPA - 1.1	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	Completed See Section 3.1.2
PPA - 1.2	Conduct water quality standards efforts for temperature, including variance(s) and rulemaking that will consider natural thermal regimes and variability for temperature.	Ongoing through June 2022	Ongoing See Section 3.1.3
PPA - 1.3	Conduct rulemaking to designate Waldo and Crater Lakes as Outstanding Resource Waters and adopt policies to protect their water quality.	November 2020	Ongoing (Near Complete)

PPA Element	Action	Time Frame	2020 Status
PPA - 1.4	Conduct a 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 2015 USFWS Biological Opinion, DEQ will revise bull trout use designations.	June 2022	In progress See Section 3.1.5
PPA - 1.5	Amend Oregon's rules to clarify the definitions for cool and cold water species related to the dissolved oxygen standard.	June 2022	In progress See Section 3.1.6
PPA - 1.6	Evaluate whether to initiate rulemaking to adopt new aquatic life 304(a) criteria.	June 2021	Completed 09/2020
PPA - 1.7	Conduct a triennial review to identify and prioritize the water quality standards projects to be initiated or completed in 2021 through 2024.	June 2021	In progress

3.1.1. Triennial Review

DEQ is conducting a Triennial Review of water quality standards. The Triennial Review evaluates and identifies priority water quality standards work for DEQ to complete or initiate between 2021 and 2023 and will result in a work plan. The projects could include rulemakings to revise water quality standards or documents that describe procedures to apply standards currently in rule, such as narrative criteria. The Triennial Review will be completed by summer 2021.

3.1.2. Cold Water Refuge Plans

In late 2017, DEQ began work on a Cold Water Refuge plan for the lower 50 miles of the 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. DEQ found that the majority of adult anadromous fish that migrate up the Willamette River to spawning streams tend not to use cold water refuge in the lower 50 miles of the mainstem. Rather, most of the runs move upstream before the natural falls at Willamette Falls become a barrier. The size and number of potential CWR is also limited by the geomorphology of this reach. However, cold water refuge may be important for some use in hot years or for other life stages or species. Therefore, it is important to protect the cold water refuge and thermal diversity of the river that exists, such as the mouth of the Clackamas River. As part of the plan, DEQ identified where CWR currently occurs and the mechanisms within DEQ's water quality programs to protect them.

3.1.3. Aluminum Criteria Promulgation

EPA promulgated a federal aluminum criteria for Oregon in December 2020. The new criteria will become effective April 19, 2021. In 2013, EPA disapproved Oregon's freshwater aluminum aquatic life criteria, which was adopted by DEQ in 2004.

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

DEQ is developing strategies to implement Oregon's water temperature standard following the invalidation of Oregon's natural conditions criterion (NCC) for temperature by a federal court in 2012. To date DEQ is focused on temperature TMDLs and considering variances for permittees who cannot feasibly attain temperature permit limits. DEQ does not plan to revise the temperature standard via rulemaking at this time.

3.1.4. Water quality standards variances

DEQ is considering possible approaches to issuing 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 has also began evaluating 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 conducting research and development for a rulemaking to update the state's aquatic life use designations based on new data and information. DEQ is relying primarily on the Oregon Department of Fish and Wildlife habitat distribution spatial data and timing data, as we did when we developed the current maps in 2003. In addition, DEQ will use some data from the U.S. Fish and Wildlife Service for specific inland resident species, as well as stream temperature data from multiple sources. DEQ expects to complete the project by mid-2022.

3.1.6. Rulemaking related to Oregon's dissolved oxygen standard

This is a narrow rulemaking to clarify the definitions for cold water aquatic life and cool water aquatic life in the definitions section of the water quality standards rules in order to ensure there is no inconsistency with the intended use of the terms in different rules within OAR 340 Division 41. The rulemaking will be conducted together with the aquatic life use update rulemaking discussed above.

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

DEQ adopted a rule that establishes a multiple discharger variance for methylmercury for point source dischargers in the Willamette Basin in January 2020. 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 2020-2022 Performance Partnership Agreement. The following sections describe progress on these action items in 2020.

Table 2. Description of monitoring and assessment actions or outputs identified in the 2020-2022 Performance Partnership Agreement and the status in 2020.

PPA Element	Action	Time Frame	2020 Status
PPA - 1.8	Revise and update assessment methodologies for submittal of 2022 Integrated Report.	Spring 2021- Completed June 2021	In Progress: completion Spring 2021
PPA - 1.9	Hold data call for 2022 Integrated Report.	Winter 2020/2021 Completed call for data from February - April 2021	Preparing for February 2021 data call
PPA - 1.10	Completion of DEQ's 2022 Integrated Report and submittal to EPA.	April 2022	In progress
PPA - 1.11	DEQ's 2022 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. Final submittal by April 2022	Ongoing
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 groundwater. Enhance engagement with ODA, 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 Committee has been established with meetings every two months. DEQ contacts participating domestic well owners for nitrate notifications. Action Plan Activities listed from Section 3.1.3 to Section 3.6.3 in the following document: https://lubgwma.org/wp-content/uploads/2020/12/Second-LUBGWMA-Action-Plan_FINAL.pdf Activities have been affected by lack of funding although some work has been done as described in status.	Ongoing See Section 3.2.3 Examining domestic well data to understand domestic well impacts. Discussing nitrogen budget model and organic compound fingerprinting through machine learning.

PPA Element	Action	Time Frame	2020 Status
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 NRCS and SWCD working with farmers to implement plan. Alternative irrigation and fertilization management practices have been designed for the area. No samples collected in 2020	Ongoing See Section 3.2.3 Conducted nitrate trend analysis in early 2020. Shows nitrate concentrations decreasing.
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 Developed educational story map on nitrate. Continued to collect nitrate samples and analyzing for stable isotopes in well water with EPA.	Ongoing See Section 3.2.3 Hosted GWMA meetings and attended partnership meetings. Launched first wave of nitrate testing outreach
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 Klamath Basin is the current study region. Data will be available in late 2021 The Harney County summary report will be published in spring 2021 and the Mid-Willamette is expected in early 2022.	Ongoing See Section 3.2.3 Walla Walla summary report published in late 2020.
PPA - 4.5	Complete federal and state groundwater reporting requirements.	Ongoing or as scheduled	Ongoing See Section 3.2.3

PPA Element	Action	Time Frame	2020 Status
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 Impacted by pandemic, but maintained 30 out of 45 scheduled runs through adjusted protocol for health and safety.	Ongoing See Section 3.2.1
PPA - 7.2	Collect water quality data to support TMDL development and to interpret implementation effectiveness.	Ongoing	Ongoing See Section 3.2.1
PPA - 7.3	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	Completed See Section 3.2.2
PPA - 7.4	Reporting of biological, chemical and habitat data at reference and study locations in Western Oregon, at statewide trends sites and in the Deschutes Basin.	10/2021	Very near completion, should be completed in first half of 2021.
PPA - 7.5	Migrate raw macroinvetebrate data to AWQMS.	10/1/22	Completed
PPA - 7.6	Migrate “habitat metrics” into AWQMS.	10/1/22	In progress Work began following completion of PPA – 7.5.
PPA - 7.7	Collect and ship samples to EPA Manchester lab for Microbial Source Tracking analysis (MST) at Cannon Beach Oregon	10/1/21	Work delayed (pandemic) To begin in 2022
PPA - 7.8	Complete development of Water Quality Monitoring Strategy	8/1/2020	Completed
PPA - 7.9	DEQ will collaborate with EPA, as resources allow, on EPA	As scheduled by EPA	Ongoing Working on qPCR

PPA Element	Action	Time Frame	2020 Status
	monitoring projects conducted in Oregon.		analysis for cyanotoxin above DW sources and National Coastal Condition Assessment monitoring. Microbial source tracking work scheduled for summer 2022.

In 2020 the Water Quality Monitoring section collected over 5000 water samples representing over 28,000 analyses. Monitoring efforts in 2020 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;
- Report writing on groundwater quality in vulnerable aquifers;
- Data collection for trend analysis in Groundwater Management Areas;
- Revising statewide reference sites using improved screening procedures; and
- Technical support for volunteer organizations. (This is a nicely done, bulleted summary of the monitoring work.

Highlights of the Monitoring and Assessment program for 2020 included:

- Monitoring Cyanotoxin in source-water supplies of 57 vulnerable public drinking water systems-bi-weekly;
- Assessing 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) collecting and analyzing almost 1000 water samples across nine PSP watersheds;
- Monitoring over 90 wells in Harney County to evaluate potential nitrate, arsenic, and pesticide contamination issues;

- Monitoring 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 and Nestucca watersheds;
- Monitoring continuous temperature and dissolved oxygen plus discrete total phosphorus and bacteria to support TMDL implementation effectiveness and status and trends in the Dairy and McKay watersheds of the Tualatin Basin;
- Monitoring continuous dissolved oxygen, temperature, pH, conductivity, in situ chlorophyll and phycocyanin monitoring in three Cascades Lakes plus instantaneous measurements of nutrients and chlorophyll used for development of watershed management approaches, including TMDLs; plus, HABs toxin data and qPCR data for understanding and addressing HABs.
- Provided sampling support and analysis of nutrients from water samples collected by the ODA for an agricultural NPS control project in Upper Klamath Lake.
- Monitoring to determine how DEQ can use the CyAN app produced by the US EPA most effectively in Oregon. Project objectives were to:
  1) Assess how well predictions of cyanobacteria cell counts from the CyAN app compare to in situ measurements of cyanobacteria and related data (chlorophyll a, phycocyanin, and dissolved oxygen) at specified lakes.
- 2) Determine how well early warning detection methods for CyanoHABs that have been developed for in situ data can be applied to remotely-sensed data products such as CyAN.
- Collecting data in the Dairy and McKay Creek watersheds to assess progress towards meeting TMDL allocations for Total Phosphorus, bacteria, temperature and dissolved oxygen;
- Toxics monitoring to assess impacts from Oregon's 2020 wildfires;
- Providing resources and technical assistance to volunteer organizations to collect and assess data in their own watersheds through the volunteer monitoring program; and
- Monitoring 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

DEQ laboratory staff coordinated cyanotoxin monitoring of vulnerable public water facilities from May through October 2020 (Figure 2). Almost 600 samples were collected, analyzed, and evaluated using EPA Health Advisory Levels for microcystin and cylindrospermopsin. Key points from the monitoring were:

- 56 facilities participated in the DEQ/OHA monitoring program;
- 58 drinking water facilities were deemed to be at risk for harmful algae blooms by OHA and DEQ;
- 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;
- 594 samples for cyantoxin analysis
- About 500 samples received for the year 2020 for drinking water qPCR analysis (56 facilities)
- Almost 70 qPCR sample collected for characterization of HABs on Cascade high lakes
- 4 facilities had total microcystins detections over the action levels; and
- 0 facilities had a detection over the cylindrospermopsin action level.

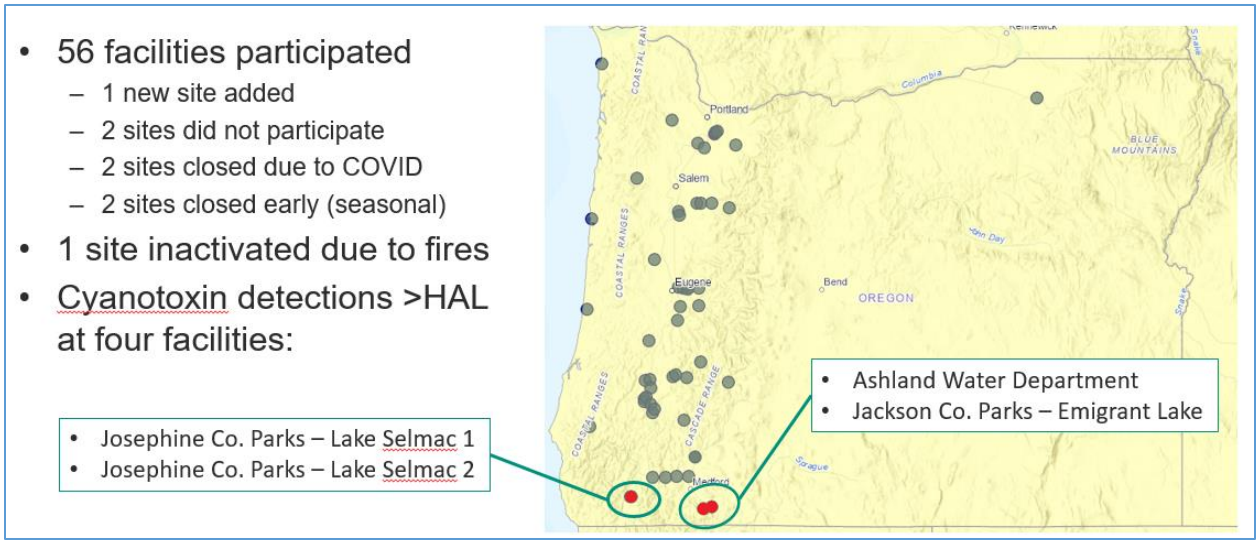

Figure 2. Monitored public water facilities for harmful algal bloom detections.

TMDL monitoring activities in 2020 focused on data collection in priority watersheds. Water quality parameters and data collection efforts were specifically planned for use in identifying status and trend of dissolved oxygen, phosphorus, temperature and bacteria in the Dairy and McKay Creek watersheds and temperature in the Necanicum, Nehalem and Nestucca watersheds. The DEQ partnered with the ODA to provide analytical support for water samples to refine TMDL implementation and measure progress towards meeting load allocations. Sampling in Deschutes Basin lakes provided data for the development of watershed management approaches including TMDLs for DO, pH, and harmful algal bloom water quality impairments.

3.2.2. Biomonitoring Program

All field monitoring work in 2020 was canceled for the Biomonitoring Program, due to COVID-19. We were scheduled to sample 22 estuaries as part of the National Coastal Condition Assessment (NCCA), as well as 12 Biomonitoring Reference Trend stations. All of that work will be pushed to the 2021 sampling season.

To meet other PPG commitments, the Biomonitoring Program has worked to completely overhaul our Reference Condition Approach. We finalized reference (least disturbed by human activities) screening procedures that allow us to apply screening thresholds equally across the entire state. We partnered with Utah State University's National Aquatic Monitoring Center to examine study sites from other major federal partners (USFS, BLM) and expand our coverage across the state. The final result of this work is a much improved reference network with more than 300 reference sites statewide.

We also worked with the Resource Assessment and Technical Services section to migrate all of our macroinvertebrate assemblage data into our Agency-controlled AWQMS database. This was a large effort and represents a significant improvement in the security of our biological data, as well as providing the public access to an important component of our monitoring data.

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 Klamath Basin is the region where groundwater is currently being studied. This area was selected based on a variety of data including past studies and nitrate data collected during real estate transactions. DEQ began the Klamath Basin regional groundwater study in 2019. The study completed one sampling event (60 wells) in fall 2019 and will conduct the second sample event in summer 2021 (40 more wells and 20 resampled wells) to look into seasonal and climatic differences in groundwater quality. The sample locations included a variety of domestic use, irrigation, livestock, and dedicated monitoring wells. DEQ will analyze the complete dataset from both sampling events, which will include detections of common water chemistry parameters, nitrate, arsenic, bacteria, common ions, metals, current use and legacy pesticides and herbicides, pharmaceuticals, and volatile organic compounds. This data will be made available in late 2021. The DEQ also partners with the USGS to collect isotope samples at DEQ's sampling locations to help with analysis of the age and origin of groundwater sources. That data is held and analyzed by the USGS.

The Walla Walla Basin summary report was made public in late 2020. The Harney County Study summary report was made public in spring 2021. A summary report for the Mid-Willamette Basin Study is expected in early 2022. Presentations of this data, summarizing the general extent of regional detections in each area, will be available by request. Several presentations on the findings of the Mid-Rogue Groundwater study conducted in 2015 and the North Coast Groundwater study in 2015-2016 have been 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.

As previously mentioned, the DEQ Groundwater Technical Advisory Team met in early in 2019 and selected the Klamath Basin as the groundwater monitoring study area for 2019 and 2021. The sampling began in fall of 2019. Sampling of the two existing Groundwater Management Areas also continued in 2020. The Lower Umatilla Basin Groundwater Management Area (GWMA) was sampled quarterly as in previous years. Sampling in the Southern Willamette Valley GWMA was reduced. The full well network in the Southern Willamette Valley GWMA was sampled just once, and a sub-set of twelve wells was sampled quarterly. The Northern Malheur County GWMA was not sampled in 2020 due to budgetary constraints.

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. 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 from 1995 through 2019. In addition, in 2020 DEQ successfully migrated biological and habitat data and metrics into the AWQMS system. DEQ used AWQMS to upload 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 Action 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 2018/2020 Integrated Report was submitted to EPA in April 2020 and approved by EPA in November 2020. For the first time, DEQ released the report as an interactive map tool, story map, and online database.

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 began improvements to its 2022 Assessment Methodology in the second quarter of 2020 and released its draft methodology for public comment in December 2020. Water Quality Assessment staff anticipate finalizing the methodology in the second quarter of 2021.

3.3. Drinking Water Protection Program

In FY2020, approximately $780,000 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 2020 include:

- As of June 30, 2020, 319 community water systems (36 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 2.97 million Oregonians, which accounts for 85% of Oregonians served by community water systems.
- "Updated Source Water Assessments" for Community and Non-Transient Non-Community public water systems using surface water are now complete. In 2020, DEQ added additional information on erosion susceptibility to coastal water systems and developed code to assist OHA in completing assessments for the remaining 500 public water systems using groundwater. DEQ staff used the information from USWAs to assist small PWSs with planning and source water protection activities which often address non-point sources of pollution.
- NRCS currently has nine National Water Quality Initiative Source Water Protection projects that are undergoing a "readiness" phase and one project where the readiness phase is complete. During the readiness phase, local partners prepare 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 one additional proposal for FY2021 funding under the NWQI SWP program. Following the readiness phase, these source water protection areas 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)

- In addition to the aforementioned items, the DEQ Drinking Water Protection Program staff: Assisted NRCS in developing and analyzing criteria to identify high priority areas throughout Oregon for NRCS source water protection focus. NRCS provides increased incentives to producers in these areas for conservation practices that relate to water quality and quantity and protect drinking water sources.
- Promoted the use of the Drinking Water Source Protection Fund for loans and grants primarily addressing nonpoint sources of pollution within drinking water areas. Six drinking water protection projects were recommended for funding with funding awards totaling $154,600. Projects recommended for funding included activities such as: forest road stabilization and removal of slide material to reduce sediment erosion and turbidity; riparian zone repair and revegetation projects; security improvements for riparian area next to an intake; stormwater management and spill response/prevention, invasive plant removal for wildfire suppression; watershed acquisition due diligence; source water protection planning; and well abandonment. 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 to develop concepts for watershed restoration and improvement projects within public drinking water source 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 2020, a total of $311,000 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, along with an additional $60,000 in related Source Water Protection grants. Specific project details are discussed in the Basin Reports in Appendices A-R.
- Provided input and managed now-completed grant agreements for Nonpoint Source program 319 grant funding proposals/projects with a drinking water nexus.
- Collaborated with EPA and others to initiate planning for two additional workshops that will be held in 2021 to bring together drinking water operators, land managers, funders, and restoration practitioners to discuss shared goals. The Rogue Basin Workshop will focus on wildfire risks and emergency preparedness while the Willamette Basin workshop will focus on protecting drinking water sources from cyano-HAB impacts.
- Responded to major wildfire events in 2020, particularly those fires that began or accelerated in September 2020. Provided technical and scientific support and geographic information system analyses to emergency responders, public water systems, DEQ staff and management, and other state agencies. Provided information and analysis to Cultural and Natural Resources Recovery Task Force, co-convened by DEQ, Oregon Department of Forestry, and Oregon Watershed Enhancement Board. Staffed the federal and state Erosion Threat Assessment and Reduction Team for evaluating post-fire threats to drinking water sources and water quality, treatment plants, and distribution systems. Educated state and federal agencies and managers on content and implications of ETART Drinking Water report. Coordinated with and assisted state agencies, watershed councils, public water systems, and others on implementation of the report findings and recommendations and other watershed recovery efforts.
- Provided technical support to Oregon Health Authority on Harmful Algal Blooms (HABs) in drinking water during the 2020 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. DEQ also provided technical assistance to OHA in reviewing a cyanotoxin rule monitoring waiver request which required coordination with DEQ's TMDL and Standards programs to evaluate potential recommendations for delisting algae and aquatic weeds.
- 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.

- Initiated a Watershed Based Plan for the drinking water source area serving several coastal water systems.
- Participated in 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 2020 included reviewing and providing detailed comments on revised draft chapters including providing supporting references, geospatial information, analysis, and information on regulations and state government efforts around drinking water source protection. Provided review and comment on draft of OFRI's summary report of the study. The final report (working papers, findings, and recommendations) was finalized in 2020, as was the OFRI summary. The report showed a need for additional management measures for source water protection during industrial forestry operations, particularly around headwaters (small non-fish-bearing) streams and landslide-prone slopes.
- Collaborated on an Oregon State University Extension Phase I and II 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 2020 included geospatial analysis, work with stakeholders to implement an online risk assessment tool, and method testing.
- 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, Molalla, and Clackamas subbasins.
- Participated in Southern Willamette Valley Groundwater Management Area events by providing technical assistance to OSU Extension and other partners, as needed. Continued outreach to public water systems within GWMA that have elevated nitrate.
- 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 are 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 2020, the Clean Water State Revolving Fund loan program obligated $16,345,423 toward 13 nonpoint source pollution control projects. The program completed one project, executed three new loans for three new projects and funded one new project through an existing loan for a total of four new active projects in calendar year 2020. The fund increased the total number of active nonpoint source projects by two since 2019, which continues an increasing trend of the number of nonpoint source projects funded by the program annually over the past three years. Table 3 summarizes the active projects funded during 2020, which includes some of the same projects in 2019, as many projects have long-term, multi-phased design and construction schedules. More information about these projects including reported accomplishments in 2020 are in the Basin Reports in Appendices A-R.

Table 3. CWSRF projects active or funded in 2020, 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
Hood	Reservoir Enhancement Project: Outlet Replacement and Dam Raise (In progress)	Farmers Irrigation District	$3,071,574
South Coast	Front Street Green Streets (In progress, new)	City of Coos Bay	$1,100,000
Deschutes	Smith Rock and Kingway Irrigation District Piping Project (In progress)	Central Oregon Irrigation District	$2,000,000
Clackamas	Three Creeks Floodplain Enhancement (In progress, new)	Water Environment Services	$1,450,000
Deschutes	Watson and McKenzie Main Canal Pipeline Project (In progress)	Three Sisters Irrigation District	$1,080,500
Hood	Dee Irrigation District System Pressurization Project Completed, loan amended to $777,349 to close out)	Dee Irrigation District	$777,349
Deschutes	Ochoco Irrigation District Modernization Project (In progress, new)	Ochoco Irrigation District	$680,000
Clackamas	Nonpoint Source Loan Program (In progress)	Clackamas Soil and Water Conservation District	$542,000
Hood	Mosier Deep Well #2 Project (In progress, new)	Wasco County Soil and Water Conservation District	$300,000
Clackamas	Septic System Loan Program (In progress)	Clackamas Soil and Water Conservation District	$250,000
South Coast	2nd Street Green Street and Parking Lots and Brownfields Remediation and Land Revitalization (In progress)	City of Coos Bay	$165,000
South Coast	S. 4th 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 2020-2022 Performance Partnership Agreement. The following sections describe progress on these action items in 2020.

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 2020-2022 Performance Partnership Agreement, and the status in 2020.

Goal #	Goal Topic	Action	Time Frame	2020 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
NPS - 4	Complete the Coastal Nonpoint Pollution Control Program	Submit to EPA and NOAA a plan for achieving • 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 in implementing the management plan. The current 2014 plan approved by EPA on June 15, 2015 is being updated and will be submitted to EPA in 2021. In 2020 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 by EPA and the National Oceanic and Atmospheric Administration (NOAA). In Oregon, DEQ and Department of Land Conservation and Development (DLCD) work with the other State of Oregon agencies to address all of the management measures that apply to the Oregon coastal zone management areas.

In 2015, NOAA and EPA determined that four forestry management measures were not adequate and subsequently found Oregon's CNPCP not approvable. EPA and NOAA cited the following gaps in the CNPCP plan for private forest water quality protections: riparian protections for small and medium sized fish bearing streams; legacy roads; and harvest activities on shallow landslide prone areas.

In 2020, additional management measures were not submitted by the state to address the gaps identified by EPA and NOAA. Staff who would be working on this effort were focused on completing TMDLs with court ordered deadlines. Consequently, the state of Oregon has not yet gained full approval of its CNPCP but has committed to address the outstanding management measures as resources allow.

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 2020-2022 Performance Partnership Agreement. The following sections describe progress on these action items in 2020.

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 2020.

Goal #	Goal Topic	Actions	Time Frame	2020 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	Region and HQ staff identify and rank	Ongoing	Ongoing

Goal #	Goal Topic	Actions	Time Frame	2020 Status
	Funding for pass through grants	projects to receive pass through 319 grant funds for addressing NPS Program priorities.		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
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 2020-2022 Performance Partnership Agreement and the status in 2020.

PPA Element	Actions	Time Frame	2020 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 GWMAs	May 2020 and May 2021	Ongoing 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.	2021-2022	Ongoing 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 2021, February 2022 load reduction, other GRTS data (National GRTS reporting deadlines	Ongoing 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 challenges will continue to ensure adequate staffing to meet the nonpoint source program needs.

Table 7. Oregon total 319 grant funds 2014 to 2020.

Year	DEQ Staff	Projects (Pass Through)	Total
2020	$1,549,346	$221,654 This amount excludes an additional $5,749, re-obligated from the 2015 grant year.	$1,771,000
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

Year	DEQ Staff	Projects (Pass Through)	Total
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 2020, the Federal Section 319 program appropriation funded a total of 8.98 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	4.09
Nonpoint Source Policy Development, Collaboration and Provision of Technical assistance with Stakeholders and other Local, State, and Federal Agencies	1.00
Nonpoint Source TMDL Modeling	1.89
Prorates and Management and Administrative Support	1.01
319 Grant Administration and Provision of Technical Assistance with Applicants, DEQ Staff and Coordination with Other Funding Agencies	1.00
Total	**8.99**

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 2020, $1,066,393 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 $1,288,047. Therefore, DEQ used about 73% of the total 2020 appropriation ($1,771,000) 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 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 eligible 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.

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 2020, DEQ recommended funding eleven stakeholder projects with $227,404 in Section 319 grant funds (Table 9).

Table 9. List of projects recommended for 2020 319 grant funding, showing in descending order of budget values.

Proposal Title	Organization	Basin	Type of project	Budget	Status
Remote Sensing & Source Water Inventory for the S. Fork Walla Walla R.	Walla Walla WSC	Walla Walla	WQ assessment/planning	$15,000	On track, agreement signed
Upper Willow Creek Basin BMPs Program	Morrow SWCD	Upper Willow Creek	Cost share, 40%	$10,000	On track, agreement signed

Proposal Title	Organization	Basin	Type of project	Budget	Status
City of The Dalles NPS Implementation Grant	City of The Dalles	Mill Creek, Chenowith, Threemile Crk Basins	Outreach and education	$4,546	On track, agreement signed
Fifteenmile Action to Stabilize Temperatures (FAST)	Wasco Co SWCD	Fifteenmile	Outreach and education	$20,000	On track, agreement signed
Walla Walla Basin Water Quality Education and Outreach	Walla Walla Basin WSC	Walla Walla River	Outreach and education	$11,990	On track, agreement signed
Backyard Planting Program 2020	Tillamook Estuary Partnership	Nehalem, Wilson-Trask-Nestucca	Site specific riparian planning	$28,429	On track, agreement signed
Northwest Oregon Restoration Partnership 2020	Tillamook Estuary Partnership.	Nehalem, Wilson-Trask-Nestucca	Preparing plant materials for riparian restoration	$14,928	On track, agreement signed
Nestucca, Neskowin and Sand Lake Basin Riparian Improvement Project	Nestucca Neskowin WSC	Nestucca, Neskowin and Sand Lake	Identification new project areas for riparian restoration.	$18,179	On track, agreement signed
Antelope and Little Butte Creek WQ Improvement Project	Jackson Co SWCD	Rogue River Basin: Little Butte Creek WS	BMP implementation	$43,502	On track, agreement draft in progress
Bacteria & Temperature. Monitoring/BMP Implementation in Bear and Ferguson Creek Basins	Long Tom WSC	Long Tom WS - Bear/Ferguson Creek Sub-WS	Technical assistance WQ improvement projects	$18,034	On track, agreement signed
Monitoring riparian conditions via Remote Sensing to support Statewide implementation of WBP	PSU, Institute of Natural Resources	Statewide	Technical assistance modeling / statewide monitoring	$42,796	On track, agreement signed
Total 319 cost for 2020				**$227,404**	

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 2020 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 DEQ 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 2020 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 2020 319 grant funding priorities with corresponding amounts.

2020 Type of Project	Amount Requested	% of Total Request
Riparian restoration	$61,536	27%
BMP implementation, including cost share	$53,502	24%
WQ Assessment/planning	$15,000	7%
Outreach and Education	$36,536	16
Technical Assistance	$60,830	27
Total Request		**100%**

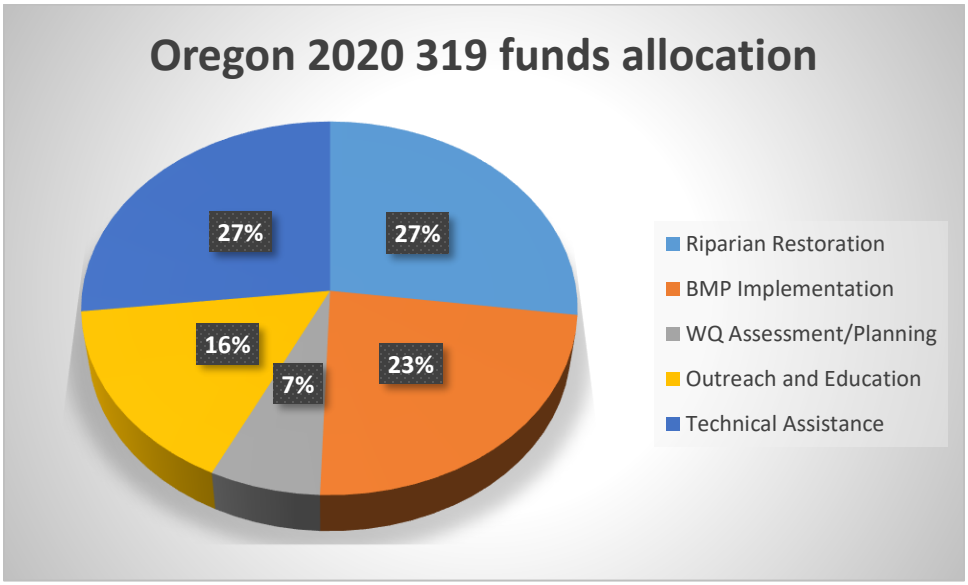

Figure 3. 2020 319 Grant Fund Distribution and Project Types (Total Budget $227,404).

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 2020 include:

- Reviewed and updated the 2020 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; and
- Estimated load reductions.

For the year 2020, 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 reductions, 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. Due to a lack of a tool to estimate the reduction of other pollutants Oregon has not been able to report on 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 2020 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	
W16670	Balance and Lick Creek	2016	Grant Soil and Water	$12,000		297	98	74

Project Number	Project Title, Watershed (HUC)	Funding Year	Project Recipient	319 Budget	BOD lbs/Yr	Nutrients* lbs/Yr		Sed T/Yr
						N	P	
	Riparian Improvements		Conservation District					
W16653	Nestucca, Neskowin and Sand Lake Watersheds Riparian Restoration Program Powder Creek-Nestucca River, 171002030206	2016	Nestucca Neskowin Watershed Council	$14,980		1117		567
W17705	Tillamook SWCD 2017 Stream Enhancement and Restoration, Upper Nehalem (171002020502)	2017	Tillamook Soil and Water Conservation District	$11,000	381	165	77	57
W1770	Backyard Planting Project, Fishhawk Creekarmer Creek (171002020204),	2017	Tillamook Estuary Program	$11,000	160	211	722	787
W17707	Nestucca Nekowin Sand Lake Riparian Restoration, Nestucca Bay (171002030210),	2017	Nestucca Neskowin Watershed Council	$11,000	7	1	16	78

Project Number	Project Title, Watershed (HUC)	Funding Year	Project Recipient	319 Budget	BOD lbs/Yr	Nutrients* lbs/Yr		Sed T/Yr
						N	P	
	Powder Creek (171002030206)							

* 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.

In 2020, the following information was added to the nonpoint source program's website:

- A link was established to the current 319 Grant RFP;
- A downloadable grant application was added;
- Background information on the 319 Grant program was presented; and
- Links to multiple water quality status and trends reports used for biennial reviews of the agricultural water quality management area rules and plans were included (see Section 3.10.2).

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

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 2020-2022 Performance Partnership Agreement. The following sections describe progress on these action items in 2020.

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 2020.

Goal #	Goal Topic	Action	Time Frame	2020 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

Goal #	Goal Topic	Action	Time Frame	2020 Status
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 2020-2022 Performance Partnership Agreement and the status in 2020.

PPA Element	Action	Time Frame	2020 Status
PPA - 8.7	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 2021 and June 2022	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. To comply with the grant requirement a "9-Key Elements checklist" is 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 planning 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. During 2020 DEQ staff completed and approved the following 9-Key Elements checklists for the:

- McKenzie Subbasin (17090004) for temperature;
- North Santiam Subbasin (17090005) for temperature; and
- Pudding River Watersheds (17090005, 1709000903, 1709000905, 170900090108, 170900090109, 170900090110) for Dichlorodiphenyltrichloroethane (DDT), Dieldrin, Chlordane, and Total Suspended Solids.

In addition, because of the widespread impacts of the 2020 wildfires there is a need for projects responding to nonpoint source pollution emergencies or public health risks. In cooperation with EPA, DEQ developed an approach to consider Alternative Watershed Based plans as described in EPA's 319 guidance. Areas with an approved Alternative Watershed Based Plan are eligible for 319 funding. The approach is that during the 319 RFP, Alternative Watershed Plans may be submitted for review for any nonpoint source pollution control project that is proposed to be implemented within a 2020 wildfire perimeter that does not already have eligibility under an approved watershed based plan. The following minimum information constitute an Alternative Watershed Plan:

I. Identification of the causes or sources of nonpoint source pollution impairment, water quality problem, or threat to water quality;
II. Watershed project goal(s) and explanation of how the proposed project(s) will achieve or make advancements towards achieving water quality goals;
III. Schedule and milestones to guide project implementation; and
IV. Water quality results monitoring component, including description of process and measures (e.g., water quality parameters, stream flow metrics, biological indicators) to gauge project success.

For the 2021 319 RFP cycle, DEQ and EPA will work together to determine the acceptability of any submitted Alternative Watershed Plan. Project priorities and wildfire areas eligible for grant funds are listed in the RFP in addition to the three approved watershed based plans identified above.

3.7.3. Volunteer Monitoring Sample Plans

In 2020 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 twelve sampling plans for organizations and worked with additional organizations to refine monitoring strategies or goals outside of the sampling plan process. Volunteer program staff continue to expand 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 have led to an increase in data submissions from scientifically sound water quality monitoring efforts. These contributions in turn help bolster NPS pollution assessments.

Volunteer sampling plans reviewed by the program included:

- Salmon Drift Creek Watershed Council: Agnes, Baldy, & Logan Creeks and Ocean Outfalls Baseline Data Acquisition ~ 2019-2020;
- Wasco County SWCD Eightmile Creek E. coli SIA Study;
- Sherman County Summer Stream Temperature Monitoring;

- Coquille Watershed Association Winter Lake Restoration Effectiveness Monitoring Project (amendments);
- Coquille Watershed Association Dement Creek Basin Assessment, Broadbent, OR;
- The Deschutes Partnership and Watercourse Engineering, Inc. McKay Creek Monitoring Project;
- Lower Rogue Watershed Council Rogue Basin Recreation Safety Monitoring 2020;
- Gilliam County SWCD Thirtymile Creek SIA Temperature Monitoring;
- Gilliam County SWCD Thirtymile / Butte Creek Temperature Monitoring;
- North Coast Watershed Association Youngs Bay, Ecola, and Nicolai- Wikiup Temperature Monitoring;
- Coos County SWCD Coquille River Off-Channel Refugia Temperature Monitoring Project; and
- Curry Watersheds Partnership Pistol River Strategic Implementation Areas (SIA) Monitoring 2020.

In 2020, DEQ staff provided water quality testing equipment or supplies to 19 different organizations. There are approximately 43 active organizations with equipment around the state working on various monitoring projects. Staff provided technical assistance on equipment and protocols over the phone and due to COVID restrictions, conducted online training in water quality monitoring techniques.

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 make 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. DEQ staff have developed a new SQL (what is SQL) database and data processing scripts to format, evaluate and prepare volunteer program data for upload into AWQMS.

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 2020-2022 Performance Partnership Agreement. The following sections describe progress on these action items in 2020.

Table 14. 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 2020.

Goal #	Goal Topic	Action	Time Frame	2020 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	Ongoing	Ongoing See Section 3.8.2

Goal #	Goal Topic	Action	Time Frame	2020 Status
		development and TMDL implementation efforts.		
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
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.	2014WB	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 TMDLs.	Ongoing	Ongoing See Section 3.8.4

Table 15. Description of TMDL and TMDL implementation program actions or outputs identified in the 2020-2022 Performance Partnership Agreement and the status in 2020.

PPA Element	Action	Time Frame	2020 Status
PPA - 2.1	Develop TMDLs and WQMPs in accordance with 303(d) list schedule. Provide IPs, and review and comment on EPA-developed temperature TMDLs.	In Progress	See Section 3.8.1
PPA – 2.2	Include robust Reasonable Assurance documentation in the TMDLs and WQMPs to implement issued TMDLs, including (where appropriate) adoption of surrogate measures.	Ongoing	Ongoing
PPA - 2.3	Provide framework for ensuring implementation of TMDLs for Nonpoint Sources in subbasins where TMDLs/WQMPs have been completed or are being completed, including load allocations where applicable. Work with	Ongoing	Ongoing See Section 3.8.4

PPA Element	Action	Time Frame	2020 Status
	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. Work with watershed councils, local governments, and other DMAs to develop implementation plans that contain appropriate management practices and milestones for meeting TMDL allocations. Work with USDA agencies to leverage Farm Bill and OWEB resources to implement priority best management practices in critical areas.		
PPA - 2.4	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; 7/16/2018) and as described in the Governor's Natural Resource Office letter (2/10/2016).	At issuance of TMDLs	Ongoing To Occur as TMDLs are developed. See Section 3.8.1
PPA - 2.5	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 in 2020:

Coquille River Subbasin TMDLs: TMDLs for the Coquille River Subbasin continue to be developed to address dissolved oxygen, chlorophyll a, temperature, and bacteria 303(d) listings; while pH is not 303(d) listed, the dissolved oxygen TMDL is designed to address elevated pH levels downstream from the City of Powers WWTP. Modeling of the main stem Coquille, North, Middle, and South Fork Coquille Rivers 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 continued to see updates in 2020 to reflect greater specificity for forestry, agriculture and road nonpoint source controls. In 2020, the focus of the TMDL work has been to review and finalize bacteria and dissolved oxygen narrative drafts, review load and wasteload allocations and develop an additional reasonable assurance tool for stakeholders. The Coquille River Subbasin TMDL is now expected to undergo a public comment period and be submitted to the EPA for approval in late 2021.

Powder, Burnt, and Brownlee Subbasins TMDLs: Currently DEQ is working on TMDLs that will address impairments for bacteria, dissolved oxygen, pH, and chlorophyll a in the Powder River, Burnt River, and Brownlee Reservoir Subbasins. In 2020 DEQ decided to complete the bacteria TMDL first and follow it with TMDLs for dissolved oxygen, pH, and chlorophyll a. A draft bacteria TMDL and Water Quality Management Plan were started in early 2021. It is anticipated that the draft bacteria TMDL will be ready for EPA review in the fourth quarter of 2021.

During 2020, work on the dissolved oxygen, pH, and chlorophyll a TMDLs included compiling existing data sets, developing the analysis/modeling strategy for examining multiple parameters, and compilation of source assessment data. The target date for these TMDLs is fourth quarter of 2022. DEQ plans to modify the WQMP upon completion of the TMDLs for these parameters.

Upper and Little Deschutes Subbasins TMDL: This TMDL will address 303(d) listings for dissolved oxygen, pH, Chlorophyll a, harmful algal blooms, and temperature in the Upper and Little Deschutes Subbasins. In 2020, DEQ collected and analyzed field and satellite data in Odell Lake, Crescent Lake, and Crane Prairie Reservoir in the headwaters of these subbasins to improve our understanding of the conditions that trigger the onset of algal blooms, and to better understand the differences in timing, duration, and magnitude of blooms in lakes with very different water quality characteristics. In 2021 we are expanding this study to include lakes contributing nutrients to the Upper Deschutes River and in Lake Billy Chinook, which is located at the downstream end of these subbasins.

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 (E. coli) TMDLs for the Upper Yaquina River watershed are addressing current Category 5 freshwater waterbodies. These TMDLs are scheduled to be released for public comment in the fourth quarter of calendar year 2021. During 2020, final QUAL-2kw model calibration, model sensitivity analyses, and determination of loading capacity were completed. Wasteload and load allocations were developed and refined for the point source and NPS sectors. Load duration bacteria loading capacity and allocations are being revised based on extensive review of applicable criteria and analytical approaches. DEQ identified minor revisions to the spatial extent to address methodology used in the 2018/2020 Integrated Report.

For TMDLs implementation planning, DEQ met with the Oregon Dept. of Agriculture, performed DMA mapping to identify spatial distribution of DMA responsibilities and strategies, and evaluated and refined potential sources of phosphorus loads using GIS tools and published information to help target BMPs implementation. DEQ is also participating in a place-based water resources planning process to produce voluntary action plans that are complementary to many of the TMDL implementation strategies.

TMDLs addressing dissolved oxygen and temperature impairments in the Siletz River were scheduled for issuance in the fourth quarter of calendar year 2021. During 2020, the Siletz River watersheds HSPF model calibration and Siletz River QUAL2Kw model were revised and circulated for peer review. The TMDL development activities were placed on hold in mid-2020 due to resource constraints and DEQ has not finalized a new issuance date. DEQ is continuing NPS watershed based planning for the Siletz subbasin through the Mid-Coast Water Planning Partnership as part of the state's integrated water resources strategy

Temperature TMDLs in the Siletz River, Yaquina, and the Yachats River Watersheds are scheduled to be developed following completion of the Upper Yaquina River dissolved oxygen and bacteria TMDLs. Activities are projected to resume on these TMDLs in 2022, after being paused for several years due to litigation which required DEQ to shift staff resources to other TMDLs with court mandated timelines.

Development activities for temperature, bacteria, biocriteria, and sediment TMDLs for other Mid-Coast waterbodies have been paused over the past five years. DEQ has not developed new schedules identifying when the TMDL development activities will resume.

Temperature TMDL Replacements

DEQ dedicated significant resources to revising multiple temperature TMDLs that were issued by DEQ and approved by EPA between 2004 and 2010. DEQ is under a court order to update and replace these temperature TMDLs to make them consistent with the current temperature standards. These TMDLs must be updated because they were based, in part on the Natural Conditions Criterion, a section of the temperature standard that was subject to litigation and has since been disapproved by EPA.

The following temperature TMDLs are being replaced as part of this project:

- Applegate Subbasin TMDL and Water Quality Management Plan (2004)
- Snake River-Hells Canyon TMDL (2004)
- Sandy River Basin TMDL (2005)
- Walla Walla Subbasin Stream Temperature TMDL and WQMP (2005)
- Umpqua Basin TMDL and WQMP (2006)
- Willamette Basin TMDL and WQMP (2006)
- Bear Creek Watershed TMDL (2007)
- Willow Creek Subbasin Temperature TMDL and WQMP (2007)
- Middle Columbia-Hood (Miles Creeks) Subbasin TMDL and WQMP (2008)
- Molalla-Pudding Subbasin TMDL and WQMP (2008)
- Rogue River Basin TMDL (2008)
- John Day River Basin TMDL and WQMP (2010)
- Lower Grande Ronde Subbasins TMDLs (2010)
- Malheur River Basin TMDL and WQMP (2010)

Additionally, DEQ is updating the following TMDLs for temperature:

- Upper Sucker Creek TMDL (1999)
- Lower Sucker Creek TMDL (2002)
- Lobster Creek Watershed TMDL (2002)
- The Little River Watershed TMDL (2001)

During 2020 most of the work on the temperature TMDL replacements was focused development of modeling Quality Assurance Project Plans (QAPPs), completing a data solicitation, mapping of DMAs, and developing a series of tools that will streamline various TMDL tasks. Modeling QAPPs provide general descriptions of the technical work to be performed to support TMDLs. The QAPPs ensure that the technical approach is scientifically valid and defensible. Data received during the solicitation will be used for filling in key data gaps and supporting the TMDL analysis in a number of ways including characterizing the seasonal variation over both spatial and temporal scales; determining the number of excursions to the temperature water quality standards; the magnitude and duration of those excursions, calculating the TMDL excess load and required load reduction; and support updates to some of the temperature models.

Additional information including the schedule for submittal of these TMDLs to EPA is described on the project website at https://www.oregon.gov/deq/wq/tmdls/Pages/tmdlreplacement.aspx.

Columbia and Lower Snake Rivers Temperature TMDL

On May 18, 2020, EPA concurrently established and issued for public review and comment the Columbia and Lower Snake River Temperature. The TMDL. The geographic scope of the TMDL includes the extent of the mainstem of the Columbia River from the Canadian border to the Pacific Ocean and within the mainstem of the lower Snake River in Washington from its confluence with the Clearwater River at the Idaho border to its confluence with the Columbia River. DEQ submitted comments to EPA during the public comment period in addition to reviewing information provided to DEQ at various points during the development process. EPA is currently considering public comments and after making any revisions deemed appropriate intends to transmit this TMDL to Oregon and Washington. DEQ is planning to establish a Water Quality Management Plan for this TMDL and made preparations for this process in 2020.

Status and Trends

In 2020, 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 2000 through 2019. Across 2595 stations statewide with available data to assess water quality status, 56% (1444 stations) attained water quality standards or TMDL targets and 44% (1151 stations) showed that the water quality standards were not attained. In the assessment of water quality for 1585 stations statewide with sufficient data, 20% (324 stations) showed improving or maintaining water quality while 31% (494 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 2020 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 2020 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 2020 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 2020 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.

3.8.2. Technical Assistance

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

In 2020 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; and
- 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);
- Workshops for DMAs on preparing a five-year review bmp effectiveness report
- 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); and
- 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 2020 are described in the Basin Reports in Appendices A-R.

The pandemic and extreme wildfire events impacted implementation for DMAs throughout the year. In-person trainings, volunteer plantings, and other close contact activities were put on hold. Activities transitioned to virtual where possible, but plans had to be adapted. Additionally cities and local entities had to shift focus to addressing high priority BMPs related to wildfires like erosion or hazardous waste sites. DEQ staff assisted these efforts with grant applications, site prioritization, and field work.

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

- Required approximately 186 implementation plans to be submitted;
- Received 153 implementation plans (82% of those required); and
- Reviewed or took action on 114 (75%) of the received implementation plans.

In 2020, DEQ has:

- Required 163 annual reports to be submitted
- Received 122 (75%) annual reports

- Reviewed or took action on 105 (86%) of those annual reports

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 2020, DEQ completed DMA maps for every county in Oregon using an automated and repeatable method. 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)(l)(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 lesser(?) 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 2020 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 2020-2022 Performance Partnership Agreement. The following sections describe progress on these action items in 2020.

Table 16. 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 2020.

Goal #	Goal Topic	Action	Time Frame	2020 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	Ongoing	Ongoing

Goal #	Goal Topic	Action	Time Frame	2020 Status
		nitrates and pesticides from urban and rural residential lands.		See Section 3.9.2

Table 17. Description of toxic program actions or outputs identified in the 2020-2022 Performance Partnership Agreement and the status in 2020.

PPA Element	Action	Time Frame	2020 Status
PPA - 8.8	Implement relevant aspects of the 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 ODA, 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

In addition to guiding the statewide implementation of the Pesticide Stewardship Partnership (PSP) Program (see below), the primary focus of the Water Quality Pesticide Management Team's work in 2020 was to complete and distribute the 2017-2019 Oregon Pesticide Stewardship Partnership Program Biennium Report. This report summarizes the accomplishments and challenges of the PSP program over the two year biennium. A few of the more notable high-level findings of the report include:

- Nearly 70% of water quality monitoring stations showed measurable improvement over the previous biennium (2015-17) based on lower concentrations and frequency of detection of pesticides
- A five-year (2015-2019) linear trend analysis of the concentrations of the 27 most commonly detected pesticides across all PSP watersheds showed a declining trend (or no detections) for 86% of the monitoring stations
- Nine (9) pesticide waste collection events were held across the state, which collected over 109,000 pounds of pesticides from 132 participants

The WQPMT also produced an accompanying one-page fact sheet that summarizes the major highlights of the biennium report. Communications staff from multiple agencies worked with technical and program representatives to develop a news release and field questions from the media outlets to increase awareness of the program and its accomplishments.

In 2020 the Water Quality Pesticide Management Team was able to coordinate and conduct only one agricultural and commercial pesticide waste collection event due to the Covid-19 pandemic. A February 2020 event was held in Madras, OR, which collected 1580 pounds of pesticides from 13 growers and applicators. The WQPMT determined that centralized collection events were covered by the Governor's executive order restricting state agency activities or events that could cause safety concerns. In 2020, the WQPMT also allocated additional funding to local partners in selected watersheds to undertake and complete PSP strategic plans intended to optimize the effectiveness of monitoring and outreach efforts, and to gain commitments from a wide array of partner organizations. Funding for local strategic planning will be staggered over time, based on funding availability. The goal is to have plans in place for all 9 PSP watersheds within the next two to three years.

In 2020, the Pesticide Stewardship Partnership external stakeholder advisory group (SAG) was formed at the end of 2019, met twice in 2020. 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. The SAG reviewed draft standard operating procedures (SOPs) for the PSP program that are intended to ensure consistency and certainty in the implementation of the program. For instance, one SOP outlines the criteria for evaluating whether a pilot monitoring initiative in a watershed should become a longer term PSP project. This decision would be based on specific data thresholds and broad support among all local partners.

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 ODA and DEQ with stable state funding for the program, and this financial support has continued through the 2019-2021 Biennium. 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 2020, watershed partners helped DEQ collect over 657 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 2020 the total number of

pesticide detections and number of individual pesticide ingredients (or degradates) in the Hood River and Wasco 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 was 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. 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.

In 2020, no detections of chlorpyrifos were detected in streams within the Walla Walla Watershed near Milton-Freewater, OR for the first time since monitoring began in 2005 (Figure 6). The OSU Extension agent in the area worked with apple growers to identify less toxic and volatile alternatives to chlorpyrifos for the pre-bloom insecticide applications. Several growers switched to an insect growth regulator that has lower EPA aquatic life benchmarks for most ecological endpoints and is less volatile, and therefore, less prone to drift. Only one detection of the new alternative insecticide was observed in the watershed in 2020.

Although some insecticide concentrations (e.g., malathion, carbaryl) fluctuate from year-to-year, the overall number of detections of all insecticides in Wasco watersheds has declined from a peak of over 40 in 2014 to between 5 and 10 over the past three years (Figure 6). Monitoring on Fifteenmile Creek in the Wasco PSP area continues to show 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. Alternative herbicides that are consistently detected from year-to-year in area streams are glyphosate (and its degradates) and hexazinone. Glyphosate is detected frequently in Fifteenmile Creek, but the lowest benchmark is 11900 ppb compared to simazine's ALB of 6 ppb. Hexazinone's lowest ALB is 7, but hasn't been detected as frequently as simazine in the first two years of Wasco monitoring. Pendimethalin (lowest ALB = 5.8 ppb) is occasionally detected much less frequently. Some alternative herbicides that we are not analyzing for could be currently in use by agriculture in the area.

The Middle Rogue is one of the newer PSP watersheds, with a full project beginning in 2016. Oxyflurofen (Goal), an herbicide primarily used in agricultural operations, has been the pesticide of greatest concern in the watershed due to detections approaching or exceeding the EPA aquatic life benchmark in Jackson Creek. A reconnaissance monitoring effort was launched in 2019 on multiple locations on Jackson Creek to help narrow the geographic area where the highest detections were found. The small stretch of the stream where the greatest concentrations were detected was identified, and the OSU Extension partner reached out to an agricultural operation in the area with commodities for which oxyfluorfen is registered for use. That operation made significant changes in the use and application of oxyfluorfen, and in 2020, no detections of this herbicide were found in Jackson Creek (Figure 6).

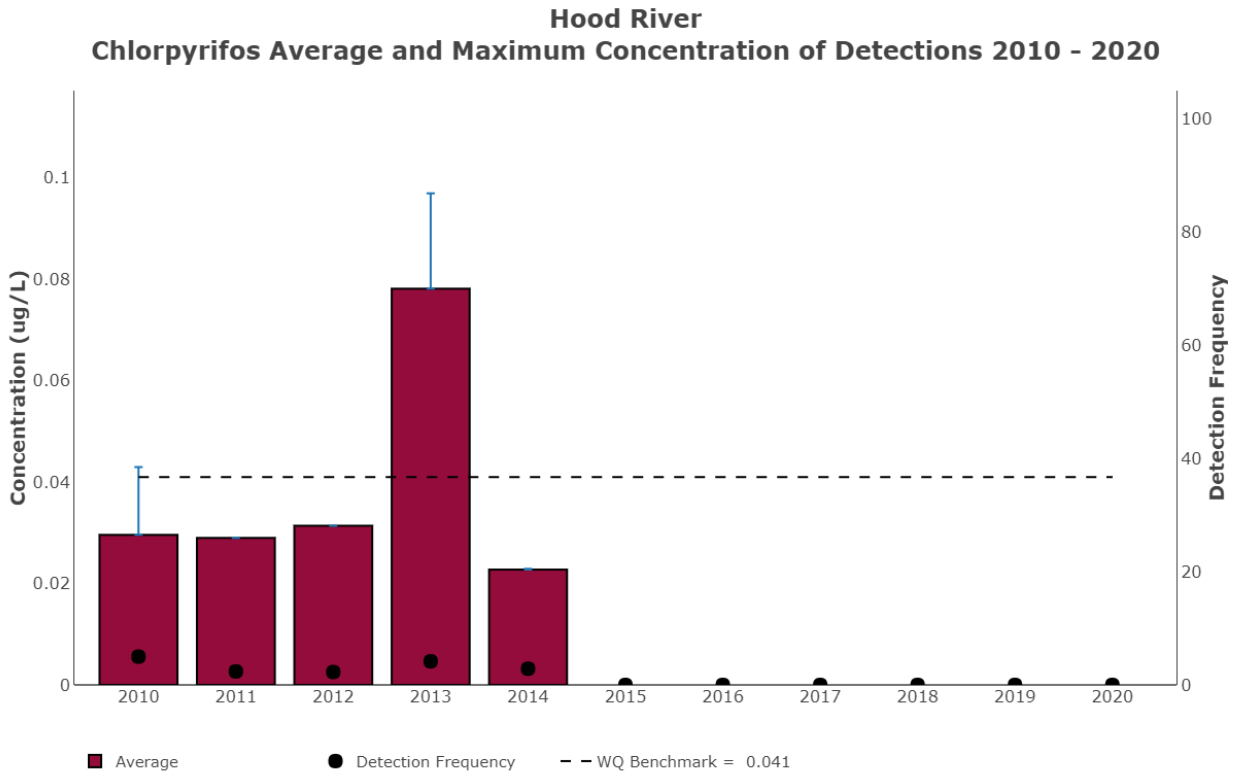

Figure 1. Hood River Watershed Pesticide Stewardship Partnership Project: average and maximum concentrations of detections of chlorpyrifos, 2012-2020.

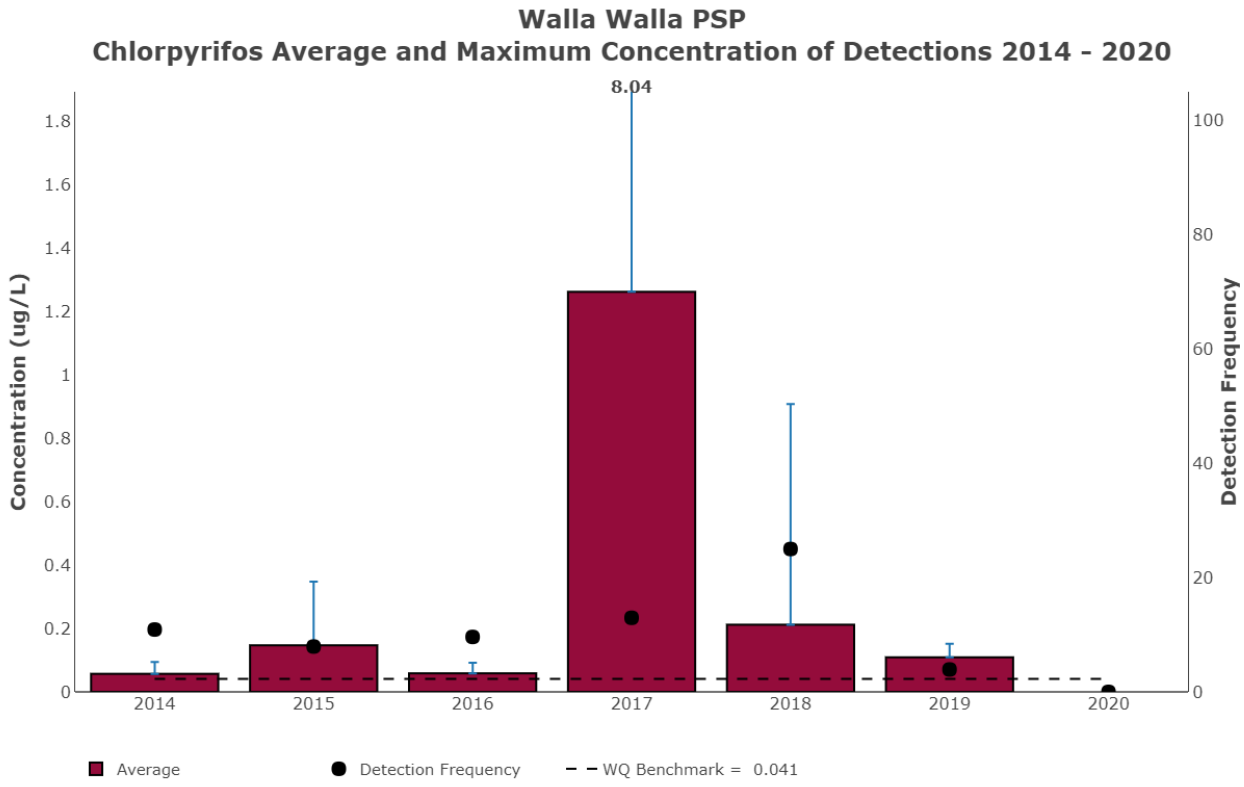

Figure 2. Walla Walla Watersheds Pesticide Stewardship Partnership Project: average and maximum concentrations of detections of chlorpyrifos, 2010-2020.

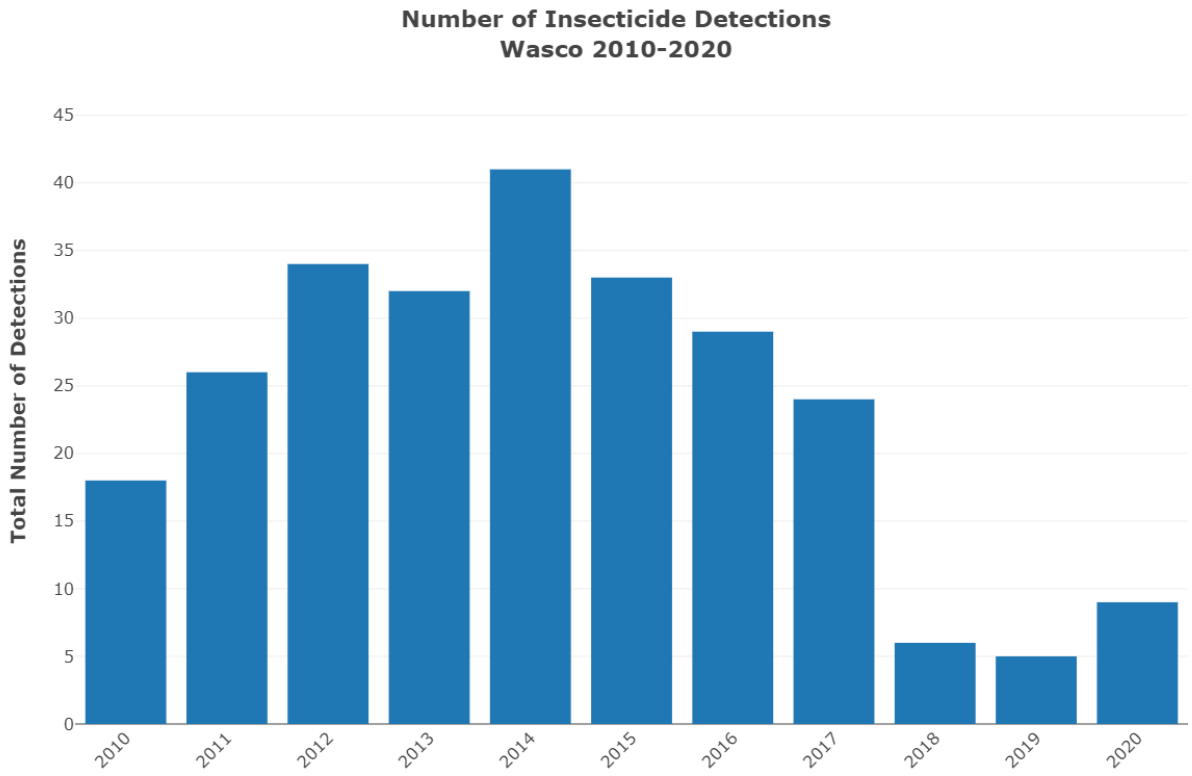

Figure 3. Wasco Watersheds Pesticide Stewardship Partnership project: number of insecticide detections, 2010-2020

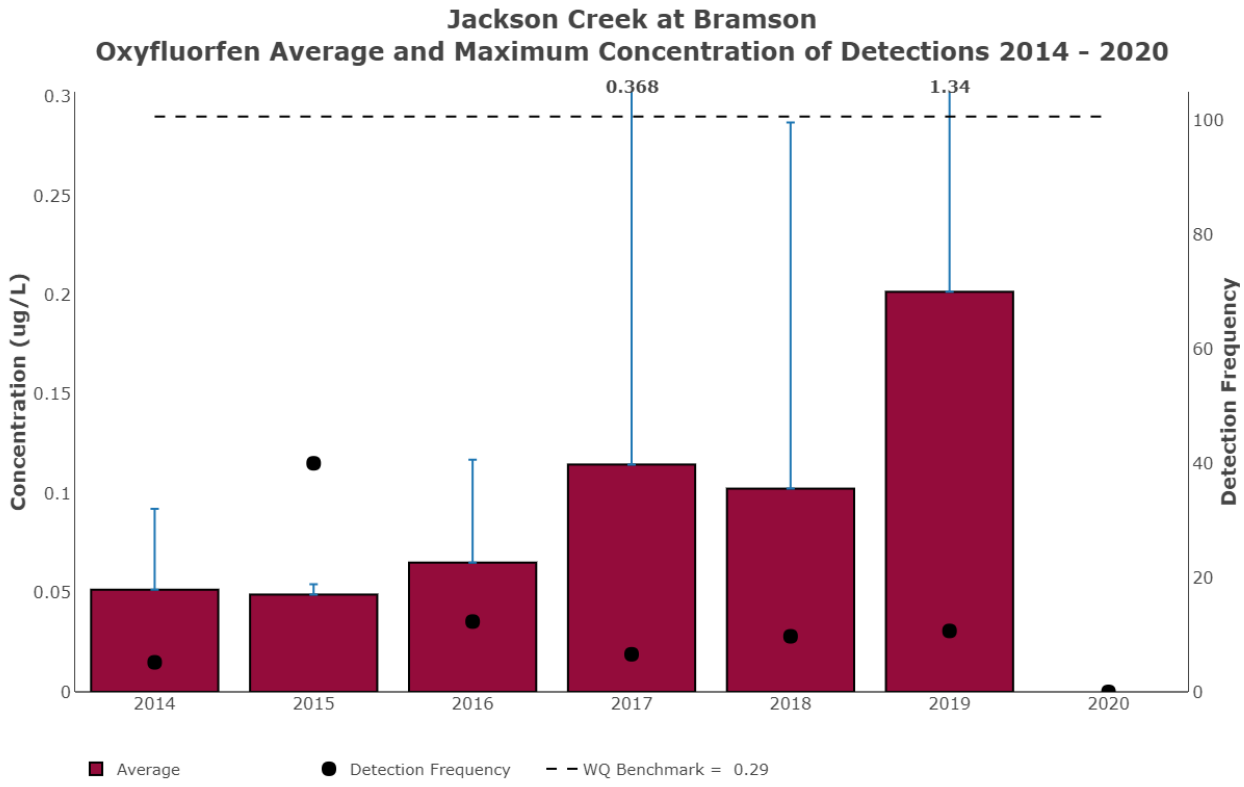

Figure 4. Middle Rogue Pesticide Stewardship Partnership project: Jackson Creek average and maximum concentrations of detections of oxyfluorfen

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 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). Dimethenamid (Outlook, Tower, Frontier) has been a pesticide of high concern for the PSP program, but has recently dropped into the "moderate" concern category based on monitoring data from the Clackamas and other watersheds. In 2020, monitoring data from North Fork Deep Creek in the Clackamas showed that average and maximum concentrations of dimethenamid, as well as detection frequency, fell to their lowest level since it was first detected in 2014 (Figure 5). A representative of the plant nursery industry on the Clackamas PSP technical advisory group has helped inform others in the industry about dimethenamid detections in Clackamas streams.

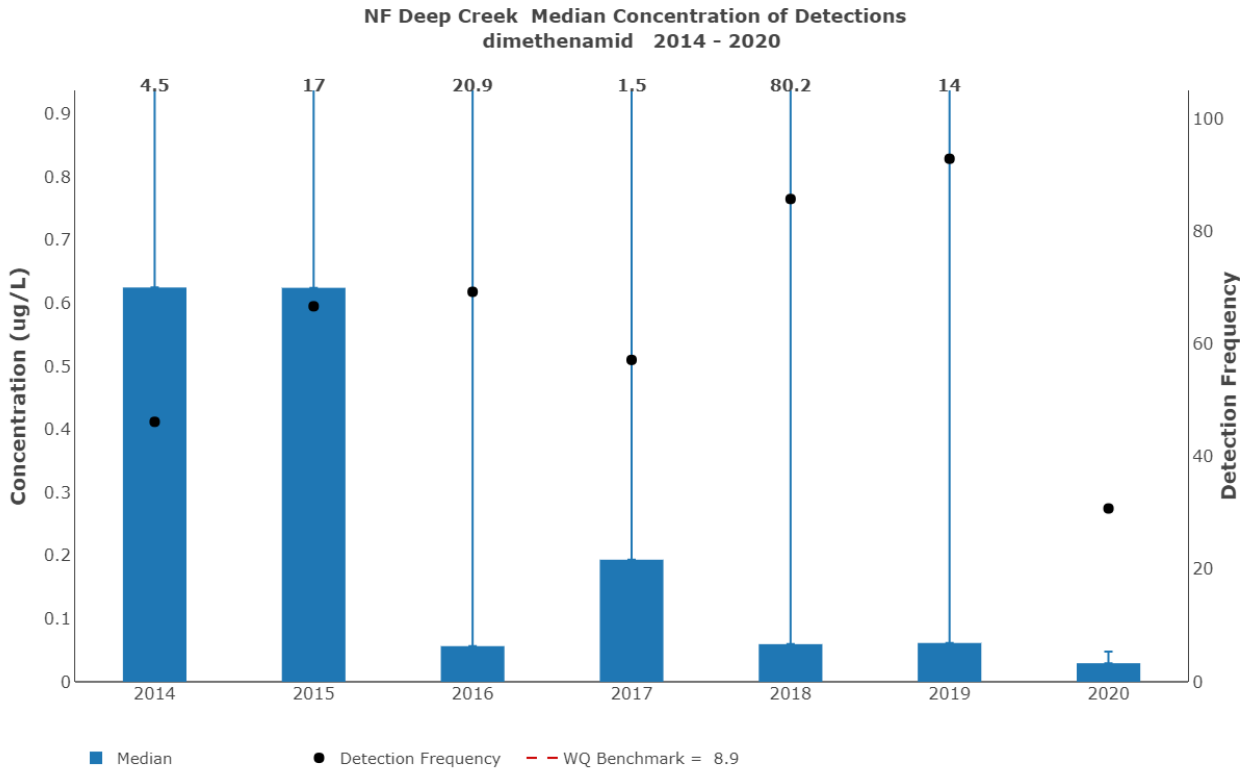

Figure 6. Clackamas Pesticide Stewardship Partnership project: Dimethenamid average and maximum concentrations 2014-2020

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 are collaborating on the evaluation of 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. The pesticide of highest concern in the watershed is the herbicide linuron (Linex), which is used for vegetation control on seed crop lands (e.g., carrot seed) in the area. The 2020 monitoring data for the **two** Campbell Creek sampling locations showed the lowest average and maximum concentrations of linuron, as well as the lowest detection frequency, since the current set of monitoring sites were established in 2017 (note: the initial 2014 pilot included only **one** Campbell Creek monitoring location). In 2018, close to 80% of samples at the two Campbell Creek sample sites (combined) had linuron detections, which dropped to approximately 50% of samples in 2020 (Figure 7).

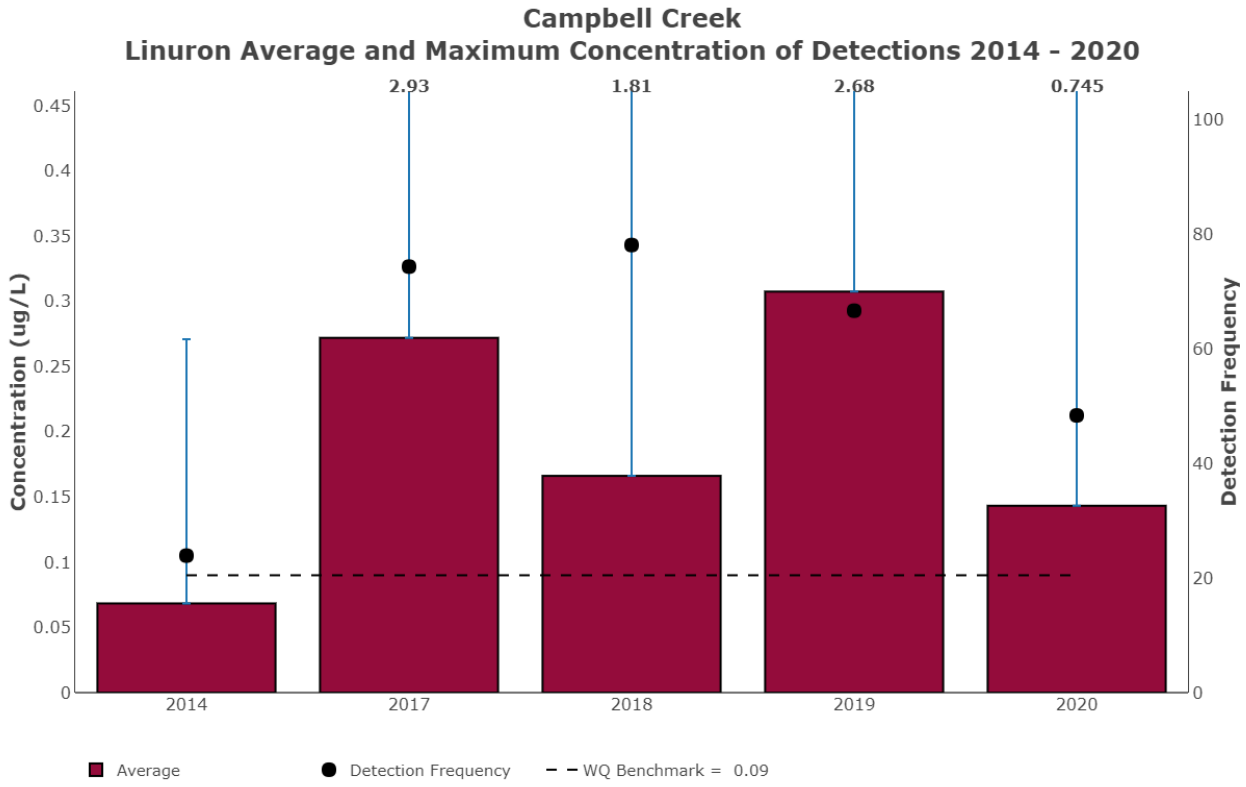

Figure 7. Middle Deschutes Pesticide Stewardship Partnership project: Campbell Creek linuron average and maximum concentrations of detections

Below is a summary of 2020 monitoring data results for each PSP watershed (Table 19 and Figure 8).

Table 18. Summary of 2020 pesticide detections and exceedances per watershed.

PSP Area	# of Sample Analyses	Detections	Benchmark or Criteria Exceedances
Amazon	7035	235	2
Clackamas	7812	274	8
Hood River	4610	73	0
Middle Deschutes	5335	237	14
Middle Rogue	7882	149	13
Pudding	5058	447	10
Walla Walla	6602	30	1
Wasco	6863	58	5
Yamhill	5058	407	29

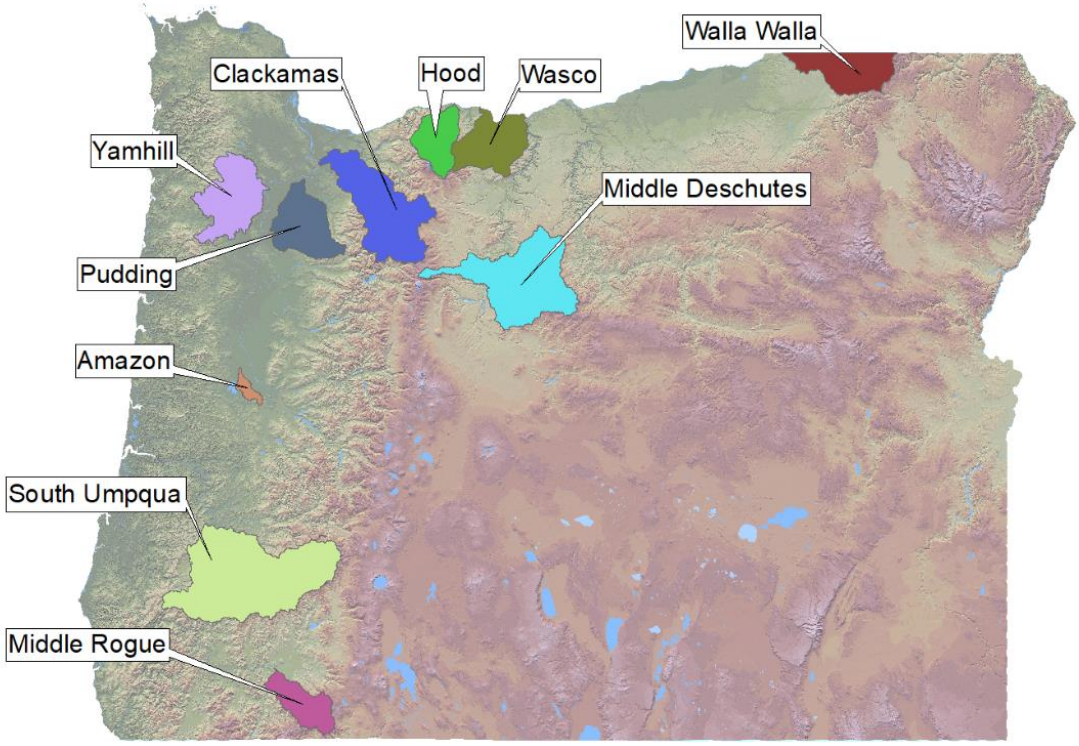

Figure 4. 2019 Pesticide Stewardship Partnership Watersheds.

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 the Cities of Port Orford and Myrtle Point in the South Coast.

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. As part of the interagency workgroup, the OHA and DEQ Drinking water programs developed

and initiated a PFAS Screening and Assessment Project Plan to determine if and where PFAS may be present in Oregon's public water system drinking water sources. In conjunction with this plan, DEQ's laboratory began to analyze methods for testing capability. DEQ and OHA will be using the mapping of potential PFAS sources along with Source Water Assessment data to prioritize water system groundwater sources based on sensitivity to infiltration of potential contaminants.

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. In September, 2020, DEQ provided an update on the implementation progress of the updated strategy to the Environmental Quality Commission.

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 and 2020, 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). In July, 2020 DEQ held a public

webinar on the updated Focus List to provide stakeholders with information on the changes to the list and to answer questions about these chemicals. 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 five 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 19. 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-**	**Ethynylestradiol, 17a-**	**Vinyl Chloride**
Current-Use Pesticides	Diazinon	Chlorpyrifos	Atrazine	Trifluralin	Chlorothalonil
	Malathion	Permethrin	Cabaryl	Pentachlorophenol	Diuron
	Glyphosate	2,4-D	~~Propoxur (Baygon)~~	~~Pendamethalin~~	
Flame Retardants & Industrial Intermediates	Polybrominate Diphenyl Ethers (PBDEs)	Polychlorinated Biphenyls (PCBs)	**Tris (2-chloroethyl) Phospate (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- (Dichloropbenzene 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 2020, 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). For instance, DEQ coordinated with Oregon and Washington purchasing agencies and suppliers to identify preferred purchasing tiers for furniture products with no (or low) priority toxic chemicals (e.g., flame retardants). With support from the EPA Pollution Prevention Grant, DEQ also conducted trainings and hired interns for businesses to promote the use of EPA Safer Choice certified products, and to advance the efforts of Oregon product manufacturers to attain Safer Choice certification for their products.

DEQ continued collaboration with the Interstate Chemicals Clearinghouse (IC2), Northwest Green Chemistry, the Environmental Council of the States and a West Coast States' collaborative to advance identification and assessment of less toxic alternatives to Focus List chemicals. In 2020 DEQ also

participated in a national multi-stakeholder initiative to develop chemical ingredient transparency principles, which will be used to support efforts to increase disclosure of chemicals in consumer and business products that are priorities for reduction.

DEQ coordinated with the Washington Department of Ecology and other entities to offer multiple chemical hazard and alternatives assessment trainings for businesses and governments in 2020. The EPA Pollution Prevention grant obtained by DEQ supported these trainings. This grant also funded the work of DEQ and Northwest Green Chemistry to complete the development of two on-line chemical alternatives and pollution prevention training modules for priority industrial toxic pollutants and phthalates.

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. In 2020, DEQ programs began developing policies and guidance related to the assessment, cleanup and disposal of PFAS materials and waste. The Oregon Health Authority, in consultation with DEQ, developed draft oral reference dose concentrations and drinking water health advisory levels for 4 PFAS compounds. These numerical values will be finalized in 2021, and can be used for fish consumption advisories and cleanup action levels. In addition, DEQ worked with local governments, the State Fire Marshal, other states and non-governmental organizations to identify and assess less toxic and persistent alternatives to PFAS-based fire-fighting foam. This foam is responsible for groundwater and surface water contamination in Oregon and across the country. 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.

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 2020.

Table 20. 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 2020.

Goal #	Goal Topic	Action	Time Frame	2020 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 - 8.11	Biennial Review of Area Rule and Plan	Participate in ODA's biennial review process by providing water quality status and trends	Ongoing	Ongoing See Section 3.10.2 and

Goal #	Goal Topic	Action	Time Frame	2020 Status
		and landscape condition in priority areas.		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 2020, 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 as traditional methods use LiDAR data that is expensive to obtain. DEQ has been pursuing 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 partnered with the Institute for Natural Resources to develop this model further and purchased a hemispherical camera analysis system that will standardize and modernize how DEQ collects canopy cover and effective shade data in the field. In 2021 DEQ will collect field data for model calibration and verification.

3.10.2. Review of Area Rules and Plans

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 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. Annually, 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.

Since 2020, DEQ provided comments or recommendations to ODA for biennial reviews in the following seventeen agricultural management areas:

- Clackamas
- Inland Rogue
- Klamath
- Lower Deschutes
- Lower John Day
- Malheur
- Mid-Coast
- Middle Willamette
- 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 shade analyses in two parts of the state.

For the Walla Walla Subbasin Temperature TMDL, DEQ evaluated 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 by an average of 15% between 1995 and 2017 across the study area. 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. In 2020, the results were incorporated into the Walla Walla Agricultural Water Quality Area Plan.

For the Willamette Basin Temperature TMDL, DEQ evaluated effective shade conditions across the southern half of the Basin, using the most recent Lidar imagery (2008 to 2014). The mean results across the study area show that show that streams on agricultural lands have 33% effective shade, which is 49% below the mean shade target of 82% across the five Agricultural Water Quality Management Areas in the study area. In 2020, the results for agricultural lands were incorporated into two Agricultural Water Quality Area Plans: Upper Willamette-Upper Siuslaw and Middle Willamette. The results for agricultural lands in the other Management Areas (Southern Willamette Valley, South Santiam, and North Santiam portion of Molalla-Pudding-North Santiam) will be added to those Area Plans the next time they are revised.

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 2020. DEQ is working with ODA to update the biennial review guidance.

3.10.4. Strategic Implementation Areas 2014 to 2020

Strategic Implementation Areas (SIA) are a multiagency effort that engages the Oregon Watershed Enhancement Board (OWEB), Oregon Department of Environmental Quality, ODA, Oregon Department of Fish and Wildlife, Soil and Water Conservation Districts, Watershed Councils, 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 and where water quality priorities and programs align.

The prioritization criteria include:

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

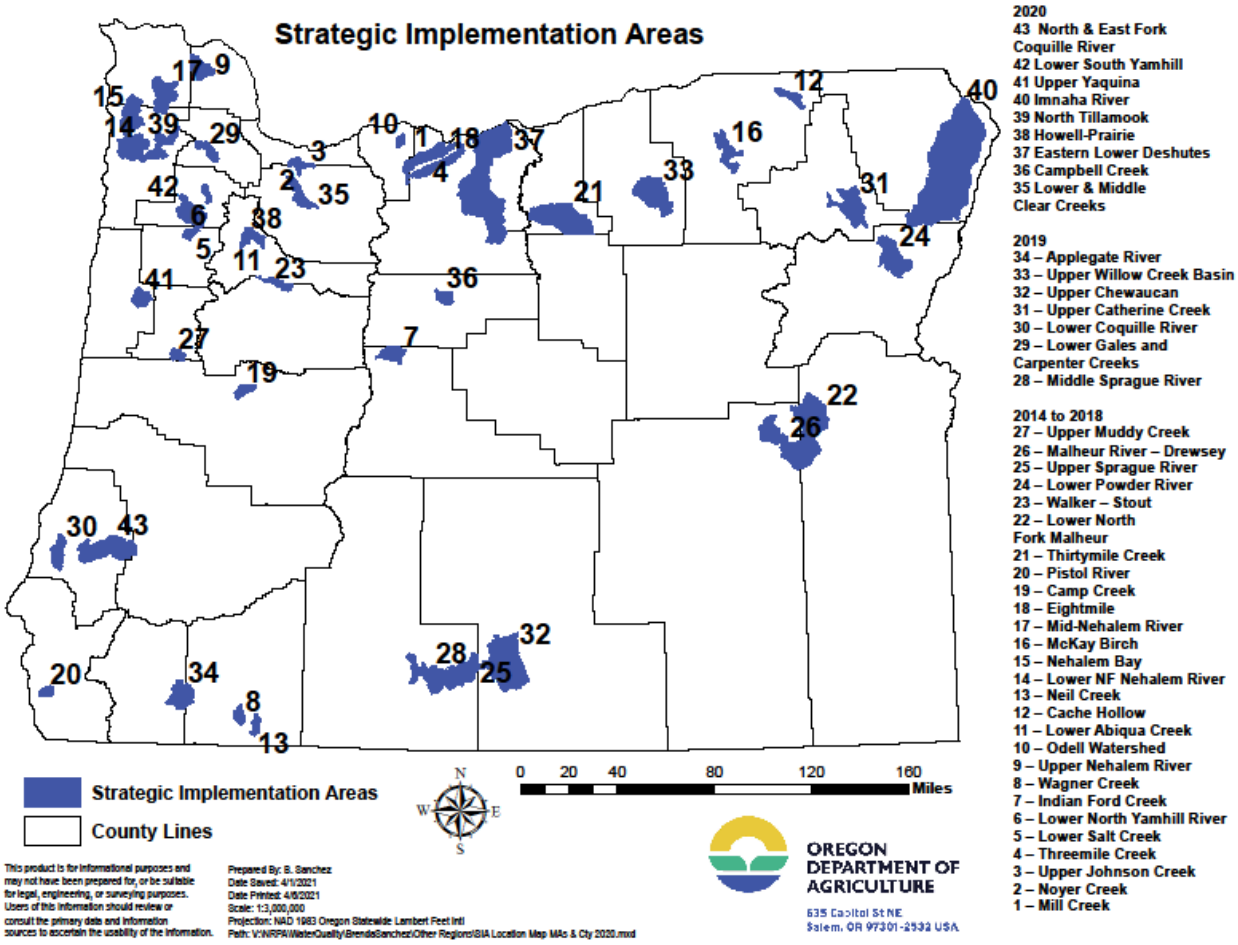

Figure 5. Strategic Implementation Areas (2014-2020) by Agricultural Water Quality Management Area.

SIA Process Overview:

1. ODA convenes a local 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 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 landowner contact.

Between January 2014 and December 2020 ODA initiated a total of 43 SIAs consisting of 15,167 agricultural tax lots in 164 watersheds. ODA evaluated 5,907 stream miles and 1,275,553 agricultural acres. A high percentage (96.4%) of tax-lots were evaluated at the lowest concern levels; indicating that these lands are most likely in compliance with agricultural water quality regulations.

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 2020.

Table 21. 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 2020.

Goal #	Goal Topic	Action	Time Frame	2020 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 rules to the study, but these rule compliance evaluations are on hold (see below). Results show that compliance rates are generally high (>90%) with compliance for some riparian rules (e.g., protection of small Type-N streams and small wetlands) lower and in need of increased compliance. 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, non-response and refused permission from landowners could have introduced bias in the sampling approach. Non-response and refused permission

from landowners tended to be higher for non-industrial forestlands.. For these reasons, ODF began reviewing the study design and analysis in 2019. In 2020, ODF contracted with an environmental sampling and analysis company to evaluate the compliance analysis and to design and implement changes to address representativeness of sampling and the statistical methods and inferences. ODF plans to resume active sampling during 2021.

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 the Siskiyou Streamside Protection Review 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 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 ended in 2020. In February 2020, environmental and timber stakeholders signed a MOU to participate in a mediated process to pursue a science-informed policy development process to evaluate and jointly recommend substantive and procedural changes to Oregon forest practice laws and regulations. The goal of these meetings is to finalize a plan to prepare a Habitat Conservation Plan application to the federal services (US Fish and Wildlife and National Marine Fisheries) with proposed changes to Oregon's Forest Practices Act and implementing regulations to implement an approvable Habitat Conservation Plan (HCP) or other mechanism for federal regulatory assurances. The HCP or other assurance would cover listed salmonids and other aquatic and riparian-dependent species. These MOU cooperators also formally requested that the Board suspend this Siskiyou work and pass a temporary rule extending riparian rules for Salmon, Steelhead, and Bull Trout (SSBT) streams to the Siskiyou region. The Board made a decision regarding this request at their June 3, 2020 meeting. A permanent rule expanding SSBT stream protections to the Siskiyou georegion was later adopted in December 2020 as a result of legislative action (see below for more information)".

Wildfire was a larger than usual component of both federal and non-federal forest water quality concern in 2020. More than 1 million acres burned in multiple conflagrations during the week of Labor Day, severely impacting the west side of the Cascade Mountains and affecting the source areas of multiple public drinking water systems. Large areas of private, federal, and state forestland burned to varying degrees of severity, creating major challenges to water quality and drinking water sources. DEQ is on one of three state agencies co-convening the Cultural and Natural Resources Recovery Task Force. DEQ initially responded to remove hazardous waste and debris in residential parcels within the burn perimeters. Basin coordinators have since worked with local partners and designated management agencies to protect and recover water quality and riparian conditions within the burned areas. Drinking Water Protection staff have been heavily involved in wildfire response (see the DWP section for details).

In early September 2020, the Beachie Creek and Lionshead fires caused widespread damage throughout the Santiam Canyon, including the Santiam State Forest. Approximately 24,300 acres (51%) of the Santiam State Forest were within the fire perimeters. The fire severity ranged from no burn (7,700 ac) to high intensity stand-replacing fire (5,500 ac) creating a mosaic of fire effects across the landscape. The State Forests Division revised the 10-year Implementation Plan for the Santiam State Forest and began immediate restoration and recovery planning. In 2021, 1,090 acres were replanted, and 4,800 acres were aerially seeded. In 2022, 2,739 acres are slated for replanting. Planned salvage and recovery harvests for FY21 include 1,852 acres of modified clear cut (retain all green trees with live crowns >15%), 1,639

acres of roadside hazard partial cut, and 35 acres of partial cut. DEQ and Oregon Department of Fish and Wildlife reviewed and commented on the revised Implementation Plans; as a result, riparian protections and green tree retention requirements during salvage are more likely to meet fish, wildlife, and water quality protection needs. DEQ and ODFW will continue to consult with ODF's State Forests Division during implementation.

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 effective in achieving the goals for stream protection rules and 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. 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 was halted by legislative action (see below).

ODF has finished their analysis of stream temperature based on RipStream results. ODF is now evaluating the effectiveness of the FPA stream protection rules in meeting the goals for Desired Future Conditions (DFC) and large wood recruitment along fish use streams. The goal for DFC along fish use streams is to grow and retain vegetation so that, over time, average conditions across the landscape become similar to those of mature streamside stands. ODF has completed a technical report that analyzed Ripstream data with a focus on riparian vegetation, large wood in streams, and downed wood in riparian areas. ODF is additionally working on developing a modeling approach for projecting riparian stand growth and large wood recruitment using RipStream data and data from published scientific literature.

A memorandum of understanding between a group of 13 conservation NGOs and 13 timber industry representatives (known as the Private Forests MOU or Forestry Accords) committed both groups to try in good faith to reach an agreement on a Habitat Conservation Plan (HCP) for aquatic species and acquire approval from federal agencies by 2027. As part of a good faith start to the process, both groups backed legislation, passed by the Oregon Legislature in 2020 in the form Senate Bill 1602to 1) expand the salmon, steelhead, and bull trout habitat riparian management areas adopted for most of western Oregon in 2017 to the Siskiyou georegion; 2) increase helicopter herbicide spray buffer minima to 75ft on fish-bearing and domestic use streams (from 60ft) and to 50ft on non-fish/domestic streams (Type-N) with flowing water (from no buffer), while also creating an electronic notification system for neighbors and public water systems with day-before-helicopter-spray notifications; and 3) providing money for the Governor's Office to mediate sessions between the two parties to reach a framework to apply for an application for the HCP. Negotiations are expected to continue through 2021.

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 sits 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 relevant water quality standards). The Scoping Team and Steering Committee met throughout 2020, and completed an administrative draft HCP for western Oregon State Forests on March 31, 2021. On March 8, 2021, the National Marine Fisheries Service filed its notice of intent to prepare an Environmental Impact Statement (EIS) in the federal register. A record of decision is expected winter of 2022.

3.11.3. ODF/DEQ MOU Revision

DEQ committed to participate with ODF on revising the MOU between ODF and DEQ, and this work is ongoing. The MOU was last revised in 1998. No revisions were made in 2020, but the two agencies began a revision process and wrote a draft outline and presented at EQC and BOF meetings.

In related work, the Oregon Department of Justice, in collaboration with DEQ and ODF personnel, wrote a legal memo clarifying the roles and responsibilities of DEQ and ODF in developing and implementing Total Maximum Daily Loads (TMDLs) on non-federal forestlands. The memo states that DEQ is responsible for developing TMDLs, setting load allocations and surrogate measures, and the Board is then obligated to implement rules that establish forest practices (which may include voluntary actions as well as regulatory changes) consistent with the TMDL. This is significant in that it affirms ODF is required to implement TMDLs as part of achieving and maintaining water quality standards, which under statute is done via the Forest Practices Act.

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 22. 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 2020.

Goal #	Goal Topic	Action	Time Frame	2020 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.

Current/ongoing 2020 activities include:

DEQ convened a TMDL-MS4 Collaboration project team to ensure clarity and consistency in coordinating implementation of the TMDL and MS4 regulatory programs, beginning at TMDL development through MS4 permit issuance and implementation. By ensuring clear and consistent coordination between these two programs, DEQ will minimize the likelihood of recommending or developing inconsistent requirements for management and control of pollutants from municipal stormwater for those entities in geographic areas where the programs intersect via assigned permits and issued TMDLs. In addition, further coordination between TMDL and MS4 programs will provide cross-program opportunities to streamline processes and improve tracking and monitoring toward water quality improvements.

Desired project outcomes or goals:

- Assess the intersection of the TMDL and MS4 programs and the associated implementation issues in detail to identify the appropriate or opportune timelines or process points for coordination and collaboration to achieve improvements to requirements and internal processes;
- Conduct an internal coordination process to resolve priority issues between TMDL and MS4 programs;
- Improve agency relationships with DMAs and permittees by providing consistent messaging
- Present recommendations to managers for consideration;
- Develop guidance or tools to document approved decisions and processes.
- Provide training (or orientation) on key process outputs to staff.

Recommendations and decisions, as well as issues or tasks that cannot be completed by the Project Team, will be documented for future reference.

In 2020 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 2020. 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 2020.

Table 23. 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 2020.

Goal #	Goal Topic	Action	Time Frame	2020 Status
FED – 1	USFS Mid-Term Status Report	The USFS will submit to DEQ a Statewide Annual Status Report to meet the MOU and any DEQ TMDL reporting requirements.	2021	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.	2023	Revised to complete in 2023 based on the renewed MOU. See Section 3.13.2
FED – 3	BLM Mid-Term 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. Report was 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.	2022	In progress. Revised to be completed in 2022 based on the renewed MOU in 2017. 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	Ongoing	Ongoing See Section 3.13.5

Goal #	Goal Topic	Action	Time Frame	2020 Status
		quality on BLM and USFS administered lands, this will include WQRPs.		
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 2020; the next report is due in 2021.

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 mid-term report was scheduled to be completed in 2020. Due to workload and staff resources diverting to wildfire response, no mid-term report was prepared in 2020. DEQ staff will work to get the mid-term report done in 2021.

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 nor with the USFS in 2020. 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.

DEQ is collaborating with USFS and BLM staff on wildfire response and drinking water source protection within burned areas through basin coordinator and drinking water protection staff outreach. DEQ staff collaborated with USFS staff on the Erosion Threat Assessment and Reduction Team reports for the four largest fires (Archie Creek, Beachie Creek/Lionshead, Holiday Farm, and Riverside) and the statewide drinking water/water quality report (see Drinking Water Protection section for more information.

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 Pacific Northwest Drinking Water Providers Partnership to allocate grant funds in Oregon and Washington. In 2020, a total of $311,000 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 2020 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 2020.

Table 24. 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 2020.

Goal #	Goal Topic	Action	Time Frame	2020Status
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, ODA, 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 of ten projects in Oregon have been approved by NRCS and are undergoing the "readiness" phase, which involves developing a detailed watershed assessment and an outreach strategy to address agricultural-related impacts to source water quality. DEQ assisted the conservation partners as they gathered data for the watershed assessments and has been assisting with the technical advisory team in these areas. The assessments typically take 1-2 years to complete and the following assessments are currently in progress:

Approved for FY2019

- 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 (Assessment Completed)
- South Umpqua River, Lookingglass Creek Sub-Watershed: serving Cites of Winston and Dillard

Approved for FY2020

- 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 (project withdrawn by conservation partners)

Approved for FY2021

- Siletz River: serving Cities of Newport, Toledo, Siletz and Seal Rock Water District.

Following the readiness phase, these source water protection areas are then eligible to receive enhanced 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.

In addition, in 2020 DEQ assisted NRCS in developing and analyzing criteria to respond to NRCS National Bulletin 300-20-37 which required state NRCS offices to refine Source Water Protection Local Priorities for Fiscal Year 2021. Criteria for identifying Oregon high priority areas for source water protection focus were selected based on presence and density of drinking water source areas, population served, percent acreage of private agricultural lands, and overall susceptibility based on a number of factors like soil erosion potential, wildfire risk, presence of harmful algal blooms, listings for various 303(d) criteria, critical habitat for salmon, steelhead or bull trout, public water system chemical detections, and known areas of aquifer depletion or groundwater management. NRCS provides increased incentives to producers in these areas for conservation practices that relate to water quality and quantity and protect drinking water sources.

Note: In 2020, NRCS NWQI also approved planning phase assessments for selected sub-Basins within the Trout Creek watershed in Jefferson and Wasco Counties. This is not a source water protection project but under the general NWQI category. .

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. Flow measurement continued throughout 2020 and the 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, ODA, 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; and
- 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 2020-2022 Performance Partnership Agreement (Table 26) and the progress on the action item in 2020.

Table 25. Description of nonpoint source success stories action identified in the 2020-2022 Performance Partnership Agreement and the status in 2020.

Goal #	Action	Time Frame	2020 Status
PPA - 8.5	Determine with EPA available NPS Success Stories documenting either water quality progress or full restoration under PAM.	September 2020 and September 2021	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 2020, 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 Columbia Slough

The Columbia Slough is a 19 mile long complex of narrow and shallow channels located on the southern floodplain of the Columbia River between Fairview Lake and the Willamette River. Most of the Slough is located within the City of Portland. It serves as one of the City of Portland's largest open space and wildlife habitat areas. As the area developed, the Slough had been gradually turned into a highly managed water system for drainage and flood control for the surrounding lowlands. This heavy management resulted in significant impacts to water quality and beneficial uses supported by the watershed.Today, the Slough drains approximately 40,000 acres of land with many kinds of land use including heavy and light industries, residential areas, vegetable farming and the Portland International Airport. Because of this the watershed is affected by many sources of pollution. Among these sources are combined sewer overflows (CSOs), groundwater, landfill leachate, airport de-icing fluids, urban runoff, past practices, industrial runoff, and conventional National Permit Discharge Elimination System (NPDES) point sources.

The Columbia Slough, from the mouth to Fairview Lake, had been placed on DEQ's 1994/1996 303(d) list for multiple parameters, including bacteria. Elevated bacteria levels through all seasons impacted the water contact recreation use (swimming). In 1998, DEQ issued and EPA approved the Columbia Slough TMDL. The TMDL addressed multiple parameters including bacteria. The TMDL determined that combined sewer overflows (CFOs) were a significant source of the degradation of water quality in the Lower Columbia Slough as they contributed high amounts of bacteria from the overflow of raw sewage entering the system. The TMDL determined that CSOs contributed 67% and 84% of the Fecal Coliform load in the summer and winter respectively. The Upper and Middle Slough contributed <3% of bacteria loads to the Lower Slough. The Middle Slough is mainly affected by unknown sources, likely illicit sources, such as failing septic systems and homes that discharge directly to the slough. In the Upper Slough, the most significant source is from storm water contributing 91% of the bacterial load in both the summer and winter.

There were various programs and projects implemented to address the CFOs including downspout disconnection, stream diversion, stormwater sumps, sewer separation, and treatment of the combined

sewer and stormwater. The sewer separatation and treatment project is commonly known as the “Big Pipe Project”. These projects resulted in more than 56,000 downspout disconnections, 3,000 stormwater sumps and sedimentation manholes, and diversions of stormwater to a constructed wetland. The Columbia Slough Big Pipe was the largest project aimed at CSO mitigation and was completed in 2000. The project included 3.5 miles of tunnel preventing the overflow of approximately 300 million gallons into the slough each year. As a result of these projects, combined sewer overflows in the Columbia Slough have been reduced by 99 percent from pre-project levels.

Healthy riparian vegetation has been shown to have positive impacts on the amount of pollutants entering surface water through runoff or other pathways. In 1995, the City of Portland’s Watershed Revegetation Program, in an effort to reduce water temperatures in the slough, began planting trees in the surrounding riparian zones. As of 2020, the program has planted more than 816,000 native tree seedlings within the watershed. Some of the positive water quality impacts, including a reduction in bacteria levels, could be a result of this increased vegetation.

Additional projects have been implemented over the years that could have had an effect on bacteria levels in the Columbia Slough. These projects included abandoning septic tanks and cesspools, enhancing instream habitat, controlling invasive species, encouraging wetland plant communities, and educating citizens around best management practices and watershed health.

All of this work surrounding the Columbia Slough has had an impact on water quality related to bacteria. From 2008 to 2017 there have been no violations of the criteria for bacteria in the Lower Slough. As a result, the 2018/2020 Integrated Report delisted this waterbody from 303(d) list and now shows the Lower Columbia Slough assessment unit as attaining (category 2).

5. Nonpoint Source Basin Level Achievements in 2020

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 2020.

Table 26. 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	2020 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	3964	0.4	7.5	1.0	89.9	1.3

Subbasin	Watershed Area (km2)	% Urban/Roads	% Forest	% Cultivated	% Range/Forest Disturbance	%Other
Little Deschutes	2727	1.9	61.9	0.4	32.4	3.3
Lower Crooked	4787	2.7	20.8	6.0	70.0	0.5
Lower Deschutes	5946	1.5	28.1	6.7	62.6	1.2
Trout	1793	1.0	11.2	3.6	84.1	0.0
Upper Crooked	2994	0.2	28.4	0.9	68.5	2.0
Upper Deschutes	5580	4.2	57.3	2.5	30.0	6.1

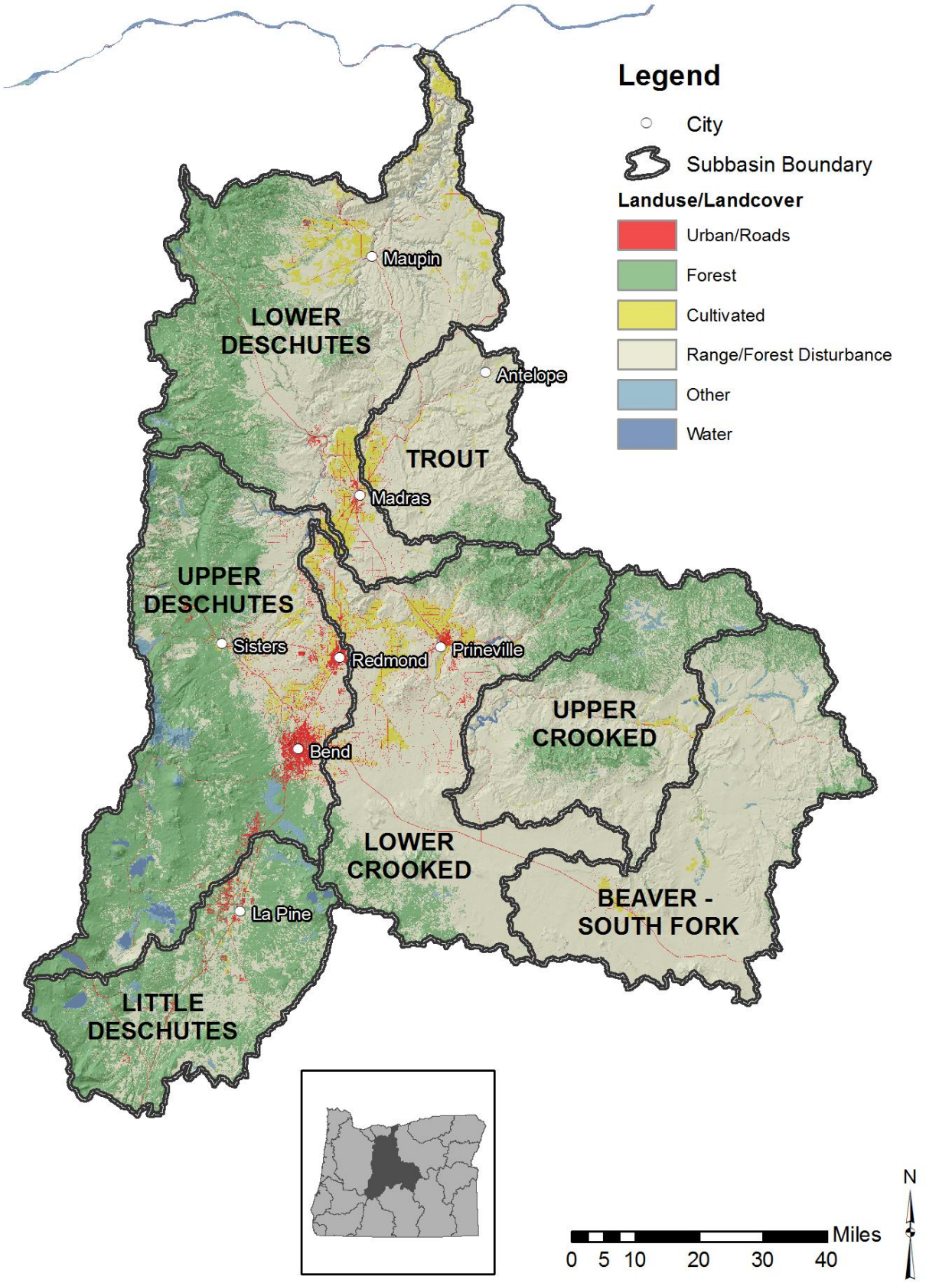
Legend
City
Subbasin Boundary
Landuse/Landcover
Urban/Roads
Forest
Cultivated
Range/Forest Disturbance
Other
Water
Maupin
LOWER DESCHUTES
Antelope
TROUT
Madras
UPPER DESCHUTES
Sisters
Redmond
Prineville
UPPER CROOKED
Bend
LOWER CROOKED
BEAVER - SOUTH FORK
La Pine
LITTLE DESCHUTES
N
Miles
0 5 10 20 30 40

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: Smita.Mehta@deq.state.or.us
Deschutes Basin	Tessa Edelen: 541-633-2028: edelen.tessa@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 assessment units with and without a TMDL as identified in Oregon's 2018/2020 Integrated Report and Assessment database.

Parameter	Assessment units without a TMDL	Assessment units with a TMDL
Arsenic, Inorganic	1	0
BioCriteria	24	0
Chlorophyll-a	7	0
Chlorpyrifos	1	0
DDE 4,4'	1	0
Dieldrin	1	0
Dissolved Oxygen	24	0
Dissolved Oxygen - Cold Water	1	0
E. coli	8	0
Harmful Algal Blooms	7	0
Iron (total)	2	0
Methylmercury	10	0
pH	18	0

Parameter	Assessment units without a TMDL	Assessment units with a TMDL
Phosphorus	10	0
Sedimentation	14	0
Temperature	124	0
Total Dissolved gas	2	0
Turbidity	4	0

2.2 Total Maximum Daily Load Watershed Plans

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

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

The Water Quality Management Plan (WQMP) is the framework for TMDL implementation that is issued by Oregon along with the TMDL (Oregon Administrative Rules 340-042-0040(l)). The TMDL and WQMP serve as a multi-sector plan and provides the blueprint for TMDL related implementation activities.

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 2020. Note this section does not identify or include projects proposed and awarded a grant in 2020. 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 2020 see Section 3.6.2 of the main report.

In 2020 there were no 319 projects with reported outputs in the Deschutes.

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 2020.

In 2020 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-4 describes the projects and the reported outputs.

Table A-4: Nonpoint source related Clean Water State Revolving Fund project outputs reported in 2020.

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 2020.

In 2020 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-5 describes the projects and the reported outputs.

Table A-5: Nonpoint source Drinking Water Source Protection program projects and outputs for 2020.

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 2020.

In 2020 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 19 OWEB funded projects completed in 2019 with a total cash and in-kind budget of $2,655,429. 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-6: Summary of OWEB grant funded fish passage projects completed in 2019, the most recent year data is available in the OWEB OWRI database.

Subbasin	Fish Passage Crossing improvement (Number of treatments)
Upper Deschutes	1

Table A-7: Summary of OWEB grant funded instream projects completed in 2019, the most recent year data is available in the OWEB OWRI database.

Subbasin	Engineered structures installed (Number of treatments)
Upper Deschutes	4

Table A-8: Summary of OWEB grant funded instream projects completed in 2019, the most recent year data is available in the OWEB OWRI database.

Subbasin	Instream habitat: Large wood placement (Number of treatments)
Upper Deschutes	749

Table A-9: Summary of OWEB grant funded riparian projects completed in 2019, the most recent year data is available in the OWEB OWRI database.

Subbasin	Riparian fencing (Area treated)	Riparian fencing (Stream sides treated)
Lower Deschutes	7	2
Upper Crooked	10	2

Table A-10: Summary of OWEB grant funded riparian projects completed in 2019, 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 (Length of treatment)	Riparian vegetation planting (Stream sides treated)
Lower Deschutes	NA	NA	0.3	NA
Upper Deschutes	1	7	1.0	2

Table A-11: Summary of OWEB grant funded upland projects completed in 2019, 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)	Upland erosion control (Acre)	Water/ sediment control basins (Acre)	Water/ sediment control basins (Number of treatments)
Lower Crooked	255	4000	NA	NA	NA	NA	NA	NA
Lower Deschutes	614	2500	602	24674	15	NA	350	15

Sub basin	Irrigation system improvement (Acre)	Irrigation system improvement (Feet)	Terracing (Acre)	Terracing (Feet)	Terracing (Number of treatments)	Upland erosion control (Acre)	Water/ sediment control basins (Acre)	Water/ sediment control basins (Number of treatments)
Upper Deschutes	NA	NA	NA	NA	NA	5	NA	NA

Table A-12: Summary of OWEB grant funded upland projects completed in 2019, the most recent year data is available in the OWEB OWRI database.

Subbasin	Off-channel livestock or wildlife watering (Number of treatments)
Lower Crooked	3
Lower Deschutes	4

Table A-13: Summary of OWEB grant funded upland projects completed in 2019, 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 Crooked	NA	18	NA
Lower Deschutes	1149.0	NA	NA
Upper Crooked	4937.0	2630	535
Upper Deschutes	112.2	NA	NA

Table A-14: Summary of OWEB grant funded instream projects completed in 2019, the most recent year data is available in the OWEB OWRI database.

Subbasin	Wetland invasive plant control (Area treated)	Wetland vegetation planting (Area treated)
Upper Deschutes	6	6

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 100ºF 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.

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	1.1	42.7	12.1	33.5	10.6
Lake Abert	2671	0.6	25.1	1.5	63.7	8.9
Summer Lake	10709	1.0	14.2	2.7	74.2	7.9
Warner Lakes	4444	0.3	9.2	0.6	81.6	8.3

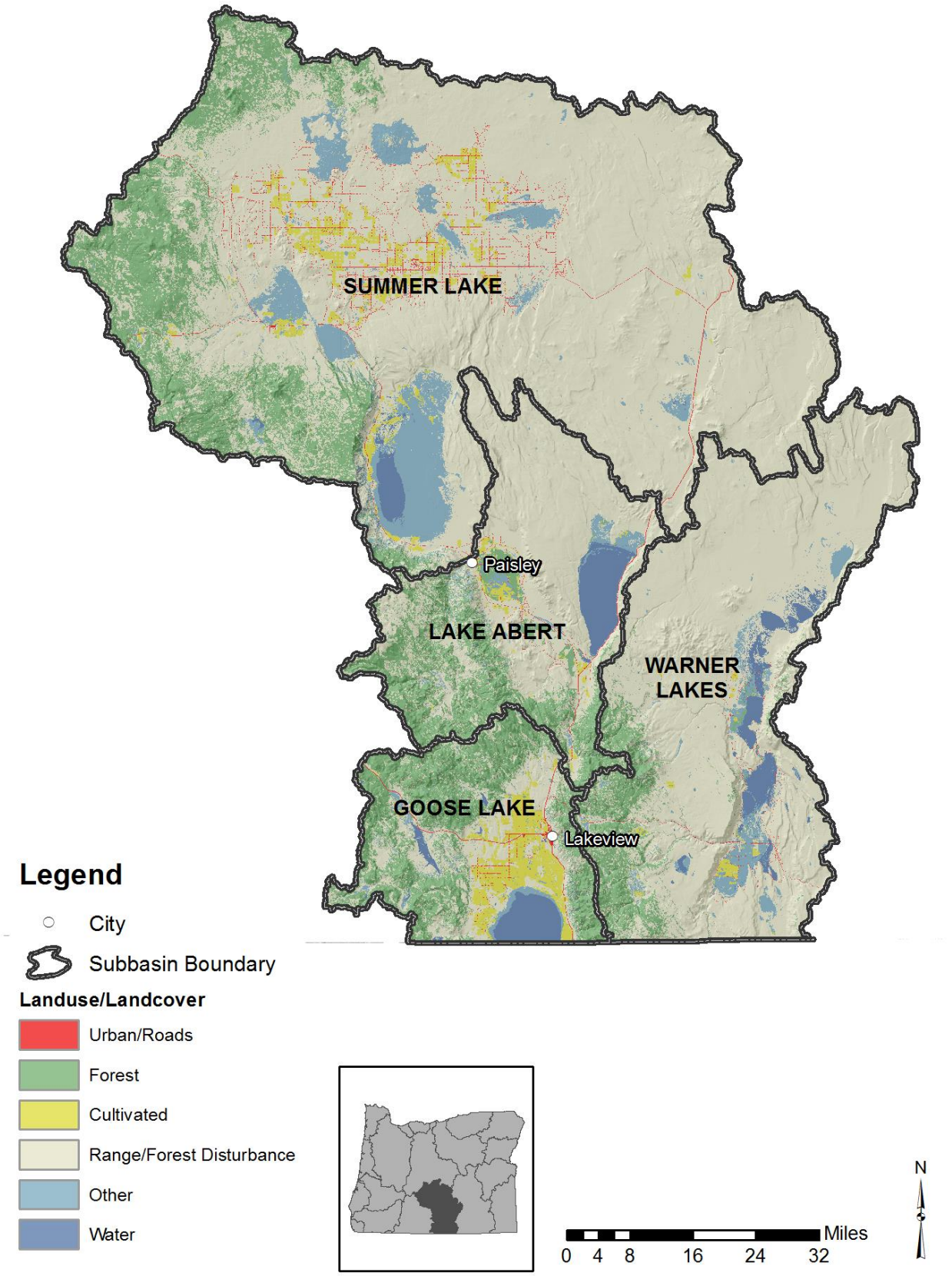
SUMMER LAKE
Paisley
LAKE ABERT
WARNER LAKES
GOOSE LAKE
Lakeview
Legend
City
Subbasin Boundary
Landuse/Landcover
Urban/Roads
Forest
Cultivated
Range/Forest Disturbance
Other
Water
N
Miles
0 4 8 16 24 32

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
Goose and Summer Lakes Basin	John Dadoly: 541-278-4616: john.dadoly@deq.state.or.us
Goodse and Summer Lakes Basin	Mike Hiatt: 541-273-7002: hiatt.mike@deq.state.or.us
Goodse and Summer Lakes Basin	Tessa Edelen: 541-633-2028: edelen.tessa@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 assessment units with and without a TMDL as identified in Oregon's 2018/2020 Integrated Report and Assessment database.

Parameter	Assessment units without a TMDL	Assessment units with a TMDL
Arsenic, Inorganic	3	0
BioCriteria	7	0
Dissolved Oxygen	4	0
Iron (total)	3	0
Phosphorus	1	0
Silver	2	0
Temperature	52	1
Thallium	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.

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 2020. Note this section does not identify or include projects proposed and awarded a grant in 2020. 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 2020 see Section 3.6.2 of the main report.

In 2020 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 2020.

In 2020 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 2020.

In 2020 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 2020.

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 2020.

In 2020 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 19 OWEB funded projects completed in 2019 with a total cash and in-kind budget of $5,824,986. 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 2019, the most recent year data is available in the OWEB OWRI database.

Subbasin	Fish Passage Non-crossing improvement (Number of treatments)
Warner Lakes	1

Table B-6: Summary of OWEB grant funded upland projects completed in 2019, the most recent year data is available in the OWEB OWRI database.

Subbasin	Upland fencing (Acre)	Upland fencing (Mile)
Goose Lake	35	2.8

Table B-7: Summary of OWEB grant funded upland projects completed in 2019, 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	945	79.7
Lake Abert	NA	2721.0
Warner Lakes	NA	2986.0

Table B-8: Summary of OWEB grant funded instream projects completed in 2019, the most recent year data is available in the OWEB OWRI database.

Subbasin	Wetland invasive plant control (Area treated)
Warner Lakes	1732

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, 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
Hells Canyon	499	0.1	29.8	0.4	69.8	0.1
Imnaha	2203	0.4	49.1	0.1	48.8	1.7
Lower Grande Ronde	3049	0.1	53.1	1.9	44.7	0.2
Lower Snake-Asotin	182	0.0	36.4	0.1	63.5	0.0
Upper Grande Ronde	4238	1.7	57.8	14.6	25.6	0.3
Wallowa	2471	1.0	51.3	8.0	34.1	5.5

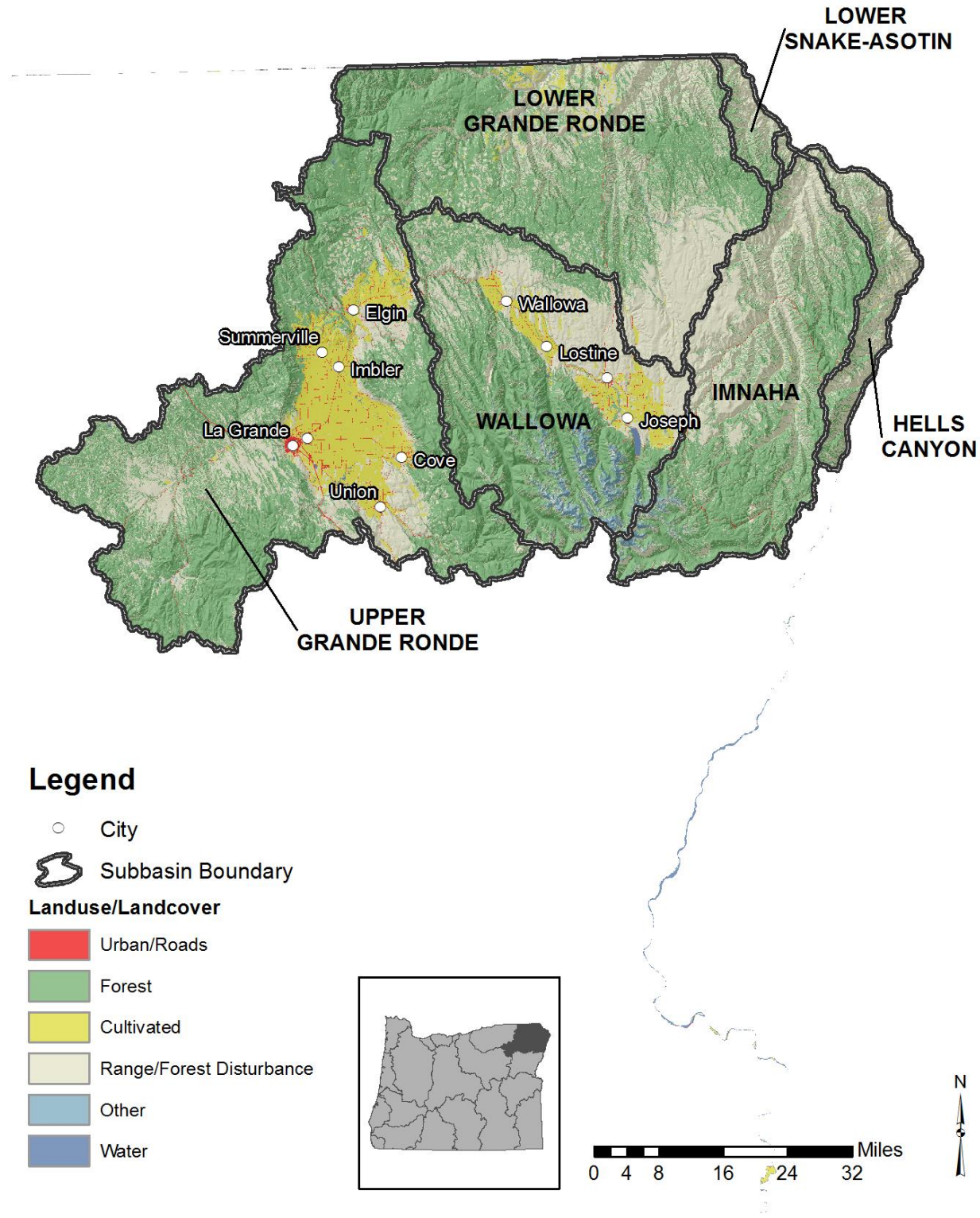

Figure C-1: Land use in the Grande Ronde administrative basin.

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
Grand Ronde Basin	Tessa Edelen: 541-633-2028: edelen.tessa@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 assessment units with and without a TMDL as identified in Oregon's 2018/2020 Integrated Report and Assessment database.

Parameter	Assessment units without a TMDL	Assessment units with a TMDL
BioCriteria	10	0
Dissolved Oxygen	4	4
E. coli	3	5
Excess Algal Growth	0	7
Fecal Coliform	0	8
Iron (total)	4	0
Methylmercury	4	0
pH	0	5
Phosphorus	1	7
Sedimentation	18	37
Temperature	128	0
Total Dissolved gas	0	3

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 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
Lower Grande Ronde Subbasins TMDLS	Bacteria (water contact recreation), Temperature
Upper Grande Ronde River Subbasins TMDL	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 2020. Note this section does not identify or include projects proposed and awarded a grant in 2020. 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 2020 see Section 3.6.2 of the main report.

In 2020 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 2020.

In 2020 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 2020.

In 2020 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 2020.

In 2020 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 20 OWEB funded projects completed in 2019 with a total cash and in-kind budget of $8,570,800. 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 2019, the most recent year data is available in the OWEB OWRI database.

Subbasin	Fish Passage Crossing improvement (Number of treatments)
Imnaha	2

Table C-6: Summary of OWEB grant funded instream projects completed in 2019, the most recent year data is available in the OWEB OWRI database.

Subbasin	Stream bank stabilized (Miles)	Engineered structures installed (Number of treatments)
Lower Grande Ronde	0.3	NA
Upper Grande Ronde	1.5	3

Table C-7: Summary of OWEB grant funded instream projects completed in 2019, 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)	Off-channel habitat created, protected, or reconnected (Number of treatments)
Upper Grande Ronde	832	3966	33	9

Table C-8: Summary of OWEB grant funded riparian projects completed in 2019, the most recent year data is available in the OWEB OWRI database.

Subbasin	Riparian fencing (Area treated)	Riparian fencing (Stream sides treated)	Water gap development (Area treated)	Water gap development (Number of treatments)
Lower Grande Ronde	NA	NA	0.2	2
Upper Grande Ronde	95	2	NA	NA

Table C-9: Summary of OWEB grant funded riparian projects completed in 2019, 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 (Stream sides treated)
Lower Grande	NA	NA	NA	3	2

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 (Stream sides treated)
Ronde					
Upper Grande Ronde	61.2	NA	4	NA	NA
Wallowa	NA	1	NA	NA	NA

Table C-10: Summary of OWEB grant funded road projects completed in 2019, the most recent year data is available in the OWEB OWRI database.

Subbasin	Peak flow passage improvement (Number of treatments)
Lower Grande Ronde	1

Table C-11: Summary of OWEB grant funded upland projects completed in 2019, the most recent year data is available in the OWEB OWRI database.

Subbasin	Irrigation system improvement (Acre)	Irrigation system improvement (Feet)
Wallowa	1912	30150

Table C-12: Summary of OWEB grant funded upland projects completed in 2019, 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 Grande Ronde	3	19	0.4
Upper Grande Ronde	4	NA	NA

Table C-13: Summary of OWEB grant funded upland projects completed in 2019, the most recent year data is available in the OWEB OWRI database.

Subbasin	Upland invasive plant control (Area treated)	Upland vegetation management (Area treated)
Imnaha	387.7	NA
Lower Grande Ronde	437.0	NA
Upper Grande Ronde	187.6	64.0
Wallowa	693.4	126.2

Table C-14: Summary of OWEB grant funded instream projects completed in 2019, the most recent year data is available in the OWEB OWRI database.

Subbasin	Wetland restoration (Area treated)	Wetland vegetation planting (Area treated)
Upper Grande Ronde	27	10

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 2020.

Table C-15: TMDL implementation activities reported in 2020 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 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	2959	3.8	37.9	20.7	36.1	1.5

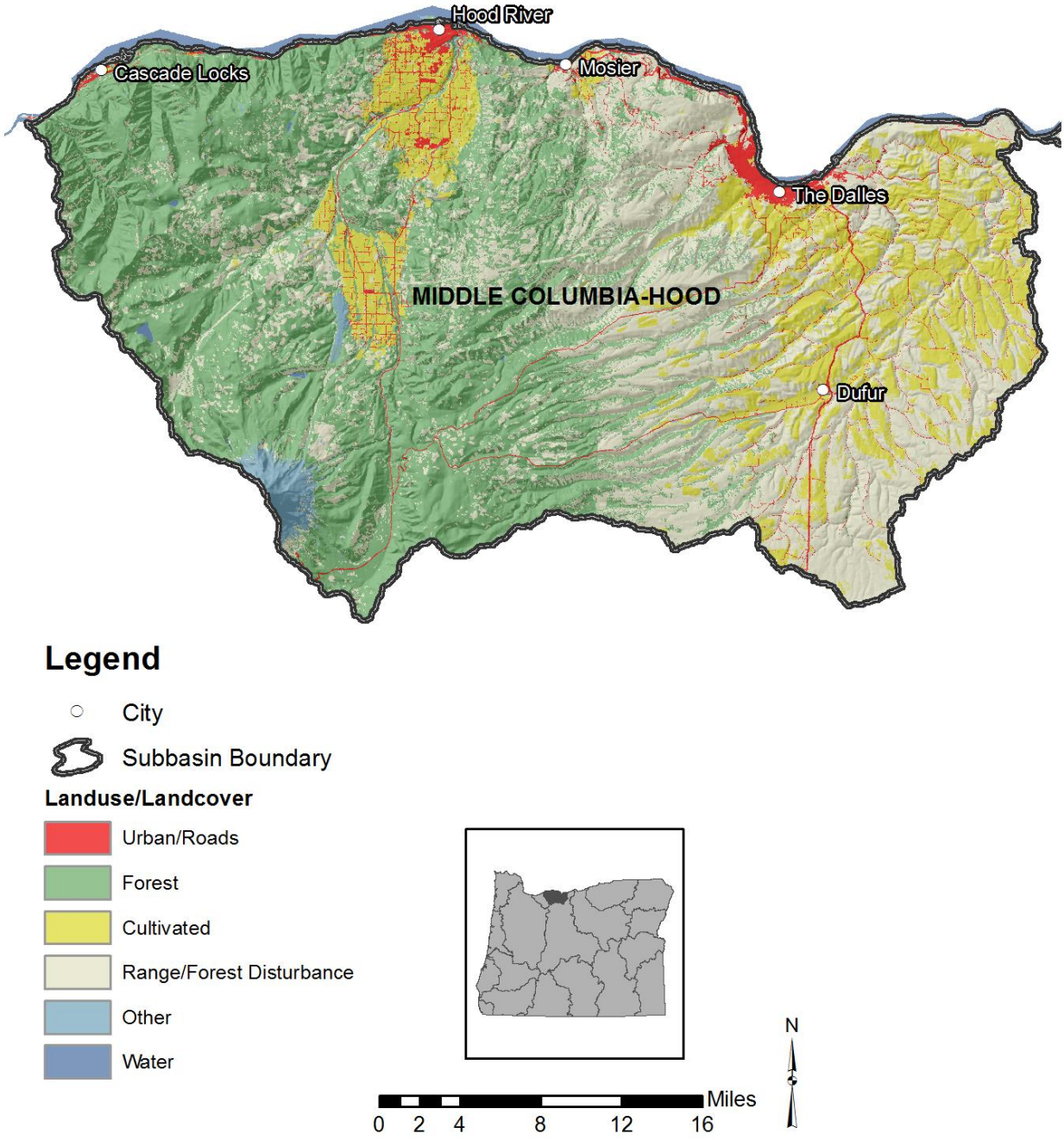

Figure D-1: Land use in the Hood administrative basin.

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: Smita.Mehta@deq.state.or.us
Middle Columbia - Hood Basin	Tessa Edelen: 541-633-2028: edelen.tessa@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 assessment units with and without a TMDL as identified in Oregon's 2018/2020 Integrated Report and Assessment database.

Parameter	Assessment units without a TMDL	Assessment units with a TMDL
Arsenic, Inorganic	2	0
BioCriteria	9	0
Copper	2	0
DDD 4,4'	3	0
DDE 4,4'	5	0
DDT 4,4'	6	0
Dieldrin	3	0
Dioxin (2,3,7,8-TCDD)	0	6
Dissolved Oxygen	3	0
E. coli	5	0
Guthion	1	0
Heptachlor Epoxide	2	0
Iron (total)	5	0
Malathion	2	0
Methylmercury	8	0

Parameter	Assessment units without a TMDL	Assessment units with a TMDL
pH	2	0
Polychlorinated Biphenyls (PCBs)	6	0
Sedimentation	9	0
Silver	1	0
Temperature	32	17
Thallium	3	0
Total Dissolved gas	0	6
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(l)). 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 2020. Note this section does not identify or include projects proposed and awarded a grant in 2020. 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 2020 see Section 3.6.2 of the main report.

In 2020, there was one 319 project active that reported project outputs and accomplishments to DEQ. Combined the projects have a total grant budget of $24,915. Table D-5 describes the project and the reported outputs.

Table D-5: Project outputs reported in 2020 for Section 319 pass through grants.

Project Name	Grantee	Project Description	Reported Outputs
Fifteenmile Action to Stabilize Temperatures (FAST)	Wasco County SWCD	The goal of the project is to reduce temperatures in Fifteenmile Creek in the summer when temperatures have been known to become lethal to ESA listed Middle Columbia Steelhead. The project will use a stream temperature model to forecast when stream temperatures will become lethal, and then alert irrigators to curtail their diversions from Fifteenmile Creek The FAST program compensates irrigators for the water they forgo.	Grant agreement was signed

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 2020.

In 2020 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-6 describes the projects and the reported outputs.

Table D-6: Nonpoint source related Clean Water State Revolving Fund project outputs reported in 2020.

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

Project Name	Grantee	Project Description	Reported Outputs
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 2020.

In 2020 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 2020.

In 2020 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 10 OWEB funded projects completed in 2019 with a total cash and in-kind budget of $1,164,863. 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-7: Summary of OWEB grant funded fish passage projects completed in 2019, the most recent year data is available in the OWEB OWRI database.

Subbasin	Fish Passage Crossing improvement (Number of treatments)
Middle Columbia-Hood	2

Table D-8: Summary of OWEB grant funded instream flow projects completed in 2019, the most recent year data is available in the OWEB OWRI database.

Subbasin	Other irrigation practice improvement (for instream flow) (acre-foot)
Middle Columbia-Hood	0.5

Table D-9: Summary of OWEB grant funded upland projects completed in 2019, the most recent year data is available in the OWEB OWRI database.

Subbasin	Irrigation system improvement (Acre)	Upland erosion control (Acre)
Middle Columbia-Hood	80.8	0

Table D-10: Summary of OWEB grant funded upland projects completed in 2019, 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)
Middle Columbia-Hood	0	4	0.6

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 2020.

Table D-11: TMDL implementation activities reported in 2020 by Designated Management Agencies or third parties.

TMDL	DMA	Reported Actions
Western Hood Temperature TMDL	City of Hood River	Submitted a 5 Year Review Report. 1) The City convened a Stormwater Management Advisory Committee to develop a plan to reduce the amount and reduce the pollutant load from stormwater runoff by utilizing Low Impact Development techniques. The advisory committee produced an LID plan for the City by customizing the template "Low Impact Development in Oregon: A Practical Guide for Watershed Health". The City's LID plan was evaluated by third-parties. The City Council budgeted for a new employee to assist with LID program implementation. 2) The City purchased a parcel of land at the confluence of the Hood River and Columbia River for use as a passive park and habitat restoration area. The City supported the acquisition of an easement over the riparian area by a local NGO. The NGO has used the area to engage and educate 600 students and other community members in riparian restoration. 3) The City has been working on a long-range plan known as the Westside Area Concept Plan. This Plan recommends widening the rights of way on certain streets to accommodate stormwater swales, implementing a 25ft buffer on Henderson Creek, and retaining groves of trees. This plan will be used to update the Hood River Valley Parks and Recreation District's Master Plan which will be used to help purchase more park land. 4) The City enforced its 50ft buffer requirement for new development on Indian Creek. 5) The City completed a land trade where the City obtained 372 feet of riparian land along Indian Creek in exchange for upland property.
Western Hood Temperature TMDL	Hood River County	Submitted a 5 Year Review Report. 1) The County implemented and enforced its Stream Protection Overlay guidelines and buffers and stream setbacks for buildings. 2) The County advised property owners of SPO requirements. 3) The County Forestry Dept. provided buffers along irrigation ditches to avoid non-target application. 4) The County participated in local Watershed Council and Pesticide Stewardship Partnership meetings. 5) The County conducted outreach to recreation groups to reduce erosion issues stemming from trails near and across streams.

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.

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	1.1	10.9	12.7	74.7	0.6
Middle Fork John Day	2052	0.6	54.6	0.2	44.1	0.4
North Fork John Day	4787	0.7	58.6	0.4	39.7	0.6
Upper John Day	5540	1.1	44.3	0.5	52.7	1.4


Moro
Grass Valley
Condon
LOWER JOHN DAY
Lonerock
Shaniko
Fossil
Ukiah
NORTH FORK JOHN DAY
Spray
Monument
MIDDLE FORK JOHN DAY
Granite
Long Creek
Mitchell
Dayville
Mt. Vernon
John Day
Prairie City
UPPER JOHN DAY
Canyon City
Legend
City
Subbasin Boundary
Landuse/Landcover
Urban/Roads
Forest
Cultivated
Range/Forest Disturbance
Other
Water
0 4 8 16 24 32
Miles
N

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
John Day Basin	Tessa Edelen: 541-633-2028: edelen.tessa@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 assessment units with and without a TMDL as identified in Oregon's 2018/2020 Integrated Report and Assessment database.

Parameter	Assessment units without a TMDL	Assessment units with a TMDL
BioCriteria	35	0
Dissolved Oxygen	0	31
Fecal Coliform	7	0
Iron (total)	3	0
Methylmercury	3	0
pH	3	0
Sedimentation	45	0
Temperature	180	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 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 2020. Note this section does not identify or include projects proposed and awarded a grant in 2020. 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 2020 see Section 3.6.2 of the main report.

In 2020, 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 2020 for Section 319 pass through grants.

Project Name	Grantee	Project Description	Reported Outputs
Sherman County Conservation Awareness Program (CAP) Phase II	Sherman County Soil and Water Conservation District	Grant to educate local students on salmonids and water quality in general via working directly with fish in various stages, tree planting, and soil quality programs; and work with adults on same issues via farm field days, tree sales, meetings, surveys, and soil quality programs.	This grant was closed 12/31/2019. Through this grant we accomplished these goals. We engaged both adults and youth many times in the biennium in many different forms. We did many school programs including field trips and the Salmon and Trout Education Program. We worked with 1st grade, 2nd grade, and 5th grade. We organized for the 5th grade class to visit the Oak Springs Fish Hatchery in the fall and learn about salmonid life cycles and

Project Name	Grantee	Project Description	Reported Outputs
			anatomy. We worked with 1st grade one year and 2nd grade one year to hatch fish eggs in their classroom and release fry at a local pond. Through this we taught youth about water quality, salmonid life cycle, and local aquatic flora and fauna. Though we did not organize a field trip to Cottonwood Canyon State Park in 2018, we did organize the field trip in June 2019 for kindergarten – 2nd grade. Students learned about local wildlife, firefighting, soil health, and stream morphology. They also enjoyed a beautiful day at one of the state's newest parks. In 2018 and 2019 we talked about soil health and watershed health with the 6th grade outdoor school and Sherman County 4-H Camp. We also worked with Oregon State Park to host an Arbor Day tree planting with the 4th grade class in April 2019. One of the park rangers took half the class on a nature walk while the other half planted trees and then the class switched. Teachers have told us that students are now familiar with the principles of soil health and water quality. Further, after the field trip to the hatchery, several students say they want to work in hatcheries or study fish biology. Through STEP we reached about 60 students every year. We worked with about (76) 6th grade students every year at outdoor school and about (25) 4th-6th grade students at 4-H Camp. We worked with about 19 students at the Arbor Day planting. For adults we have increasingly raised our profile in the county and held many informational events. At our annual meeting we hosted speakers on diverse topics related to the local environment and local crops. 40-60 people attended each year. We hosted our annual tree sale and helped educate community members on planting in their yards

Project Name	Grantee	Project Description	Reported Outputs
			and the benefits of trees and shrubs. We 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. We 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. We also had a large booth at the Sherman County fair both years in the biennium with information about our programs and educational materials about conservation issues and fire issues in the county. We handed out materials with our logo on it and candy to attract people to the display. These programs informed attendees about healthy watersheds and practices to improve watershed health. Through all these events we were able to reach about 350 landowners, producers, and community members. We additionally resumed sending the quarterly newsletter in Fall 2018. We send the newsletter to about 300 recipients quarterly and have copies in the office. We include information on grant and program opportunities, watershed health information, and local weather. This keeps the community informed on our events and watershed health programs. Several people come in after each newsletter asking about how to get involved in programs they read about.
Lower John Day UAV Protocol Development	Gilliam County SWCD	With the increasing availability of unmanned aerial vehicles (UAVs), and	The project was just getting started in 2019; no project outputs to report yet.

Project Name	Grantee	Project Description	Reported Outputs
		recent improvements in video and other imaging (LiDAR) equipment and software processing capabilities, it is possible to provide the technological tools to create digital elevation models and do vegetation surveys without the prohibitive expense. However, standardized comparisons of LiDAR data collected by UAV and planes and standardized protocols for UAV-based imagery collection (LiDAR) and data processing are currently unavailable. This project will develop a procedure for continuous monitoring of the riparian vegetation using a 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	

Project Name	Grantee	Project Description	Reported Outputs
		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.	
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 and work with Project partners to install a minimum of eight (8) livestock watering troughs in pastures associated with Ballance and Lick Creeks. 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 noxious weed treatment.	Landowner/community outreach as well as project site selection has been completed. Materials have been purchased, and the in-kind match is ready. Actual construction has not yet taken place due to weather and wildfire concerns.

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 2020.

In 2020 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 2020.

In 2020 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 2020.

In 2020 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 21 OWEB funded projects completed in 2019 with a total cash and in-kind budget of $1,567,612. 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 2019, 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)
Upper John Day	1	1

Table E-7: Summary of OWEB grant funded instream projects completed in 2019, 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)
Lower John Day	NA	21	NA	NA
Upper John Day	82	15	1080	2

Table E-8: Summary of OWEB grant funded riparian projects completed in 2019, 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)
Upper John Day	18	0.3	2

Table E-9: Summary of OWEB grant funded riparian projects completed in 2019, the most recent year data is available in the OWEB OWRI database.

Subbasin	Riparian invasive plant control (Length of treatment)
Lower John Day	15

Table E-10: Summary of OWEB grant funded upland projects completed in 2019, the most recent year data is available in the OWEB OWRI database.

Subbasin	Irrigation system improvement (Acre)	Irrigation system improvement (Feet)	Terracing (Acre)	Terracing (Feet)	Terracing (Number of treatments)
Lower John Day	NA	NA	294	10807	11
Upper John Day	116	9860	NA	NA	NA

Table E-11: Summary of OWEB grant funded upland projects completed in 2019, 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)	Upland fencing (Mile)
Lower John Day	NA	6	NA	NA
Middle Fork John Day	NA	4	3100	6.2
Upper John Day	12	7	2	0.2

Table E-12: Summary of OWEB grant funded upland projects completed in 2019, 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	931.0	223	239
Middle Fork John Day	36.0	NA	NA
Upper John Day	622.5	928	NA

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	0.0	88.0	0.0	11.3	0.8
Lost	3378	3.3	31.2	23.9	38.8	2.8
Lower Klamath	0	Inf	Inf	NaN	Inf	NaN
Sprague	4171	0.4	53.1	2.3	39.9	4.3
Upper Klamath	1480	1.2	65.1	0.1	32.1	1.5
Upper Klamath Lake	1875	1.8	55.2	13.0	8.2	21.8
Williamson	3726	0.8	63.2	1.7	24.7	9.6

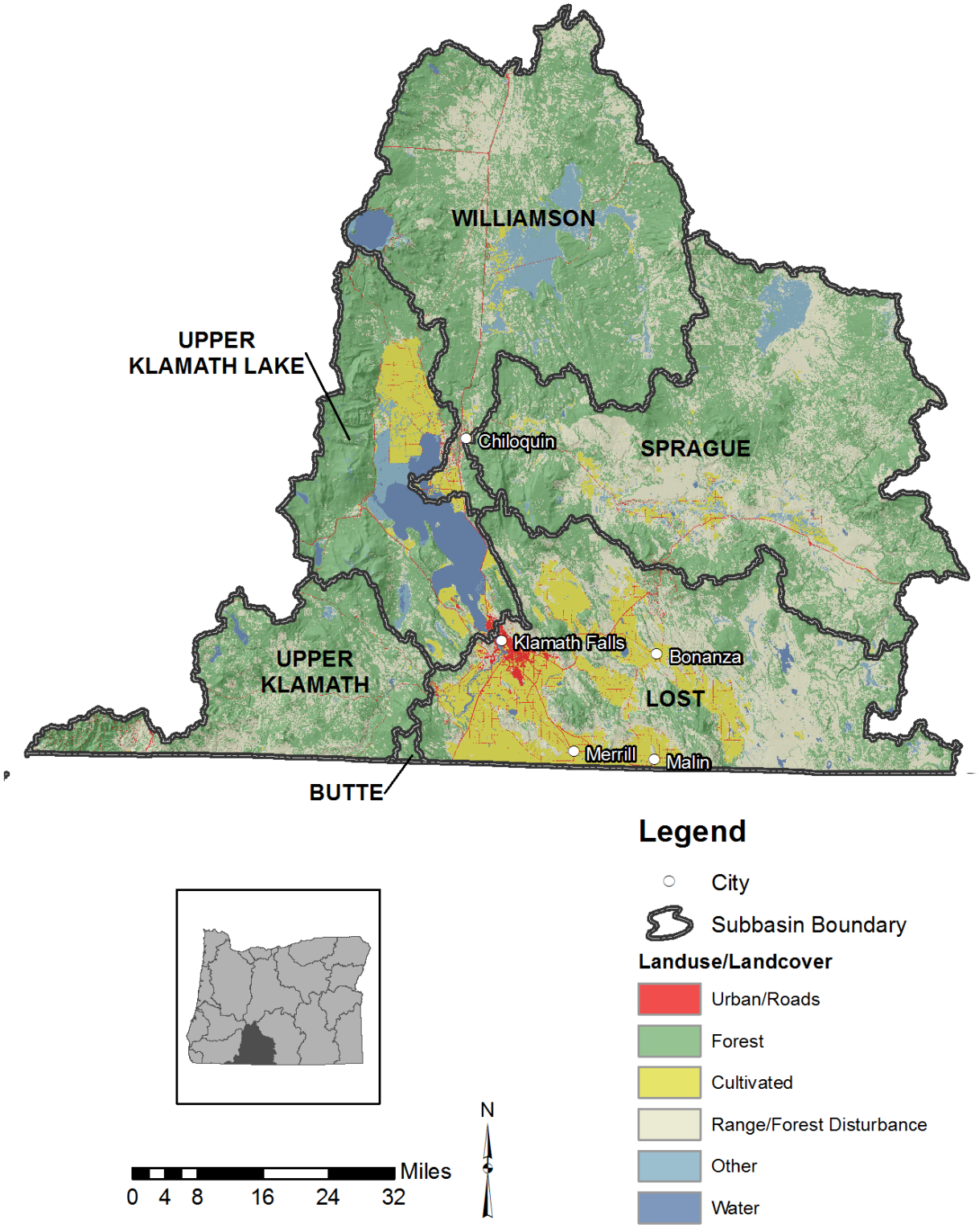

Figure F-1: Land use in the Klamath administrative basin.

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 assessment units with and without a TMDL as identified in Oregon's 2018/2020 Integrated Report and Assessment database.

Parameter	Assessment units without a TMDL	Assessment units with a TMDL
Ammonia	0	7
Arsenic, Inorganic	5	0
BioCriteria	4	0
Chlorophyll-a	2	13
Dissolved Oxygen	2	27
E. coli	1	0
Harmful Algal Blooms	2	5
Methylmercury	4	0
pH	2	4
Phosphorus	0	1
Sedimentation	17	0
Temperature	0	71
Total Dissolved gas	6	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 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
Upper Klamath and Lost River Subbasin Nutrient TMDL and WQMP	Ammonia, Chlorophyll a, Dissolved Oxygen, pH
Upper Klamath and Lost Subbasins Temperature TMDL and WQMP	Temperature
Upper Klamath Lake Drainage TMDL and WQMP	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 2020. Note this section does not identify or include projects proposed and awarded a grant in 2020. 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 2020 see Section 3.6.2 of the main report.

In 2020, 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 2020 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 Migratotory 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 2020.

In 2020 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 2020.

In 2020 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 2020.

In 2020 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 six OWEB funded projects completed in 2019 with a total cash and in-kind budget of $116,225. 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 instream projects completed in 2019, the most recent year data is available in the OWEB OWRI database.

Subbasin	Stream bank stabilized (Miles)
Sprague	0

Table F-7: Summary of OWEB grant funded instream projects completed in 2019, the most recent year data is available in the OWEB OWRI database.

Subbasin	Instream habitat: Structure placement (Number of treatments)
Sprague	7

Table F-8: Summary of OWEB grant funded upland projects completed in 2019, the most recent year data is available in the OWEB OWRI database.

Subbasin	Irrigation system improvement (Acre)
Upper Klamath	0.1

Table F-9: Summary of OWEB grant funded upland projects completed in 2019, 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)
Lost	1	NA	NA
Upper Klamath	1	1	0.2

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 2020.

Table F-10: TMDL implementation activities reported in 2020 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 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	1518	0.7	1.0	3.0	93.5	1.7
Lower Malheur	2457	1.5	0.3	8.8	88.9	0.5
Middle Snake-Payette	415	9.2	0.1	59.5	30.7	0.6
Upper Malheur	6289	0.2	18.8	0.6	79.0	1.4
Willow	1968	1.5	3.3	7.6	87.2	0.4

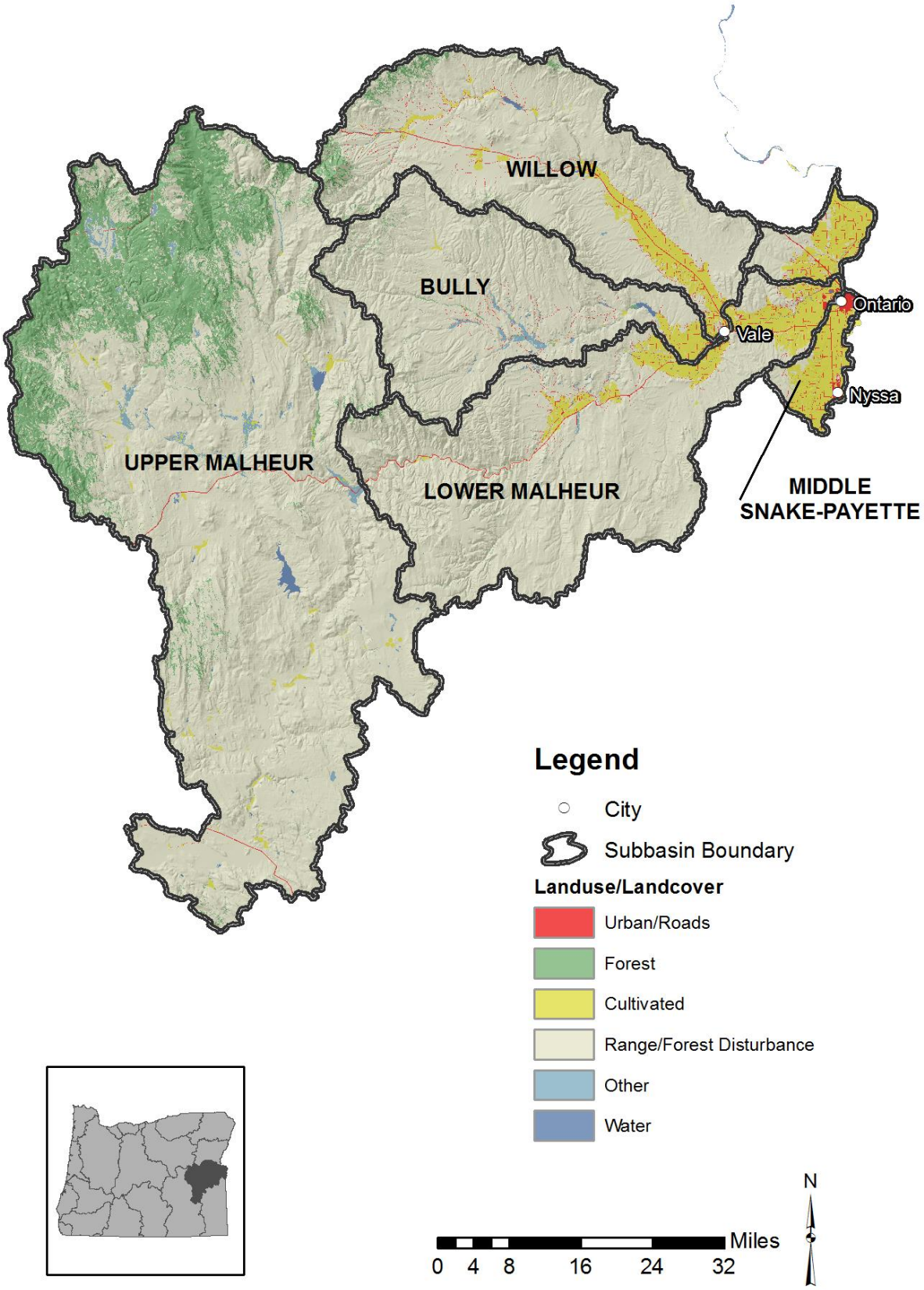
WILLOW
BULLY
Ontario
Vale
Nyssa
UPPER MALHEUR
LOWER MALHEUR
MIDDLE
SNAKE-PAYETTE
Legend
City
Subbasin Boundary
Landuse/Landcover
Urban/Roads
Forest
Cultivated
Range/Forest Disturbance
Other
Water
N
Miles
0 4 8 16 24 32

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: john.dadoly@deq.state.or.us
Malheur River Basin	Tessa Edelen: 541-633-2028: edelen.tessa@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 assessment units with and without a TMDL as identified in Oregon's 2018/2020 Integrated Report and Assessment database.

Parameter	Assessment units without a TMDL	Assessment units with a TMDL
Arsenic, Inorganic	6	0
BioCriteria	8	0
Chlorophyll-a	6	0
DDD 4,4'	0	2
DDE 4,4'	0	2
DDT 4,4'	1	2
Dieldrin	1	2
Dissolved Oxygen	1	4
E. coli	1	19
Fecal Coliform	0	13
Iron (total)	8	0
Lead	1	0
Methylmercury	6	0
Sedimentation	1	1
Temperature	37	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 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 2020. Note this section does not identify or include projects proposed and awarded a grant in 2020. 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 2020 see Section 3.6.2 of the main report.

In 2020, there were two 319 projects active that reported project outputs and accomplishments to DEQ. Combined the projects have a total grant budget of $45,867. Table G-5 describes the projects and the reported outputs.

Table G-5: Project outputs reported in 2020 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.
Gettin' With the Flow: Monitoring the Owyhee and the Malheur Rivers	Malheur SWCD	Our plan is to maintain 12 continuous flow gauges, sample water monthly during the irrigation season at these gauges, at sites on the Malheur and Owyhee Rivers and project related sites (22 total).	Our 2020 goals and objectives are as follows; 1) Characterize current water quality conditions for bacteria, TSS, and Total Phosphorus in the Malheur/Owyhee River watersheds using parameter concentrations and continuous flow data. 2) Determine the contribution of agricultural drains to water quality problems in the Malheur/Owyhee and Snake Rivers using parameter concentrations and continuous flow data with focus on two largest agricultural drainage areas. 3) Prioritize conservation

Project Name	Grantee	Project Description	Reported Outputs
			activities based on the results of monitoring data by monitoring in NRCS, ODA, and SWCD priority areas and determining the effectiveness of specific conservation practices. 4) Maintain long term "Focus Area Monitoring" in Willow Creek to test for trends. 5) More accurately determine trends in water quality in the Malheur and Owyhee Basins.

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 2020.

In 2020 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 2020.

In 2020 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 2020.

In 2020 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 15 OWEB funded projects completed in 2019 with a total cash and in-kind budget of $2,012,424. 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 fish passage projects completed in 2019, the most recent year data is available in the OWEB OWRI database.

Subbasin	Fish Passage Crossing improvement (Number of treatments)
Willow	2

Table G-7: Summary of OWEB grant funded instream projects completed in 2019, the most recent year data is available in the OWEB OWRI database.

Subbasin	Stream bank stabilized (Miles)	Engineered structures installed (Number of treatments)
Willow	0.9	10
Upper Malheur	NA	24

Table G-8: Summary of OWEB grant funded instream projects completed in 2019, 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)
Upper Malheur	NA	28
Willow	24	NA

Table G-9: Summary of OWEB grant funded riparian projects completed in 2019, 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 (Area treated)	Riparian vegetation planting (Stream sides treated)
Upper Malheur	15	2	NA	NA
Willow	NA	NA	112	2

Table G-10: Summary of OWEB grant funded upland projects completed in 2019, the most recent year data is available in the OWEB OWRI database.

Subbasin	Irrigation system improvement (Acre)	Terracing (Acre)	Terracing (Feet)	Terracing (Number of treatments)
Bully	16	NA	NA	NA
Lower Malheur	630	NA	NA	NA
Upper Malheur	96	NA	NA	NA
Willow	32	49	10507	6

Table G-11: Summary of OWEB grant funded upland projects completed in 2019, 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)	Upland fencing (Mile)
Upper Malheur	NA	3	1000	1.9
Willow	3300	7	360	4.8

Table G-12: Summary of OWEB grant funded upland projects completed in 2019, the most recent year data is available in the OWEB OWRI database.

Subbasin	Upland invasive plant control (Area treated)	Upland vegetation management (Area treated)
Lower Malheur	77	NA
Upper Malheur	168	179
Willow	140	NA

Table G-13: Summary of OWEB grant funded instream projects completed in 2019, the most recent year data is available in the OWEB OWRI database.

Subbasin	Wetland creation (Area treated)	Wetland improvement (Area treated)
Lower Malheur	23	13

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 2020.

Table G-14: TMDL implementation activities reported in 2020 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 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 Wagontire, Riley, Suntex, 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 100ºF 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).

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	5165	0.3	1.0	0.9	90.3	7.5
Donner und Blitzen	2045	0.3	7.0	4.0	82.2	6.5
Guano	6627	0.2	0.4	0.1	92.9	6.3
Harney-Malheur Lakes	3762	1.6	5.9	15.6	67.2	9.7
Silver	4361	0.4	7.9	2.9	87.1	1.8
Silvies	3414	1.4	40.0	10.7	45.0	3.0
Thousand-Virgin	699	0.0	0.1	0.0	99.8	0.1

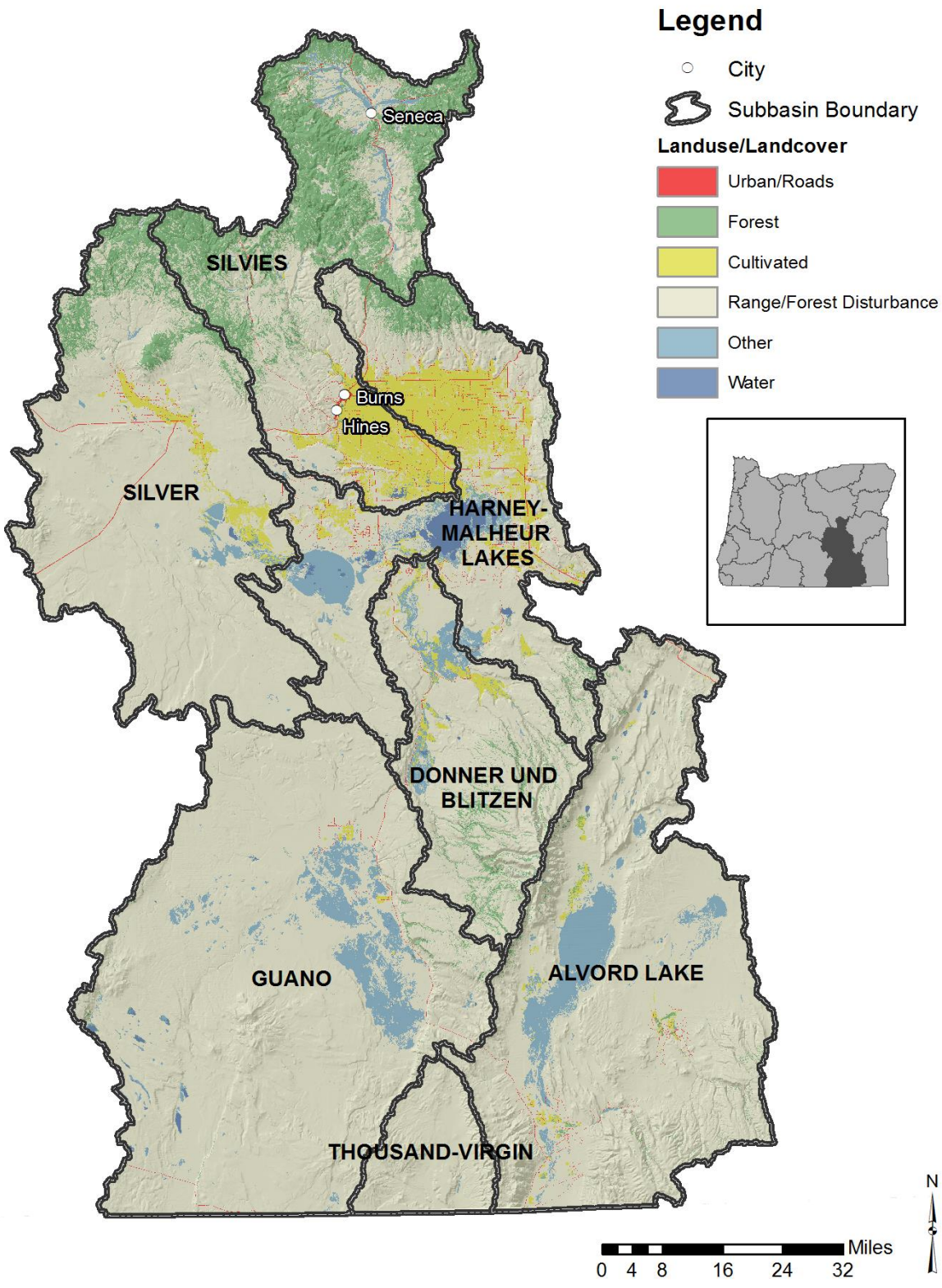

Figure H-1: Land use in the Malheur Lakes administrative basin.

1.1 Basin Contacts

Table H-2: Oregon DEQ basin contact.

Administrative Area	DEQ Basin Coordinator
Malheur Lake	John Dadoly: 541-278-4616: john.dadoly@deq.state.or.us
Malheur Lake	Tessa Edelen: 541-633-2028: edelen.tessa@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 assessment units with and without a TMDL as identified in Oregon's 2018/2020 Integrated Report and Assessment database.

Parameter	Assessment units without a TMDL	Assessment units with a TMDL
Arsenic, Inorganic	1	0
BioCriteria	8	0
Dissolved Oxygen	7	0
E. coli	0	1
Iron (total)	4	0
Methylmercury	1	0
pH	2	0
Temperature	45	7

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 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 2020. Note this section does not identify or include projects proposed and awarded a grant in 2020. 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 2020 see Section 3.6.2 of the main report.

In 2020, 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 2020 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 2020.

In 2020 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 2020.

In 2020 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 2020.

In 2020 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 2019 with a total cash and in-kind budget of $1,873,002. 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.

Table H-6: Summary of OWEB grant funded fish passage projects completed in 2019, the most recent year data is available in the OWEB OWRI database.

Subbasin	Fish Passage Non-crossing improvement (Number of treatments)
Silvies	2

Table H-7: Summary of OWEB grant funded upland projects completed in 2019, the most recent year data is available in the OWEB OWRI database.

Subbasin	Off-channel livestock or wildlife watering (Number of treatments)
Harney-Malheur Lakes	1
Silvies	2

Table H-8: Summary of OWEB grant funded upland projects completed in 2019, 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)
Harney-Malheur Lakes	2572.3	4510	280
Silvies	21.8	NA	NA

Table H-9: Summary of OWEB grant funded instream projects completed in 2019, the most recent year data is available in the OWEB OWRI database.

Subbasin	Wetland improvement (Area treated)
Silvies	500

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	6.0	79.3	0.9	12.1	1.7
Siletz-Yaquina	1948	7.6	57.6	0.7	31.1	3.1
Siltcoos	336	4.9	53.4	0.2	25.4	16.2
Siuslaw	1993	5.4	72.1	1.4	19.6	1.5


Lincoln City
Depoe Bay
SILETZ-YAQUINA
Siletz
Newport
Toledo
Waldport
ALSEA
Yachats
SIUSLAW
Florence
Dunes City
SILTCOOS
Legend
City
Subbasin Boundary
Landuse/Landcover
Urban/Roads
Forest
Cultivated
Range/Forest Disturbance
Other
Water
N
Miles
0 2.5 5 10 15 20

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 assessment units with and without a TMDL as identified in Oregon's 2018/2020 Integrated Report and Assessment database.

Parameter	Assessment units without a TMDL	Assessment units with a TMDL
Aquatic Weeds	2	0
Arsenic, Inorganic	4	0
BioCriteria	34	0
Chloride	1	0
Chlorophyll-a	2	0
Dissolved Oxygen	31	2
E. coli	20	0
Enterococci	1	0
Fecal Coliform	20	0
Harmful Algal Blooms	3	0
Iron (total)	1	0
pH	3	0
Phosphorus	0	2
Sedimentation	12	0

Parameter	Assessment units without a TMDL	Assessment units with a TMDL
Shellfish Toxins	44	0
Temperature	148	0
Turbidity	3	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 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 2020. Note this section does not identify or include projects proposed and awarded a grant in 2020. 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 2020 see Section 3.6.2 of the main report.

In 2020, 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 2020 for Section 319 pass through grants.

Project Name	Grantee	Project Description	Reported Outputs
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
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 environed as long-term Ag sites. Landowner outreach was conducted, but further efforts delayed by COVID-19 situation

Figure I-2: Bear Creek BMP project: 1,650 feet of exclusion fencing on 0.92 acres and 0.15 stream miles of riparian seedlings in the Fiddle Creek subwatershed

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 2020.

In 2020 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 2020.

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 2020.

In 2020 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 2020.

Project Name	Grantee	Project Description	Reported Outputs
Turbidity-Sediment Monitoring and Erosion Control Projects for Source Protection and Planning in the Siletz Sub-basin - Phase II	City of Newport and Toledo Water Utilities	Water quality monitoring, landowner outreach to design and implement voluntary projects for bank stability, coordinate with Mid-Coast place based planning effort.	Lincoln SWCD staff continued to assist with turbidity monitoring equipment setup and sampling, as well as 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	City advertised project and prepared for hiring a consultant. All work will be performed by GSI in 2020.

Project Name	Grantee	Project Description	Reported Outputs
		contaminant sources, providing public education and best management practice information, and report preparation.	
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 2020.

In 2020 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 30 OWEB funded projects completed in 2019 with a total cash and in-kind budget of $1,773,874. 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 2019, the most recent year data is available in the OWEB OWRI database.

Subbasin	Fish Passage Crossing improvement (Number of treatments)
Siletz-Yaquina	13
Siltcoos	1
Siuslaw	2

Table I-9: Summary of OWEB grant funded instream projects completed in 2019, 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)
Siltcoos	5016	1

Table I-10: Summary of OWEB grant funded instream projects completed in 2019, the most recent year data is available in the OWEB OWRI database.

Subbasin	Instream habitat: Large wood placement (Number of treatments)
Siletz-Yaquina	197
Siltcoos	603

Table I-11: Summary of OWEB grant funded riparian projects completed in 2019, the most recent year data is available in the OWEB OWRI database.

Subbasin	Voluntary riparian tree retention (Acres)	Voluntary riparian tree retention (Miles)
Siuslaw	6.3	0.5

Table I-12: Summary of OWEB grant funded riparian projects completed in 2019, the most recent year data is available in the OWEB OWRI database.

Subbasin	Riparian fencing (Length of treatment)
Siltcoos	0.1

Table I-13: Summary of OWEB grant funded riparian projects completed in 2019, 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)
Siletz-Yaquina	0.5	2

Table I-14: Summary of OWEB grant funded road projects completed in 2019, 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)
Siletz-Yaquina	3	NA
Siltcoos	NA	33

Table I-15: Summary of OWEB grant funded upland projects completed in 2019, the most recent year data is available in the OWEB OWRI database.

Subbasin	Upland invasive plant control (Area treated)	Upland tree planting (Area treated)
Siletz-Yaquina	8	NA
Siltcoos	17	8.5

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	9.2	55.2	0.8	27.9	6.9
Lower Columbia-Clatskanie	771	8.0	58.3	5.7	23.7	4.4
Necanicum	355	13.0	52.1	0.0	31.3	3.6
Nehalem	2205	5.3	61.2	1.1	31.3	1.0
Wilson-Trask-Nestucca	2448	6.9	72.5	2.5	15.7	2.5

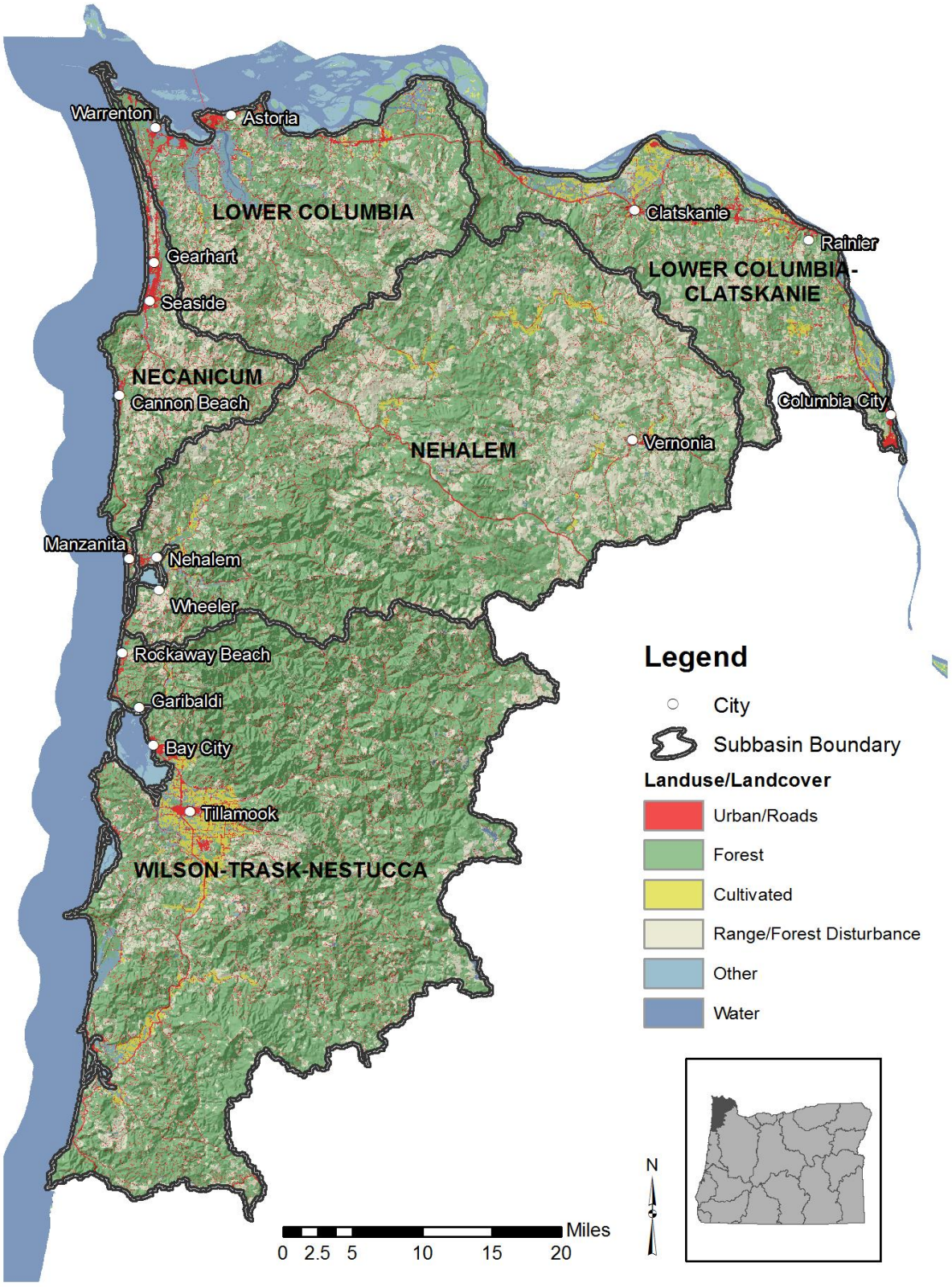

Figure J-1: Land use in the North Coast administrative basin.

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 assessment units with and without a TMDL as identified in Oregon's 2018/2020 Integrated Report and Assessment database.

Parameter	Assessment units without a TMDL	Assessment units with a TMDL
Aquatic Weeds	3	0
Arsenic, Inorganic	15	0
BioCriteria	41	0
Chromium VI	1	0
Copper	1	0
DDE 4,4'	13	0
Dioxin (2,3,7,8-TCDD)	0	13
Dissolved Oxygen	23	1
Dissolved Oxygen - Cold Water	1	0
Dissolved Oxygen - Cool Water	1	0
Dissolved Oxygen - Estuary	1	0
E. coli	12	11
Enterococci	5	0
Fecal Coliform	4	42
Iron (total)	4	0
Methylmercury	3	0

Parameter	Assessment units without a TMDL	Assessment units with a TMDL
Polychlorinated Biphenyls (PCBs)	13	0
Polycyclic Aromatic Hydrocarbons (PAHs)	1	0
Sedimentation	0	6
Shellfish Toxins	33	0
Temperature	12	114
Total Dissolved gas	0	13
Turbidity	1	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(l)). 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 2020. Note this section does not identify or include projects proposed and awarded a grant in 2020. 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 2020 see Section 3.6.2 of the main report.

In 2020, there were 13 319 projects active that reported project outputs and accomplishments to DEQ. Combined the projects have a total grant budget of $230,823. Table J-5 describes the projects and the reported outputs.

Table J-5: Project outputs reported in 2020 for Section 319 pass through grants.

Project Name	Grantee	Project Description	Reported Outputs
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 involvement and engagement, and management directed towards water quality protection and pollution prevention.	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.
2016 Stream Enhancement	Tillamook County SWCD	Riparian Restoration	Open not reporting
Northwest Oregon Restoration 2018	Tillamook Estuary Partnership	Riparian Plant Propagation	Open not reporting
Tillamook SWCD 2018 Stream Enhancement & Restoration	Tillamook County SWCD	Riparian Restoration	Open not reporting
Nestucca,	Nestucca-	Riparian Restoration	Open not reporting

Project Name	Grantee	Project Description	Reported Outputs
Neskowin and Sand Lake Basin Riparian Improvement Project	Neskowin Sandlake WC		
Backyard Planting Program 2018	Tillamook Estuary Partnership	Riparian Restoration	Open not reporting
Upper Nehalem Riparian Restoration	Upper Nehalem Watershed Council	Riparian Restoration	Pending
Stream Enhancement and Restoration	Tillamook SWCD	Riparian Restoration	Pending
Backyard Planting Program	Tillamook Estuary Partnership	Riparian Restoration	Pending
Northwest Oregon Regional Partnershi (NORP)	Tillamook Estuary Partnership	Riparian Plant Propagation	Pending
Backyard Planting Program 2020	Tillamook Estuary Partnership	Riparian Restoration	Pending
Northwest Oregon Restoration Partnership 2020	Tillamook Estuary Partnership	Riparian Plant Propagation	Pending
Nestucca, Neskowin and Sand Lake Basin Riparian Improvement Project	Nestucca-Neskowin WC	Riparian Restoration	Pending

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 2020.

In 2020 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 2020.

In 2020 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 2020.

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.
Shark Creek Sediment Prevention Partnership	Arch Cape Water District (00802)	Recuce 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	Neskowin Regional Water District (00970)	Planning activities to enable acquisition of ~1,600 acres within Hawk Creek drinking	PWS signed contract and inititiated work internally. Hired managing consultant and

Project Name	Grantee	Project Description	Reported Outputs
Watershed Acquisition Due Diligence		water source area including contracting a property assessment, conducting due diligence and appraisal, and developing forest management recommendations to maintain water quality and quantity.	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 2020.

In 2020 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 25 OWEB funded projects completed in 2019 with a total cash and in-kind budget of $3,246,517. 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 fish passage projects completed in 2019, the most recent year data is available in the OWEB OWRI database.

Subbasin	Fish Passage Crossing improvement (Number of treatments)
Lower Columbia	10
Lower Columbia-Clatskanie	1
Nehalem	3
Wilson-Trask-Nestucca	5

Table J-8: Summary of OWEB grant funded instream projects completed in 2019, the most recent year data is available in the OWEB OWRI database.

Subbasin	Instream habitat: Large wood placement (Number of treatments)
Nehalem	24

Table J-9: Summary of OWEB grant funded riparian projects completed in 2019, the most recent year data is available in the OWEB OWRI database.

Subbasin	Riparian fencing (Area treated)	Riparian fencing (Stream sides treated)
Wilson-Trask-Nestucca	2.7	2

Table J-10: Summary of OWEB grant funded riparian projects completed in 2019, 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)
Lower Columbia	0.7	NA	2	NA	0.6	NA
Necanicum	NA	0.1	NA	NA	NA	NA
Nehalem	0.6	NA	NA	0.2	NA	1

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)
Wilson-Trask-Nestucca	13.0	NA	3	0.5	0.8	2

Table J-11: Summary of OWEB grant funded road projects completed in 2019, 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 grass seeding (1 station or 100 Feet)	Surface drainage improvement (1 station or 100 Feet)	Surface drainage improvement (Number of treatments)
Lower Columbia	12	100.3	NA	NA	NA
Nehalem	12	27.4	0.1	3.8	4
Wilson-Trask-Nestucca	6	79.0	NA	NA	NA

Table J-12: Summary of OWEB grant funded upland projects completed in 2019, the most recent year data is available in the OWEB OWRI database.

Subbasin	Upland invasive plant control (Area treated)
Lower Columbia	0.6
Wilson-Trask-Nestucca	5.0

Table J-13: Summary of OWEB grant funded instream projects completed in 2019, the most recent year data is available in the OWEB OWRI database.

Subbasin	Wetland invasive plant control (Area treated)
Lower Columbia	37

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 2020.

Table J-14: TMDL implementation activities reported in 2020 by Designated Management Agencies or third parties.

TMDL	DMA	Reported Actions
Nestucca Bay	NA	The Nestucca-Neskowin-Sandlake Watershed Coucil implemented the Clear Creek fish passage project that replaced an aging, failing, undersized culvert with an

TMDL	DMA	Reported Actions
		appropriately sized bridge that accommodates natural channel processes and restores fish passage to 4.4 miles of high quality habitat and cold water refugia. The restored channel reach includes installation of natural channel bed materials and will provide improved juvenile and adult passage, access to winter hydraulic refugia and increase flow capacity. The project is also adjacent to past 319 riparian restoration projects that encompus Creak Creek downstream to the Nestucca River and a portion of the Nestucca upstream of the confluence.
Tillamook Bay	NA	The North Coast Land Conservancy's purchase of 73 acres of wetland habitat, known as the Tillamook River Wetlands, took place is 2020. Conservation of the property, located south of the City of Tillamook, is the first step in a proposed restoration of the tidal floodplain along the Tillamook River. A collaboration between North Coast Land Conservancy and Tillamook Estuaries Partnership, the project will restore habitat complexity critical to healthy salmon and trout populations and improve water quality.
North Coast Subbasins	NA	North Coast Watershed Association partnered with The City of Cannon Beach to hire a contractor to implement beaver restoration in the Ecola Creek Forest Reserve. The contractor developed a habitat survey and replanting plan and created habitat recovery sites to attract and support populations of beaver that are struggling to reestablish within the reserve due to habitat shortages. This project restored beaver habitat in the Ecola Creek Forest Reserve, meeting needs identified in the 2013 ECFR Stewardship Plan to support beaver populations in this protected system.

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	0.3	0.0	0.2	99.4	0.1
East Little Owyhee	343	0.0	0.0	0.0	100.1	0.0
Jordan	1813	0.8	1.4	2.6	88.3	6.9
Lower Owyhee	5116	0.2	0.3	2.0	96.1	1.4
Middle Owyhee	3111	0.1	0.5	0.2	98.8	0.4
Middle Snake-Succor	836	1.1	0.3	10.4	85.9	2.2
South Fork Owyhee	22	0.0	0.0	0.0	99.7	0.0

Subbasin	Watershed Area (km2)	% Urban/Roads	% Forest	% Cultivated	% Range/Forest Disturbance	%Other
Upper Quinn	1400	0.4	0.5	0.1	97.0	2.0

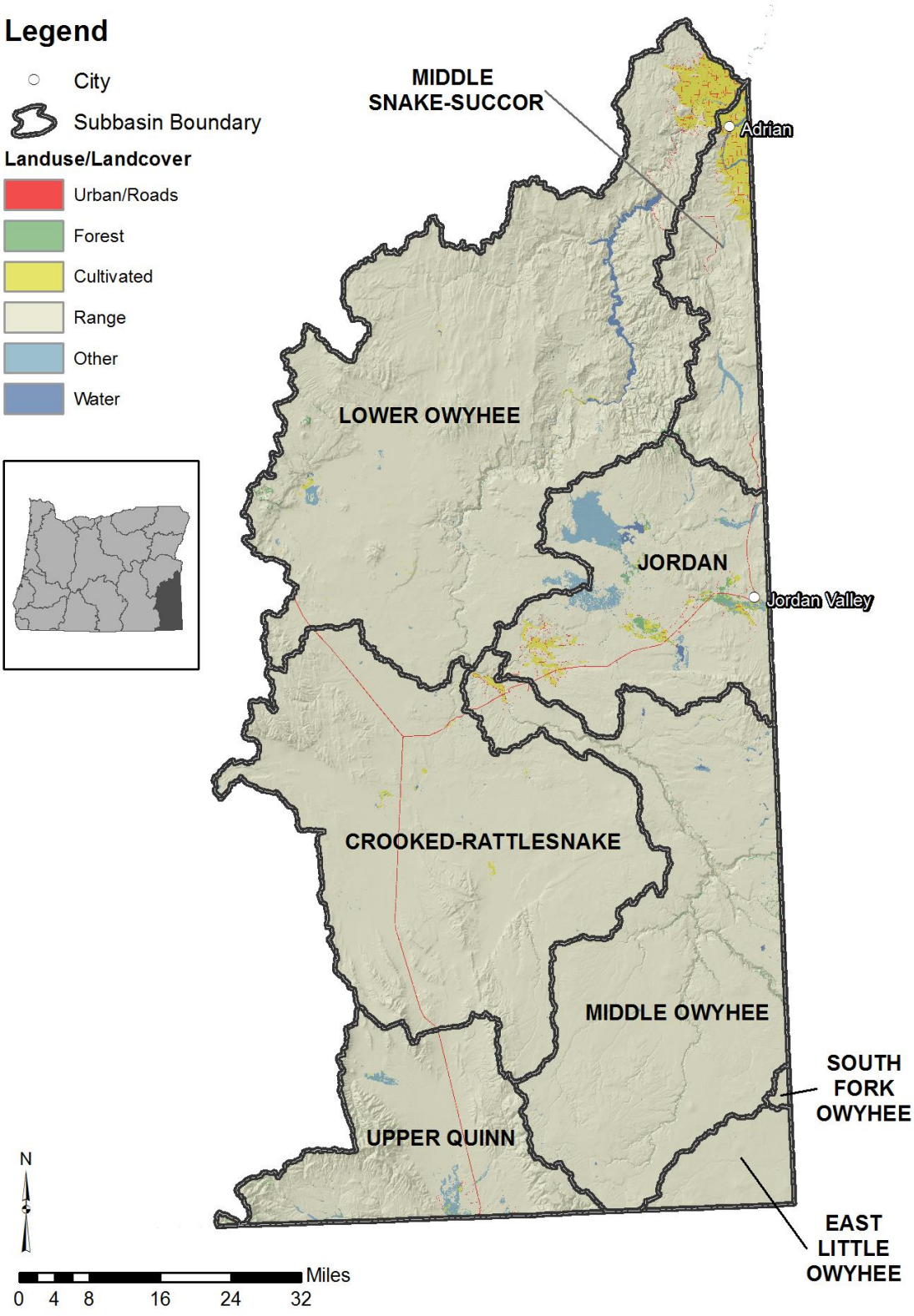

Figure K-1: Land use in the Owyhee administrative basin.

1.1 Basin Contacts

Table K-2: Oregon DEQ basin contact.

Administrative Area	DEQ Basin Coordinator
Owyhee River Basin	John Dadoly: 541-278-4616: john.dadoly@deq.state.or.us
Owyhee River Basin	Tessa Edelen: 541-633-2028: edelen.tessa@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 assessment units with and without a TMDL as identified in Oregon's 2018/2020 Integrated Report and Assessment database.

Parameter	Assessment units without a TMDL	Assessment units with a TMDL
Arsenic, Inorganic	7	0
Chlorophyll-a	2	0
Copper	2	0
DDD 4,4'	0	1
DDE 4,4'	0	1
DDT 4,4'	1	1
Dieldrin	1	1
Dissolved Oxygen	4	0
E. coli	4	2
Fecal Coliform	1	0
Iron (total)	7	0
Lead	2	0
Mercury (total)	2	0
Methylmercury	11	0
pH	1	0
Phosphorus	1	0

Parameter	Assessment units without a TMDL	Assessment units with a TMDL
Sedimentation	1	0
Temperature	16	1
Thallium	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.

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 2020. Note this section does not identify or include projects proposed and awarded a grant in 2020. 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 2020 see Section 3.6.2 of the main report.

In 2020 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 2020.

In 2020 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 2020.

In 2020 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 2020.

In 2020 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.

Based on the most recent data available in OWEB's Oregon Watershed Restoration Inventory (OWRI) database, there were eight OWEB funded projects completed in 2019 with a total cash and in-kind budget of $611,938. 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 2019, the most recent year data is available in the OWEB OWRI database.

Subbasin	Irrigation system improvement (Acre)	Irrigation system improvement (Feet)
Lower Owyhee	149	NA
Middle Snake-Succor	141	3560

Table K-5: Summary of OWEB grant funded upland projects completed in 2019, the most recent year data is available in the OWEB OWRI database.

Subbasin	Upland invasive plant control (Area treated)
Jordan	3722.4

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	1631	1.1	29.9	5.5	63.0	0.5
Burnt	2847	1.0	28.0	2.1	68.0	0.9
Powder	4423	1.6	34.8	10.5	51.5	1.6

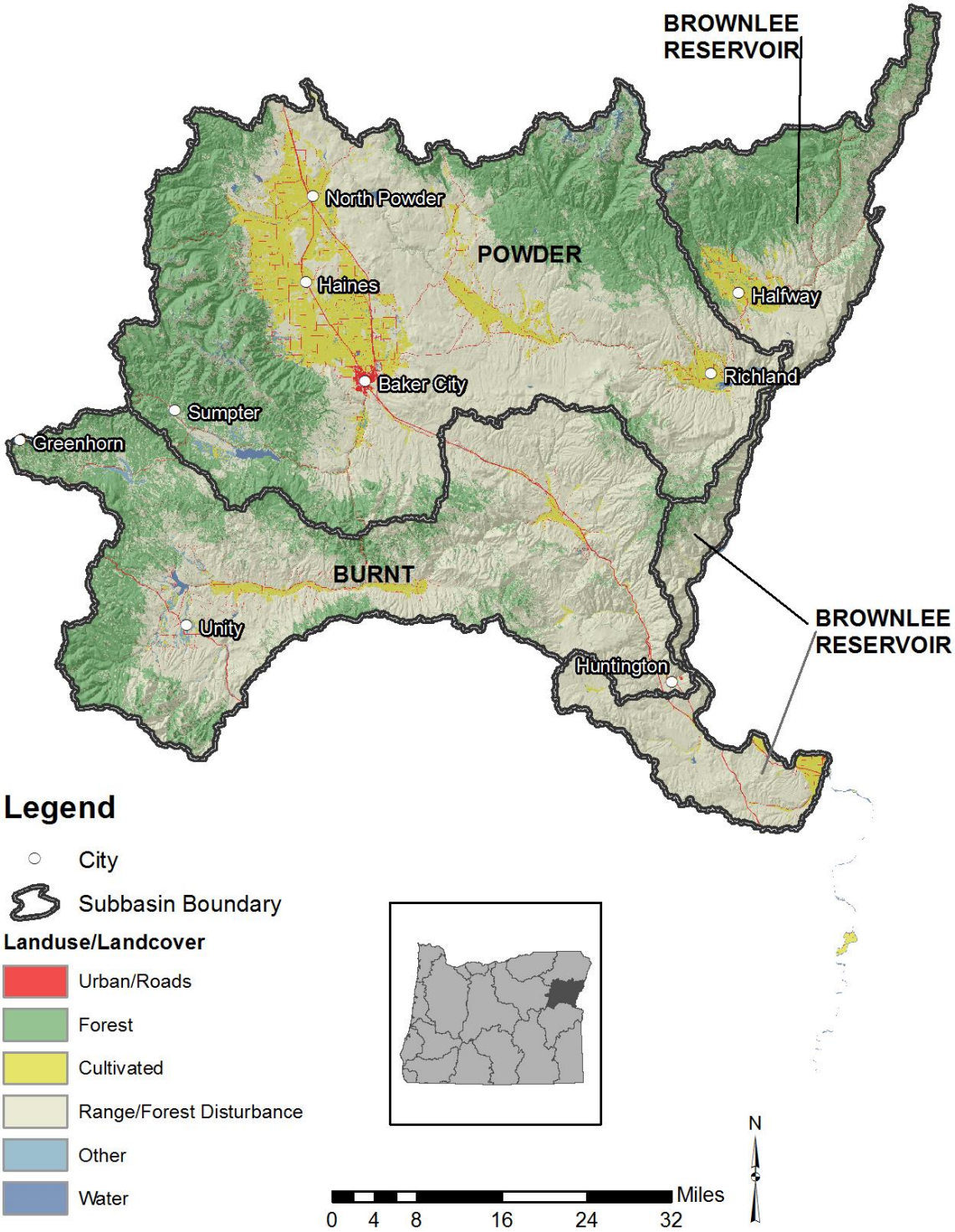

Figure L-1: Land use in the Powder administrative basin.

1.1 Basin Contacts

Table L-2: Oregon DEQ basin contact.

Administrative Area	DEQ Basin Coordinator
Powder River Basin	John Dadoly: 541-278-4616: john.dadoly@deq.state.or.us
Powder River Basin	Tessa Edelen: 541-633-2028: edelen.tessa@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 assessment units with and without a TMDL as identified in Oregon's 2018/2020 Integrated Report and Assessment database.

Parameter	Assessment units without a TMDL	Assessment units with a TMDL
Arsenic, Inorganic	4	0
BioCriteria	2	0
Chlorophyll-a	2	0
DDD 4,4'	0	3
DDE 4,4'	0	3
DDT 4,4'	0	3
Dieldrin	0	3
Dissolved Oxygen	14	1
E. coli	7	1
Fecal Coliform	1	0
Iron (total)	4	0
Methylmercury	10	0
pH	1	0
Phosphorus	1	0
Sedimentation	14	1
Temperature	60	2

Parameter	Assessment units without a TMDL	Assessment units with a TMDL
Total Dissolved gas	0	2
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(l)). 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 2020. Note this section does not identify or include projects proposed and awarded a grant in 2020. 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 2020 see Section 3.6.2 of the main report.

In 2020, 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 2020 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 exanimate 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 2020.

In 2020 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 2020.

In 2020 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 2020.

In 2020 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 five OWEB funded projects completed in 2019 with a total cash and in-kind budget of $2,107,819. 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 upland projects completed in 2019, the most recent year data is available in the OWEB OWRI database.

Subbasin	Irrigation system improvement (Acre)	Irrigation system improvement (Feet)
Powder	6075	6924

Table L-6: Summary of OWEB grant funded upland projects completed in 2019, the most recent year data is available in the OWEB OWRI database.

Subbasin	Off-channel livestock or wildlife watering (Number of treatments)
Burnt	7
Powder	6

Table L-7: Summary of OWEB grant funded upland projects completed in 2019, the most recent year data is available in the OWEB OWRI database.

Subbasin	Upland invasive plant control (Area treated)
Powder	225.9

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	4.5	64.9	3.5	26.3	0.8
Illinois	2412	3.1	73.0	1.0	22.3	0.5
Lower Rogue	2347	4.2	79.6	0.5	14.8	0.9
Middle Rogue	2285	11.4	44.7	12.1	31.2	0.7
Upper Rogue	4183	1.1	67.8	3.3	26.2	1.5

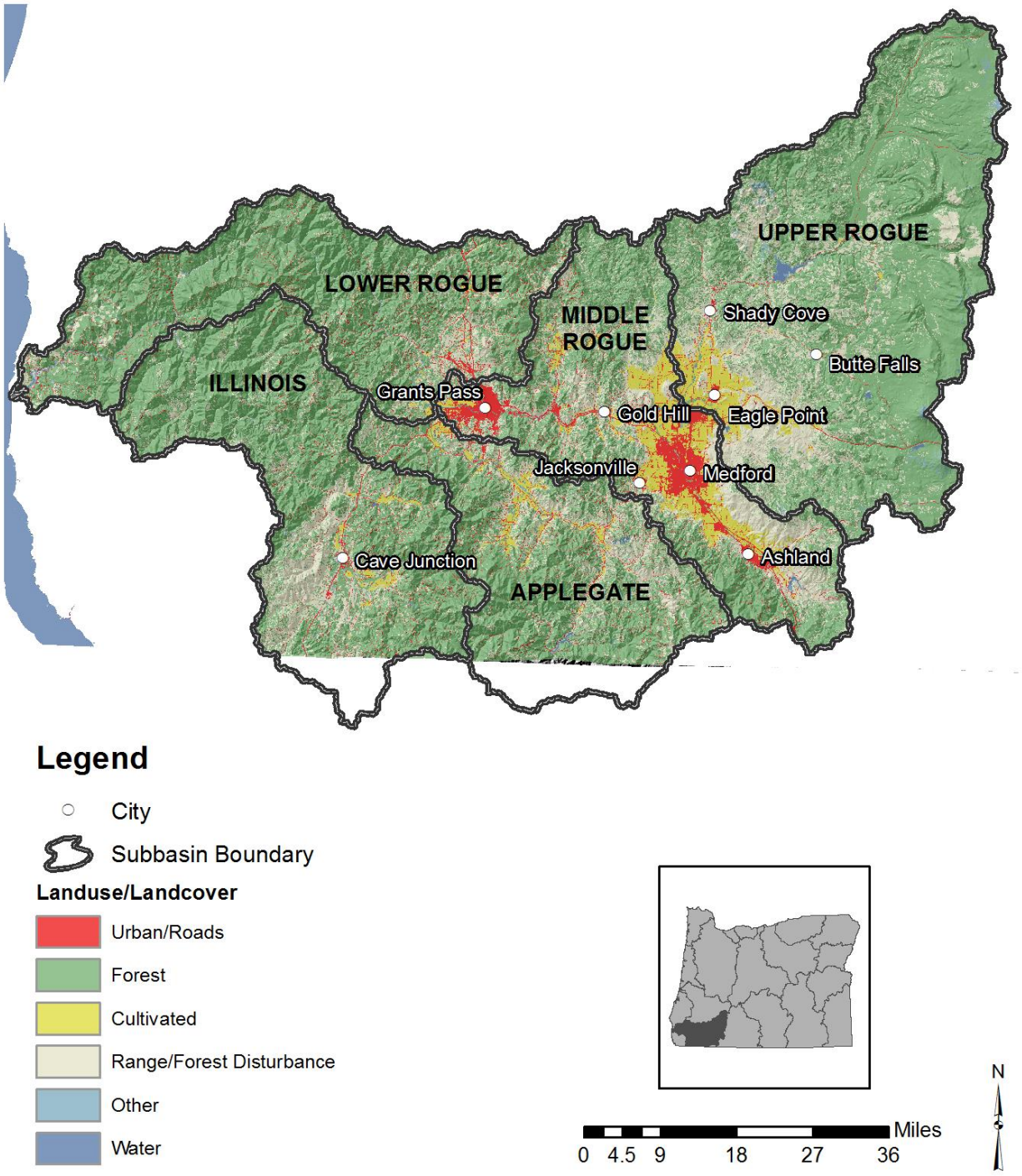

Figure M-1: Land use in the Rogue administrative basin.

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 assessment units with and without a TMDL as identified in Oregon's 2018/2020 Integrated Report and Assessment database.

Parameter	Assessment units without a TMDL	Assessment units with a TMDL
BioCriteria	25	0
Chlorophyll-a	1	0
Dissolved Oxygen	24	17
E. coli	0	29
Excess Algal Growth	0	1
Fecal Coliform	0	16
Harmful Algal Blooms	6	0
Iron (total)	2	0
Methylmercury	6	0
pH	2	2
Phosphorus	1	0
Sedimentation	10	0
Temperature	193	12
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(l)). 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 2020. Note this section does not identify or include projects proposed and awarded a grant in 2020. 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 2020 see Section 3.6.2 of the main report.

In 2020, 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 2020 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 2020.

In 2020 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 2020.

Project Name	Grantee	Project Description	Reported Outputs
Riparian Restoration in Bear Creek Watershed	City of Ashland	Construct a riparian buffer along Bear Creek to reduce temperatures as part of the City's Water	In progress - design

Project Name	Grantee	Project Description	Reported Outputs
		Quality Trading Plan to meet its NPDES permit limits.	

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 2020.

In 2020 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 2020.

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 conditions, stabilizing severely eroding banks, and increasing public awareness of the	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.

Project Name	Grantee	Project Description	Reported Outputs
		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.	

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 2020.

In 2020 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 2020.

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 11 OWEB funded projects completed in 2019 with a total cash and in-kind budget of $1,040,703. 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.

Table M-9: Summary of OWEB grant funded fish passage projects completed in 2019, 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)
Applegate	1	1
Middle Rogue	NA	1
Upper Rogue	NA	2

Table M-10: Summary of OWEB grant funded instream projects completed in 2019, the most recent year data is available in the OWEB OWRI database.

Subbasin	Stream bank stabilized (Miles)	Engineered structures installed (Number of treatments)
Applegate	0.1	4

Table M-11: Summary of OWEB grant funded instream projects completed in 2019, 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)
Applegate	10	222

Table M-12: Summary of OWEB grant funded riparian projects completed in 2019, 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)
Applegate	1	NA	1	NA	0.1	NA
Illinois	NA	NA	NA	0	NA	2
Middle Rogue	NA	0	NA	NA	NA	NA
Upper Rogue	NA	NA	NA	NA	0.1	NA

Table M-13: Summary of OWEB grant funded upland projects completed in 2019, the most recent year data is available in the OWEB OWRI database.

Subbasin	Irrigation system improvement (Acre)	Irrigation system improvement (Feet)	Upland erosion control (Acre)	Upland erosion control (Number of treatments)
Applegate	11.0	NA	NA	NA
Middle Rogue	5.8	400	0.2	2

Table M-14: Summary of OWEB grant funded upland projects completed in 2019, the most recent year data is available in the OWEB OWRI database.

Subbasin	Nutrient/manure management (Acre)	Nutrient/manure management (Number of treatments)
Middle Rogue	0.2	1

Table M-15: Summary of OWEB grant funded upland projects completed in 2019, the most recent year data is available in the OWEB OWRI database.

Subbasin	Upland invasive plant control (Area treated)	Upland vegetation management (Area treated)
Illinois	2	NA
Lower Rogue	NA	10

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 2020.

Table M-16: TMDL implementation activities reported in 2020 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.
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;

TMDL	DMA	Reported Actions
		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 storm drains clean. The quotes for mats that cover the storm drains 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 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

TMDL	DMA	Reported Actions
		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 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.

TMDL	DMA	Reported Actions
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	3.3	78.3	4	12.1	2.4

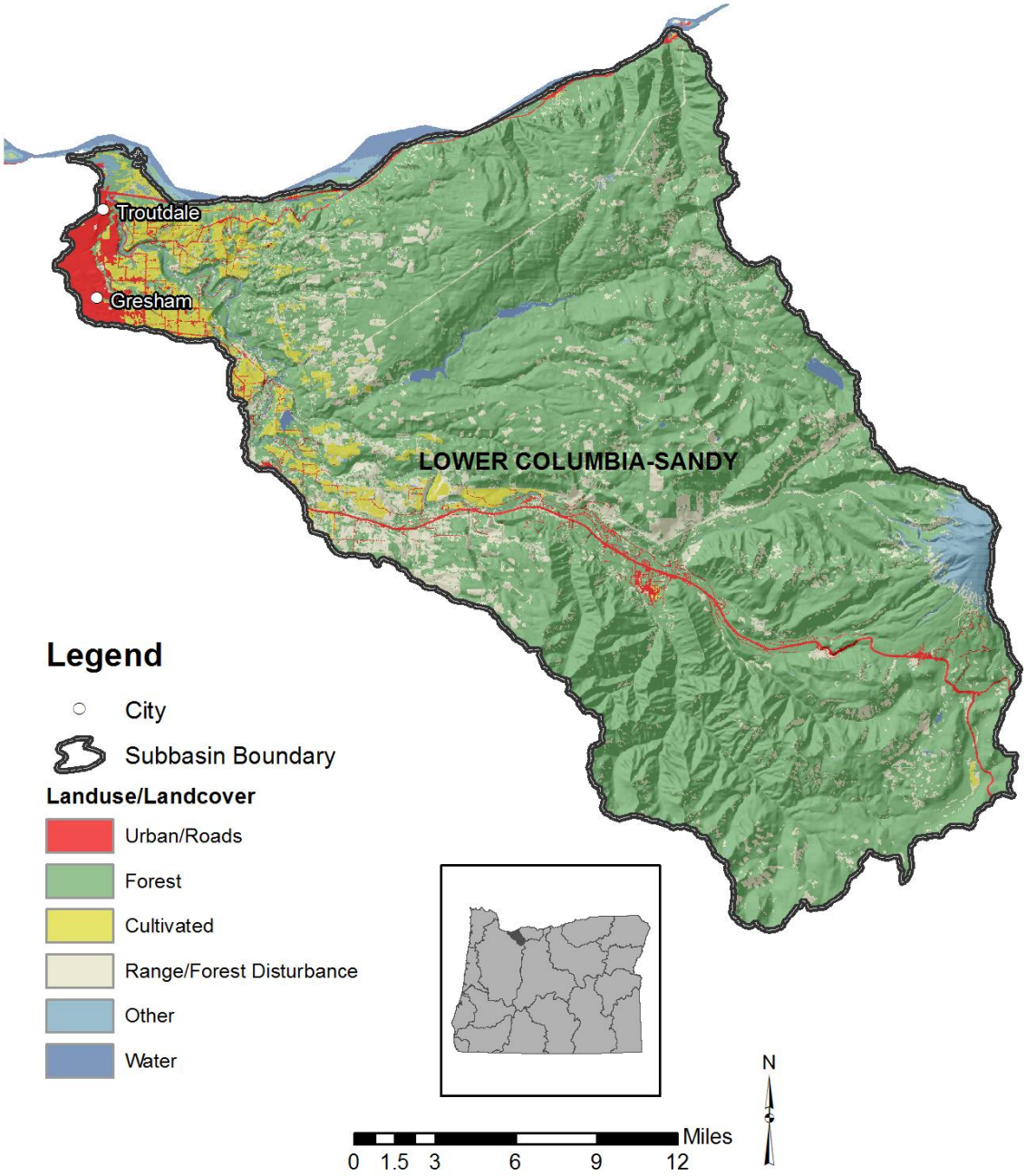

Figure N-1: Land use in the Sandy administrative basin.

1.1 Basin Contacts

Table N-2: Oregon DEQ basin contact.

Administrative Area	DEQ Basin Coordinator
Sandy Basin	Roxy Nayar: 503-229-6414: nayar.roxy@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 assessment units with and without a TMDL as identified in Oregon's 2018/2020 Integrated Report and Assessment database.

Parameter	Assessment units without a TMDL	Assessment units with a TMDL
BioCriteria	5	0
Chlordane	2	0
DDD 4,4'	2	0
DDE 4,4'	6	0
DDT 4,4'	4	0
Dieldrin	2	0
Dioxin (2,3,7,8-TCDD)	0	4
Dissolved Oxygen	3	0
E. coli	0	4
Heptachlor Epoxide	2	0
Iron (total)	1	0
Methylmercury	2	0
Polychlorinated Biphenyls (PCBs)	4	0
Polycyclic Aromatic Hydrocarbons (PAHs)	4	0
Temperature	40	0
Total Dissolved gas	0	4

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 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 2020. Note this section does not identify or include projects proposed and awarded a grant in 2020. 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 2020 see Section 3.6.2 of the main report.

In 2020, 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 2020 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 infastructure

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 2020.

In 2020 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 2020.

In 2020 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 2020.

In 2020 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 six OWEB funded projects completed in 2019 with a total cash and in-kind budget of $2,592,009. 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 2019, the most recent year data is available in the OWEB OWRI database.

Subbasin	Main stream channel modified / created (Feet)	Engineered structures installed (Number of treatments)
Lower Columbia-Sandy	600	3

Table N-7: Summary of OWEB grant funded instream projects completed in 2019, 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)
Lower Columbia-Sandy	220	730	4

Table N-8: Summary of OWEB grant funded upland projects completed in 2019, the most recent year data is available in the OWEB OWRI database.

Subbasin	Upland tree planting (Area treated)
Lower Columbia-Sandy	0.5

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 2020.

Table N-9: TMDL implementation activities reported in 2020 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. Preformed 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

TMDL	DMA	Reported Actions
		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 coodinate 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	1592	4.5	78.1	0.2	16.4	0.9
Coos	1865	6.6	58.7	0.8	27.7	6.1
Coquille	2737	5.1	58.4	3.8	30.2	2.5
Sixes	1214	4.4	64.1	1.9	25.4	4.2
Smith	235	1.3	62.0	0.0	36.8	0.0

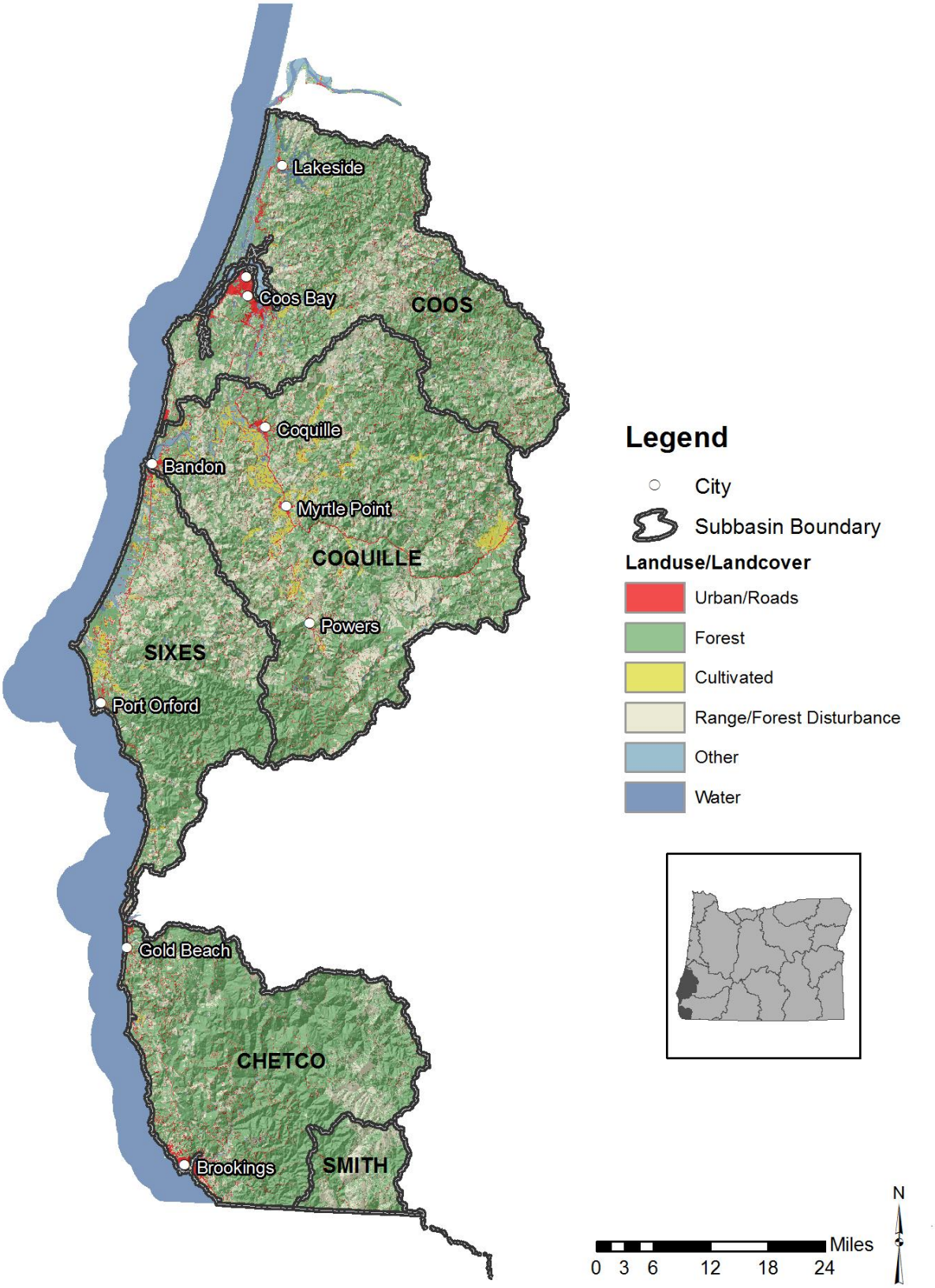

Figure O-1: Land use in the South Coast administrative basin.

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 assessment units with and without a TMDL as identified in Oregon's 2018/2020 Integrated Report and Assessment database.

Parameter	Assessment units without a TMDL	Assessment units with a TMDL
Aquatic Weeds	2	1
Arsenic, Inorganic	2	0
BioCriteria	28	0
Chloride	1	0
Chlorophyll-a	1	3
Dieldrin	1	0
Dissolved Oxygen	26	5
Dissolved Oxygen - Estuary	3	1
E. coli	14	0
Enterococci	3	0
Fecal Coliform	29	0
Harmful Algal Blooms	2	1
Iron (total)	4	0
Methylmercury	4	0
pH	6	0
Sedimentation	0	6
Shellfish Toxins	56	0

Parameter	Assessment units without a TMDL	Assessment units with a TMDL
Temperature	151	7
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(l)). 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 2020. Note this section does not identify or include projects proposed and awarded a grant in 2020. 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 2020 see Section 3.6.2 of the main report.

In 2020, there were three 319 projects active that reported project outputs and accomplishments to DEQ. Combined the projects have a total grant budget of $43,345. Table O-5 describes the projects and the reported outputs.

Table O-5: Project outputs reported in 2020 for Section 319 pass through grants.

Project Name	Grantee	Project Description	Reported Outputs
Coquille Mainstream Cold Water Refugia Monitoring Project	Coos Soil and Water Conservation District	Lower coquille River tributary temperature monitoring	Completed an additional year of temperature monitoring, compiled and processed 2019 data collected and drafted final project performance report.
South Fork Coquille River/Dement Creek Technical Assistance Project	Coquille Watershed Association	watershed planning for Dement Creek through WQ and habitat assessment	Continued landowner outreach, completed watershed water quality field assessments and data analysis conducted for Dement Creek project, SF Coquille River. Final watershed assessment analysis and final report drafted in 2020.
City of Mrytle Point TMDL Water Quality Implementation Plan	City of Mrytle Point	City of Mrytle Point TMDL WQIP development	Completed final performance report and Water Quality Implementation Plan, deliverable in 2020

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 2020.

In 2020 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 2020.

Project Name	Grantee	Project Description	Reported Outputs
2nd Street Green Street and Parking Lots and Brownfields Remediation and Land Revitalization	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 flooding downtown. The brownfield remediation of Engelwood School will reduce environmental contamination and safety risks, improve management of stormwater runoff, reduce floating debris	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.

Project Name	Grantee	Project Description	Reported Outputs
		during flooding events, improve water quality and protect waterways connected to Coos Bay.	
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 2020.

In 2020 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 2020.

In 2020 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 2020.

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-2: Restoration work in Langlois' drinking water source area included new riparian fence adjacent to Floras Creek. Photo Credit: Matt Swanson, Curry SWCD.

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 20 OWEB funded projects completed in 2019 with a total cash and in-kind budget of $1,511,609. 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 2019, the most recent year data is available in the OWEB OWRI database.

Subbasin	Fish Passage Crossing improvement (Number of treatments)
Coos	3

Subbasin	Fish Passage Crossing improvement (Number of treatments)
Coquille	1
Sixes	5

Table O-9: Summary of OWEB grant funded instream projects completed in 2019, 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)
Coos	138	NA
Sixes	18	27

Table O-10: Summary of OWEB grant funded riparian projects completed in 2019, the most recent year data is available in the OWEB OWRI database.

SubbasinActual	Voluntary riparian tree retention (Acres)	Voluntary riparian tree retention (Miles)
Coquille	5.9	0.3

Table O-11: Summary of OWEB grant funded riparian projects completed in 2019, the most recent year data is available in the OWEB OWRI database.

Subbasin	Riparian fencing (Area treated)	Riparian fencing (Stream sides treated)
Coos	2.0	1
Sixes	6.5	2

Table O-12: Summary of OWEB grant funded riparian projects completed in 2019, 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)	Riparian vegetation planting (Stream sides treated)
Coos	3	2	0.5	2
Coquille	58	2	NA	NA
Sixes	NA	2	1.5	NA

Table O-13: Summary of OWEB grant funded road projects completed in 2019, the most recent year data is available in the OWEB OWRI database.

Subbasin	Surface drainage improvement (1 station or 100 Feet)
Sixes	10

Table O-14: Summary of OWEB grant funded upland projects completed in 2019, the most recent year data is available in the OWEB OWRI database.

Subbasin	Off-channel livestock or wildlife watering (Number of treatments)
Sixes	23

Table O-15: Summary of OWEB grant funded upland projects completed in 2019, the most recent year data is available in the OWEB OWRI database.

Subbasin	Upland invasive plant control (Area treated)
Chetco	0.1

Subbasin	Upland invasive plant control (Area treated)
Coos	12.7
Coquille	1.0

Table O-16: Summary of OWEB grant funded instream projects completed in 2019, the most recent year data is available in the OWEB OWRI database.

Subbasin	Wetland invasive plant control (Area treated)	Wetland vegetation planting (Area treated)
Coos	19.9	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 2020.

Table O-17: TMDL implementation activities reported in 2020 by Designated Management Agencies or third parties.

TMDL	DMA	Reported Actions
Tenmile Lakes TMDL	NA	No reporting occurred in 2020, Tenmile Lakes DMAs have renewed efforts to address water quality, however reporting to DEQ was not accomplished in 2020.

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	2033	5.2	0.2	49.5	44.2	1.0
Umatilla	6542	3.4	15.9	33.5	46.7	0.5
Walla Walla	1243	3.1	30.6	41.8	24.0	0.4
Willow	2247	2.0	5.6	27.9	63.8	0.7

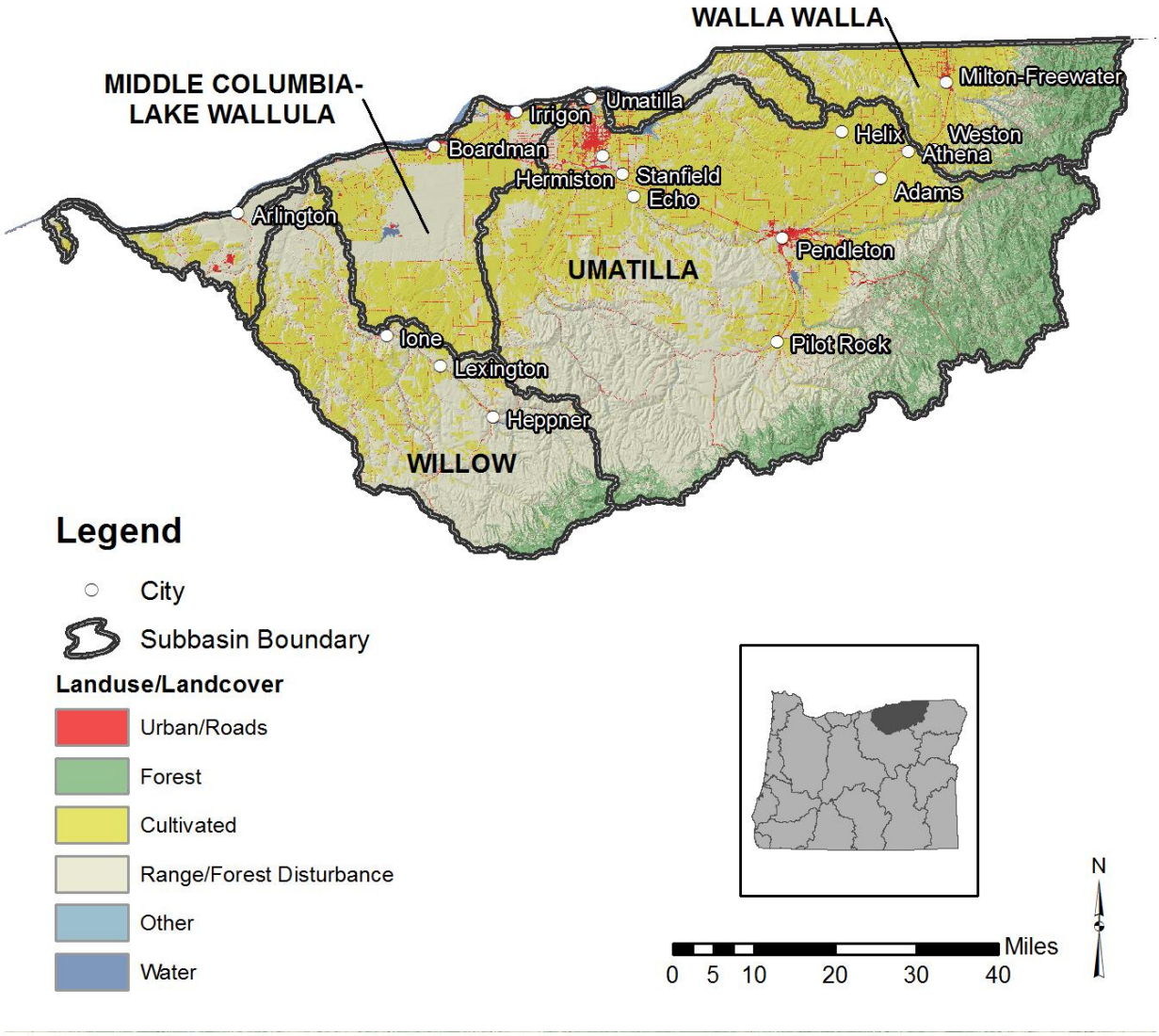

Figure P-1: Land use in the Umatilla administrative basin.

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
Umatilla Basin	Tessa Edelen: 541-633-2028: edelen.tessa@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 assessment units with and without a TMDL as identified in Oregon's 2018/2020 Integrated Report and Assessment database.

Parameter	Assessment units without a TMDL	Assessment units with a TMDL
Ammonia	0	1
Arsenic, Inorganic	2	0
BioCriteria	5	0
Chlorpyrifos	2	0
Dioxin (2,3,7,8-TCDD)	0	14
Dissolved Oxygen	15	0
E. coli	0	2
Excess Algal Growth	0	3
Fecal Coliform	1	5
Guthion	1	0
Harmful Algal Blooms	1	0
Iron (total)	12	0
Methylmercury	18	0
Nitrates	4	0
Parathion	1	0
pH	0	11
Phosphorus	3	0
Polychlorinated Biphenyls (PCBs)	10	0
Sedimentation	1	17
Temperature	26	23
Total Dissolved gas	0	12
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(l)). 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
Umatilla River Basin TMDL and WQMP	Ammonia, Aquatic Weeds, Bacteria (water contact recreation), Nitrate, pH, Sedimentation, Temperature, Turbidity
Walla Walla Subbasin Stream Temperature TMDL and WQMP	Temperature
Willow Creek Subbasin Temperature, pH and Bacteria TMDL and WQMP	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 2020. Note this section does not identify or include projects proposed and awarded a grant in 2020. 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 2020 see Section 3.6.2 of the main report.

In 2020, 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 2020 for Section 319 pass through grants.

Project Name	Grantee	Project Description	Reported Outputs
Salmon Safe Certification in Peas/Wheat Agronomic Crop Rotation	OSU Ext. 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. The Recipient will continue implementation of the information and education program designed to encourage participation in the Salmon-Safe IPM. The Recipient will track enrollment and participation in the Salmon-Safe IPM	This project closed 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 HeatSource 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 HeatSource Model's ability to model the effect of various Best Management Practices (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 insure 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 Watershed	The Recipient has been very active in education and outreach programs and activities in the	In 2019, the WWBWC hosted a clean-up, a Wildlife Habitat Field Day for 5th grade students, water

Project Name	Grantee	Project Description	Reported Outputs
	Foundation	Subbasin. In 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.	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.

Project Name	Grantee	Project Description	Reported Outputs
		Activities will focus primarily in the Milton-Freewater area, but will also be implemented in also other locations within the Subbasin.	
Couse Creek Watershed Assessment	Walla Walla Basin Watershed Foundation	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	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.

Project Name	Grantee	Project Description	Reported Outputs
		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.	

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 2020.

In 2020 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 2020.

In 2020 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 2020.

In 2020 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 11 OWEB funded projects completed in 2019 with a total cash and in-kind budget of $1,274,298. 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 fish passage projects completed in 2019, the most recent year data is available in the OWEB OWRI database.

Subbasin	Fish Passage Crossing improvement (Number of treatments)
Willow	2

Table P-7: Summary of OWEB grant funded instream projects completed in 2019, the most recent year data is available in the OWEB OWRI database.

Subbasin	Stream bank stabilized (Miles)	Engineered structures installed (Number of treatments)
Willow	0.9	10

Table P-8: Summary of OWEB grant funded instream projects completed in 2019, 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	69	10296	3
Willow	24	NA	NA

Table P-9: Summary of OWEB grant funded instream flow projects completed in 2019, the most recent year data is available in the OWEB OWRI database.

SubbasinActual	Other irrigation practice improvement (for instream flow) (acre-foot)
Walla Walla	9

Table P-10: Summary of OWEB grant funded riparian projects completed in 2019, 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)
Umatilla	NA	0.3	NA
Walla Walla	0.1	NA	1

Table P-11: Summary of OWEB grant funded riparian projects completed in 2019, the most recent year data is available in the OWEB OWRI database.

Subbasin	Riparian vegetation planting (Length of treatment)
Willow	0.8

Table P-12: Summary of OWEB grant funded upland projects completed in 2019, the most recent year data is available in the OWEB OWRI database.

Subbasin	Irrigation system improvement (Acre)	Terracing (Acre)	Terracing (Feet)	Terracing (Number of treatments)
Umatilla	0.3	NA	NA	NA
Willow	32.0	49	10507	6

Table P-13: Summary of OWEB grant funded upland projects completed in 2019, 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)	Upland fencing (Mile)
Willow	3300	7	360	4.8

Table P-14: Summary of OWEB grant funded upland projects completed in 2019, the most recent year data is available in the OWEB OWRI database.

Subbasin	Upland invasive plant control (Area treated)
Walla Walla	54
Willow	140

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 2020.

Table P-15: TMDL implementation activities reported in 2020 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	1.1	77.6	2.9	17.3	1.2
South Umpqua	4666	3.1	67.7	5.9	22.6	0.7
Umpqua	3885	4.5	63.0	6.7	24.1	1.7

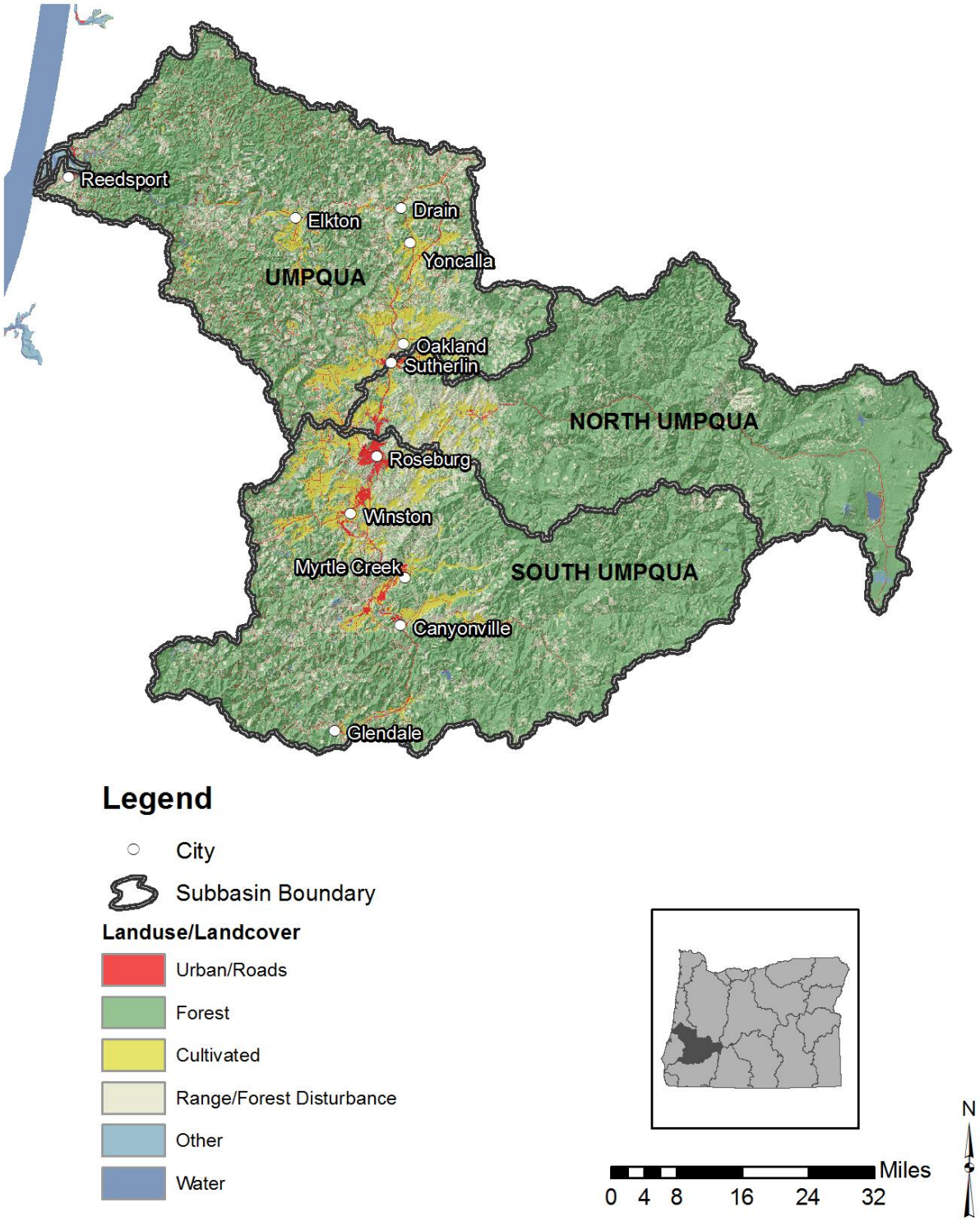

Figure Q-1: Land use in the Umpqua administrative basin.

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 assessment units with and without a TMDL as identified in Oregon's 2018/2020 Integrated Report and Assessment database.

Parameter	Assessment units without a TMDL	Assessment units with a TMDL
Ammonia	0	1
Aquatic Weeds	1	0
Arsenic, Inorganic	5	0
BioCriteria	60	1
Cadmium	2	0
Chlorine	0	3
Chlorophyll-a	0	1
Copper	4	0
Dissolved Oxygen	0	20
E. coli	28	0
Excess Algal Growth	2	0
Fecal Coliform	7	0
Harmful Algal Blooms	6	0
Iron (total)	7	0
Lead	3	0
Manganese	1	0
Mercury (total)	1	0

Parameter	Assessment units without a TMDL	Assessment units with a TMDL
Methylmercury	3	0
Nickel	2	0
pH	0	15
Phosphorus	0	1
Sedimentation	0	19
Temperature	242	21
Total Dissolved gas	0	1
Turbidity	1	0
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
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 2020. Note this section does not identify or include projects proposed and awarded a grant in 2020. 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 2020 see Section 3.6.2 of the main report.

In 2020, there was one 319 project active that reported project outputs and accomplishments to DEQ. Combined the projects have a total grant budget of $11,645. Table Q-5 describes the project and the reported outputs.

Table Q-5: Project outputs reported in 2020 for Section 319 pass through grants.

Project Name	Grantee	Project Description	Reported Outputs
South Umpqua Non-Point Source Turbidity Assessment	Partnership for the Umpqua Rivers, Inc.	Review available raw water turbidity data from public water systems; identify additional turbidity sampling sites based on data collected by Recipient and/or drinking water providers; summarize known land uses and type of ownership at new turbidity sampling sites; collect and analyze turbidity samples at each sampling site over a period of up to two years; analyze data and develop recommendations for subsequent project work; share findings and develop final report.	Evaluation of existing data; summary of trends; identification of priority monitoring sites; storm sampling

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 2020.

In 2020 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 2020.

In 2020 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-6 describes the projects and the reported outputs.

Table Q-6: Nonpoint source Drinking Water Source Protection program projects and outputs for 2020.

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.
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 2020.

In 2020 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-7 describes the projects and the reported outputs.

Table Q-7: Drinking Water Providers Partnership projects and outputs for 2020.

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 complete the design for the culvert replacement in preparation for seeking funding for the larger effort of implementation.	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.
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	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.

Project Name	Grantee	Project Description	Reported Outputs
		elementary school students. This project will complete Essential Project #1 in the Skillet-Emerson WRAP.	
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 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.	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 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

Project Name	Grantee	Project Description	Reported Outputs
			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.

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 66 OWEB funded projects completed in 2019 with a total cash and in-kind budget of $1,913,564. 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-8: Summary of OWEB grant funded fish passage projects completed in 2019, the most recent year data is available in the OWEB OWRI database.

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

Table Q-9: Summary of OWEB grant funded instream projects completed in 2019, 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)
North Umpqua	775	308
Umpqua	65	100

Table Q-10: Summary of OWEB grant funded riparian projects completed in 2019, the most recent year data is available in the OWEB OWRI database.

Subbasin	Voluntary riparian tree retention (Acres)	Voluntary riparian tree retention (Miles)
North Umpqua	0.9	0.1
South Umpqua	26.1	2.2
Umpqua	52.7	5.6

Table Q-11: Summary of OWEB grant funded road projects completed in 2019, 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)	Surface drainage improvement (1 station or 100 Feet)
Umpqua	3	51	18

Table Q-12: Summary of OWEB grant funded upland projects completed in 2019, the most recent year data is available in the OWEB OWRI database.

Subbasin	Upland invasive plant control (Area treated)
South Umpqua	2.4
Umpqua	560.2

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 2020.

Table Q-13: TMDL implementation activities reported in 2020 by Designated Management Agencies or third parties.

TMDL	DMA	Reported Actions
Umpqua Basin (temperature, nutrients, DO/pH, bacteria)	Myrtle Creek	Since 1997 Myrtle Creek has been land applying waste water effluent. Waste water is used to irrigate the Myrtle Creek Golf Course. This action is ongoing.
Umpqua Basin-Dimond Lake	ODFW	The ODFW stocked 310,355 Rainbow trout fingerlings in June 2020. Additionally 21,150 brown trout and 15,989 tiger trout were stocked. Both Brown and Tiger trout stocked are sterile. Macro-invertebrate sampling was conducted, and quantity was estimated at 427.1 lbs/acre. Summer trap netting was conducted to monitor and remove non-native cyprinids. Trapping efforts removed 36 tui chub and 19,889 golden shiner from Diamond Lake.
Umpqua Basin - Temperature	U.S. Forest Service	Temperature monitoring (51) locations on three districts; monitoring long term trends, implementation of forest management plans and projects that include steam or riparian protection/restoration and watershed action plans that identify restoration opportunities.
Umpqua Basin -	U.S. Forest Service	In 2020 the Forest Service 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 2020 two monitoring events were completed by PSU, one on July 8, 2020 and another on September 4, 2020. 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 plus nitrite, ammonia nitrogen and silicon. Secchi depth measurements were made by Forest Service staff and by PSU staff during their site visits

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:

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

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

North Santiam Subbasin

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

- Breitenbush River Watershed

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

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

Upper Willamette Subbasin

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

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

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

McKenzie Subbasin

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

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

- Mohawk River Watershed
- Lower McKenzie River Watershed

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

Coast Fork Willamette Subbasin

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

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

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

Middle Fork Willamette Subbasin

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

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

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

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

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

Subbasin	Watershed Area (km2)	% Urban/Roads	% Forest	% Cultivated	% Range/Forest Disturbance	%Other
Clackamas	2442	3.6	75.2	6.7	13.7	0.7
Coast Fork Willamette	1726	3.4	64.6	7.9	23.2	0.9
Lower Willamette	1061	45.3	27.7	10.8	9.4	6.9
McKenzie	3468	1.3	75.5	2.1	17.1	3.9
Middle Fork Willamette	3540	1.0	78.6	2.0	15.4	3.0
Middle Willamette	1841	19.9	17.3	53.4	6.7	2.9
Molalla-Pudding	2268	6.6	39.2	37.2	16.5	0.6
North Santiam	1979	2.2	70.3	9.2	15.8	2.5
South Santiam	2696	1.9	59.1	14.0	23.9	1.2
Tualatin	1836	22.1	32.9	26.6	17.2	1.1
Upper Willamette	4850	11.1	31.1	39.3	16.3	2.2
Yamhill	1999	6.6	38.7	34.3	19.4	1.0

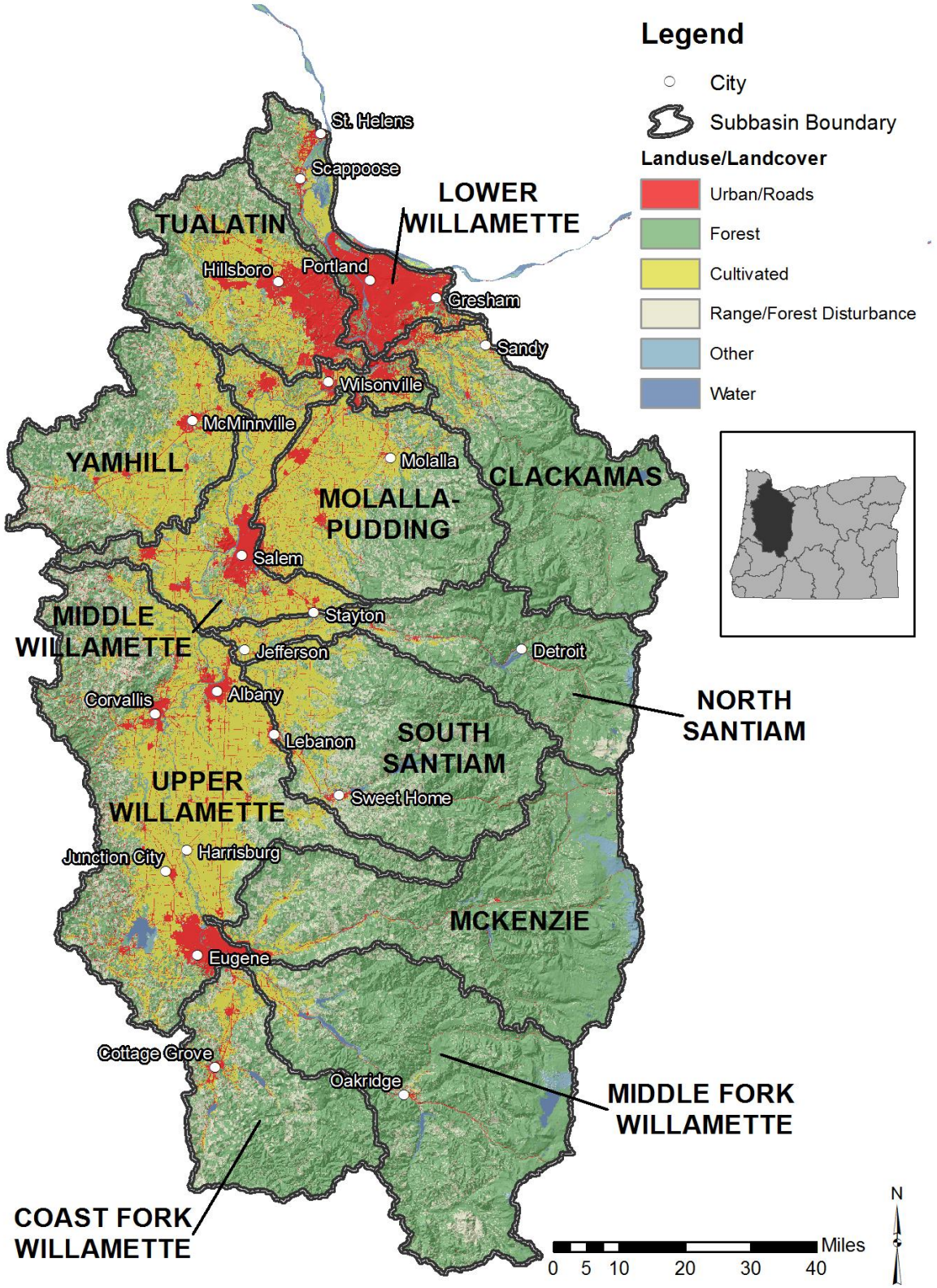

Figure R-1: Land use in the Willamette administrative basin.

1.1 Basin Contacts

Table R-2: Oregon DEQ basin contact.

Administrative Area	DEQ Basin Coordinator
Lower Willamette Subbasin	Andrea Matzke: 503-229-5350: andrea.matzke@deq.state.or.us
Tualatin Subbasin	Brian Creutzburg: 503-348-5968: brian.creutzburg@deq.state.or.us
Clackamas Subbasin	Roxy Nayar: 503-229-6414: nayar.roxy@deq.state.or.us.
Middle Willamette Mainstem, North Santiam, Pudding, and Yamhill Subbasins	Nancy Gramlich: 503-378-5073: gramlich.nancy@deq.state.or.us
Coast Fork, McKenzie, Middle Fork Willamette, and South Santiam Subbasins	Priscilla Woolverton: 541-687-7347: priscilla.woolverton@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 assessment units with and without a TMDL as identified in Oregon's 2018/2020 Integrated Report and Assessment database.

Parameter	Assessment units without a TMDL	Assessment units with a TMDL
Aldrin	5	0
Ammonia	7	0
Aquatic Weeds	10	0
Arsenic, Inorganic	3	0
Benz(a)anthracene	1	0
Benzo(a)pyrene	1	0
Benzo(b)fluoranthene 3,4	1	0
Benzo(k)fluoranthene	1	0
BioCriteria	94	0
Chlordane	2	0

Parameter	Assessment units without a TMDL	Assessment units with a TMDL
Chlorophyll-a	7	9
Chlorpyrifos	4	0
Chromium VI	3	0
Chrysene	1	0
Copper	6	0
Cyanide	2	0
DDE 4,4’	7	2
DDT 4,4’	5	5
Diazion	2	0
Dieldrin	12	2
Dioxin (2,3,7,8-TCDD)	0	9
Dissolved Oxygen	129	67
E. coli	5	89
Endosulfan	2	0
Endosulfan Sulfate	2	0
Endrin Aldehyde	3	0
Enterococci	1	0
Ethylbenzene	2	0
Ethylhexyl Phthalate bis 2	1	0
Excess Algal Growth	2	0
Fecal Coliform	14	16
Guthion	1	0
Harmful Algal Blooms	16	1
Heptachlor	1	0
Hexachlorobenzene	2	0
Indeno(1,2,3-cd)pyrene	1	0
Iron (total)	32	4
Malathion	1	0
Mercury (total)	1	3
Methylmercury	4	14
Nitrates	1	1
Pentachlorophenol	0	2
pH	12	1
Phosphorus	3	20
Polychlorinated Biphenyls (PCBs)	6	1
Polycyclic Aromatic Hydrocarbons (PAHs)	3	0

Parameter	Assessment units without a TMDL	Assessment units with a TMDL
Sedimentation	7	0
Temperature	353	25
Tetrachloroethylene	2	0
Trichloroethylene	1	0
Turbidity	8	1
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(l)). The TMDL and WQMP serve as a multi-sector plan and provides the blueprint for TMDL related implementation activities. Table R-4 lists the TMDLs that have been approved in the Willamette Basin.

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

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

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

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 2020. Note this section does not identify or include projects proposed and awarded a grant in 2020. 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 2020 see Section 3.6.2 of the main report.

In 2020, there were three 319 projects active that reported project outputs and accomplishments to DEQ. Combined the projects have a total grant budget of $50,051. Table R-5 describes the projects and the reported outputs.

Table R-5: Project outputs reported in 2020 for Section 319 pass through grants.

Project Name	Grantee	Project Description	Reported Outputs
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.	The city used 319 grant funding to complete an update of the city's Stormwater Design Standards and Drawings. The City of Scappoose is not a MS4 permittee, but these design standards are similar to requirements set forth in MS4 permits.
Macroinvertebrate Rapid Bioassessment Sampling to Test for Restoration Efficacy	Clackamas River Basin Council	Recipient performed macroinvertebrate and baseline water quality sampling as well as stream channel characteristic measurements at seven sampling sites in 2019. Results of water quality testing will be reported and distributed to the public. Monitoring results will inform efficacy of both riparian	Staff worked up macroinvertebrate and water quality data collected in 2019, formatted it, and submitted it to DEQ staff. Staff added the data set to existing sets collected by CRBC in 2010, 2013 and 2014 and by their partners in the Clackamas Technical Working Group (CTWG).

Project Name	Grantee	Project Description	Reported Outputs
		restoration and in-stream restoration projects over time. This data is also key to educating local individuals, businesses, and landowners about actions they can take that benefit and/or protect water quality.	
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, 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.	In 2020, LTWC completed and closed the project titled "Shading Amazon Creek from Private Commercial & Industrial Lands." This effort included updating digital maps to represent previous tree and willow planting efforts that are providing shade, as well as areas not yet planted, and areas that were planted in the past but need to be replanted. LTWC also completed researching and interviewing implementers from 16 different shading programs to identify successful strategies for engaging private landowners in the Amazon Creek watershed. The results of this were incorporated into the development of additional outreach and educational tools. As a result of LTWC's research and outreach to businesses in areas identified as high priority for riparian restoration, two different sites in the Amazon watershed were treated for invasive plants and replanted to provide additional shade and riparian function. The City of Eugene was an important supporter and collaborator on this project.

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 2020.

In 2020 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 2020.

Project Name	Grantee	Project Description	Reported Outputs
Septic System 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 - implemented one septic 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 2020.

In 2020 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 2020.

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 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.	Three 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.

Project Name	Grantee	Project Description	Reported Outputs
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 of all seven municipal water providers who get their drinking water from the Clackamas River.	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 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.

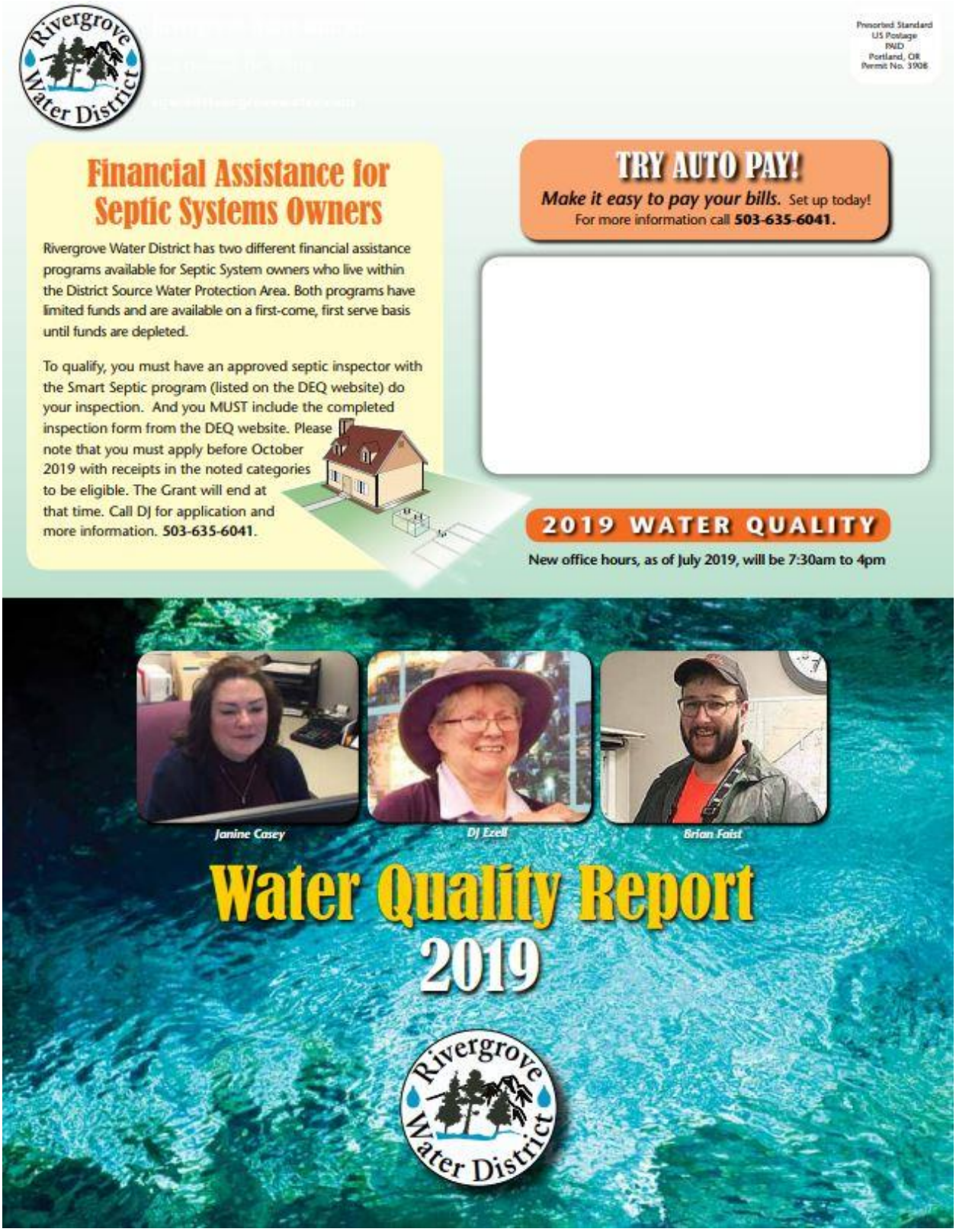

Figure R-2: Rivergrove Water District highlights septic system outreach materials in Consumer Confidence Report (2018).

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 2020.

In 2020 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 2020.

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	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

Project Name	Grantee	Project Description	Reported Outputs
		floodplain in the lower South Fork McKenzie River below Cougar Dam. Project is co-managed by the Willamette National Forest and McKenzie Watershed Council.	decommissioning, planting and seeding disturbed areas, and treating weeds. (based on 2019 proposal and assumption that all tasks were completed in 2019)

Figure R-3: 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 62 OWEB funded projects completed in 2019 with a total cash and in-kind budget of $4,005,816. 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 2019, the most recent year data is available in the OWEB OWRI database.

Subbasin	Fish Passage Crossing improvement (Number of treatments)
Lower Willamette	2
Middle Willamette	1
Upper Willamette	1

Table R-10: Summary of OWEB grant funded instream projects completed in 2019, the most recent year data is available in the OWEB OWRI database.

Subbasin	Instream habitat: Large wood placement (Number of treatments)
Lower Willamette	230
McKenzie	1396

Table R-11: Summary of OWEB grant funded riparian projects completed in 2019, 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 management (Area treated)	Riparian vegetation management (Stream sides treated)	Riparian vegetation planting (Area treated)	Riparian vegetation planting (Length of treatment)	Riparian vegetation planting (Stream sides treated)
Clackamas	0.5	NA	1	NA	NA	4.0	NA	2
Coast Fork Willamette	2.3	NA	1	NA	NA	NA	0.1	NA
Lower Willamette	0.1	7.6	NA	NA	NA	16.9	NA	4
McKenzie	NA	0.1	NA	NA	NA	2.3	NA	1
Middle Fork Willamette	NA	NA	NA	NA	NA	1.2	NA	1
Molalla-Pudding	NA	NA	NA	NA	NA	NA	0.3	NA
North Santiam	NA	NA	NA	NA	NA	2.1	NA	NA
Upper Willamette	NA	51.0	NA	14.9	2	NA	0.1	NA
Yamhill	1.8	NA	2	NA	NA	NA	NA	NA

Table R-12: Summary of OWEB grant funded road projects completed in 2019, 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)
Middle Fork Willamette	NA	NA	4
Molalla-Pudding	NA	163.4	2
North Santiam	2	510.5	5

Table R-13: Summary of OWEB grant funded upland projects completed in 2019, the most recent year data is available in the OWEB OWRI database.

Subbasin	Irrigation system improvement (Acre)	Upland erosion control (Acre)
Lower Willamette	NA	0.1
Middle Fork Willamette	NA	0.4
Middle Willamette	116	NA
Upper Willamette	NA	0.5

Table R-14: Summary of OWEB grant funded upland projects completed in 2019, the most recent year data is available in the OWEB OWRI database.

Subbasin	Grazing management (Acre)	Nutrient/manure management (Acre)	Nutrient/manure management (Number of treatments)	Off-channel livestock or wildlife watering (Number of treatments)
Coast Fork Willamette	NA	0.1	1	NA
Middle Fork Willamette	NA	52.1	2	NA
Upper Willamette	4	0.5	1	4

Table R-15: Summary of OWEB grant funded upland projects completed in 2019, 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)
Coast Fork Willamette	NA	NA	NA	0.1
Lower Willamette	41.1	1.2	10	16.9
Middle Fork Willamette	7.0	NA	4	3.0
Middle Willamette	2.5	NA	NA	24.5
Upper Willamette	23.8	NA	4	22.5
Yamhill	3.8	NA	NA	NA

Table R-16: Summary of OWEB grant funded instream projects completed in 2019, the most recent year data is available in the OWEB OWRI database.

Subbasin	Wetland improvement (Area treated)	Wetland invasive plant control (Area treated)	Wetland restoration (Area treated)	Wetland vegetation planting (Area treated)
Middle Willamette	NA	9.0	NA	NA

Molalla-Pudding	0.4	NA	NA	NA
Upper Willamette	NA	26.6	5	26.6

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 2020.

Table R-17: TMDL implementation activities reported in 2020 by Designated Management Agencies or third parties.

TMDL	DMA	Reported Actions
Middle Willamette	Newberg	TMDL annual report on progress included interactive option with web links for reading, watching videos, and accessing city tools for water quality protection.
Middle Willamette	Keizer	TMDL annual report on progress included interactive option with web links for reading, watching videos, and accessing city tools for water quality protection.
North Santiam	Detroit	Virtual DEQ and North Santiam canyon cities annual TMDL implementation progress and post-wildfire priorities update workshop. Key efforts are underway to rebuild, and support rebuild efforts, in North Santiam Subbasin after the catastrophic wildfires. The cities are committed to reestablishing and maintaining safe and environmentally protective operations and delivery of services.
North Santiam	Gates	Virtual DEQ and North Santiam canyon cities annual TMDL implementation progress and post-wildfire priorities update workshop. Key efforts are underway to rebuild, and support rebuild efforts, in North Santiam Subbasin after the catastrophic wildfires. The cities are committed to reestablishing and maintaining safe and environmentally protective operations and delivery of services.
North Santiam	Jefferson	Electronic street side reader board for increasing awareness to protect water quality with education and outreach; Fee for growth, operation, and maintenance of stormwater municipal operations; Growth in status on wetland and greenspace program and park acquisition
North Santiam	Mill City	Virtual DEQ and North Santiam canyon cities annual TMDL implementation progress and post-wildfire priorities update. Mill City highlighted the riparian protection strategy for public city lands anticipated for Mar 2021 City Council. Key efforts are underway to rebuild, and support rebuild efforts, in North Santiam Subbasin after the catastrophic wildfires. The cities are committed to reestablishing and maintaining safe and environmentally protective operations and delivery of services.
North Santiam	North Santiam Watershed Council	North Santiam Water Council Director facilitated North Santiam Partnership monthly restoration priority strategy development meetings from January through August. Some of the partners participating include local, state, and federal governmental natural resource agencies, Soil and Water Conservation Districts, Santiam Water

TMDL	DMA	Reported Actions
		Control District, Confederated Tribes of Grande Ronde, and DEQ. In September 2020 the Partners of the North Santiam business was put on hold because of the unprecedented wildfires in the North Santiam (Beachie Creek and Lionshead). The focus turned to meetings to facilitate immediate and future technical and potential funding resources for landowners concerned about their natural resources impacted by the fire.
Lower Willamette	Bonneville Power Association Habitat Technical Team Willamette Biological Opinion	DEQ Watersheds Assessment presented the Cold Water Refuge plan for the lower Willamette River final draft report to the Habitat Technical Team hosted by BPA.
North Santiam	Marion County	• Marion County continued to supply pet waste stations at County parks (1,200 bags dispensed per/year) • Interpretive signs providing information about riparian buffers, salmon biology, hydrology, and stream ecology were present along the Powder House Trail at Niagara Park, prior to the Beachy Creek Fire. Marion County hosted monthly (Sept-Dec) wildfire meetings on behalf of the partners and stakeholders impacted and supporting wildfire recovery efforts. • MC Building Inspection and Planning Division hosted the annual training event for septic installers. • All herbicide applicators are licensed and receive regular training to maintain that certification. The Marion County BMP guide also outlines best practices when using herbicides. • The County has continued education and outreach efforts through media and classroom activities in outlying school districts. The Waste Matters print publication was sent to residents county-wide which includes a water-quality protection component The • The County donated native trees to a riparian restoration project along S. Valentine Creek, which was led by the North Santiam Watershed Council (330 native trees). South Valentine Creek is 5.3 miles long and represents a portion of a greater regional restoration initiative that is ongoing.
Middle	St Paul	Installed additional pet waste station on Park Ave. February 27, 2020. Continue to label catch basin and have sent out educational flyer with March 2020 bill. Working on

TMDL	DMA	Reported Actions
		getting Storm Water Master Plan updated with 2020-2021 budget.
Middle	Polk County	Polk County's GIS mapping of old and new septic systems project continues (167 new data points collected). Pet pick-up stations installed at 3 parks. Code enforcement responded to and addressed 5 pollution complaints to date.
Middle	Monmouth	Drafted and approved stormwater fee for implementation in 2021. Fee is critical for sustaining a stormwater management program that supports TMDL implementation
Molalla-Pudding	Mt Angel, Silverton, Woodburn, Gervais, Donald, Marion County, Salem, Silverton	Participated in DEQ hosted virtual workshop for launch of TMDL five-year review requirements for determining plan effectiveness, plan updates for TMDL parameters including the revised mercury TMDL for 2021-2026 implementation. The Molalla-Pudding Five-Year review will be the second comprehensive assessment of TMDL implementation activities for Pudding cities and counties between 2015-2020.
Willamette and Tualatin Basin, and Columbia Slough TMDLs	City of Portland	The City of Portland completed its preliminary geospatial assessment of riparian conditions using historic LiDAR data, and released draft maps of the revised environmental overlay zones for East Buttes, Northwest Hills, and Southwest Hills. The city has completed the inventory of all active watershed restoration projects and developed an interactive web tool to share the inventory content. This inventory includes information, such as cost, location, project goals, and outcomes. The city is in the design stages of reconnecting a straightened reach of Johnson Creek to its historic floodplain in Southeast Portland with the goal of improving stream habitat complexity and hydraulics by returning the channel pattern to follow its historic meander and adding large wood. This work Includes invasive species treatment and riparian plantings. BES has already successfully purchased 13 private properties in the project area and removed the buildings in the floodplain.
Willamette Basin TMDL	Gladstone	Ecology in Classrooms and Outdoors (ECO) worked on the Dahl Beach site at the confluence of the Clackamas and Willamette Rivers during this past reporting period. ECO staff, teachers and students worked together on restoration of the riparian area while learning about watershed health, fish and wildlife habitat, human impacts to the local watershed, native and invasive plants, soil health, macroinvertebrates and water quality, and vegetation monitoring. Through this project, 180

TMDL	DMA	Reported Actions
		students from View Acres Elementary, New Urban High School, and Gladstone High School completed restoration and service learning activities and maintained a 3.5-acre portion of the park. Over the course of the year, students removed more than 80% of the invasive plants, and planted native plants in the floodplain, reaching a native plant density of 1,600 plants per acre. In the riparian area infill, students planted more than 10 species of native plants including Western Red Cedar, Big leaf Maple, and a variety of native shrubs.
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 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.
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 ft2 of invasive species and planted about 1,500 trees and shrubs.
Tualatin, 2001/2012	Metro	Protecting clean water and restoring fish and wildlife habitat are central to Metro's parks and nature mission. Metro completed at least: 81 projects to restore habitat and protect clean water; 12 wetland restoration projects; 1,500 acres of restored habitat, with another 2,100 acres under way; 48 planting projects; and 79 weed treatment projects.
Tualatin, 2001/2012	Washington County	Washington County promoted water quality protection through educational and outreach programs.
Willamette	Clackamas County	Submitted 2019-2020 Annual Report for Water Environment Services, and the Cities of Happy Valley, and Rivergrove.

TMDL	DMA	Reported Actions
Molalla-Pudding	Clackamas County Department of Transportation	2019-2020 Molalla-Pudding TMDL Annual Report submitted
Willamette	Water Environment Services	2019-2020 Tualatin and Willamette TMDL Annual Report submitted
Sandy	City of Troutdale	2020 TMDL Annual Report submitted
Willamette Basin Mercury TMDL	City of Adair Village	The city engineer completed a formal scope and cost analysis to undertake a review and revision of the development, which includes stormwater codes and regulations. It is cost- prohibitive for the city to move forward with updating or revising all municipal code at this time, so the city developed and proposed an Internal Management Memorandum that formalizes a policy that the City Administrator will always use Section 5.126(1) of the Development Code to require developers to include stormwater treatment measures in all new development.
Willamette Basin Temperature TMDL	City of Halsey	In 2020, the city specifically budgeted to complete a wetlands assessment that includes the entire urban growth boundary (UGB) of the city to take place in 2021.
Willamette Basin Bacteria TMDL	Lane County	Lane County included new stormwater treatment facilities for six projects outside the UGB, which included pollution control man holes, bioinfiltration swales, and flow through planters.
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 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.
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.

TMDL	DMA	Reported Actions
		Over 1,200 volunteers removed over 100,000 square feet of invasive species and planted about 1,500 trees and shrubs.

3.6.1 Additional Highlights

TMDL Implementation Reporting

Every fifth year management agencies submit a TMDL effectiveness evaluation report. In 2020, DEQ published and posted two Willamette Basin documents on the DEQ TMDL Reporting website summarizing the TMDL implementation of activities in the Willamette Basin between 2013 and 2018 from the evaluation. DEQ hopes that this information can be helpful when management agencies throughout Oregon update their nonpoint source TMDL implementation plan matrices.

Willamette Basin Five-Year Report

This report focuses on TMDL activities completed between 2013 and 2018 by city, county and special districts named as designated management agencies in the Willamette Basin 2006 TMDL. DEQ administered the first five-year review in 2013 and the following five year review was administered in 2018. This report compares results between the 2013 and 2018 evaluations.

https://www.oregon.gov/deq/FilterDocs/WB5YrReport2013-2018.pdf

Willamette Basin Five-Year Report -New Information

This document highlights some of the strategies/BMPs reported by DMAs that were not captured in Willamette Basin Five Year Review Report: City, County, and Special District Implementation 2013-2018. Some of these strategies may be innovative or underused, and therefore important to communicate to other TMDL implementation practitioners.

https://www.oregon.gov/deq/wq/Documents/Willamette-DMAStrategies.pdf

Appendix S

Section 319 Funding Priorities for Fiscal Year 2020

Eligible Watersheds Where WBPs are in place, by Region

DEQ will only accept work plans addressing the implementation of Watershed-Based Plans, as referenced in the priorities outlined below. Proposals may either implement a portion of a plan, or a complete plan. All projects are designed to implement Best Management Practices (BMPs) in a manner that leads to significant reduction in the nonpoint source pollutant load to a waterbody.

Eastern Region Project Priorities

Watershed Name (HUC)	Parameter	Applicable Watershed Planning Documents	Project Need
East Fork Hood River Watershed (1707010505) West Fork Hood River Watershed (1707010506) Hood River Watershed (1707010507) Mosier Creek – Columbia River Watershed (1707010511) Eagle Creek – Columbia River	Temperature	City of Hood River Western Hood River Subbasin TMDL Implementation Plan. Hood River County Western Hood Subbasin TMDL Implementation Plan. Hood River Watershed Action Plan Hood River Agricultural Water Quality Management Area Plan. Western Hood Subbasin Total Maximum Daily Load and Water Quality Management Plan.	Projects that address temperature impairment: Target projects that would: work toward greater community awareness of nonpoint source pollution issues, provide riparian buffer protection and restoration, and reduce heat pollution. Agriculture practices that reduce erosion, runoff, riparian degradation, and heat loading. Implementation of efforts identified in the Water Quality Management Plans (WQMP). 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, groundwater protection, drinking water protection and/or implementation monitoring.

Watershed (1707010512)		Other relevant Watershed Based Plans	TMDL/WQMP implementation activities including public outreach and education about water quality issues, planning, code/ordinance review, particularly targeting development of and protection of riparian buffers, increasing instream flow, erosion control, large wood placement, and channel restoration. Projects to evaluate the status of TMDLs or approved watershed-based plan objectives. Project activities may include: analysis of water quality status and trends in relation to management practice implementation and/or status of meeting TMDL or watershed-based plan milestones.
John Day River Basin (170702)	Temperature reduction to address biological conditions, and dissolved oxygen impairments	John Day River Basin Total Maximum Daily Load and Water Quality Management Plan City of John Day Total Maximum Daily Load Implementation Plan USFS John Day River Basin Water Quality Restoration Plan North & Middle Forks John Day River Agricultural Water Quality Management Area Plan Other relevant Watershed Based Plans	Projects that address temperature and/or bacteria impairment: Target projects that would: work toward greater community awareness of nonpoint source pollution issues, provide riparian buffer protection and restoration, and reduce heat and bacteria pollution. Agriculture practices that reduce erosion, runoff, riparian degradation, and bacteria and nutrient loading. Implementation of efforts identified in the Water Quality Management Plans (WQMP). 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, groundwater protection, drinking water protection and/or implementation monitoring. TMDL/WQMP implementation activities including public outreach and education about water quality issues, planning, code/ordinance
John Day River Basin (170702)	Bacteria		

			review, particularly targeting development of and protection of riparian buffers, increasing instream flow, erosion control, large wood placement, and channel restoration. Projects to evaluate the status of TMDLs or approved watershed-based plan objectives. Project activities may include: analysis of water quality status and trends in relation to management practice implementation and/or status of meeting TMDL or watershed-based plan milestones.
Lower Grande Ronde HUCs: Imnaha River (17060102) Wallowa River (17060105) Lower Grande Ronde (17060106)	Temperature on private agricultural lands and within the City of Enterprise.	City of Enterprise. (2013). Total Maximum Daily Load Implementation Plan. Grand Ronde Model Watershed. (2018). Grande Ronde Model Watershed Synthesis 1992-2016. Oregon Department of Environmental Quality. (2010). Lower Grande Ronde Subbasins TMDLs. Oregon Department of Agriculture. (2016). Wallowa Agricultural Water Quality Management Area Plan. Ecovista. (2004). Imnaha Subbasin Management Plan. Northwest Power and Conservation Council. Nowak , M.C. (2004a). Grande Ronde Subbasin Plan. Northwest Power and Conservation Council. Nowak, M.C. (2004b) Grande Ronde Subbasin Plan Supplement. Northwest Power and Conservation Council	Projects that address temperature impairment: Target projects that would: work toward greater community awareness of nonpoint source pollution issues, provide riparian buffer protection and restoration, and reduce heat pollution. Agriculture practices that reduce erosion, runoff, riparian degradation, and heat loading. Implementation of efforts identified in the Water Quality Management Plans (WQMP). 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, groundwater protection, drinking water protection and/or implementation monitoring. TMDL/WQMP implementation activities including public outreach and education about water quality issues, planning, code/ordinance review, particularly targeting development of and protection of riparian buffers, increasing instream flow, erosion control, large wood placement, and channel restoration.

			Projects to evaluate the status of TMDLs or approved watershed-based plan objectives. Project activities may include: analysis of water quality status and trends in relation to management practice implementation and/or status of meeting TMDL or watershed-based plan milestones.
Lower Malheur Subbasin (17050117) Upper Malheur Subbasin (17050116) Willow Creek Subbasin and Willow Creek Reservoir (17050119) Bully Creek Subbasin (17050118) Middle Snake-Payette Subbasin (17050115)	Bacteria from private agricultural lands Total phosphorus from private agricultural lands to address chlorophyll a impairments	Willow Creek Action Plan *Malheur Watershed Council Action Plan* *Malheur River Basin Agricultural Water Quality Management Area Plan* *Malheur River Basin Total Maximum Daily Load* and Water Quality Management Plan Other relevant Watershed Based Plans	Projects that address temperature, nutrients, and/or bacteria impairment: Target projects that would: work toward greater community awareness of nonpoint source pollution issues, provide riparian buffer protection and restoration, and reduce heat, nutrient, and bacteria pollution. Agriculture practices that reduce erosion, runoff, riparian degradation, and bacteria and nutrient loading. Implementation of efforts identified in the Water Quality Management Plans (WQMP). 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, groundwater protection, drinking water protection and/or implementation monitoring. TMDL/WQMP implementation activities including public outreach and education about water quality issues, planning, code/ordinance review, particularly targeting development of and protection of riparian buffers, increasing instream flow, erosion control, large wood placement, and channel restoration. Projects to evaluate the status of TMDLs or approved watershed-based plan objectives. Project activities may include: analysis of

			water quality status and trends in relation to management practice implementation and/or status of meeting TMDL or watershed-based plan milestones.

Western Region Project Priorities

Watershed Name (HUC)	Parameter	Applicable Watershed Planning Documents	Project Need
Tenmile Creek-Frontal Pacific Ocean Tenmile Lakes Watershed (1710030404)	Elevated sediment and phosphorus to address Aquatic Weeds, Algae, and pH.	Tenmile Lakes Watershed Total Maximum Daily Load and Water Quality Management Plan Tenmile Lakes Voluntary Water Quality Implementation Plan Tenmile Lakes Basin Partnership Monitoring Plan Tenmile Lakes Voluntary Fish Passage and Road Improvement Project Plan Other relevant Watershed Based Plans	Implementation of efforts identified in Water Quality Implementation Plans (WQIP) or Water Quality Management Plans (WQMP). TMDL implementation activities, including code/ordinance review, particularly targeting post construction storm water management and riparian buffers. Agriculture practices that reduce erosion, runoff, riparian degradation. Targeted projects that would: lead to reductions in sediment and nutrient load reductions, wetland acquisition, wetland protection and restoration, and riparian protection and restoration. Projects to evaluate the status of TMDLs or approved watershed based plan objectives. Project activities may include: • Identification, summarization, and evaluation of implemented or planned management practices • Analysis of water quality status and trends in relation to sequences of management practice implementation • Assessment of the status of meeting TMDL or watershed based plan milestones Development of alternative monitoring and assessment strategies to examine TMDL or watershed based plan status
Long Tom River Watershed (1709000301)	Elevated bacteria loads	City of Eugene, NPDES Storm Water Monitoring Plan City of Eugene, Oregon Total Daily Maximum (TMDL) Implementation Plan	Implementation of efforts identified in Water Quality Implementation Plans (WQIP) or Water Quality Management Plans (WQMP). TMDL implementation planning and implementation, particularly targeting storm water management and riparian buffers.

Watershed Name (HUC)	Parameter	Applicable Watershed Planning Documents	Project Need
		Long Tom Watershed Council Conservation Strategy Lane County, Willamette Basin Total Maximum Daily Load (TMDL) 5-Year Implementation Plan Middle Willamette Agricultural Water Quality Management Area Plan Upper Willamette and Upper Siuslaw Agricultural Water Quality Management Area Plan Willamette Basin Total Maximum Daily Load and Water Quality Management Plan Upper Willamette River Conservation and Recovery Plan for Chinook Salmon and Steelhead Other relevant Watershed Based Plans	Agricultural practices that improve manure management, and practices that reduce erosion, runoff, and riparian degradation. Projects to evaluate the status of TMDLs or approved watershed based plan objectives. Project activities may include: • Identification, summarization, and evaluation of implemented or planned management practices • Analysis of water quality status and trends in relation to sequences of management practice implementation • Assessment of the status of meeting TMDL or watershed based plan milestones Development of alternative monitoring and assessment strategies to examine TMDL or watershed based plan status
Little Butte Creek Watershed in the Upper Rogue Basin, 1710030708	Bacteria	TMDLs Adopted and 303(d) listings for bacteria, including: Rogue River Basin TMDL. Chapter 3: Bacteria (2008a) Rogue River Basin TMDL. Chapter 4: Water Quality Management Plan (2008b) Inland Rogue Agricultural Water Quality Management Area Plan (2018) Little Butte Creek Water Quality Improvement Plan (2018)	Implementation of efforts identified in Water Quality Implementation Plans, Water Quality Management Plans, and Agriculture Watershed Management Plans. Agricultural practices that improve manure management, and practices that reduce erosion, runoff, and riparian degradation Projects to evaluate the status of TMDLs or approved watershed based plan objectives. Project activities may include: • Identification, summarization, and evaluation of implemented or planned management practices

Watershed Name (HUC)	Parameter	Applicable Watershed Planning Documents	Project Need
			• Analysis of water quality status and trends in relation to sequences of management practice implementation • Assessment of the status of meeting TMDL or watershed based plan milestones Development of alternative monitoring and assessment strategies to examine TMDL or watershed based plan status
Southern Willamette Valley Ground Water Management Area	Nitrate-Nitrogen	Southern Willamette Valley Groundwater Management Area Action Plan Southern Willamette Valley Groundwater Management Area, Nitrogen/Nitrate Budget Report Other relevant Watershed Based Plans	Implementation of efforts identified in the Southern Willamette Valley GWMA Action Plan that will reduce nitrate and other pollutant loading to groundwater.

Northwest Region Project Priorities:

Watershed Name (HUC)	Parameter	Applicable Watershed Planning Documents	Project Need
Tillamook River (1710020303)	temperature, bacteria	Oregon Department of Environmental Quality [DEQ]. (2001). Tillamook Bay Watersheds Total Maximum Daily Load and Water Quality Management Plan. Addendum #1 Modification to the North Coast Basin Temperature Waste Load and Load Allocations (2006) Tillamook Estuaries Partnership [TEP]. (2019). Comprehensive Conservation and Management Plan. https://www.tbnep.org/comprehensive-conservation-and-management-plan.php	*Projects that address temperature and/or bacteria impairments:* **Examples:** • Riparian and in-channel restoration (e.g. native planting, erosion control, large wood placement) • Riparian projects with livestock exclusion fencing or off channel watering applications, or removal of inline ponds • Storm water or other projects that address bacteria impairments • Projects within drinking water source areas that address temperature and/or bacteria impairments and are documented in DEQ/OHA Source Water Assessments or public drinking Water Protection Plans. Public drinking water source areas (see http://www.oregon.gov/deq/wq/programs/Pages/DWP-Maps.aspx for locations) *Projects to evaluate the status of TMDLs or approved watershed based plan objectives.* **Examples:** • Identification, summarization, and evaluation of implemented or planned management practices • Analysis of water quality status and trends in relation to sequences of management practice implementation • Assessment of the status of meeting TMDL or watershed based plan milestones
Trask River (1710020304)	temperature, bacteria		
Wilson River (1710020305)	temperature, bacteria		
Kilchis River (1710020306)	temperature, bacteria		
Miami River (1710020307)	temperature, bacteria		
Nehalem River (17100202)	Bacteria Temperature	Oregon Department of Environmental Quality [DEQ]. (2003). North Coast Sub basins Total Maximum Daily Load and Water Quality Management Plan. Addendum #1 Modification to the North Coast Basin Temperature Waste Load and Load Allocations (2006) Tillamook Estuaries Partnership [TEP]. (2019). Comprehensive Conservation and Management Plan. https://www.tbnep.org/comprehensive-conservation-and-management-plan.php	
Nestucca River, (1710020302)	Bacteria Temperature	Oregon Department of Environmental Quality [DEQ]. (2002). Nestucca Bay Watershed Total Maximum Daily Load and Water Quality Management Plan. Addendum #1 Modification to the North Coast Basin Temperature	
Little Nestucca River (1710020301)	Bacteria Temperature		

Watershed Name (HUC)	Parameter	Applicable Watershed Planning Documents	Project Need
		Waste Load and Load Allocations (2006) Tillamook Estuaries Partnership [TEP]. (2019). Comprehensive Conservation and Management Plan. https://www.tbnep.org/comprehensive-conservation-and-management-plan.php	• Development of alternative monitoring and assessment strategies to examine TMDL or watershed based plan status
Johnson Creek (1709001201)	Temperature	Oregon Dept. of Environmental Quality (Sept. 2006). Willamette Basin TMDL: Chapter 5: Lower Willamette Sub basin TMDL. Oregon Dept. of Environmental Quality (Sept. 2006). Willamette Basin TMDL Chapter 14: Water Quality Management Plan (WQMP) Johnson Creek Watershed Council (Nov. 2015). Johnson Creek Water Quality 2009 to 2014. Johnson Creek Watershed Council (2015). Johnson Creek Watershed Council Action Plan 2015 - 2025. Johnson Creek Watershed Council (2018). Johnson Creek Watershed Council 2018 Annual Report Johnson Creek Watershed Council (Sept. 24, 2019). JCWC 2019 Pond Monitoring Report to OWEB City of Portland (Mar. 2019, resubmitted Oct. 2019). TMDL Implementation Plan for the Willamette River & Tributaries. City of Portland (Nov. 1, 2019). Total Maximum Daily Load (TMDL) Implementation Plan Annual Status Report No. 11 City of Gresham (Feb. 2019). TMDL Implementation Plan	*Restoration projects that address temperature impairments:* **Examples:** • Riparian and in-channel restoration (e.g. native planting, erosion control, large wood placement) • Riparian projects with livestock exclusion fencing or off channel watering applications, or removal and/or better management of inline ponds *Assessment projects to evaluate the status of meeting temperature TMDLs or watershed planning objectives.* **Examples:** • Identification, summarization, and evaluation of implemented or planned management practices • Analysis of water quality status and trends to assess effectiveness of implementation actions • Compile and format continuous temperature data for submission to DEQ's AWQMS database. Data in AWQMS is used to assess status of state waterbodies and for conducting status and trends analyses. This project is not eligible for funding if grantee data submission to DEQ is already required under other authorities. • Assess status of meeting TMDL objectives, such as percent effective shade targets, or other watershed

Watershed Name (HUC)	Parameter	Applicable Watershed Planning Documents	Project Need
		VOLUME III: Temperature TMDL Implementation Plan City of Fairview and City of Gresham (Nov. 2019). Gresham and Fairview NPDES Annual Report 2019 2019 Permit Year 24. See Appendix E—City of Gresham TMDL Report.	planning milestones related to temperature

Statewide Project Priorities:

Watershed Name (HUC)	Parameter	Applicable Watershed Planning Documents	Project Need
Statewide	Temperature and Shade		*Assessment methods for monitoring the status and trends of riparian condition and effective shade on a consistent and cost effective basis* **Examples:** • Develop statewide map of riparian canopy cover. • Develop statewide map of riparian vegetation height. • Develop statewide map of riparian vegetation composition. • Quantify the relationship between riparian condition and effective shade. • Remote sensing analysis of riparian condition change. • Collection of riparian condition field data.