Oregon Nonpoint Source Pollution Program Annual Report for 2021

Submitted to EPA Region 10
as required by the Federal Clean Water Act

July 2022

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

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Executive Summary

In 2021 there were many improvement efforts within Oregon's watersheds focused on restoring and protecting water quality from nonpoint source impacts thanks to the funds provided by the Federal Clean Water Act Section 319(h). These 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 2021 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 2021 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, bacteria loadings, biocriteria and sedimentation, which account for approximately 76% (3741 out of 4894) of known pollutant impaired waters listed in the state's most recent 2018/2020 Integrated Report. The report also includes updates on milestones, implementation targets and annual reporting requirements identified in the 2022 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 identified 61 nonpoint source program related actions or milestones scheduled to be ongoing or completed in calendar year 2021. 56 (or 92%) of the 61 action milestones were completed in 2021. Two actions were completed early. There were five actions not fully completed.

Actions not fully meeting scheduled milestones include:

- Updating the Nonpoint Source Management Program Plan every 5 years. DEQ has issued a draft plan and expects to submit the updated plan to EPA in 2022.
- Submit to EPA and NOAA a plan for achieving the additional management measures for Forestry. Oregon has submitted a plan but in 2015 EPA and NOAA found that Oregon has not submitted a fully approval program. Oregon continues to work with EPA and NOAA on an approval program. In 2021 the "Private Forestry Accords" agreement was reached that may address the identified deficiencies.
- Developing TMDLs and WQMPs in accordance with 303(d) list schedule.
- DEQ working with BLM and USFS on a mid-term MOU status report (two separate actions).

Some significant activities and actions accomplished in 2021 include:

- A memorandum of understanding between a group of 13 conservation NGOs and 13 timber industry representatives (known as the Private Forests MOU or Private 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 of Senate Bill 1602 to 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 aerial 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 came to a successful conclusion at the end of October 2021.

- DEQ conducted rulemaking to designate Waldo and Crater Lake as Outstanding Resource Waters and adopted policies to protect the lake's existing high quality and ecological and recreation values from degradation. The proposed rule amendments were adopted by the Environmental Quality Commission on January 25, 2021.
- DEQ has completed the 2021 Triennial Review process to review Oregon water quality standards and determine priority projects for the next three years. During this process, DEQ took public input on a draft list of priority water quality standards review and revision needs. The result is a report that outlines the projects that DEQ's water quality standards program will complete or initiate between July 2021 and June 2024.
- In April 2021, DEQ completed the call for data for the 2022 Integrated Report, resulting in new data from 22 organizations.
- In January 2021, DEQ made updates to the 2022 assessment methodology to improve delisting for dissolved oxygen, use continuous pH, better define minimum data requirements for Category 2, utilize updated aquatic life aluminum criteria and provide clarity in assessment of watershed assessment units.
- DEQ completed the National Coastal Condition Assessment in the summer of 2021, sampling 22 estuaries as well as 12 Biomonitoring Reference Trend stations.
- DEQ completed TMDL monitoring projects in the Deschutes, Upper Klamath, and Lost River basins, as well as the Dairy Creek, McKay Creek, and Sycan River watersheds.
- Migration of all raw macroinvertebrate data into the Ambient Water Quality Monitoring System was completed.
- As of June 30, 2021, 332 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 3 million Oregonians, which accounts for 85% of Oregonians served by community water systems.
- DEQ 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 2021, a total of $396,000 was awarded in Oregon supporting ten 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 reconnect floodplains.
- DEQ staff provided water quality testing equipment or supplies to 12 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.

- The Oregon Department of Forestry State Forests Division (ODF) revised the 10-year Implementation Plan for the Santiam State Forest and began immediate restoration and recovery planning in response to the Beachie Creek and Lionshead fires that caused widespread damage throughout the Santiam Canyon and Santiam State Forest. In 2021, 1,090 acres were replanted, and 4,800 acres were aerially seeded. 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 (ODFW) 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 continue to consult with ODF's State Forests Division during implementation.
- The current MOU between DEQ and ODF was signed in December of 2021, updating the 1998 MOU. The purpose of the MOU is to describe how DEQ and ODF will work together to carry out each agency's responsibilities and requirements in protecting clean water on non-federal forestlands. The MOU specifies how DEQ and ODF will interact and use forestry-specific data and information: during development and implementation of TMDLs; as well as forest practices sufficiency determinations; Section 319 Nonpoint Source Management Program Plan elements; water quality standards revision priorities and integrated report development. The MOU includes commitments to collaborate on forestry-specific plans and reporting on TMDL implementation, periodic assessment and reporting to the agencies' governing bodies on MOU progress and a process for updating the MOU and a dispute resolution process.
- The Pesticide Stewardship Partnership held three pesticide waste collection events across Oregon. Located in Ontario and Polk County with another special collection in Alsea, these events drew over 30 participants and collected over 35,000 pounds of chemicals to be removed from circulation.

In 2021, 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. DEQ 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 2021 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 2021 intended to address nonpoint sources. The summary includes the progress on implementing the actions or milestones identified in the 2014 Oregon Nonpoint Source Management Program Plan and in the 2020-2022 Performance Partnership Agreement between DEQ and EPA. 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. Oregon is currently updating the Nonpoint Source Management Program Plan and expects to send the updated plan to EPA in 2022. The current plan, draft updated plan, and past annual reports can be found on DEQ's Nonpoint Source Program website here: https://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.

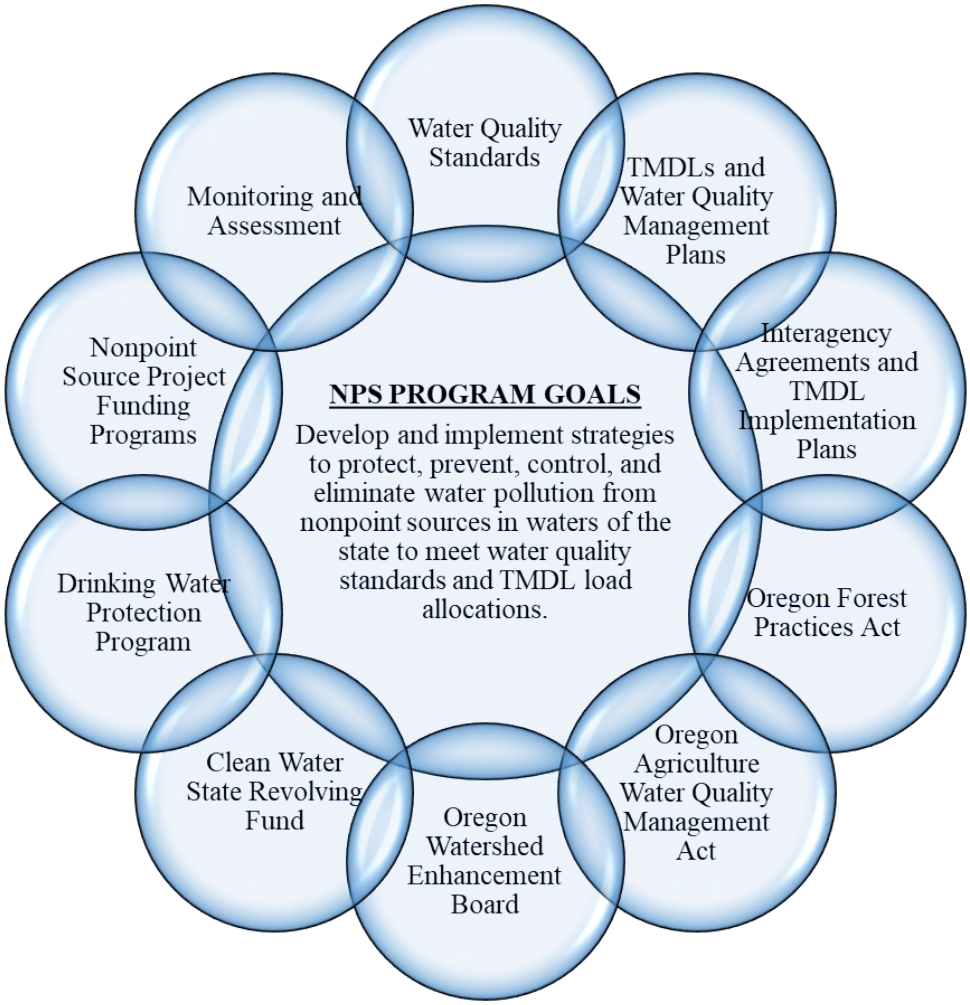

Figure 1. Representation of Oregon's Nonpoint Source Program as a diverse, interlined set of programs.

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 achievement of water quality standards. 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. With 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 to 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 ODA to develop Agricultural Water Quality Management 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 supports five Drinking Water Protection positions at DEQ. These positions integrate Federal 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 Federal 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 Nonpoint Source 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, 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 annually for public comment and is included in the Intended Use Plan (IUP) that the state must submit to 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 (OWEB) 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 processes 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 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, 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 2021. 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 2021

This section provides a description of Oregon's administration and implementation of the Nonpoint Source Management Program 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 Plan and the anticipated 2022 plan update provide focus and direction to the program through identification of current and planned goals, priorities, actions and timeframe milestones. The 2020-2022 Performance Partnership Agreement (PPA) between DEQ and EPA also clarified how DEQ will use federal funds to implement programs, including the Nonpoint Source Program in 2021. 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 2021 for each program area identified in the PPA and actions from the 2014 Plan that were completed in 2021 or continue to be implemented as a regular program activity.

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 2021.

Table 1. Description of water quality standards actions or outputs identified in the 2020-2022 Performance Partnership Agreement and the status in 2021.PPA Element

PPA Element	Action	Timeframe	2021 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,	Ongoing through June 2022	DEQ is not currently considering revisions to the temperature standard. We are developing procedures and information in preparation for temperature variances as appropriate and

PPA Element	Action	Timeframe	2021 Status
	including variance(s) and rulemaking that will consider natural thermal regimes and variability for temperature.		if requested. To date, no temperature variances have been requested.
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	The ORW rule was adopted in January 2021.
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. Expect to propose use updates to EQC by the end of 2022.
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	Completed
PPA - 1.6	Evaluate whether to initiate rulemaking to adopt new aquatic life 304(a) criteria.	June 2021	DEQ decided to conduct rulemaking to adopt new 304(a) criteria for four pollutants and to update at least one other criterion based on EPA's latest recommendations.
PPA - 1.7	Conduct a triennial review to identify and prioritize the water quality standards projects to	June 2021	The Triennial Review was completed in 2021.

PPA Element	Action	Timeframe	2021 Status
	be initiated or completed in 2021 through 2024.		

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.

DEQ has completed the 2021 Triennial Review process to review Oregon water quality standards and determine priority projects for the next three years. During this process, DEQ took public input on a draft list of priority water quality standards review and revision needs. The result is a report that outlines the projects that DEQ's water quality standards program will complete or initiate between July 2021 and June 2024.

3.1.2. Aluminum Criteria Promulgation

EPA promulgated a federal aluminum criteria for Oregon in December 2020. The new criteria will become effective April 19, 2021. DEQ completed a document on Aluminum criteria application procedures in July 2021.

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. As of 2021, this project is in progress. DEQ expects to propose use updates to the EQC by the end of 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.

3.1.7. 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.

3.1.8 Review and revise aquatic life criteria for toxic pollutants

This is a rulemaking project that is in the early research and development phase. The aquatic life criteria are scheduled to be updated by DEQ and adopted by the EQC by December 31, 2023.

Additionally, DEQ is developing procedures to apply the narrative criteria for toxic pollutants, nuisance algal growth and biocriteria. These procedures are scheduled to be completed by June 30, 2024 and are currently in the project planning phase for developing procedures to apply toxics narrative criteria. Procedures for the other criteria will not likely begin until 2023.

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 2021.

Table 2. Description of monitoring and assessment actions or outputs identified in the 2020-2022 Performance Partnership Agreement and the status in 2021.

PPA Element	Action	Timeframe	2021 Status
PPA – 1.8	Revise and update assessment methodologies for submittal of 2022 Integrated Report.	Spring 2021	Completed 1/2021 – DEQ made updates in the 2022 assessment methodology to improve dislisting for dissolved oxygen, use continuous pH, better define minimum data requirements for Category 2, utilize updated aquatic life aluminum criteria and provide clarity in assessment of watershed assessment units.
PPA – 1.9	Hold data call for 2022 Integrated Report.	Winter 2020/2021	Completed 4/2021 – Received data from 22 organizations.

PPA Element	Action	Timeframe	2021 Status
PPA – 1.10	Prepare and submit the 2022 Integrated Report to EPA.	April 2022	Expected 4/2022
PPA – 1.11	DEQ's 2022 Integrated Report and 303(d) list will be submitted into EPA's ATTAINS data system.	April 2022	Expected 4/2022
PPA – 7.1	Ambient Monitoring Network - DEQ will continue to monitor approximately 160 ambient water quality station 6 times annually throughout Oregon. These stations provide status and trend data for understanding water quality.	Ongoing	Completed.
PPA – 7.2	Collect water quality data to support TMDL development and to interpret implementation effectiveness.	Ongoing	All TMDL 2021 data collection projects have been completed and data has been reviewed and released. North Coast Temperature Trend monitoring was not completed in 2021 but is expected to resume in 2022.
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.	October 2020	95% Complete. Need to finalize and publish the final report.
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.	October 2021	100% Complete
PPA – 7.5	Migrate raw macroinvertebrate data to AWQMS.	October 2022	100% Complete
PPA - 7.6	Migrate "habitat metrics" into AWQMS.	October 2022	Incomplete. ~ 40% complete. Loss of staff may result in inadequate resources to complete in 2022. Target = Nov 2022.
PPA - 7.7	Collect and ship samples to EPA Manchester lab for Microbial Source Tracking analysis (MST) at Cannon Beach Oregon	October 2021	Work begins in May of 2022. The project was delayed due to the pandemic.

PPA Element	Action	Timeframe	2021 Status
PPA - 7.8	Complete development of Water Quality Monitoring Strategy	August 2020	Completed
PPA - 7.9	DEQ will collaborate with EPA, as resources allow, on EPA monitoring projects conducted in Oregon.	As scheduled	NCCA complete. NLA field season preparation is underway.

In 2021 the Water Quality Monitoring section collected over 5000 water samples representing over 28,000 analyses. Monitoring efforts in 2021 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.
- PFAS monitoring at public water facilities.
- Sediment collection and toxics monitoring locations in the Willamette Basin.
- Data collection for National Coastal Condition Assessment.
- Technical support for volunteer organizations.

Highlights of the Monitoring and Assessment program for 2021 included:

- Monitoring cyanotoxins in source-water supplies of 56 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 over 1000 water samples across nine PSP 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 four Deschutes Basin Lakes, continuous temperature and dissolved oxygen in a fifth lake, 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 in all five lakes.

- Provided sampling support and analysis of nutrients from water samples collected by ODA for an agricultural NPS control project in Upper Klamath Lake.
- Monitoring to determine how DEQ can use the CyAN app produced byEPA 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.
- Collected and analyzed pre-implementation water quality samples for nutrients and suspended sediment to assess implementation effectiveness of restoration actions.
- 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.
- 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 2021 (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 2021 for drinking water qPCR analysis (56 facilities).
- Almost 70 qPCR sample collected for characterization of HABs on Cascade high lakes.

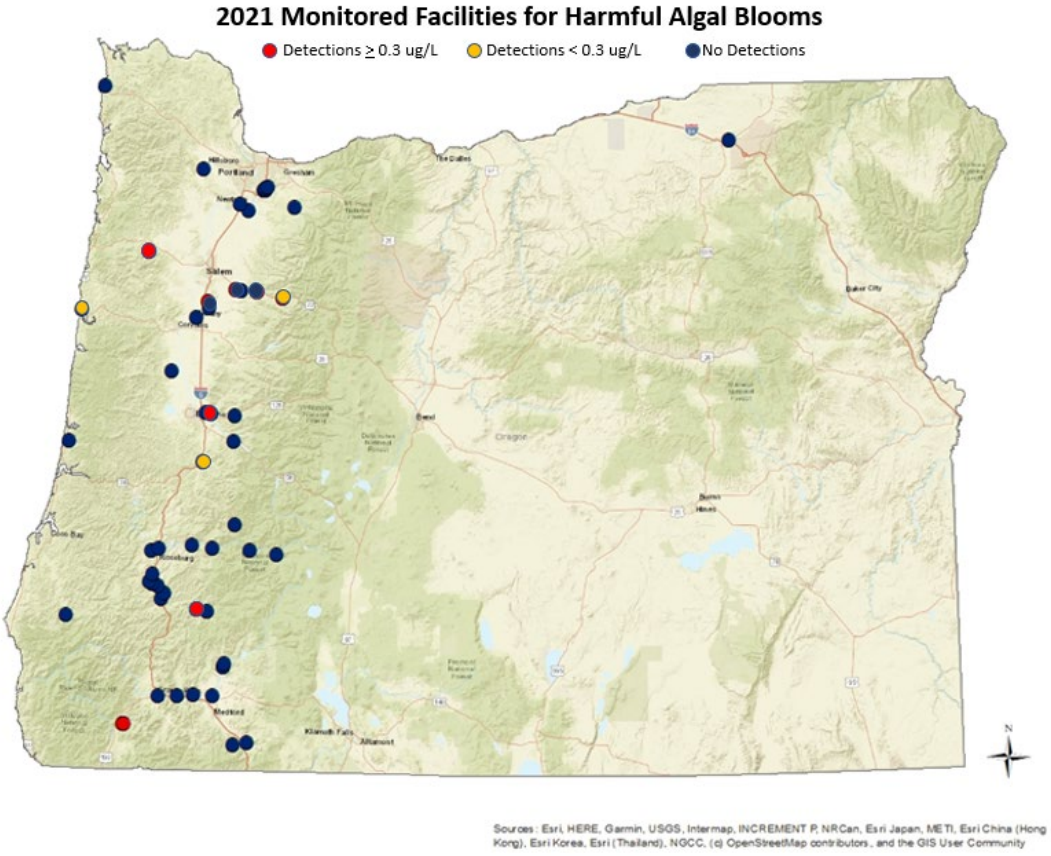

Figure 2. Monitored public water facilities for harmful algal bloom detections.

TMDL monitoring activities in 2021 focused on data collection in priority watersheds. Water quality parameters and data collection efforts were specifically planned for use in identifying status and trends of dissolved oxygen, phosphorus, temperature and bacteria in the Dairy and McKay Creek watersheds. In the Upper Klamath and Lost River subbasins, the first summer of continuous temperature data was collected to evaluate progress in achieving applicable temperature criteria and determine the status of dam and reservoir compliance. In the Sycan River watershed, nutrient and suspended sediment data was collected at a future site of a pilot stream restoration project to determine if the restoration will be useful for achieving TMDL targeted total phosphorus reductions. DEQ partnered with 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

DEQ sampled 22 estuaries as part of the National Coastal Condition Assessment (NCCA), as well as 12 Biomonitoring Reference Trend stations.

To meet other PPG commitments, the Biomonitoring Program has worked to completely overhaul the 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. A final SOP document has been approved. A final summary report needs internal review before making it available to the public.

We are working to migrate summary habitat metrics to AWQMS. The data has been queried from Access databases. The Biomon team is working to update all required AWQMS metadata to ensure a smooth import. However, this project is at risk, due to the loss of staff to a job rotation. Other resources will be required to finish this task.

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 conducted a 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. 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.

3.2.4. Environmental Monitoring Database

DEQ continues to manage environmental monitoring data using the Ambient Water Quality Monitoring System (AWQMS) at https://orwater.deq.state.or.us/. This system houses data generated at DEQ's laboratory as well as third-party data. In 2019, DEQ began to add raw continuous data. 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 2020. In addition, in 2021 DEQ completed migration of biological and habitat data and metrics into the AWQMS system. DEQ continues to use 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 Federal 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 draft 2022 Integrated Report was released for public comment in February 2022 and is anticipated to be submitted to EPA in May 2022. For the second cycle, DEQ released the report as an interactive map tool, story map, and online database.

Updates to the 2022 Integrated Report Assessment Methodology focused on the expanded use of continuous data for pH, expanded rationales for support of assessment conclusions, and more localized impairment information for watershed units by assessing at the monitoring station level. DEQ assessed five years of data provided by over 101 organizations, totaling over 37,000 parameter assessments using the updated and revised methodology. DEQ began prioritizing improvements to its 2024 Assessment Methodology in the fourth quarter of 2021 and anticipate finalizing the methodology in the fourth quarter of 2022.

3.3. Drinking Water Protection Program

In FY2021, approximately $860,000 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 2021 include:

- As of June 30, 2021, 332 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 3 million Oregonians, which accounts for 85% of Oregonians served by community water systems.
- DEQ staff continue to use "Updated Source Water Assessments" for Community and Non-Transient Non-Community public water systems to assist small PWSs with planning and source water protection activities which often address non-point sources of pollution.
- NRCS currently has ten National Water Quality Initiative Source Water Protection projects that are undergoing a "planning" phase and one project where the planning 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 FY2022 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).
- Promoted the use of the Drinking Water Source Protection Fund for loans and grants primarily addressing nonpoint sources of pollution within drinking water areas. Ten drinking water protection projects were recommended for funding with funding awards totaling $273,000. Projects recommended for funding included activities such as: outreach to recreational river users, riparian restoration, forest road maintenance, stormwater pollution reduction, source water protection planning

and developing forest management plans watershed acquisition due diligence to prepare for land conservation. 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 2021, a total of $396,000 was awarded in Oregon supporting ten 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 reconnect floodplains. Specific project details are discussed in the Basin Reports in Appendices A-R.
- Provided input and managed now-completed grant agreements for four Nonpoint Source program 319 grant funding proposals/projects with a drinking water nexus.
- Completed two workshops that brought together drinking water operators, land managers, funders and restoration practitioners to discuss shared goals. The Rogue Basin Workshop was held January 2021 and focused on wildfire risks and emergency preparedness while the Willamette Basin workshop was held April 2021 and focused on protecting drinking water sources from cyano-HAB impacts.
- Continued response and recovery actions for wildfire events in 2020 and 2021. Provided technical and scientific support and geographic information system analyses to water systems and restoration partners as recovery actions were implemented. Educated state and federal agencies and managers on content and implications of the federal and state Erosion Threat Assessment and Reduction Team (ETART) Drinking Water report that evaluated post-fire threats to drinking water sources and water quality, treatment plants and distribution systems. 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 2021 sampling season including tracking HAB monitoring results and recreational advisories and initiating development of methods for early detection of HABs that may impact public water systems.
- Contacted surface water systems with known or suspected turbidity issues to request raw water turbidity data for use in identifying waters that do not meet state water quality standards.
- Conducted initial review of sediment/turbidity targets and surrogate measures for future TMDLs for drinking water and ecological impairments. Initiated contact with DEQ basin coordinators to assist in evaluating source areas with turbidity impacts.
- Ongoing work on State Forest Habitat Conservation Plan which has an indirect benefit to drinking water sources.
- Work with State Forests Division of Oregon Department of Forestry to incorporate drinking water protections into new Forest Management Plans.
- Continued developing a Watershed Based Plan for the drinking water source area serving several coastal water systems.
- Finalized 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 2021 included participating in and presenting at workshop to share results with the public, providing information for a water system atlas and drafting a crosswalk to assist individual public water systems

in obtaining information from relevant sections. The information from this review can assist with implementing risk reduction strategies on forested lands within their source areas as well as inform a DEQ/OHA communication strategy, forestry FAQ and resources document for public water systems. The Forestry FAQ and resources document will provide an overview of forestry laws and authorities and details on how to get information about planned forestry.

- Steering committee work for ODF's compliance monitoring work and forest practice/stream protection analysis for shade and temperature (southwestern Oregon) and for riparian stand condition (all of western Oregon). Reviewed and commented on protocols, goals and objectives.
- Provided technical assistance and support to several Oregon water systems, land trusts and local partners to leverage voluntary tools like land acquisition and conservation easements to help communities and landowners.
- Assisted the state's Water Quality Pesticide Management Team with understanding drinking water protection efforts, drinking water source area delineation and drinking water regulations.
- 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 2021 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, North Santiam, 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.
- Initial engagement with multiagency state government climate change workgroup. Cross-division discussions within DEQ, conversation with other state agencies and universities and access to climate change impact evaluation tools.

3.4. Clean Water State Revolving Fund (CWSRF)

In 2021, the Clean Water State Revolving Fund loan program has committed $20,422,179 toward 16 nonpoint source pollution control projects. The program executed three new loans for three new projects and amended one loan to increase funding for one existing project. The fund increased the total number of

active nonpoint source projects by three since 2020, which continues an increasing trend of the number of nonpoint source projects funded by the program annually over the past four years. Table 3 summarizes the active projects funded during 2021, which includes some of the same projects in 2020, as many projects have long-term, multi-phased design and construction schedules. More information about these projects including reported accomplishments in 2021 are in the Basin Reports in Appendices A-R.

Table 3. CWSRF projects active or funded in 2021, 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
Hood	Kingsley Reservoir Expansion Phase 3	Farmers Irrigation District	$2,777,000
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	Mini Hydro-electric Plant	Three Sisters Irrigation District	$800,000
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	$549,756
Deschutes	Lone Pine Irrigation District Modernization Project – Design	Lone Pine Irrigation 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

Admin Basin	Project Name	Project Implementer	Budget
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 2021.

Table 4. Description of specific Nonpoint Source Program plan actions or outputs identified in the 2014 Nonpoint Source Management Program Plan and the 2020-2022 Performance Partnership Agreement, and the status in 2021.

Goal #	Goal Topic	Action	Time Frame	2021 Status
NPS-1	Update the Nonpoint Source Management Program Plan every 5 years	Update Oregon's Nonpoint Source Management Program 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	Draft Completed. Final expected in 2022. 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.	Annually	Completed for 2020 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	Forestry Accord agreement completed 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 2022. In 2021 there was substantial work on updating the plan including preparing the draft plan for public comment which occurred in the first quarter of 2022.

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.

In 2021, DEQ worked with EPA on and moving up the timeframe for submitting the annual report to EPA's for review and action. The target submission date is end May of each year. An earlier submission date will allow DEQ complete the 319 grant RFP process start developing agreements with selected grantees sooner.

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.

Oregon is working with EPA and NOAA to resolve the additional management measures. One of the approaches proposed by Oregon is to develop and implement a TMDL, WQMP, and Implementation Plan to address the deficiencies in the CZARA Coastal Nonpoint Control Plan additional management measures for forestry.

Another approach that may address the deficiencies is a comprehensive agreement reached between timber industry advocates and conservation groups that the Oregon legislature has committed to codify into law. The negotiation process and agreement are known as the Private Forestry Accord. The negotiation process was convened by Oregon's Governor to seek resolution to a set of competing ballot measures intended to reform forest laws and forest landuse regulation. The legislature supported the negotiation through the passage of Senate Bill 1602 in the 2020 special session which also included provisions addressing stream buffers for pesticides. In addition, the accord participants announced an agreement in principle in October of 2021 that proposed a wide-ranging set of actions and management practices that are intended to serve as the basis for a Habitat Conservation Plan under federal laws protecting fish and wildlife. These practices may also have a significant effect on improving water quality and, if codified through statute and regulation, are expected to narrow the circumstances and instances where additional water quality actions are needed on private forestlands to meet federally-approved water quality standards and may address the remaining CNPCP forestland issues identified by EPA and NOAA.

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 2022 Nonpoint Source Management Program Plan and the 2020-2022 Performance Partnership Agreement. The following sections describe progress on these action items in 2021.

Table 5. Description of 319 Grant program actions or outputs identified in the 2020-2022 Performance Partnership Agreement and the status in 2021.

PPA Element	Action	Time Frame	2021 Status
PPA – 8.1	Solicit and select 319 projects that support priorities.	May 2020 and May 2021	Completed for 2021
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	Completed. See Section 3.6.1.
PPA – 8.5	Enter GRTS 319 mandated elements to 319 project tracking data by national deadlines, including load reductions as available.	September 2020 and September 2021	Completed. See Section 3.6.5 and Section 3.6.6

Table 6. 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 2021.

Goal #	Goal Topic	Actions	Time Frame	2021 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 2021 accomplishments in 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	Completed See Section 3.6.2
319 - 3	Priority projects to receive 319 Grant Funding for pass through grants	Region and HQ staff identify and rank projects to receive pass through 319 grant funds for addressing NPS Program priorities.	Ongoing	Completed 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, revised to ongoing	Completed See Section 3.6.4
319 - 6	GRTS	Continue to report 319 grant data into GRTS; Meet annual reporting deadlines.	Ongoing	Completed 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	Completed See Basin Reports Appendices A-S

Goal #	Goal Topic	Actions	Time Frame	2021 Status
319 - 8	DEQ's NPS Program Website	Update DEQ's NPS Program Website as needed	Ongoing	Completed See Section 3.6.7

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 5. Oregon total 319 grant funds 2014 to 2021.

Year	DEQ Staff	Projects (Pass Through)	Total
2021	$1,549,346	$260,552 This amount includes an additional $8,098, reobligated from the 2016 grant year	$1,809,898
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
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 2021, the Federal Section 319 program appropriation funded a total of 8.99 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).

Table 6. Oregon's 2021 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**

Federal 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 2021, $1,385,553 of Section 319 funds and state general fund 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 $1,646,105. Therefore, DEQ spent the equivalent of 91% of the total 2021 appropriation ($1,801,800) 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 2021, DEQ recommended funding ten stakeholder projects with $227,404 in Section 319 grant funds (Table 9).

Table 7. List of projects recommended for 2021 319 grant funding, showing in descending order of budget values.

Proposal Title	Organization	Basin	Type of project	Budget	Status
Down and Dirty in Eastern Oregon	Malheur SWCD Walla Walla WSC	Lower Malheur, Owyhee, Middle Snake	Outreach and education	$24,200	On track, agreement signed Agreement signed
Walla Walla River Forks Floodplain Reconnection and In-stream Enhancement Implementation	Confederated Tribes of Umatilla Indian Reservation (CTUIR)	Walla Walla river	Restoration	$47,813	Draft agreement
Reforestation of Humbug Creek on the ODFW Wildlife Refuge	Upper Nehalem WSC	Nehalem	Restoration	$12,512	Draft agreement
Johnson Creek--Gresham Riparian Reforestation	Johnson Creek WSC	Upper Johnson Creek, Lower Willamette	Restoration	$16,000	Draft agreement
Northwest Oregon Restoration Partnership 2021	Tillamook Estuary Partnership	Nehalem, Wilson-Trask-Nestucca	Restoration	$27,500	Draft agreement
Nestucca, Neskowin and Sand Lake Basin Riparian Improvement Project	Nestucca Neskowin WSC	Nestucca, Neskowin and Sand Lake	Restoration	$16,000	Draft agreement
Siletz Watershed BMP Landowner Engagement	Lincoln SWCD	Siletz	Public outreach	$7,429	Draft agreement

Proposal Title	Organization	Basin	Type of project	Budget	Status
Phase #2 (126-20) Amendment					
South Umpqua NPS Turbidity Assessment Phase #2 (123-20)	Partnership of Umpqua Rivers	South Umpqua	Assessment and monitoring	$39,640	Agreement signed
Bacteria, continuous temp. and pesticide monitoring in the Long Tom WS (094-21)	Long Tom WSC	Long Tom Watershed	Assessment and monitoring	$24,943	Agreement signed
Reallocation of funds				$44,514	
Total 319 cost for 2021				**$260,552**	

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 2021 319 Request for Proposals (RFPs) as regional and statewide project priorities. Those priorities as presented in the RFPs can be reviewed in Appendix T. Funded project types and the amount requested from DEQ are presented in Table 10.

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 2021 319 Grant was funded for the following projects areas: riparian restoration in priority waters, public outreach and watershed assessment/monitoring (Table 10).

Table 8. Oregon 2021 319 grant funding priorities with corresponding amounts.

2021Type of Project	Amount Requested	% of Total Request
Watershed assessment/monitoring	$109,097	42%
Public Outreach	$31,629	12%
Riparian Restoration	$119,825	46%
Total Request	**$260,552**	**100%**

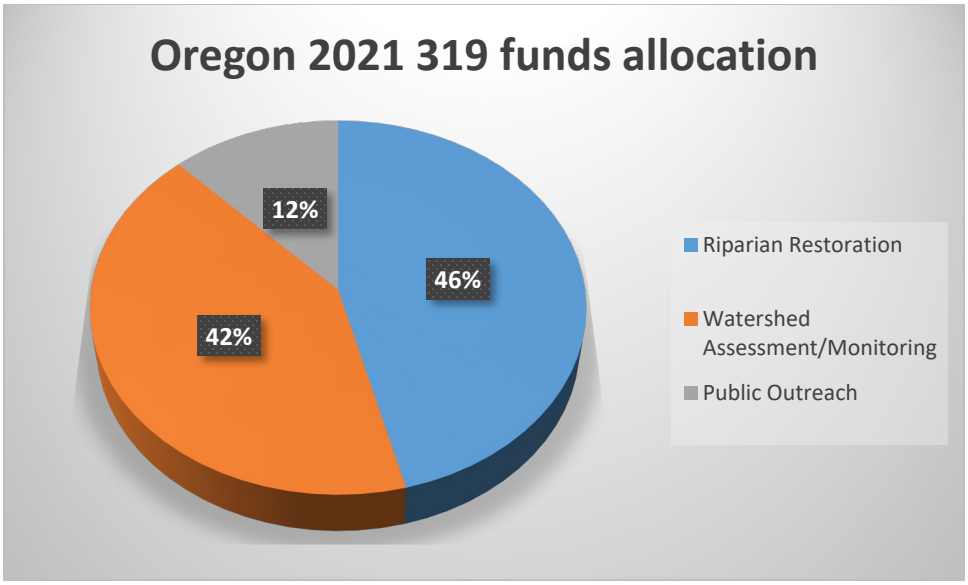

Figure 3. 2021 319 Grant Fund Distribution and Project Types (Total Budget $227,404).

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 2021include:

- Reviewed and updated the 2021 Request for Proposals; including priorities for funding activities under 319 funding.
- Assisted with boilerplate edits for drafting 319 grant agreements with stakeholders.
- Planned and provided training for 319 staff.
- Updated 319 related milestone schedule.
- 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 Federal Clean Water Act and the projects which match Federal Section 319 funds, using EPA's Grants Reporting and Tracking System (GRTS).

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

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

For the year 2021, load reduction estimates are not completed yet. EPA provided an extended date for entering the estimates and typically we include the estimates once they have been entered in EPA database. We estimate to have the entries completed after March 30, 2022 and will include the FY 2021 in the next reporting update.

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 2021, 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.
- 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 9. 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	2021 Status
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	See Section 3.7.1
WBP-3	EPA's Nine Key Elements	Report on how TMDL Implementation Plans and Watershed Basin Status and Action Plans meet EPA's Nine Key Elements.	Ongoing	Multiple checklists and one alternative plan completed. See Section 3.7.2
WBP-4	Volunteer Monitoring	Volunteer Monitoring Watersheds Sample Plans Are Developed.	Ongoing	Multiples plans developed. See Section 3.7.3

Table 10. 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	Compleated 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 2021, with the assistance of EPA, DEQ staff completed and approved the following 9-Key Elements checklists for the:

- Upper Klamath Subbasin (18010206) for temperature, total phosphorus, total nitrogen and carbonaceous biochemical oxygen demand (CBOD).
- Lost Subbasin (18010204) for temperature, dissolved inorganic nitrogen and carbonaceous biochemical oxygen demand (CBOD).
- Umpqua, South Umpqua, and North Umpqua subbasins (17100303, 17100302, 17100301) for temperature and bacteria.
- Multiple Umpqua watersheds including Calapooya Creek (1710030301), Middle Umpqua River (1710030304), Deer Creek (1710030213), Jackson Creek (1710030202), Steamboat Creek (1710030107), Middle Cow Creek (1710030207), Lower Cow Creek (1710030209), Upper Cow

Creek (1710030206), and the South Umpqua River for total phosphorus, biochemical oxygen demand (BOD), organic solids, inorganic Nitrogen and inorganic Phosphorus.

In addition, the South Santiam Subbasin Alternative Plan Checklist for Bacteria - Oregon's first protection plan submitted as an Alternative Watershed Based plan - was approved by EPA on November 8, 2021.

DEQ is also seeking alternative plans from the public to address the widespread impacts of the 2020 wildfires. 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:

1) Identification of the causes or sources of nonpoint source pollution impairment, water quality problem or threat to water quality.
2) Watershed project goal(s) and explanation of how the proposed project(s) will achieve or make advancements towards achieving water quality goals.
3) Schedule and milestones to guide project implementation.
4) 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 worked together to determine the acceptability of any submitted Alternative Watershed Plan. Project priorities and wildfire areas eligible for grant funds are listed in the 319 RFP in addition to the th3 approved watershed based plans identified above.

3.7.3. Volunteer Monitoring Sample Plans

In 2021, 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 fifteen 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:

- Coos SWCD Lower Coquille Strategic Implementation Area (SIA) Monitoring Project.
- Benton SWCD Willamette Focused Investment Partnership Effectiveness Monitoring Program: 2019-2024 Monitoring.
- Eco Logical Research, Inc.: Bear Creek Temperature Monitoring.
- Eco Logical Research, Inc.: Bridge Creek Temperature Monitoring.
- South Fork John Day Watershed Council: Upper South Fork of the John Day River 2021 Bioassessment.
- Wasco County SWCD: The Dalles Watershed Temperature Monitoring.
- Wasco County SWCD: Mill Creek Bacteria Study.
- Baker SWCD: Lower Power River SIA Monitoring.
- Lakeview SWCD: Upper Chewaucan SIA Monitoring.

- Oregon Department of Agriculture: Long Term Stream Temperature Monitoring.
- Gilliam County SWCD John Day Steelhead Overshoot Monitoring.
- Johnson Creek Watershed Council: Clackamas Focused Investment Partnership (FIP) Project Macroinvertebrate Sampling.
- Tualatin SWCD: Lower Gales and Carpenter Creeks SIA Monitoring.
- Clackamas River Basin Council Water Temperature Study.
- Columbia SWCD Water Quality Trend Monitoring Program, Addendum.

In 2021, DEQ staff provided water quality testing equipment or supplies to 12 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.

3.8. TMDLs and TMDL Implementation

DEQ has identified thirteen TMDL and TMDL implementation related action items (Table 14 and Table 15) 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 2021.

Table 11. 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 2021.

Goal #	Goal Topic	Action	Time Frame	2021 Status
WQP-2	Technical Assistance	DEQ headquarters and region staff will provide technical assistance to DMAs, DEQ staff, other local, state, and federal staff on TMDL development and TMDL implementation efforts.	Ongoing	Ongoing See Section 3.8.2
WQP-3	TMDL Implementation Plans	Work with DMAs to develop and implement TMDL Implementation Plans (including annual reports) as described in the TMDL/WQMP.	Ongoing	Ongoing See Section 3.8.3
WQP-4	TMDL Implementation Plans	DEQ reviews TMDL Implementation Plan annual reports.	Ongoing	Ongoing See Section 3.8.3
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	2014	Ongoing See Section 3.8.3, 3.10.1, and 3.10.2

Goal #	Goal Topic	Action	Time Frame	2021 Status
		milestones including water quality status and trends.		
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 12. Description of TMDL and TMDL implementation program actions or outputs identified in the 2020-2022 Performance Partnership Agreement and the status in 2021.

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 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.	Ongoing	Ongoing See Section 3.8.4
PPA-2.4	Develop and implement TMDL/WQMP/IP as one of the approaches to address the deficiencies in	At issuance of TMDLs	To occur as TMDLs are developed.

PPA Element	Action	Time Frame	2020 Status
	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).		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 2021.

Coquille River Subbasin TMDLs: TMDLs for the Coquille River Subbasin continue to be developed to address dissolved oxygen, chlorophyll a, pH, temperature, and bacteria 303(d) listings. 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 2021 to reflect greater specificity for forestry, agriculture, and road nonpoint source controls. In 2021, the focus of the TMDL work has been to finalize bacteria, dissolved oxygen and temperature narrative drafts, review loading capacities and allocations and develop standardized TMDL reporting template and technical support documents. 2021 also saw the beginning groundwork for the issuance of the Coquille Subbasin TMDLs as a rule and on-going coordination with EPA. The Coquille River Subbasin TMDL is now expected to undergo the rulemaking and public input processes and be submitted for EPA action in mid to late 2023.

Powder, Burnt, and Brownlee Subbasins TMDLs: TMDLs are needed to address impairments for bacteria, dissolved oxygen, pH, and chlorophyll a in the Powder River, Burnt River, and Brownlee Reservoir Subbasins. In 2021 DEQ continued work to complete the bacteria TMDL, which is intended to be issued by rule. DEQ began the groundwork for the rulemaking process, including use of standardized templates for a TMDL Report, Technical Support Document and Water Quality Management Plan. In 2022, DEQ will continue with the rulemaking and public input processes, prior to submittal for EPA action in early to mid 2023.

Following issuance of the bacteria TMDL, work on the dissolved oxygen, pH, and chlorophyll a TMDLs will be restarted. DEQ plans to modify the WQMP upon completion of the TMDLs for these parameters.

Upper and Little Deschutes Subbasins TMDLs: These TMDLs will address 303(d) listings for dissolved oxygen, pH, Chlorophyll a, harmful algal blooms, and temperature in the Upper and Little Deschutes Subbasins. In 2021, DEQ collected and analyzed field and satellite data in Odell Lake, Crescent Lake, Lake Billy Chinook, 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 2022 we are expanding this study to include the source lake contributing nutrients to the Upper Deschutes River. In 2022, we are also collecting continuous turbidity data on the

Upper Deschutes below Wickiup Reservoir to characterize the turbidity regime to address 303(d) listings for turbidity and sedimentation.

Upper Yaquina Watershed TMDLs: The dissolved oxygen and bacteria (E. coli) TMDLs for the Upper Yaquina River watershed are addressing current Category 5 freshwater impairments and an additional dissolved oxygen impairment identified through the TMDL technical analysis. During 2021, DEQ began the groundwork for issuing these TMDLs as rules, including development of standardized templates for the TMDL Report, Technical and Policy Support Document and Water Quality Management Plan. During 2021, wasteload and load allocations were developed and refined for the point source and NPS sectors, respectively. And minor revisions to the spatial extent were completed to address methodology used in the 2018/2020 Integrated Report.

DEQ conducted a final local stakeholder advisory committee meeting to communicate the draft load allocations and approach. These TMDLs are scheduled to undergo rulemaking and public input processes, prior to submittal for EPA action in early to mid-2023.

Siletz River TMDLs: 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. No additional activities were conducted in 2021.

Mid-Coast TMDLs: Other than TMDLs for the Upper Yaquina Watershed, TMDL development activities for temperature, biocriteria, and sediment category 5 listings for Mid-Coast waterbodies have been paused over the past five years due to litigation which required DEQ to shift staff resources to other TMDLs with court mandated timelines. DEQ has not developed new schedules identifying when these TMDL development activities will resume.

Schooner Creek Turbidity TMDLs: A turbidity TMDL to protect drinking water in the Schooner Creek Watershed is currently in development. In 2021 the primary TMDL development activity included planning and project scoping. Activities expected to occur in 2022 include a data review and completion of the modeling Quality Assurance Project Plan (QAPP). The modeling QAPP documents the analysis approach that will support the turbidity TMDL as well as providing other project details.

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 2021 most of the work on the temperature TMDL replacements was focused on development and completion of modeling Quality Assurance Project Plans (QAPPs) and temperature modeling in the Willamette Basin and Sandy Subbasin.

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 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. In 2021, EPA completed the agency's response to public comments document and issued the final TMDL on August 13, 2021. DEQ is planning to establish a Water Quality Management Plan for this TMDL and made preparations for this process.

Status and Trends

In 2021, DEQ worked on completing the 2022 Water Quality Status and Trends Report. The report will evaluate dissolved oxygen, pH, total phosphorus, temperature, total suspended solids, *Escherichia coli*, enterococcus, and fecal coliform status and trends over a twenty-year period from 2000 through 2019.

The 2022 report relies upon 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 2022 Statewide Water Quality Status and Trends Report and interactive web map will be available 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 2021, technical assistance for TMDL development was focused on:

- Coquille Subbasin dissolved oxygen, pH, and bacteria, and temperature TMDLs.
- Powder, Burnt, and Brownlee Subbasins bacteria, pH, and dissolved oxygen TMDLs.
- Upper Yaquina Watershed bacteria and dissolved oxygen TMDLs.
- The Upper Deschutes and Little Deschutes Subbasins nutrient TMDLs.
- The Temperature TMDL replacements

DEQ technical assistance for TMDL implementation efforts was focused on:

- Assistance to Designated Management Agencies on development or revision of TMDL implementation plans to address pollutants in the Umpqua Basin TMDL, Willamette Basin Mercury, Temperature, and Bacteria TMDLs, Molalla-Pudding Subbasin TMDL, and Western Hood and Miles Creeks Temperature TMDLs (see Section 3.8.3).
- Review of Designated Management Agencies TMDL implementation plans and annual reports (see Section 3.8.3).
- Implementation of management strategies and monitoring assessments in the Willamette, Rogue, South Coast, Klamath, and Hood Basins (see Appendices A – R).
- Review and comment on agricultural water quality rules and area plans (see Section 3.10.2).

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 2021 are described in the Basin Reports in Appendices A-S.

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:

- Required approximately 132 implementation plans to be submitted;
- Received 99 implementation plans (75% of those required); and
- Reviewed or took action on 83 (84%) of the received implementation plans.

In 2021, DEQ:

- Received 21 new or revised TMDL implementation plans
- Required 154 annual reports to be submitted
- Received 110 (71%) annual reports
- Reviewed or took action on 87 (79%) of those annual reports

Note that the count of required implementation plans and annual reports has changed from previous years because of corrections to the count, the requirements of new or revised TMDLs, litigation, or differing requirements on when DMAs are required to report (some DMAs do not report every year).

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.

In addition, the Water Quality Management Plan (WQMP) should include 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 (OAR 340-042-0040(4)(l)(J)).

The Federal 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 Federal 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 and OAR 340-042-0040(6)(g) directs that these determinations include consideration of whether practices capable of reducing the specified pollutant load exist, are technically feasible at a level required to meet allocations, and 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, wasteload allocation to point sources is appropriate. Without a demonstration of reasonable assurance that relied-upon nonpoint source reductions will occur, 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 2021, DEQ and EPA continued to work on reasonable assurance, primarily in the context of the TMDLs being developed for Coquille Subbasin, Upper Yaquina Watershed, and the Temperature TMDL replacements. DEQ also worked on completing an enforcement guidance to be used for violations related to requirements in TMDLs and WQMPs. 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.
- Commitment by DEQ to track water quality status and trends concurrently as management strategies are implemented.

Assessment and monitoring strategy documents will accompany TMDLs currently under development when these TMDLs are issued. 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 16 and Table 17) 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 2021.

Table 13. 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 2021.

Goal #	Goal Topic	Action	Time Frame	2021 Status
TOX-1	Water Quality Pesticide Management Team and Pesticide Stewardship Partnerships (PSPs)	Continue to work with the WQ-PMT and implement programs to address water quality pesticide issues including the PSP projects.	Ongoing	Ongoing See Section 3.9.1 and 3.9.3
TOX-2	Public Water System (PWS)	Continue developing contaminant-specific reduction strategies for public water system use, such as for nitrates and pesticides from urban and rural residential lands.	Ongoing	Ongoing See Section 3.9.2

Table 14. Description of toxic program actions or outputs identified in the 2020-2022 Performance Partnership Agreement and the status in 2021.

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, OHA, ODF, OWEB 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 2021, approximately $237,261 of the 2021-2023 PSP agreements had been allocated to Yamhill, Wasco, Walla Walla, Amazon, Middle Deschutes, Middle Rogue, Hood River and Clackamas PSPs. Additionally, waste collection events were less frequent in 2020 and 2021 due to issues with gathering during the pandemic and provided an opportunity to reallocate some of those funds to OSU extension to develop education materials and provide expertise to local groups in developing strategic plans. A pilot project standard operating procedure document was finalized to help guide the PSP program in designating future pilot projects and to decide if and when to cease pilot project activity or move them forward as a full-scale PSP watershed.

The Pesticide Stewardship Partnership external stakeholder advisory group (SAG) met twice in 2021. 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. Representatives from the WQPMT met with the SAG to provide progress reports, staff changes, updates to process and gather input to aid decision making within the WQPMT.

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 2021, watershed partners helped DEQ collect over 479 surface water grab 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.

In the Hood River Watershed there have been no exceedances of state water quality criteria or EPA aquatic life benchmarks since 2017, with the exception of imadacloprid. In 2021, the total number of pesticide detections in the Hood River and Wasco area streams fell to the lowest level since 2009 (Figure 4, Figure 5), when there was a five-fold increase in the number of pesticides analyzed by DEQ's laboratory.

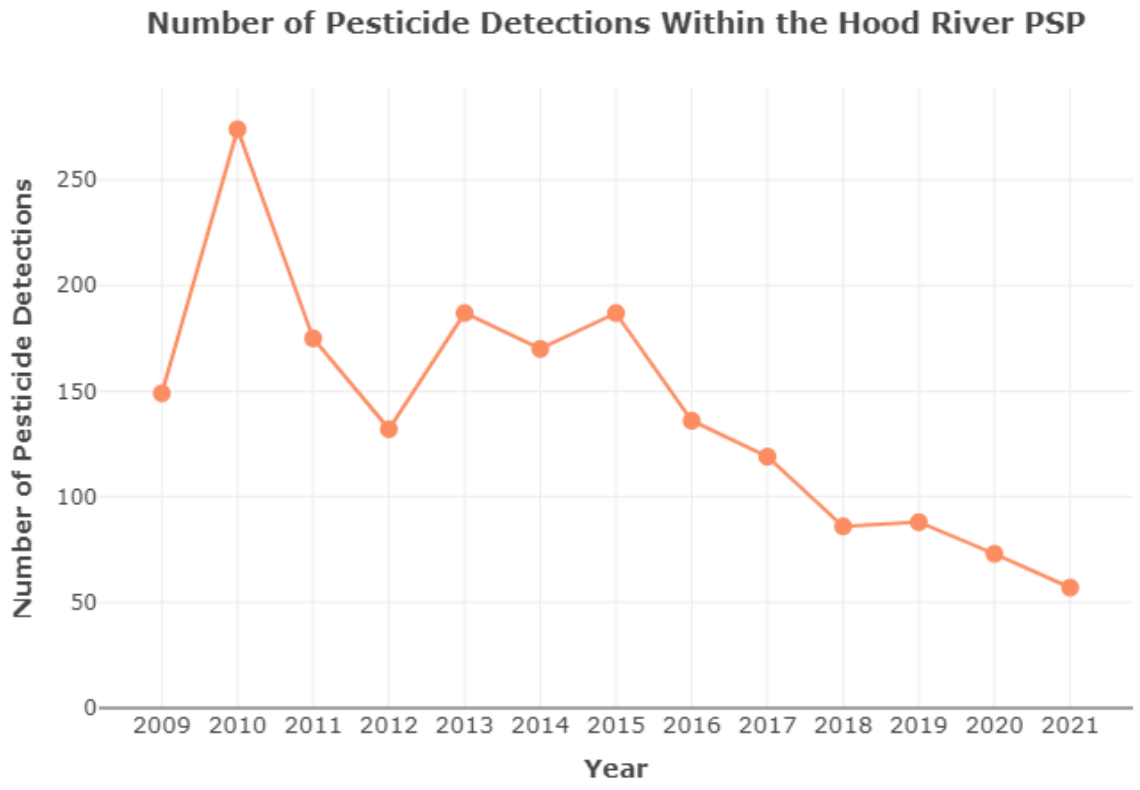

Figure 4. Total number of pesticide detections within the Hood River PSP from 2009 to 2021.

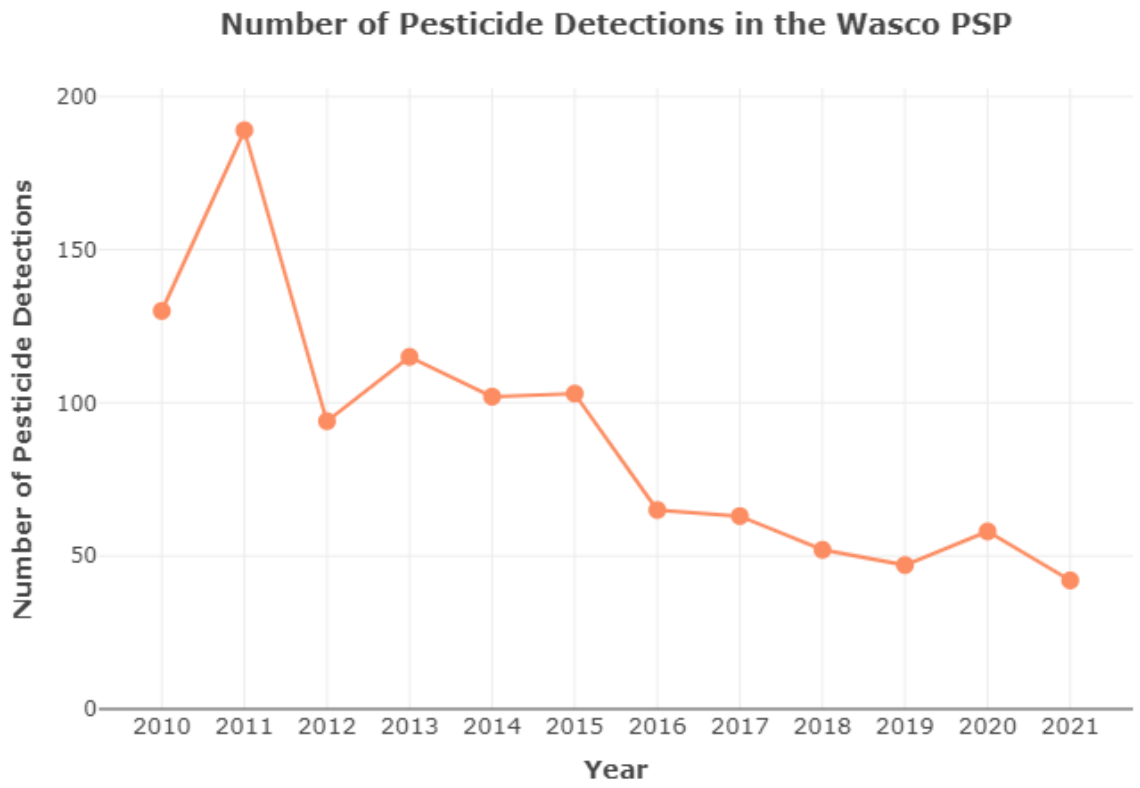

Figure 5. Total number of pesticide detections within the Wasco PSP from 2010 to 2021

Historically, the primary pesticide of concern in the Hood and other watersheds had been chlorpyrifos, an insecticide 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 River PSP Watershed since 2014 (Figure 6) or Wasco PSP Watershed since 2015 (Figure 7). 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.

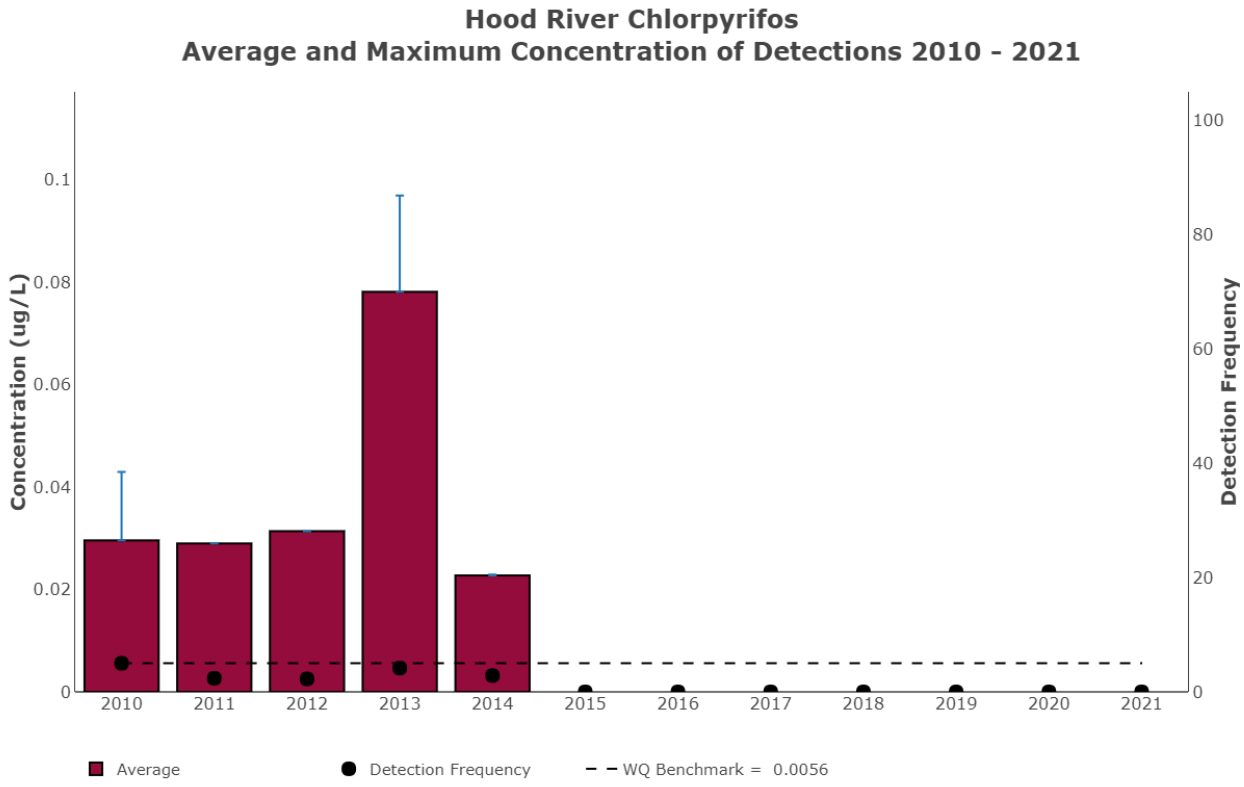

Figure 6. Hood River Watershed Pesticide Stewardship Partnership Project: average and maximum concentrations of detections of chlorpyrifos, 2010-2021.

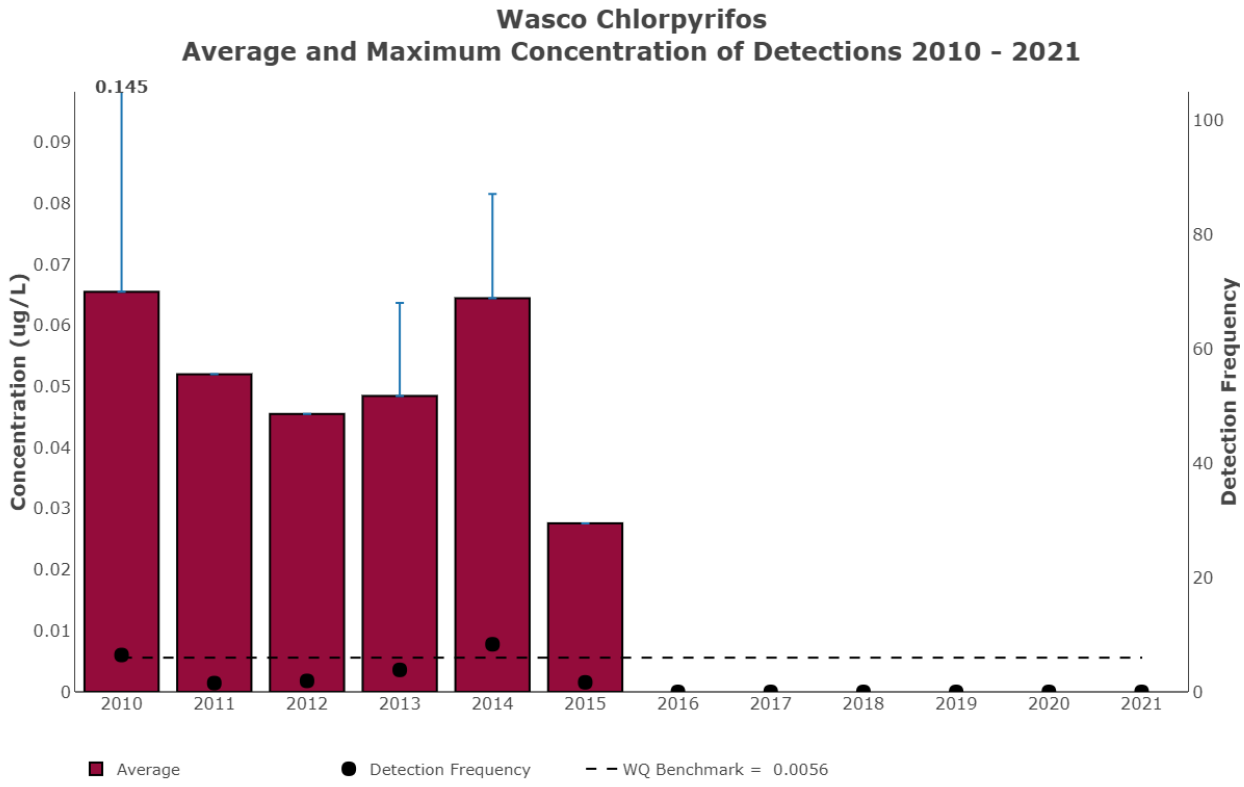

Figure 7. Wasco Watershed Pesticide Stewardship Partnership Project: average and maximum concentrations of detections of chlorpyrifos, 2010-2021.

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 PSP, but the total number of pesticides and detection frequencies for some of those pesticides remain relatively high, although those detection frequencies continue to decrease through 2021. The watershed strategic plans that are starting to be developed will address pesticides of concern in critical areas of each PSP watershed. 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 (Clackamas, Pudding, Yamhill, etc.), but a wide variety of insecticides, herbicides and fungicides are registered for use on the specialty crops that are grown in that watershed. 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 2021 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 2021 with a decrease in both average and maximum concentration of detections (Figure 8).

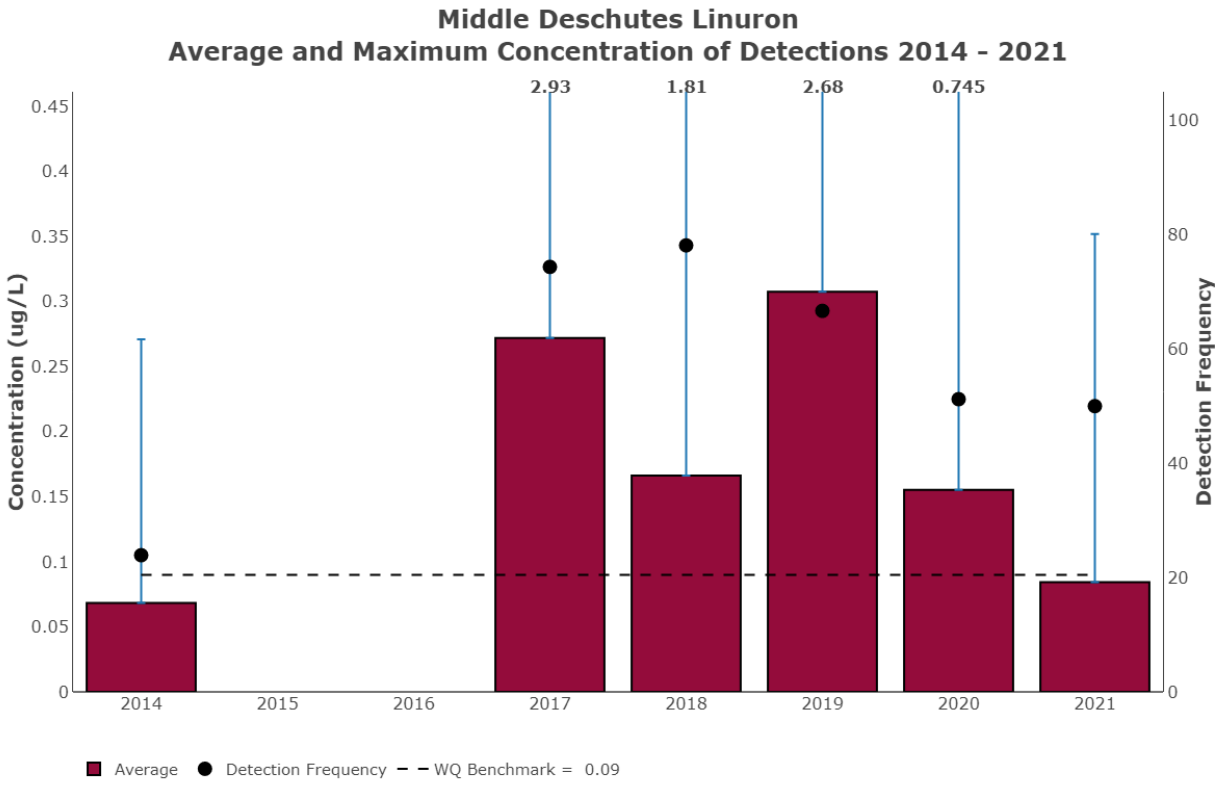

Figure 8. Middle Deschutes Pesticide Stewardship Partnership project: Campbell Creek linuron average and maximum concentrations of detections 2014-2021.

Below is a summary of 2021 monitoring data results for each PSP watershed (Table 18 and Figure 9).

Table 15. Summary of 2021 pesticide detections and exceedances per watershed.

PSP Area	# of Sample Analyses	Detections	Benchmark or Criteria Exceedances
Amazon	6397	206	17
Clackamas	5589	182	4
Hood River	4473	57	1
Middle Deschutes	5257	181	15
Middle Rogue	7361	151	11
Pudding	6335	395	31
Walla Walla	7777	28	4
Wasco	6939	42	4
Yamhill	3364	233	15

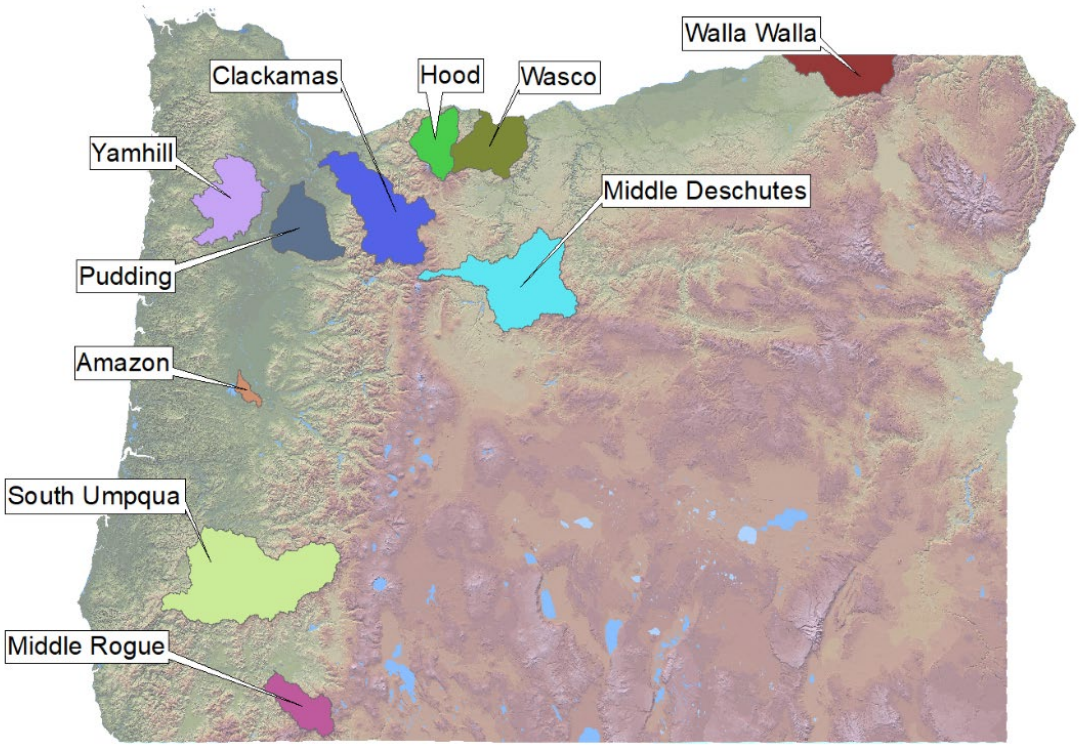

Figure 9. 2021 Pesticide Stewardship Partnership Watersheds.

Additionally, the Pesticide Stewardship Partnership held three pesticide waste collection events throughout 2021 at separate locations across Oregon. These events were held in Ontario and Polk County with another special collection in Alsea. In total, the waste collection drew over 30 participants and collected over 35,000 pounds of chemicals to be removed from circulation.

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 2021, DEQ used the previously completed mapping of potential PFAS sources along with OHA Source Water Assessment data to prioritize water system groundwater sources based on sensitivity to infiltration of potential contaminants. Based on the results of the PFAS screening and assessment, OHA and DEQ selected 157 PFAS sampling locations: 137 related to groundwater sources and 20 related to surface water sources. Sampling of these systems began in October 2021 and analytical results will be compared to state specific PFAS Health Advisory Levels established by OHA's Environmental Public Health Testing Program. DEQ's lab is conducting the analysis using EPA Method 533. OHA has a Response Protocol in place for PFAS detections at water systems that involves recommendations based on PFAS types and concentrations for the PWS that range from sharing results with their water users, continued monitoring, issuing advisories, and installing treatment (if needed).

Protecting the land upstream of drinking water intakes is critical to protecting public health and reducing treatment costs for communities as well as supporting economic stability, recreation opportunities, and wildlife/aquatic habitat. Without land protection many communities are being forced to rely on back up supplies, make expensive upgrades, and even shut off water to address land uses that are negatively impacting their water supply. DEQ Drinking Water Protection staff are working with several Oregon water systems, land trusts and local partners to leverage voluntary tools like land acquisition and conservation easements to help communities and landowners.

3.9.3. Agency Integrated Toxics Reduction Strategy

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

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

In 2019 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. In 2019, DEQ updated a "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: 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: In 2019, DEQ evaluated 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 19). 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 2021, 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). 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.

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 2021, DEQ programs continued to develop 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 were finalized in 2021, and are available for use 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 can be found here: 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 20) in the 2014 Nonpoint Source Management Program Plan. The following sections describe progress on these action items in 2021.

Table 16. 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 2021.

Goal #	Goal Topic	Action	Time Frame	2021 Status
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 and landscape condition in priority areas.	Ongoing	Ongoing See Section 3.10.2 and Basin Reports Appendices A-R
AG – 4	Update DEQ Guidance for Biennial Reviews	Collaborate with ODA for updating DEQ guidance for providing comment during ODA's Biennial review Process.	2015	Completed with additional work ongoing. See Section 3.10.3
AG – 5	Grant Funding	Participate in local grant funding process to direct resources to high priority agricultural issues.	Ongoing	Ongoing DEQ has ongoing coordination with ODA on grant funding process through CEP, 319 and NWQI.
AG – 6	ODA Area Rule Compliance	Work with ODA to prioritize and help develop assessment methodologies for addressing temperature, sediment and sedimentation, bacteria, nutrients and pesticides.	Ongoing	Ongoing See Section 3.10.4 and Section 4.1

3.10.1. Landscape Condition Assessments

During 2021, DEQ continued to evaluate new methods to conduct future landscape condition assessments statewide. One of the limiting factors in conducting a statewide assessment using current methods is the resources required to acquire the necessary remote sensing data and complete the analysis. Traditional methods require hand digitization of aerial imagers or use of 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 which is then used to derive effective shade. 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 2021 DEQ utilized federal 319 funds to support a project with the Institute for Natural Resources to further develop this model.

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 2021, DEQ provided comments or recommendations to ODA for biennial reviews in the following seventeen agricultural management areas:

- Burnt River
- Curry
- Crooked River
- Goose and Summer Lakes
- Greater Harney
- Lower Deschutes
- Lower John Day
- Malheur
- Mid-Coast
- Molalla-Pudding-French Prairie-North Santiam
- North Coast
- North and Middle Fork John Day
- Owyhee
- Sandy
- South Willamette
- Upper Grande Ronde
- Upper Middle and South Fork John Day
- Willow Creek

Under goal AG -3 DEQ committed to provide information about landscape condition in the status and trends reports. In 2021, DEQ did not include information on landscape condition in the status and trends report. However, DEQ worked on a project with the Institute for Natural Resources to develop a model

that will allow quantification of effective shade status and trends of shade across the state (see Section 3.10.1).

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's guidance was updated in 2020 for ODA's full review process and in 2021 for ODA's lite review process. DEQ has had ongoing coordination with ODA on biennial reviews and will continue to refine the biennial review guidance as needed.

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.
- Input from stakeholders.

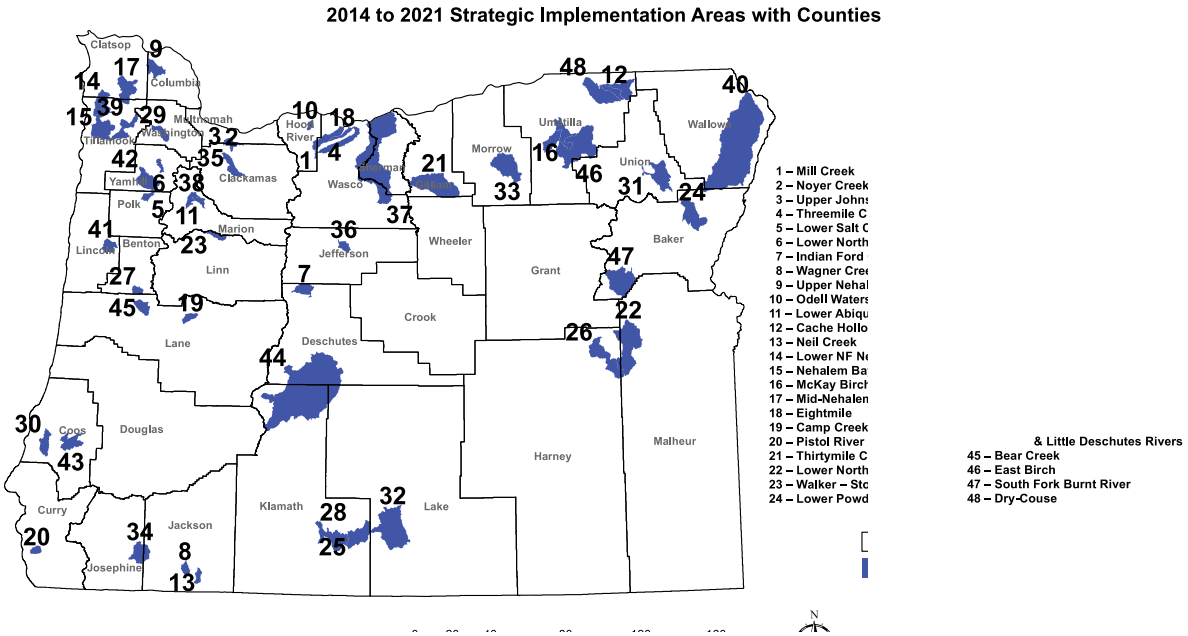

Figure 10. Strategic Implementation Areas (2014-2020) by Agricultural Water Quality Management Area.

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 and local partners implement the outreach and monitoring plan.
8. ODA ensures compliance in the SIA through voluntary and regulatory actions.

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 21) in the 2014 Nonpoint Source Management Program Plan. The following sections describe progress on these action items in 2021.

Table 17. 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	Completed (Signed December 2021)

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 are issues with the appropriateness of using some statistical methods in the previous study design to calculate compliance rates. ODF does not currently 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 were 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's contractor completed the compliance audit evaluation during 2021.

Wildfire was a larger than usual component of both federal and non-federal forest water quality concern in 2020 and 2021. More than 1 million acres burned in multiple conflagrations during the week of Labor Day in 2020, 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 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). Salvage harvest was a common response on private industrial forestlands within the burned areas. Private nonindustrial (family) forestlands less frequently engaged in salvage harvest due to limits in available operators (loggers). Hazard tree removal along roads and rural residential properties was frequent and often took place near to waterbodies due to proximity of roads and residences to water. Seedling supply limitations have been an issue, but ODF and private nurseries have provided trees and shrubs to small landowners for replanting efforts. The state, through ODF and the Oregon Watershed Enhancement Board, have provided money and technical support to landowners for fire recovery and resiliency projects (e.g., replanting, fuel reduction, erosion control) within burned areas.

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 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 and evaluated 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.

A memorandum of understanding between a group of 13 conservation NGOs and 13 timber industry representatives (known as the Private Forests MOU or Private 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 1602 to:

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 aerial 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) Provide 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 came to a successful conclusion at the end of October 2021.

The resulting Private Forest Accords compromise includes numerous components and was enacted into law by the Oregon Legislature during the 2022 legislative session. Implementing rules are to be adopted by the end of November 2022. Fish-bearing stream buffers will be effective in July 2023, and the other rules will be effective in January 2024. Increased protections for aquatic ecosystems and water quality are included in numerous ways:

- wider no-cut buffers on fish-bearing streams.
- no-cut buffers on significant portions of perennial non-fish streams.
- improved equipment restriction zones on other non-fish streams.
- no-cut buffers on half of debris flow-prone non-fish streams.
- no-harvest rules for the most unstable landslide-prone areas.
- improvements to road rules with an inventory and upgrade scheduling system.
- protection changes and conservation incentives for family forestlands.
- a conservation fund for mitigation and restoration activities.
- substantial changes to rule update procedures for aquatic species protection.

As part of implementing these rules and to keep them in effect, the State will apply for and must receive a Habitat Conservation Plan with an Incidental Take Permit from the federal government by 2027. Within three years, analysis and rulemaking must be completed for tethered logging and post-disturbance (salvage) logging practices. While these changes are targeted specifically at aquatic species and their habitats, the changes should significantly improve water quality on private forestlands. DEQ retains its water quality authority under state and federal law and received two general fund positions to coordinate and implement water quality/aquatic habitat programs on forestlands as part of the enabling legislation.

ODF's State Forests Division is engaged in planning for Habitat Conservation Plans (HCP) for terrestrial (e.g., spotted owls, marbled murrelets) and aquatic (e.g., salmonids, amphibians) species in the western Oregon state forests (e.g., Tillamook and Clatsop State Forests). DEQ Watershed Management staff representing the Nonpoint Source and Drinking Water Protection programs sit on the Scoping Team, while the DEQ'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 2021, 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. Work on the HCP, EIS and related State Forest Management Plan continued through 2021 with robust protections for aquatic ecosystems, water quality and drinking water sources. A record of decision is expected winter of 2022.

3.11.3. ODF/DEQ MOU Revision

The current MOU between DEQ and ODF was signed in December of 2021, updating the 1998 MOU. The purpose of the MOU is to describe how DEQ and ODF will work together to carry out each agency's responsibilities and requirements in protecting clean water on non-federal forestlands. The MOU specifies how DEQ and ODF will interact and use forestry-specific data and information: during development and implementation of TMDLs; as well as forest practices sufficiency determinations; Section 319 Nonpoint Source Management Program Plan elements; water quality standards revision priorities and integrated report development. The MOU includes: commitments to collaborate on forestry-specific plans and reporting on TMDL implementation; periodic assessment and reporting to the agencies' governing bodies on MOU progress; a process for updating the MOU and a dispute resolution process.

3.12. Urban and Rural Residential

In the 2014 Nonpoint Source Program Management Plan, DEQ has identified that the development of guidance (Table 22) to improve and establish consistent coordination between TMDL and stormwater programs as the highest priority to improve program implementation and effectively address nonpoint sources on urban and rural residential lands.

Table 18. 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 2021.

Goal #	Goal Topic	Action	Time Frame	2021 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 2021 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. DEQ managers approved the Charter on this work in February 2021. By ensuring clear and consistent coordination between these two programs, DEQ will minimize the likelihood of implementing 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, improve tracking and monitoring toward water quality improvements, and build better DEQ relationships with DMAs and permittees by providing consistent messaging.

The team has completed, and DEQ managers have approved, the following three Procedure documents:

1. TMDL and MS4 Staff Coordination in Reviewing MS4 and TMDL Annual Reports (effective Jan. 13, 2022).
2. MS4 and TMDL Staff Coordination in MS4 Permit Writing (effective on March 11, 2022).
3. Water Quality Management Plan (WQMP) Requirements for Cities with Non-permitted MS4s (effective on May 12, 2022).

The TMDL/MS4 Collaboration Team developed training for DEQ staff on the three Procedure documents on June 14, 2021. The team has identified and documented additional cross-program issues that may be addressed in a second phase of this work.

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 23) in the 2014 Nonpoint Source Management Program Plan. The following sections describe progress on these action items in 2021.

Table 19. 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 2021.

Goal #	Goal Topic	Action	Time Frame	2021 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	Not completed, transitioning away from annual report to five-year report See Section 3.13.1
FED – 2	USFS/DEQ Five-Year Progress Report	The 2013 USFS/DEQ MOU requires the preparation of a USFS/ DEQ five-Year MOU Progress Report. USFS-DEQ MOU updated and renewed for four years, effective 2019.	2023	Will be completed in 2023 based on the renewed 2019 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.	Not completed See Section 3.13.3
FED – 4	BLM Five-Year Progress Report	The 2011 BLM/DEQ MOU requires the preparation of a BLM/ DEQ Five-Year MOU Progress Report. The BLM-DEQ MOU was updated and renewed for five years, effective 2017.	2022	In progress. Will be completed in 2022. See Section 3.13.4
FED – 5	Coordination of USFS and BLM with DEQ	The USFS and BLM will coordinate with DEQ for establishing priorities, strategies and funding using a watershed approach to protect and restore water quality on BLM and USFS administered lands, this will include WQRPs.	Annually	Completed See Section 3.13.5
FED - 6	USFS BMPs	As needed, USFS will develop Oregon specific land use activity BMPs and monitor implementation and effectiveness of BMPs following the USDA National Best Management Practices for Water Quality national protocols.	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

Goal #	Goal Topic	Action	Time Frame	2021 Status
FED – 8	Pre-TMDLs and Post-TMDL	The USFS and BLM will use the Forest Service and Bureau of Land Management Protocol for Addressing Federal 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 2021; the next report will be completed in 2022.

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 five-year report for one more year. After discussion between the USFS and DEQ, it was determined that both agencies would forego the five-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 will 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 (five 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 and 2021. DEQ staff will defer to the five-year report.

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, USFS, and BLM met several times in 2021 to coordinate on a variety of topics including water quality monitoring, TMDL development, TMDL implementation reporting, and reporting restoration best management practices implemented.

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 2021, a total of $396,000 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 BMPs 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 and 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.

In 2021, DEQ and USFS worked on a process to annually summarize and report on the restoration BMPs implemented statewide on USFS forestlands. A summary of BMPs reported for 2021 are included in Appendix S.

PIBO (Eastern Oregon) and AREMP (Western Oregon) trend monitoring of aquatic systems also continues. For PIBO, reports are based on specific study areas while 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 Federal Clean Water Act Section 303(d)-listed waters through water quality assessments, providing data, validating listings and by working with DEQ and other state agencies as well as 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 24) in the 2014 Nonpoint Source Management Program Plan. The following sections describe progress on this action item in 2021.

Table 20. 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	2021 Status
AG – 5	Grant Funding	Participate in local grant funding process to direct resources to high priority agricultural issues.	Ongoing	Ongoing See Section 4.1 and Section 4.2

4.1. National Water Quality Initiative (NWQI)

The 2013 Nonpoint Source Program and Grants Guidelines for States and Territories directs DEQ to devote sufficient Section 319 resources to coordinate with the Natural Resources Conservation Service (NRCS). In Oregon, the NRCS has partnered with DEQ, ODA, U.S. Fish and Wildlife Service and others to identify 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 eleven projects in Oregon have been approved by NRCS and are undergoing the "planning" 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 planning 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.

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 2021 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.
- 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.

In 2021, the Conservation Effectiveness Partnership Technical Team worked on the development of a case study technical report and story map for the Floras Creek study area. The report and story map are to be finalized and published by mid-2022. The CEP also selected Thirtymile as the next case study and will begin work in 2022.

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 25) and the progress on the action item in 2021.

Table 21. Description of nonpoint source success stories action identified in the 2020-2022 Performance Partnership Agreement and the status in 2021.

Goal #	Action	Time Frame	2021 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	Columbia Slough success story completed. 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.

In 2021, a success story was completed documenting the improvement in bacteria levels in the Lower Columbia Slough. In the mid-1990s, water samples showed that the Columbia Slough exceeded the applicable bacteria water quality standard, DEQ added the slough to the 1998 section 303(d) list of impaired waters for failing to support its recreational designated use. Stakeholders implemented riparian restoration and revegetation projects to slow and filter water, added green infrastructure practices to reduce the volume of stormwater, educated residents to increase acceptance of environmental practices, and installed a "Big Pipe" project to reduce combined sewer overflows (CSOs). Bacteria levels dropped and now meet water quality standards. DEQ removed an 8-mile segment of the Columbia Slough from the impaired waters list for bacteria in the 2018/2020 Integrated Report. This success story and all previous success stories can be found at: https://www.epa.gov/nps/success-stories-about-restoring-water-bodies-impaired-nonpoint-source-pollution#or. The Columbia Slough success story was developed with assistance from EPA's contractor Tetra Tech.

5. Nonpoint Source Basin Level Achievements in 2021

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. Appendix S includes restoration BMPs implemented statewide on USFS forestlands.

DEQ identified the basin specific action item (Table 26) in the 2014 Nonpoint Source Management Program Plan. The Appendices A - S describe progress on this action item in 2021.

Table 22. 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	2021 Status
BSA -1	Basin specific activities	Basin specific activities and projects will be prioritized through the various TMDL/NPS Program processes.	Ongoing	See Basin Reports Appendices A-S for completed activities and projects

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
Little Deschutes	2727	1.9	61.9	0.4	32.4	3.3

Subbasin	Watershed Area (km2)	% Urban/Roads	% Forest	% Cultivated	% Range/Forest Disturbance	%Other
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

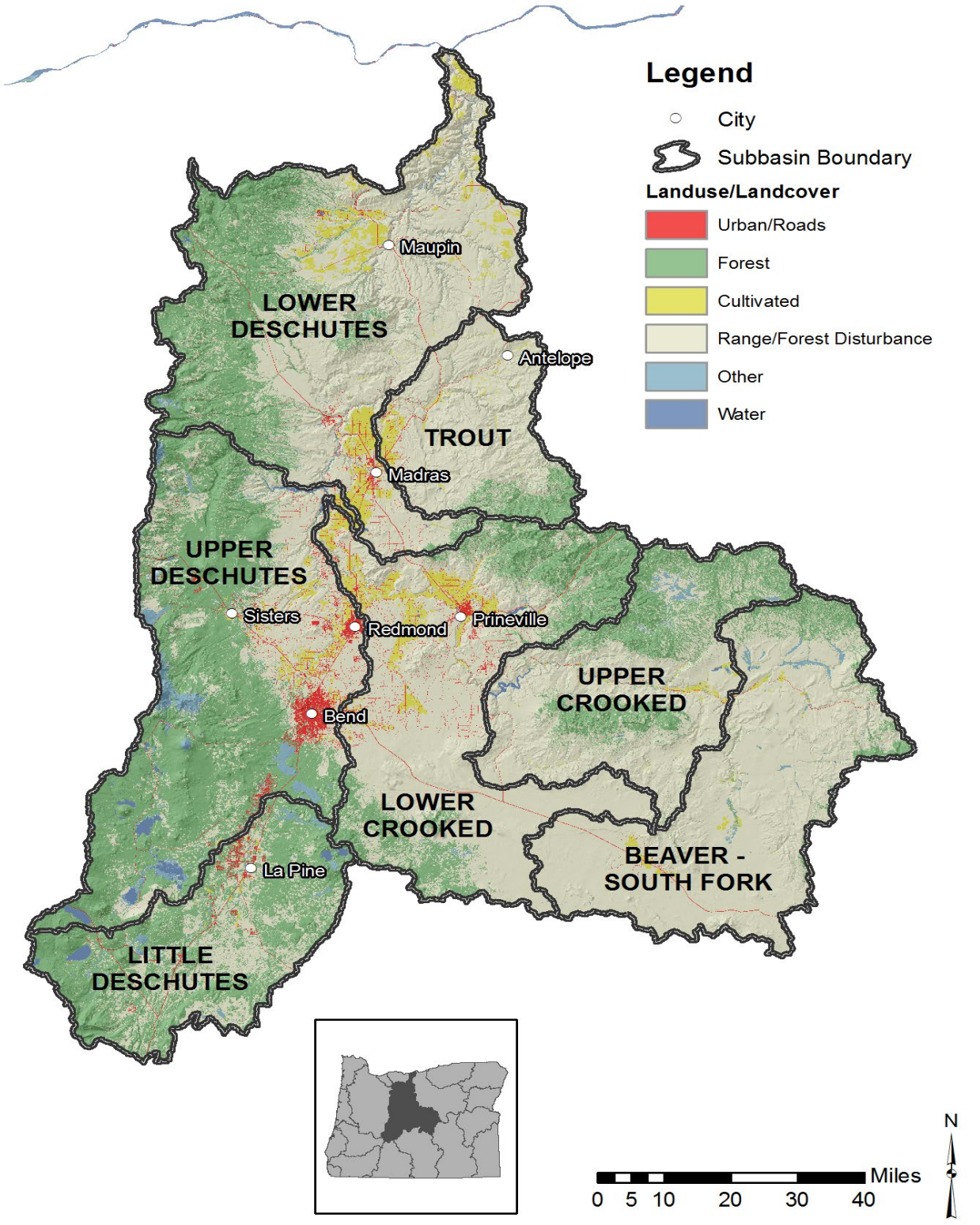

Figure A-1: Land use in the Deschutes administrative basin.

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.oregon.gov

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 2018/2020 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 2021. Note this section does not identify or include projects proposed and awarded a grant in 2021. 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 2021 see Section 3.6.2 of the main report.

In 2021 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 2021.

In 2021 there were no nonpoint source related Clean Water State Revolving Fund projects with reported outputs in the Deschutes.

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 2021.

In 2021 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 $27,170. Table A-4 describes the project and the reported outputs.

Table A-4: Nonpoint source Drinking Water Source Protection program projects and outputs for 2021.

Project Name	Grantee	Project Description	Reported Outputs
One Watershed Shared by Many: Bend Municipal Watershed Entry and Education Sign Project	Bend Water Department	Bend Water Department plans to conduct a 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 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.	In 2021, Bend completed design of the trail signs in partnership with USFS recreation teams and biology teams. The trail signs and kiosks are designed to to increase visitors' awareness of watershed and drinking water values. NEPA related work for installation has also been completed and signs will be installed at nine sites in 2022 to educating users of the hiking trails in the Bend

Project Name	Grantee	Project Description	Reported Outputs
			Municipal watershed. One information kiosk has been installed at the Tumalo Falls overlook area, near the bottom of Bend's watershed area. Design and production of the educational panel including a map of the watershed area and explaination of the allowed uses and protection reasoning will occur in 2022.

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 2021.

In 2021 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 23 OWEB funded projects completed in 2020 with a total cash and in-kind budget of $4,987,813. 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-5: Summary of OWEB grant funded fish passage projects completed in 2020, the most recent year data is available in the OWEB OWRI database.

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

Table A-6: Summary of OWEB grant funded instream projects completed in 2020, the most recent year data is available in the OWEB OWRI database.

Subbasin	Stream bank stabilized (Miles)
Lower Crooked	1.2

Table A-7: Summary of OWEB grant funded instream projects completed in 2020, the most recent year data is available in the OWEB OWRI database.

Subbasin	Instream habitat: Boulder placement (Number of treatments)	Instream habitat: Large wood placement (Number of treatments)
Lower Crooked	156	47

Table A-8: Summary of OWEB grant funded riparian projects completed in 2020, the most recent year data is available in the OWEB OWRI database.

Subbasin	Riparian fencing (Area treated)	Riparian fencing (Stream sides treated)
Upper Crooked	6.1	1

Table A-9: Summary of OWEB grant funded riparian projects completed in 2020, the most recent year data is available in the OWEB OWRI database.

Subbasin	Riparian invasive plant control (Area treated)	Riparian invasive plant control (Stream sides treated)	Riparian vegetation management (Area treated)	Riparian vegetation management (Stream sides treated)
Lower Crooked	30.0	2	NA	NA
Lower Deschutes	157.8	2	NA	NA
Upper Deschutes	NA	NA	9	2

Table A-10: Summary of OWEB grant funded upland projects completed in 2020, the most recent year data is available in the OWEB OWRI database.

Subbasin	Irrigation system improvement (Acre)	Irrigation system improvement (Feet)
Little Deschutes	300.0	NA
Lower Crooked	107.0	980
Trout	499.5	6400

Table A-11: Summary of OWEB grant funded upland projects completed in 2020, the most recent year data is available in the OWEB OWRI database.

Subbasin	Off-channel livestock or wildlife watering (Number of treatments)	Upland fencing (Acre)	Upland fencing (Mile)
Lower Crooked	3	15.0	0.1
Lower Deschutes	3	NA	NA
Upper Crooked	9	302.3	4.8

Table A-12: Summary of OWEB grant funded upland projects completed in 2020, 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	244.2	75.0	75
Lower Deschutes	88.2	NA	NA
Upper Crooked	2725.0	2928.8	60
Upper Deschutes	1817.0	NA	NA

3.6 USFS Data

The US Forest Service catalogs special restoration related projects in their central database that have been provided by each National Forest. These projects differ from their standard BMPS implemented as part of their management plans (e.g. buffer widths) and include projects such as road decommissioning, large wood placement, and riparian planting, among others. DEQ has provided this information in Appendix T of this report. Please note the caveats for this restoration data within the “Caveats” section of the document.

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

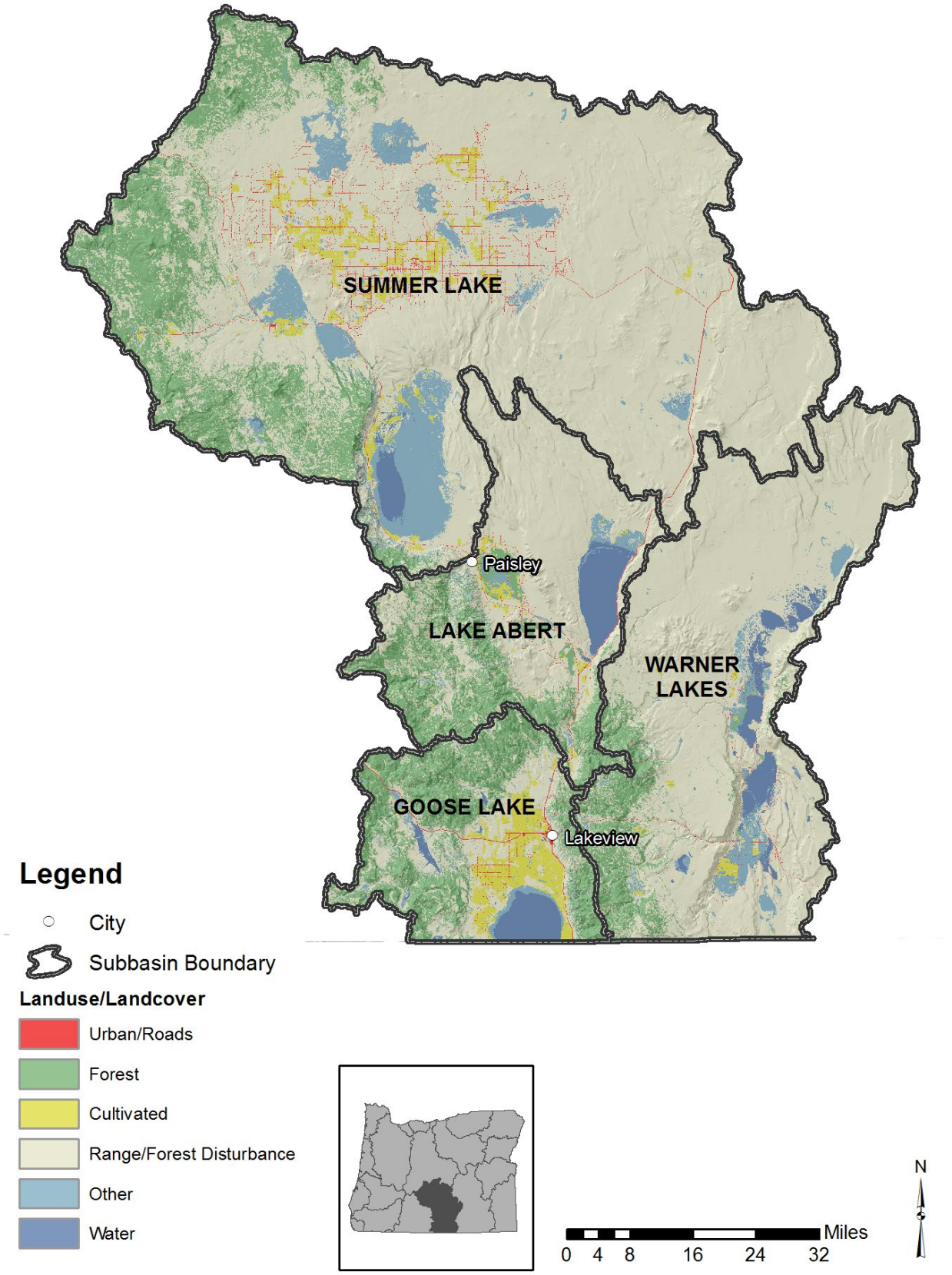
SUMMER LAKE
Paisley
LAKE ABERT
WARNER LAKES
GOOSE LAKE
Lakeview
Legend
City
Subbasin Boundary
Landuse/Landcover
Urban/Roads
Forest
Cultivated
Range/Forest Disturbance
Other
Water
N
Miles
0 4 8 16 24 32

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: 541-241-0072: john.dadoly@deq.oregon.gov
Goodse and Summer Lakes Basin	Mike Hiatt: 541-273-7002: hiatt.mike@deq.state.or.us

2. Water Quality Impairments and TMDLs

2.1 Water Quality Impaired Stream Segments

Under section 303(d) of the Clean Water Act, states, territories and authorized tribes must submit lists of impaired waters. Impaired waters are those that do not attain water quality standards or support all designated uses. The law requires that states establish priority rankings for waters on the lists and develop Total Maximum Daily Loads (TMDLs) for these waters. Table B-3 identifies the number of Goose & Summer Lakes Basin waterbody segments impaired by parameter from the 2018/2020 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 2021. Note this section does not identify or include projects proposed and awarded a grant in 2021. 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 2021 see Section 3.6.2 of the main report.

In 2021 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 2021.

In 2021 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 2021.

In 2021 there were no nonpoint source related Drinking Water Source Protection program projects with reported outputs in the Goose & Summer 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 2021.

In 2021 there were no active Drinking Water Providers Partnership projects with reported outputs in the Goose & Summer Lakes.

3.5 OWEB Grant Funded Projects

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

Based on the most recent data available in OWEB's Oregon Watershed Restoration Inventory (OWRI) database, there were eight OWEB funded projects completed in 2020 with a total cash and in-kind budget of $1,722,109. 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-4: Summary of OWEB grant funded fish passage projects completed in 2020, 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)
Lake Abert	1	1
Warner Lakes	NA	1

Table B-5: Summary of OWEB grant funded upland projects completed in 2020, 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	777.2	87
Lake Abert	NA	20
Warner Lakes	700.0	NA

3.6 USFS Data

The US Forest Service catalogs special restoration related projects in their central database that have been provided by each National Forest. These projects differ from their standard BMPS implemented as part of their management plans (e.g. buffer widths) and include projects such as road decommissioning, large wood placement, and riparian planting, among others. DEQ has provided this information in Appendix T of this report. Please note the caveats for this restoration data within the "Caveats" section of the document.

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

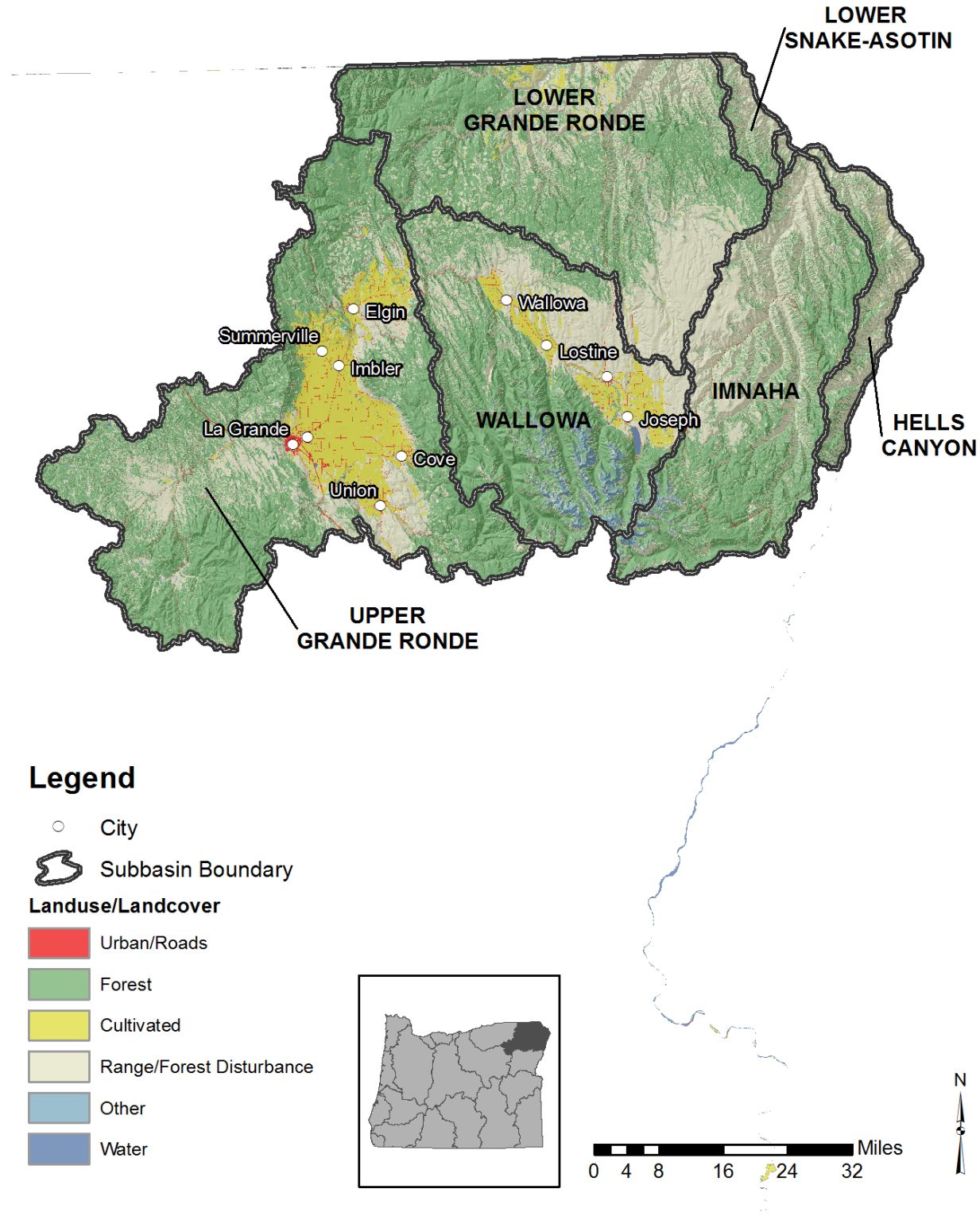

Figure C-1: Land use in the Grande Ronde administrative basin.

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

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 2018/2020 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 2021. Note this section does not identify or include projects proposed and awarded a grant in 2021. 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 2021 see Section 3.6.2 of the main report.

In 2021 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 2021.

In 2021 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 2021.

In 2021 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 2021.

In 2021 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 eight OWEB funded projects completed in 2020 with a total cash and in-kind budget of $2,626,065. 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 instream projects completed in 2020, the most recent year data is available in the OWEB OWRI database.

Subbasin	Instream habitat: Large wood placement (Number of treatments)
Upper Grande Ronde	2160

Table C-6: Summary of OWEB grant funded instream flow projects completed in 2020, the most recent year data is available in the OWEB OWRI database.

SubbasinActual	Other irrigation practice improvement (for instream flow) (acre-foot)
Upper Grande Ronde	166.5

Table C-7: Summary of OWEB grant funded riparian projects completed in 2020, the most recent year data is available in the OWEB OWRI database.

Subbasin	Riparian fencing (Area treated)	Riparian fencing (Stream sides treated)
Upper Grande Ronde	128.3	2

Table C-8: Summary of OWEB grant funded upland projects completed in 2020, the most recent year data is available in the OWEB OWRI database.

Subbasin	Off-channel livestock or wildlife watering (Number of treatments)
Imnaha	1

Table C-9: Summary of OWEB grant funded upland projects completed in 2020, the most recent year data is available in the OWEB OWRI database.

Subbasin	Upland invasive plant control (Area treated)	Upland vegetation management (Area treated)	Upland vegetation planting (Area treated)
Imnaha	370.0	NA	NA
Lower Grande Ronde	NA	NA	67
Upper Grande Ronde	42.7	NA	NA
Wallowa	940.4	1302.6	NA

3.6 USFS Data

The US Forest Service catalogs special restoration related projects in their central database that have been provided by each National Forest. These projects differ from their standard BMPS implemented as part of their management plans (e.g. buffer widths) and include projects such as road decommissioning, large wood placement, and riparian planting, among others. DEQ has provided this information in Appendix T of this report. Please note the caveats for this restoration data within the "Caveats" section of the document.

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

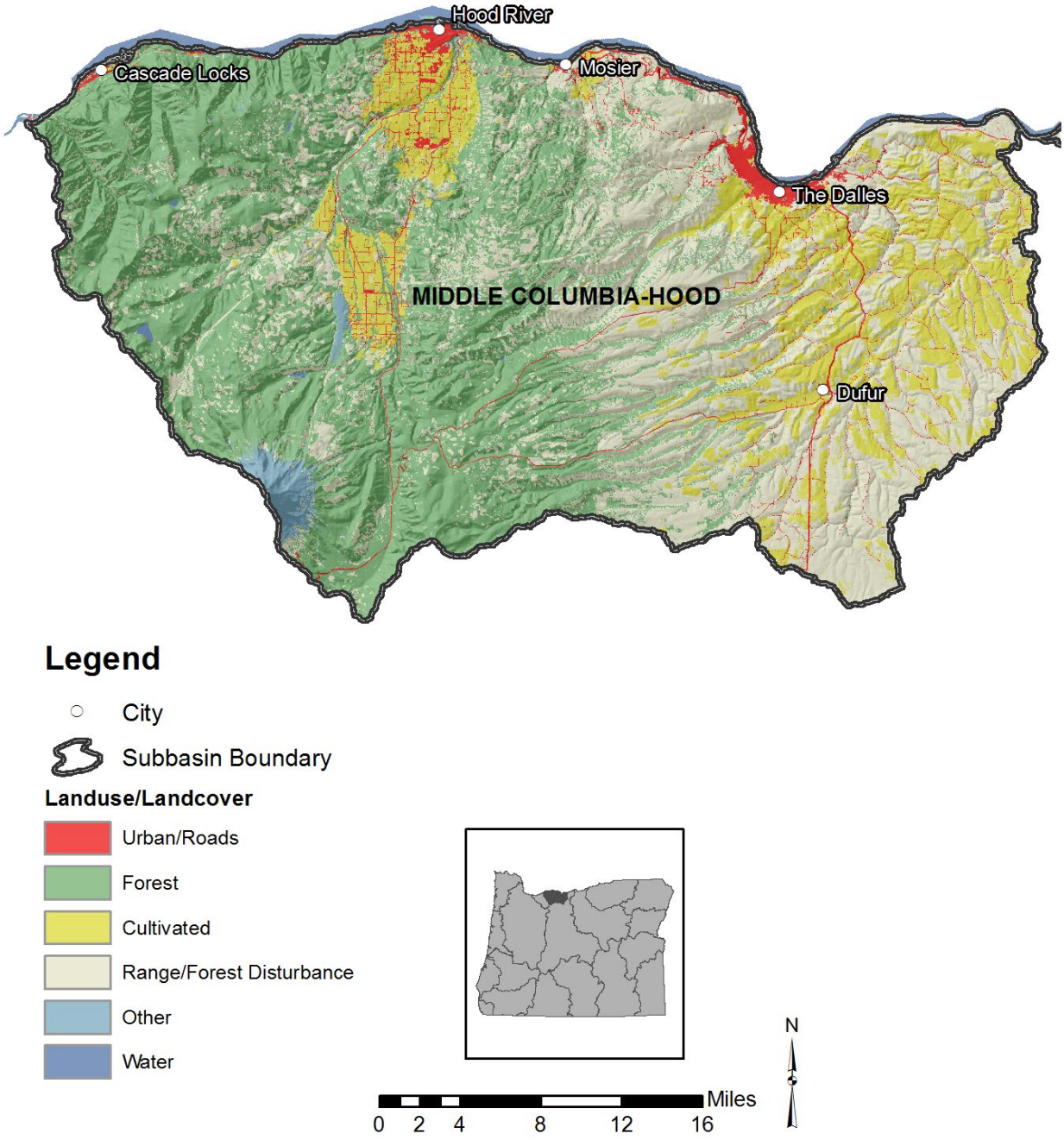

Figure D-1: Land use in the Hood administrative basin.

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.oregon.gov

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 2018/2020 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

Parameter	Assessment units without a TMDL	Assessment units with a TMDL
Methylmercury	8	0
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 2021. Note this section does not identify or include projects proposed and awarded a grant in 2021. 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 2021 see Section 3.6.2 of the main report.

In 2021, 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 2021 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.	Project was completed and all 319 funds were spent. During the 2021 irrigation season, irrigators were paid to curtail water diversions from Fifteenmile Creek during periods when stream temperatures were forecasted to be lethal to native fish species.

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 2021.

In 2021 there were no nonpoint source related Clean Water State Revolving Fund projects with reported outputs in the Hood.

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 2021.

In 2021 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 2021.

In 2021 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 nine OWEB funded projects completed in 2020 with a total cash and in-kind budget of $3,273,968. The tables below summarize reported outputs for different project activities in each Hood subbasin.

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

Table D-6: Summary of OWEB grant funded instream projects completed in 2020, 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)
Middle Columbia-Hood	395	4000	4

Table D-7: Summary of OWEB grant funded riparian projects completed in 2020, the most recent year data is available in the OWEB OWRI database.

Subbasin	Livestock stream access/crossing created or improved (Area treated)	Livestock stream access/crossing created or improved (Number of treatments)	Riparian fencing (Area treated)	Riparian fencing (Stream sides treated)
Middle Columbia-Hood	0.2	2	1.1	1

Table D-8: Summary of OWEB grant funded upland projects completed in 2020, the most recent year data is available in the OWEB OWRI database.

Subbasin	Irrigation system improvement (Acre)	Irrigation system improvement (Volumetric flow rate)
Middle Columbia-Hood	888.4	0.5

Table D-9: Summary of OWEB grant funded upland projects completed in 2020, the most recent year data is available in the OWEB OWRI database.

3	Nutrient/manure management (Acre)
Middle Columbia-Hood	1.2

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 2021.

Table D-10: TMDL implementation activities reported in 2021 by Designated Management Agencies or third parties.

TMDL	DMA	Reported Actions
Miles Creeks Temperature TMDL	City of Mosier	Investigated resource issues at the Rock Creek railroad underpass to address creek overflows at a park access road; adopted an Annual Climate Emergency Declaration to allocate budget for investigating areas of resource protection and to increase resilience in the watershed; investigating the issue of beavers cutting trees along Mosier Creek; outreach and

TMDL	DMA	Reported Actions
		education on adopting "green streets" standards in the City's Transportation System Plan; initiated updates to the city's Stormwater Capital Facilities Plan; collaborating with schools and NGOs on potential temperature monitoring of local creeks;
Miles Creeks Temperature TMDL	Northern Wasco County Parks and Recreation District	NWCPRD maintained the high level of shading along Mill Creek on their properties. No riparian vegetation was removed or disturbed in this reporting period.
Miles Creeks Temperature TMDL	Wasco County	Completed Wasco County 2040, the Comprehensive Plan Update; created outreach and education content and materials on riparian area restoration and beneficial tree species that was shared on the County website and at events; changed policies to use the State Wetland Inventory as the official source for riparian and wetland area identification and emphasized coordination with DEQ; collected 10,000 pounds of waste at the annual agricultural hazardous waste collection event; identified new stream setbacks for future updates of the Land Use Development Ordinance; adopted new development permit requirements for channel modifications and widening.
Western Hood Temperature TMDL	City of Hood River	Collaborated with the Hood River Watershed Group; established a 2020 Work Plan goal of creating a more environmentally sustainable community including three specific strategies: 1) Developing a Low Impact Development (LID) program for stormwater in a phased approach ; 2) Assessing energy and greenhouse gas emissions for City-owned facilities and fleets; and 3) considering regulation of trees on private property.
Western Hood Temperature TMDL	Hood River County	Conducted 3 enforcement actions in stream zones.

3.7 USFS Data

The US Forest Service catalogs special restoration related projects in their central database that have been provided by each National Forest. These projects differ from their standard BMPS implemented as part of their management plans (e.g. buffer widths) and include projects such as road decommissioning, large wood placement, and riparian planting, among others. DEQ has provided this information in Appendix T of this report. Please note the caveats for this restoration data within the “Caveats” section of the document.

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

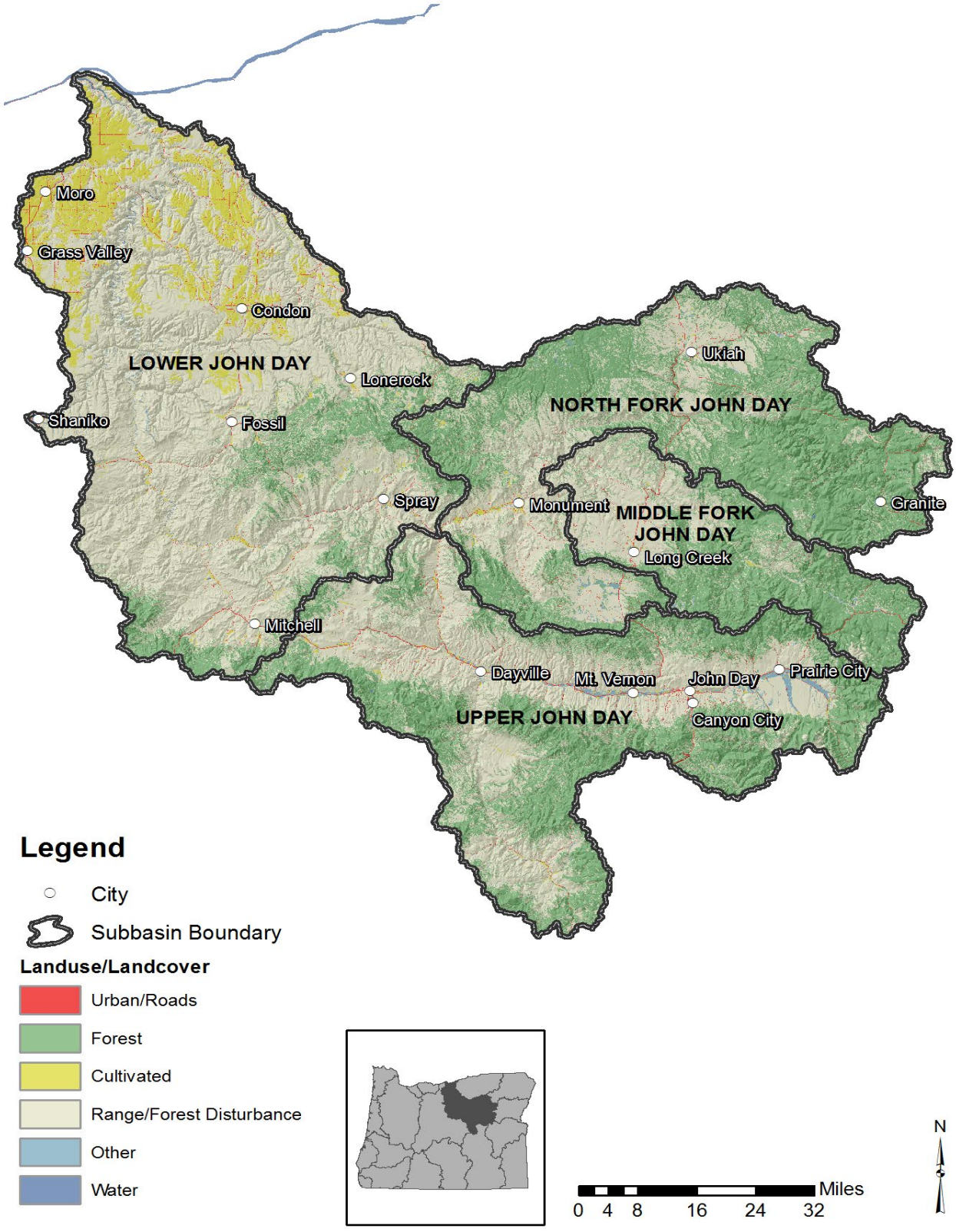

Figure E-1: Land use in the John Day administrative basin.

1.1 Basin Contacts

Table E-2: Oregon DEQ basin contact.

Administrative Area	DEQ Basin Coordinator
John Day Basin	Don Butcher: 541-278-4603: butcher.don@deq.state.or.us

2. Water Quality Impairments and TMDLs

2.1 Water Quality Impaired Stream Segments

Under section 303(d) of the Clean Water Act, states, territories and authorized tribes must submit lists of impaired waters. Impaired waters are those that do not attain water quality standards or support all designated uses. The law requires that states establish priority rankings for waters on the lists and develop Total Maximum Daily Loads (TMDLs) for these waters. Table E-3 identifies the number of John Day Basin waterbody segments impaired by parameter from the 2018/2020 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 2021. Note this section does not identify or include projects proposed and awarded a grant in 2021. 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 2021 see Section 3.6.2 of the main report.

In 2021, there were two 319 projects active that reported project outputs and accomplishments to DEQ. Combined the projects have a total grant budget of $50,479. Table E-5 describes the projects and the reported outputs.

Table E-5: Project outputs reported in 2021 for Section 319 pass through grants.

Project Name	Grantee	Project Description	Reported Outputs
John Day UAV Vegetation Monitoring	Blue Mountain Land Trust	The project proposes to use unmanned aerial vehicles (UAVs) equipped with multispectoral sensors to continuously monitor riparian vegetation throughout the John Day River Basin. The goals of this project are to collect basin-wide vegetation baseline data using UAV monitoring protocol developed by Gilliam SWCD and OSU, and to continue to monitor restoration projects over time to determine the effectiveness of	Blue Mountain Land Trust executed subcontractor agreements with several project partners. Partners including North Fork John Day Watershed Council, South Fork John Day Watershed Council, and Sherman SWCD purchased drones, had Gilliam SWCD train staff to fly drones, and received FAA drone flight certifications. Project partners have begun collecting riparian vegetation baseline data on

Project Name	Grantee	Project Description	Reported Outputs
		restoration efforts and inform future management practices.	restoration projects. SFJDWC conducted drone flights over projects in their focus area including Murderers Creek, Hole in the Ground, Brisbois Creek, South Fork John Day River, and Tex Creek.
South Fork John Day Watershed Council Bioassesment	South Fork John Day Watershed Council	Through OWEB funding, SFJDWC has begun implementation of a Rapid Riparian Revegetation (R3) effort on the South Fork John Day River. This R3 technique is meant to mimic natural riparian conditions and plant over 2,500 hard wood plants per acre along both sides of four miles of river. A bioassessment was performed in 2017, prior to R3 implementation. With 319 funds, SFJDWC will perform a follow-up bioassessment to compare conditions before and after the R3 implementation.	In 2021, the project agreement was signed and a sampling and analyis plan (SAP) was submitted and approved by DEQ. Water and air temperature loggers were installed at four sites in the project reach.

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 2021.

In 2021 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 2021.

In 2021 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 2021.

In 2021 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 35 OWEB funded projects completed in 2020 with a total cash and in-kind budget of $3,957,902. 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 2020, the most recent year data is available in the OWEB OWRI database.

Subbasin	New fish screens installed on diversions (where no screen had existed previously) (Number of treatments)	Fish Passage Non-crossing improvement (Number of treatments)
North Fork John Day	1	NA
Lower John Day	NA	1
Upper John Day	NA	2

Table E-7: Summary of OWEB grant funded instream projects completed in 2020, the most recent year data is available in the OWEB OWRI database.

Subbasin	Stream bank stabilized (Miles)	Pool excavated or blasted (Number of treatments)	Engineered structures installed (Number of treatments)
Middle Fork John Day	0.1	16	1

Table E-8: Summary of OWEB grant funded instream projects completed in 2020, the most recent year data is available in the OWEB OWRI database.

Subbasin	Instream habitat: Large wood placement (Number of treatments)	Instream habitat: Structure placement (Number of treatments)
Lower John Day	51	113
Middle Fork John Day	120	49
Upper John Day	1859	NA

Table E-9: Summary of OWEB grant funded riparian projects completed in 2020, 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)	Water gap development (Area treated)	Water gap development (Number of treatments)
Lower John Day	NA	1.3	NA	0.4	3
North Fork John Day	10	NA	2	NA	NA
Upper John Day	NA	1.9	1	NA	NA

Table E-10: Summary of OWEB grant funded riparian projects completed in 2020, the most recent year data is available in the OWEB OWRI database.

Subbasin	Riparian vegetation management (Area treated)	Riparian vegetation management (Stream sides treated)	Riparian vegetation planting (Area treated)
Middle Fork John Day	NA	NA	5.4
Upper John Day	27.6	2	NA

Table E-11: Summary of OWEB grant funded upland projects completed in 2020, 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)
Lower John Day	NA	393.4	21620	38
Upper John Day	14.5	NA	NA	NA

Table E-12: Summary of OWEB grant funded upland projects completed in 2020, the most recent year data is available in the OWEB OWRI database.

Subbasin	Off-channel livestock or wildlife watering (Number of treatments)	Upland fencing (Acre)	Upland fencing (Mile)
Lower John Day	11	669.1	1.4
Middle Fork John Day	21	127.0	NA
North Fork John Day	3	382.0	1.2
Upper John Day	21	502.6	1.4

Table E-13: Summary of OWEB grant funded upland projects completed in 2020, 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	339.0	1545.1	118
Middle Fork John Day	233.4	75.0	NA
North Fork John Day	NA	2678.5	6
Upper John Day	14.5	918.0	NA

3.6 USFS Data

The US Forest Service catalogs special restoration related projects in their central database that have been provided by each National Forest. These projects differ from their standard BMPS implemented as part of their management plans (e.g. buffer widths) and include projects such as road decommissioning, large wood placement, and riparian planting, among others. DEQ has provided this information in Appendix T of this report. Please note the caveats for this restoration data within the “Caveats” section of the document.

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
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

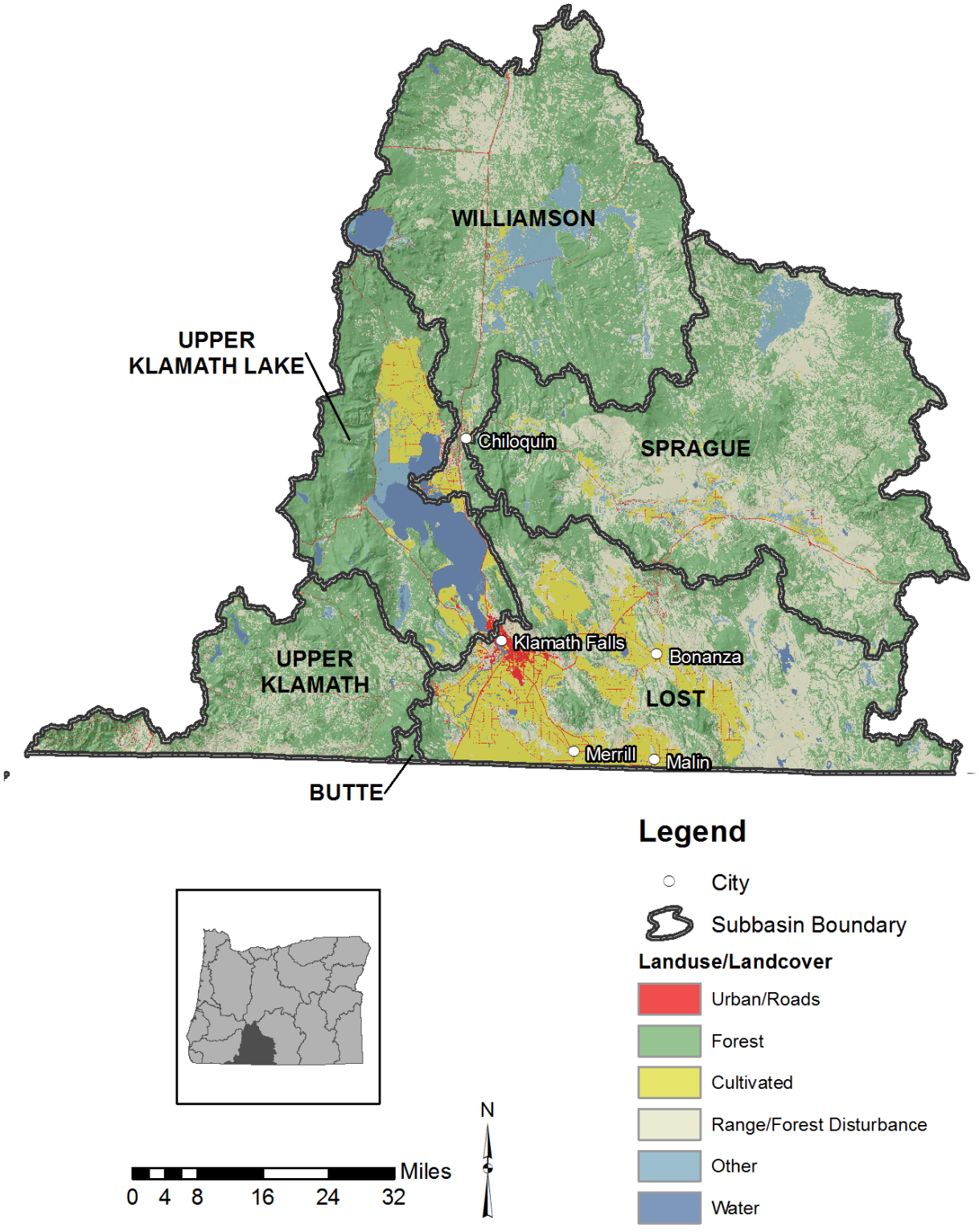

Figure F-1: Land use in the Klamath administrative basin.

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 2018/2020 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 2021. Note this section does not identify or include projects proposed and awarded a grant in 2021. 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 2021 see Section 3.6.2 of the main report.

In 2021, there was one 319 project active that reported project outputs and accomplishments to DEQ. Combined the projects have a total grant budget of $19,647. Table F-5 describes the project and the reported outputs.

Table F-5: Project outputs reported in 2021 for Section 319 pass through grants.

Project Name	Grantee	Project Description	Reported Outputs
Upper Klamath and Lost Subbasins Stewardship Agreement Planning Efforts	Klamath Water Users Association	The Klamath Water Users Association will work together with irrigation districts, The Bureau of Reclamation, U.S. Fish and Wildlife Service, DEQ, and NCWQCB to draft the Upper Klamath and Lost River Subbasins TMDL Stewardship Plan that will be reviewed and adopted by the stakeholders. The Stewardship Work Group will create a comprehensive implementation plan that will address the Upper Klamath and Lost River Subbasins Nutrient and Temperature TMDLs.	In 2021, Klamath Water Users Association (KWUA) held several meetings with DEQ and the North Coast Regional Water Quality Control Board to begin the TMDL implementation planning process. KWUA secured funding from USFWS and USBR to provide a facilitator for the planning work group and to conduct additional planning work.

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 2021.

In 2021 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 2021.

In 2021 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 2021.

In 2021 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 three OWEB funded projects completed in 2020 with a total cash and in-kind budget of $1,517,862. 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 upland projects completed in 2020, 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	3	2	0.8

Table F-7: Summary of OWEB grant funded upland projects completed in 2020, the most recent year data is available in the OWEB OWRI database.

Subbasin	Upland vegetation management (Area treated)
Sprague	40

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 2021.

Table F-8: TMDL implementation activities reported in 2021 by Designated Management Agencies or third parties.

TMDL	DMA	Reported Actions
Upper Klamath Lake Drainage	Klamath County	Klamath County public works completed several projects that adhered to TMDL guidelines to reduce sediment transport including replacing 11 ADA ramps, applying Dust Off on 20 miles of gravel roads, replacing two bridges with box culverts, repairing two bridges, blading and dragging unpaved shoulders, roadside ditch shaping and cleaning, sweeping and flushing roads, winter operations such as snow removal and sanding, and roadside vegetation management.

3.7 USFS Data

The US Forest Service catalogs special restoration related projects in their central database that have been provided by each National Forest. These projects differ from their standard BMPS implemented as part of their management plans (e.g. buffer widths) and include projects such as road decommissioning, large wood placement, and riparian planting, among others. DEQ has provided this information in Appendix T of this report. Please note the caveats for this restoration data within the “Caveats” section of the document.

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

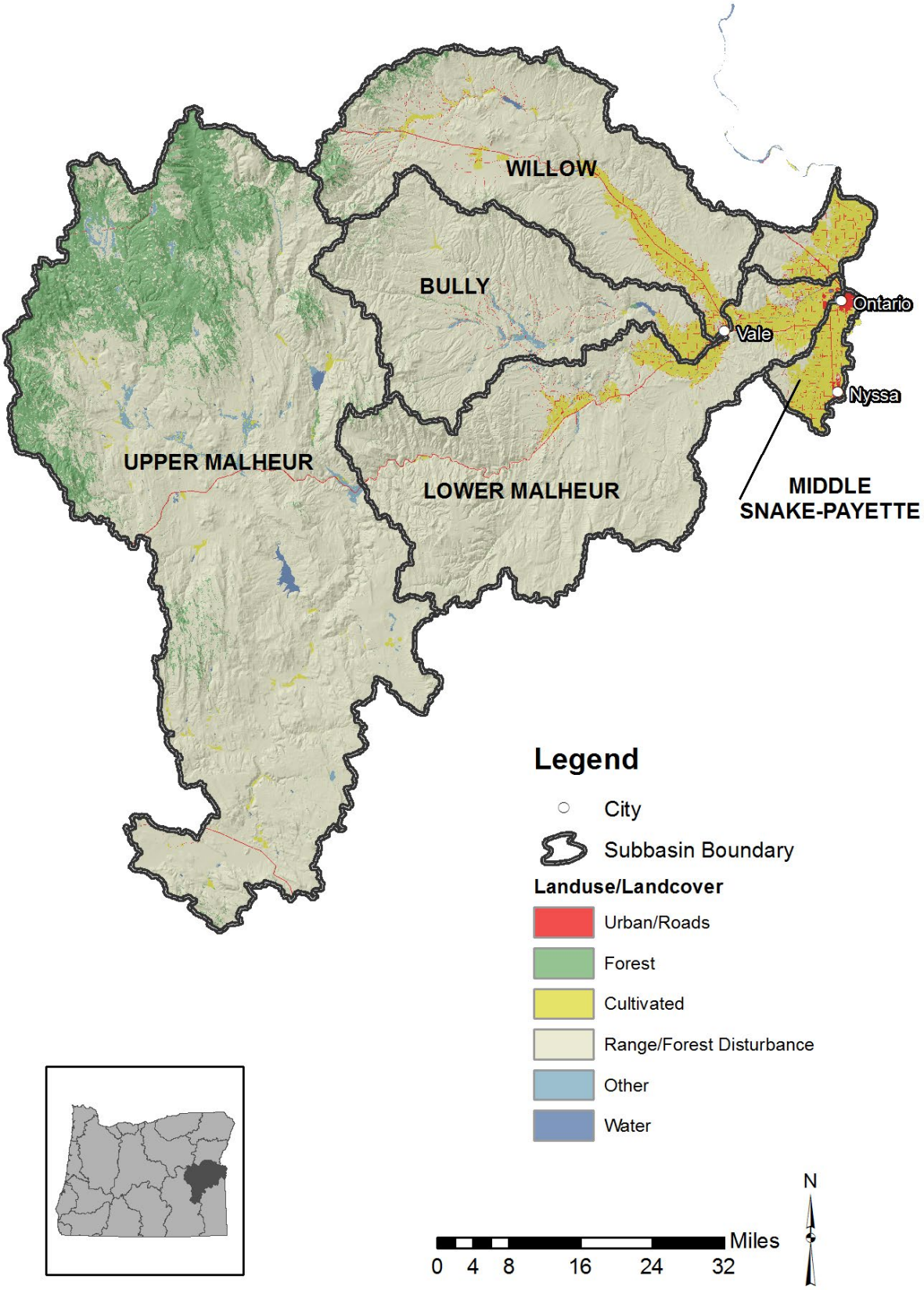
WILLOW
BULLY
Ontario
Vale
Nyssa
UPPER MALHEUR
LOWER MALHEUR
MIDDLE
SNAKE-PAYETTE
Legend
City
Subbasin Boundary
Landuse/Landcover
Urban/Roads
Forest
Cultivated
Range/Forest Disturbance
Other
Water
N
Miles
0 4 8 16 24 32

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: 541-241-0074: john.dadoly@deq.oregon.gov

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 2018/2020 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

Parameter	Assessment units without a TMDL	Assessment units with a TMDL
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 2021. Note this section does not identify or include projects proposed and awarded a grant in 2021. 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 2021 see Section 3.6.2 of the main report.

In 2021 there were no 319 projects with reported outputs in the Malheur.

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 2021.

In 2021 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 2021.

In 2021 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 2021.

In 2021 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 21 OWEB funded projects completed in 2020 with a total cash and in-kind budget of

$3,517,910. 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-5: Summary of OWEB grant funded fish passage projects completed in 2020, the most recent year data is available in the OWEB OWRI database.

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

Table G-6: Summary of OWEB grant funded instream projects completed in 2020, the most recent year data is available in the OWEB OWRI database.

Subbasin	Engineered structures installed (Number of treatments)
Willow	13

Table G-7: Summary of OWEB grant funded instream projects completed in 2020, the most recent year data is available in the OWEB OWRI database.

Subbasin	Instream habitat: Structure placement (Number of treatments)
Willow	79

Table G-8: Summary of OWEB grant funded upland projects completed in 2020, the most recent year data is available in the OWEB OWRI database.

Subbasin	Irrigation system improvement (Acre)	Irrigation system improvement (Feet)
Bully	28	NA
Lower Malheur	58	2600
Middle Snake-Payette	1558	11686
Willow	8	NA

Table G-9: Summary of OWEB grant funded upland projects completed in 2020, 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)
Willow	900	3

Table G-10: Summary of OWEB grant funded upland projects completed in 2020, 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)
Upper Malheur	NA	848	NA
Willow	600	4086	200

3.6 USFS Data

The US Forest Service catalogs special restoration related projects in their central database that have been provided by each National Forest. These projects differ from their standard BMPS implemented as part of their management plans (e.g. buffer widths) and include projects such as road decommissioning, large wood placement, and riparian planting, among others. DEQ has provided this information in Appendix T of this report. Please note the caveats for this restoration data within the “Caveats” section of the document.

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

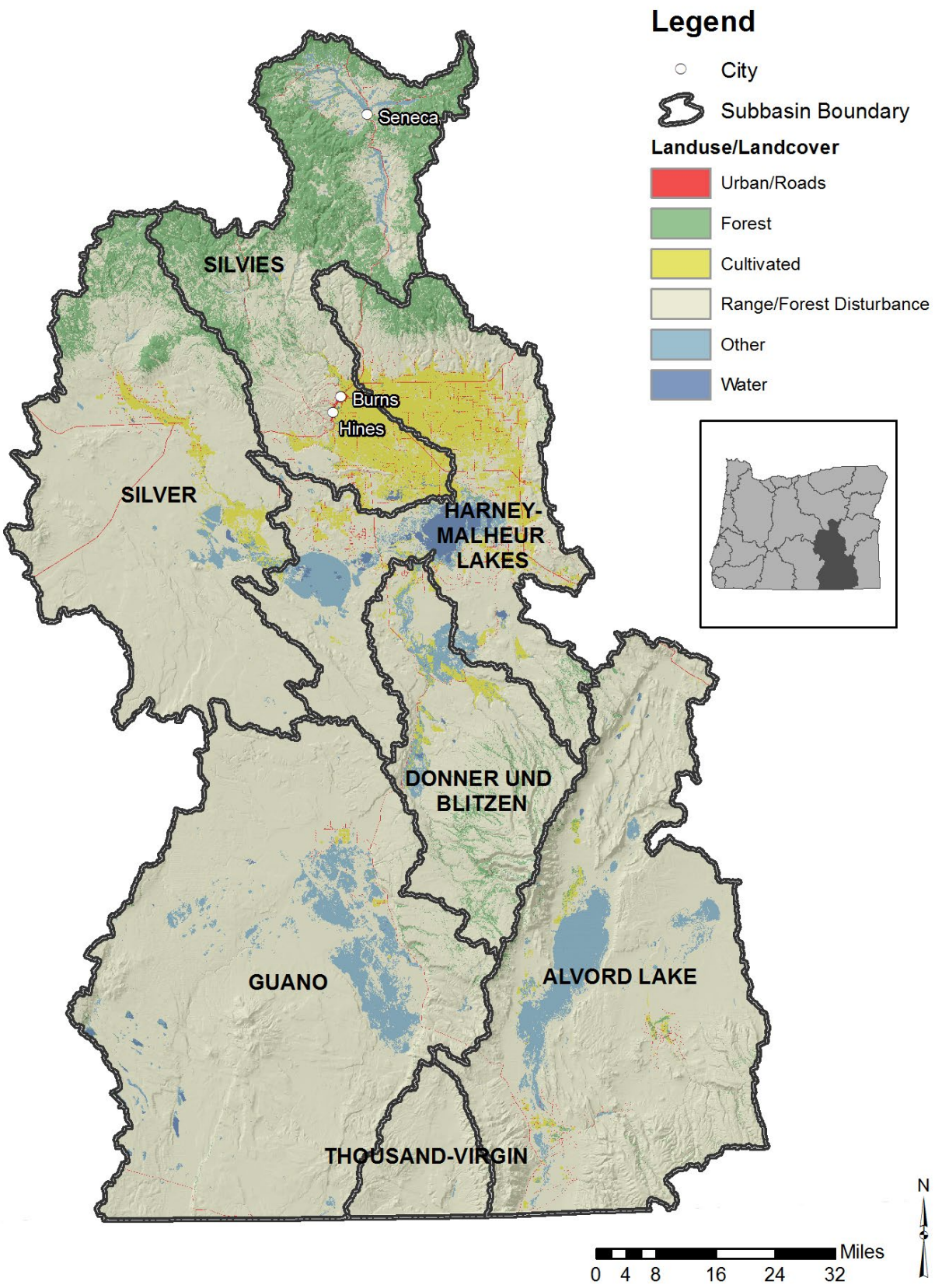
Legend
City
Subbasin Boundary
Landuse/Landcover
Urban/Roads
Forest
Cultivated
Range/Forest Disturbance
Other
Water
Seneca
Burns
Hines
SILVIES
SILVER
HARNEY-
MALHEUR
LAKES
DONNER UND
BLITZEN
GUANO
ALVORD LAKE
THOUSAND-VIRGIN
N
Miles
0 4 8 16 24 32

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: 541-241-0073: john.dadoly@deq.oregon.gov

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 2018/2020 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 2021. Note this section does not identify or include projects proposed and awarded a grant in 2021. 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 2021 see Section 3.6.2 of the main report.

In 2021 there were no 319 projects with reported outputs in the Malheur 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 2021.

In 2021 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 2021.

In 2021 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 2021.

In 2021 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 two OWEB funded projects completed in 2020 with a total cash and in-kind budget of $28,526. 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-5: Summary of OWEB grant funded upland projects completed in 2020, the most recent year data is available in the OWEB OWRI database.

Subbasin	Off-channel livestock or wildlife watering (Number of treatments)
Alvord Lake	2
Donner und Blitzen	5

Table H-6: Summary of OWEB grant funded upland projects completed in 2020, the most recent year data is available in the OWEB OWRI database.

Subbasin	Upland invasive plant control (Area treated)
Harney-Malheur Lakes	9.2
Silvies	1.7

3.6 USFS Data

The US Forest Service catalogs special restoration related projects in their central database that have been provided by each National Forest. These projects differ from their standard BMPS implemented as part of their management plans (e.g. buffer widths) and include projects such as road decommissioning, large wood placement, and riparian planting, among others. DEQ has provided this information in Appendix T of this report. Please note the caveats for this restoration data within the "Caveats" section of the document.

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

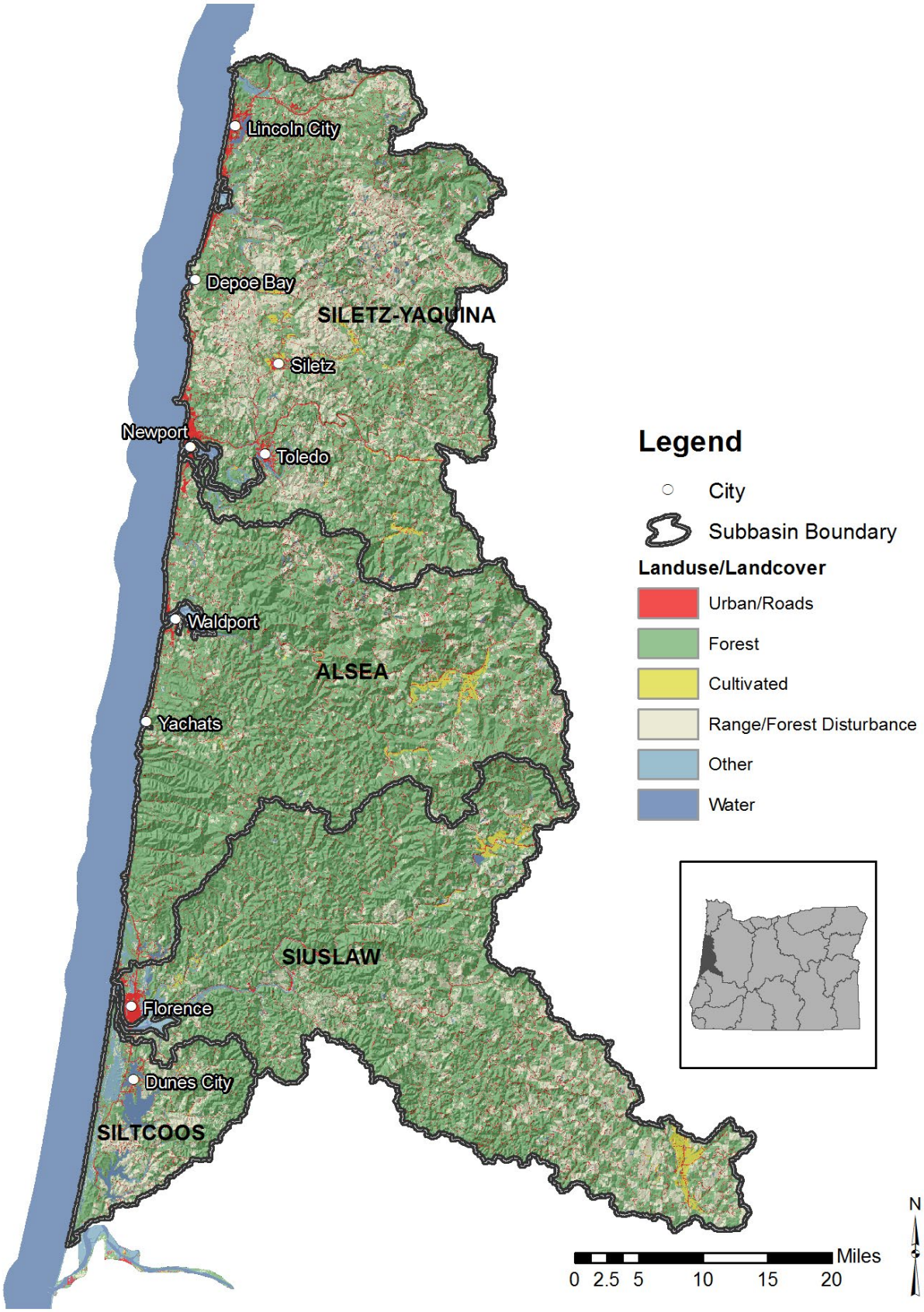
Lincoln City
Depoe Bay
SILETZ-YAQUINA
Siletz
Newport
Toledo
Waldport
ALSEA
Yachats
SIUSLAW
Florence
Dunes City
SILTCOOS
Legend
City
Subbasin Boundary
Landuse/Landcover
Urban/Roads
Forest
Cultivated
Range/Forest Disturbance
Other
Water
N
Miles
0 2.5 5 10 15 20

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 2018/2020 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 2021. Note this section does not identify or include projects proposed and awarded a grant in 2021. 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 2021 see Section 3.6.2 of the main report.

In 2021 there were no 319 projects with reported outputs in the Mid Coast.

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 2021.

In 2021 there were no nonpoint source related Clean Water State Revolving Fund projects with reported outputs in the Mid 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 2021.

In 2021 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 $127,975. Table I-5 describes the projects and the reported outputs.

Table I-5: Nonpoint source Drinking Water Source Protection program projects and outputs for 2021.

Project Name	Grantee	Project Description	Reported Outputs
Phase III - Implementing Schooner Creek Sediment Reduction (U21005)	Lincoln City	The Schooner Creek Project is a partnership between the Salmon Drift Watershed Council and Lincoln City Water District. The project will reduce sediment delivery to Lincoln City's water source by reducing road-related erosion and improving road drainage. The Schooner Creek watershed is part of the larger Siletz Bay Watershed, which is a designated wild salmon stronghold within the Oregon Coast Coho ESU providing high quality habitat for listed Oregon Coast Coho, Chinook, and chum	Completed Phase III of Schooner Creek Sediment Reduction Project including excavating and removing road slide soil from temporary storage; slope, drain, and rock rutted roadside turnouts; and research/obtain baseline water quality conditions/patterns from last 15 years.

Project Name	Grantee	Project Description	Reported Outputs
		salmon, steelhead, and Cutthroat trout.	
Post-Fire Panther Creek Turbidity Monitoring for Watershed Health Assessment and Restoration	Panther Creek Water District	Wildfire burned through approximately 25% of watershed in close proximity of the surface water intake. Project installed continuous monitoring equipment and collected water quality data to better understand impact of post-fire conditions. Data also used to identify Best Management Practices to reduce fire-induced water quality problems.	Continuous turbidity monitoring equipment installed; monitoring data collected and assessed to help characterize post-fire risks and identify appropriate management strategies to reduce vulnerability.
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 planning team, enhancing the delineation and inventory of potential contaminant sources, providing pubic education and best management practice information, and report preparation.	Yachats completed the Drinking Water Protection Plan which was subsequently approved by DEQ in August 2021.
City of Toledo Drinking Water Protection Plan	Toledo Water Utilities	Generate an enhanced potential contaminant source inventory, conduct public education, and develop a drinking water source protection plan.	In 2021, Toledo's contractor helped the City form a Drinking Water Protection Planning Team and technical advisors group. The contractor also facilitated several meetings to present and discuss risks in the drinking water source area and develop an enhanced inventory and prioritization.
Phase II - Implementing Schooner Creek Sediment Reduction (U20006)	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	Removal of waste soil stored on steep banks above the creek and trucked to the waste sites, replacement of undersized or deteriorated culverts most with new discharge flow dissapators to trap sediment, excavated and rock hardened muddy road turnouts, completed road surface improvements

Project Name	Grantee	Project Description	Reported Outputs
		water intake. Actions for 2019 will to reduce sediment include road drainage and surface improvements, and road segment stabilization.	

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 2021.

In 2021 there was one Drinking Water Providers Partnership project active that reported project outputs and accomplishments to the DWPP. Combined the projects have a total budget of $50,000. Table I-6 describes the project and the reported outputs.

Table I-6: Drinking Water Providers Partnership projects and outputs for 2021.

Project Name	Grantee	Project Description	Reported Outputs
Implementing Schooner Creek Sediment Reduction Projects	Salmon Drift Creek WS Council	The Salmon Drift Creek Watershed Council and Lincoln City Water District will alleviate stream sediment risks from culverts prone to plugging, from road cut bank failures, and from muddy road turnouts. Activities include replacing 1 culvert, installing 2 new culverts and adding dissipaters at several culverts. This is Phase III of implementing actions identified from the 2017 Sediment Reduction Project report, previously supported by DWPP funding.	In 2021, the SWCD completed tne project work including the following tasks: replaced 7 existing culverts with rock dissipaters, installed 4 new culverts all with rock dissipaters at their discharge end, installed rock dissipaters at 14 culverts that were install in the previous projects, harden several roadside pull-offs where mud and sediment are created by vehicles when they pull into these areas, harden a large the school bus roadside turnaround, harden access road to waste disposal area with 3 loads of gravel, and graded over new culverts to blend with existing roadway with 4 loads of gravel. Funding also provided a project management consultant

Project Name	Grantee	Project Description	Reported Outputs
			and contractor. This project is also funded by a Drinking Water Source Protection Fund adn Siuslaw National Forest Stewardship grants.

Figure I-2: Photos provided by Salmon Drift Creek Watershed Council for the Schooner Creek Phase III project.
Left Photo: Undersized culvert at Mile Post 6.69 (before) Right Photo: New 3' culvert on left next to existing culvert with new rip-rap wind walls. Water discharged from culverts impinges on rock disippator to slow flow and allow sediment in discharge water to settle before the water enters the creek.

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 12 OWEB funded projects completed in 2020 with a total cash and in-kind budget of $1,458,628. 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-7: Summary of OWEB grant funded fish passage projects completed in 2020, the most recent year data is available in the OWEB OWRI database.

Subbasin	Fish Passage Crossing improvement (Number of treatments)
Siletz-Yaquina	1

Table I-8: Summary of OWEB grant funded instream projects completed in 2020, the most recent year data is available in the OWEB OWRI database.

Subbasin	Instream habitat: Large wood placement (Number of treatments)
Siletz-Yaquina	248
Siuslaw	681

Table I-9: Summary of OWEB grant funded riparian projects completed in 2020, 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	1	1

Table I-10: Summary of OWEB grant funded upland projects completed in 2020, the most recent year data is available in the OWEB OWRI database.

Subbasin	Nutrient/manure management (Acre)	Nutrient/manure management (Number of treatments)
Siletz-Yaquina	0.1	1

Table I-11: Summary of OWEB grant funded upland projects completed in 2020, the most recent year data is available in the OWEB OWRI database.

Subbasin	Upland invasive plant control (Area treated)
Siletz-Yaquina	10

Table I-12: Summary of OWEB grant funded instream projects completed in 2020, the most recent year data is available in the OWEB OWRI database.

Subbasin	Wetland invasive plant control (Area treated)
Siletz-Yaquina	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 2021.

Table I-13: TMDL implementation activities reported in 2021 by Designated Management Agencies or third parties.

TMDL	DMA	Reported Actions
Temperature	Portland General Electric	To address the reduction in sediment supply below River Mill Dam, PGE implements a gravel augmentation program below the dam to help alleviate the tempeature impacts created by low alluvial sediment in the river. Each year they place gravel on the streambank, timed with a seasonal high flow event to be captured and moved downstream.

3.7 USFS Data

The US Forest Service catalogs special restoration related projects in their central database that have been provided by each National Forest. These projects differ from their standard BMPS implemented as part of their management plans (e.g. buffer widths) and include projects such as road decommissioning, large wood placement, and riparian planting, among others. DEQ has provided this information in Appendix T of this report. Please note the caveats for this restoration data within the “Caveats” section of the document.

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

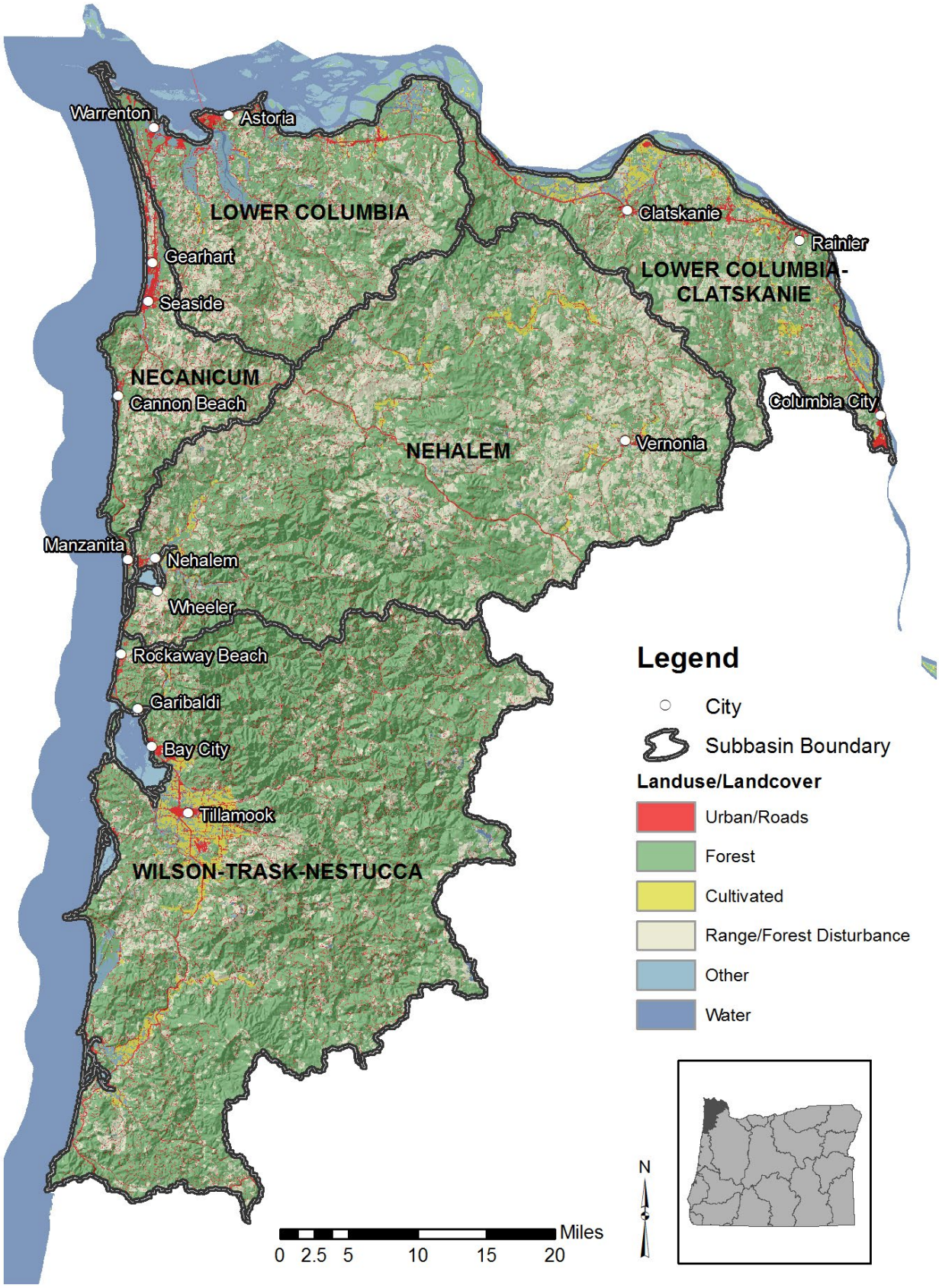
Warrenton
Astoria
LOWER COLUMBIA
Clatskanie
Rainier
Gearhart
LOWER COLUMBIA-
CLATSKANIE
Seaside
NECANICUM
Cannon Beach
Columbia City
NEHALEM
Vernonia
Manzanita
Nehalem
Wheeler
Rockaway Beach
Garibaldi
Bay City
Tillamook
WILSON-TRASK-NESTUCCA
Legend
City
Subbasin Boundary
Landuse/Landcover
Urban/Roads
Forest
Cultivated
Range/Forest Disturbance
Other
Water
N
0 2.5 5 10 15 20
Miles

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 2018/2020 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

Parameter	Assessment units without a TMDL	Assessment units with a TMDL
Fecal Coliform	4	42
Iron (total)	4	0
Methylmercury	3	0
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

TMDL Document Name	Impairments Addressed
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 2021. Note this section does not identify or include projects proposed and awarded a grant in 2021. 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 2021 see Section 3.6.2 of the main report.

In 2021 there were no 319 projects with reported outputs in the North Coast.

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 2021.

In 2021 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 2021.

In 2021 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 $160,000. Table J-5 describes the projects and the reported outputs.

Table J-5: Nonpoint source Drinking Water Source Protection program projects and outputs for 2021.

Project Name	Grantee	Project Description	Reported Outputs
Henry Creek Source Water Protection Planning and Conservation Easement Evaluation	Rhododendron Water Association	Develop & acquire conservation easements within sensitive portion of watershed. Objective is to purchase or otherwise protect timberland along Henry Creek, just upstream from the water system intake. Funds are to be used to compensate for timber that will not be harvested and for the perpetual nature of the easement agreement.	The original grant was contracted to explore property acquisition potential of privately held properties. Landowners were either non-responsive or not willing to sell until property changed hands in 2021. In 2021, Rhododendron applied for and received a $100K emergency loan/grant from the DWSRF to assist in purchasing conservation easements along Henry Creek. The funding paid for a portion of negotiated no cut buffers as a conservation easement on private timber land that spans Henry Creek. Funds used to compensate for timber that will not be harvested and for the perpetual nature of the easement agreement. The remaining balance of the 2019 DWSPF grant ($17K) was also applied to conservation easement funding in 2021 and the water system is also working to fund a $75K bridge loan that Craft3 is holding for them.
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	Finalized due diligence work and completed a forest management plan that was reviewed by DEQ. Proceeded towards land purchase with $2 million in funding from 2021 Legislative Session (HB 5006,

Project Name	Grantee	Project Description	Reported Outputs
		to maintain water quality and quantity.	ARPA) and $3.5 million from USDA Forest Service Land and Water Conservation Fund (LWCF) (Forest Legacy' program).

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 2021.

In 2021 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 19 OWEB funded projects completed in 2020 with a total cash and in-kind budget of $2,830,306. 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-6: Summary of OWEB grant funded fish passage projects completed in 2020, the most recent year data is available in the OWEB OWRI database.

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

Table J-7: Summary of OWEB grant funded instream projects completed in 2020, the most recent year data is available in the OWEB OWRI database.

Subbasin	Stream bank stabilized (Miles)
Lower Columbia	0

Table J-8: Summary of OWEB grant funded instream projects completed in 2020, the most recent year data is available in the OWEB OWRI database.

Subbasin	Instream habitat: Large wood placement (Number of treatments)	Instream habitat: Structure placement (Number of treatments)
Lower Columbia	NA	8
Nehalem	223	NA

Table J-9: Summary of OWEB grant funded riparian projects completed in 2020, 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)
Necanicum	27.5	2	3.5
Wilson-Trask-Nestucca	2.1	3	0.8

Table J-10: Summary of OWEB grant funded road projects completed in 2020, the most recent year data is available in the OWEB OWRI database.

Subbasin	Road decommission (1 station or 100 Feet)
Nehalem	15.5

Table J-11: Summary of OWEB grant funded upland projects completed in 2020, the most recent year data is available in the OWEB OWRI database.

Subbasin	Upland invasive plant control (Area treated)	Upland vegetation planting (Area treated)
Lower Columbia	0.2	0
Nehalem	0.3	NA

3.6 USFS Data

The US Forest Service catalogs special restoration related projects in their central database that have been provided by each National Forest. These projects differ from their standard BMPS implemented as part of their management plans (e.g. buffer widths) and include projects such as road decommissioning, large wood placement, and riparian planting, among others. DEQ has provided this information in Appendix T of this report. Please note the caveats for this restoration data within the "Caveats" section of the document.

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
Upper Quinn	1400	0.4	0.5	0.1	97.0	2.0

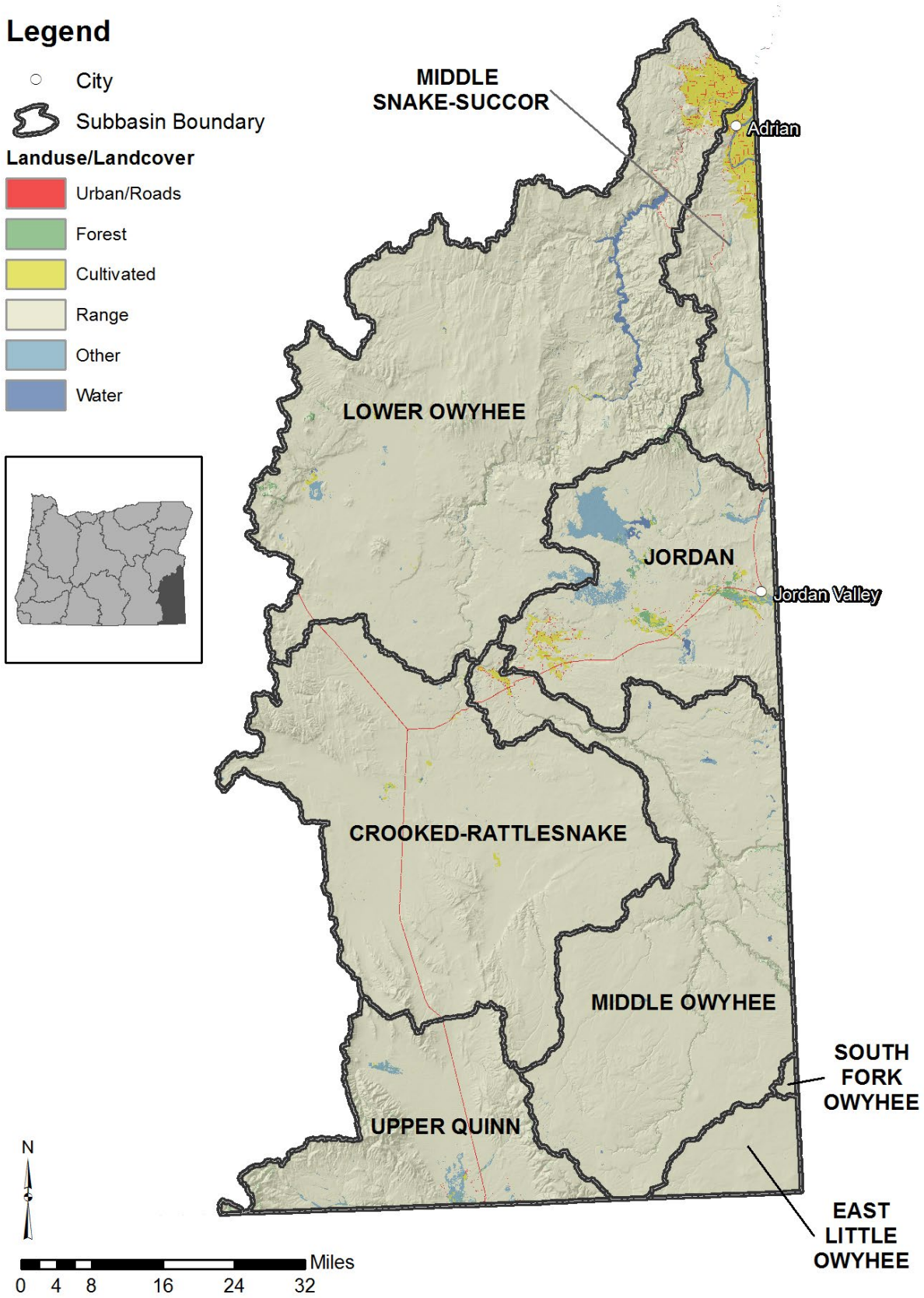
Legend
City
Subbasin Boundary
Landuse/Landcover
Urban/Roads
Forest
Cultivated
Range
Other
Water
MIDDLE SNAKE-SUCCOR
Adrian
LOWER OWYHEE
JORDAN
Jordan Valley
CROOKED-RATTLESNAKE
MIDDLE OWYHEE
SOUTH FORK OWYHEE
UPPER QUINN
EAST LITTLE OWYHEE
N
Miles
0 4 8 16 24 32

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: 541-241-0075: john.dadoly@deq.oregon.gov

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 2018/2020 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

Parameter	Assessment units without a TMDL	Assessment units with a TMDL
pH	1	0
Phosphorus	1	0
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 2021. Note this section does not identify or include projects proposed and awarded a grant in 2021. 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 2021 see Section 3.6.2 of the main report.

In 2021 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 2021.

In 2021 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 2021.

In 2021 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 2021.

In 2021 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 2020 with a total cash and in-kind budget of $1,308,115. 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 instream projects completed in 2020, the most recent year data is available in the OWEB OWRI database.

Subbasin	Instream habitat: Large wood placement (Number of treatments)
Crooked-Rattlesnake	550

Table K-5: Summary of OWEB grant funded riparian projects completed in 2020, the most recent year data is available in the OWEB OWRI database.

Subbasin	Riparian invasive plant control (Length of treatment)
Jordan	0

Table K-6: Summary of OWEB grant funded upland projects completed in 2020, the most recent year data is available in the OWEB OWRI database.

Subbasin	Irrigation system improvement (Acre)	Irrigation system improvement (Feet)	Water/sediment control basins (Acre)	Water/sediment control basins (Number of treatments)
Jordan	258	8040	NA	NA
Lower Owyhee	102	1660	3.5	1

Table K-7: Summary of OWEB grant funded upland projects completed in 2020, 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)
Crooked-Rattlesnake	NA	350	3.8
Jordan	NA	1500	1.0
Middle Snake-Succor	4	NA	NA

Table K-8: Summary of OWEB grant funded upland projects completed in 2020, the most recent year data is available in the OWEB OWRI database.

Subbasin	Upland invasive plant control (Area treated)	Upland vegetation planting (Area treated)
Jordan	3181.6	18

3.6 USFS Data

The US Forest Service catalogs special restoration related projects in their central database that have been provided by each National Forest. These projects differ from their standard BMPS implemented as part of their management plans (e.g. buffer widths) and include projects such as road decommissioning, large wood placement, and riparian planting, among others. DEQ has provided this information in Appendix T of this report. Please note the caveats for this restoration data within the "Caveats" section of the document.

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

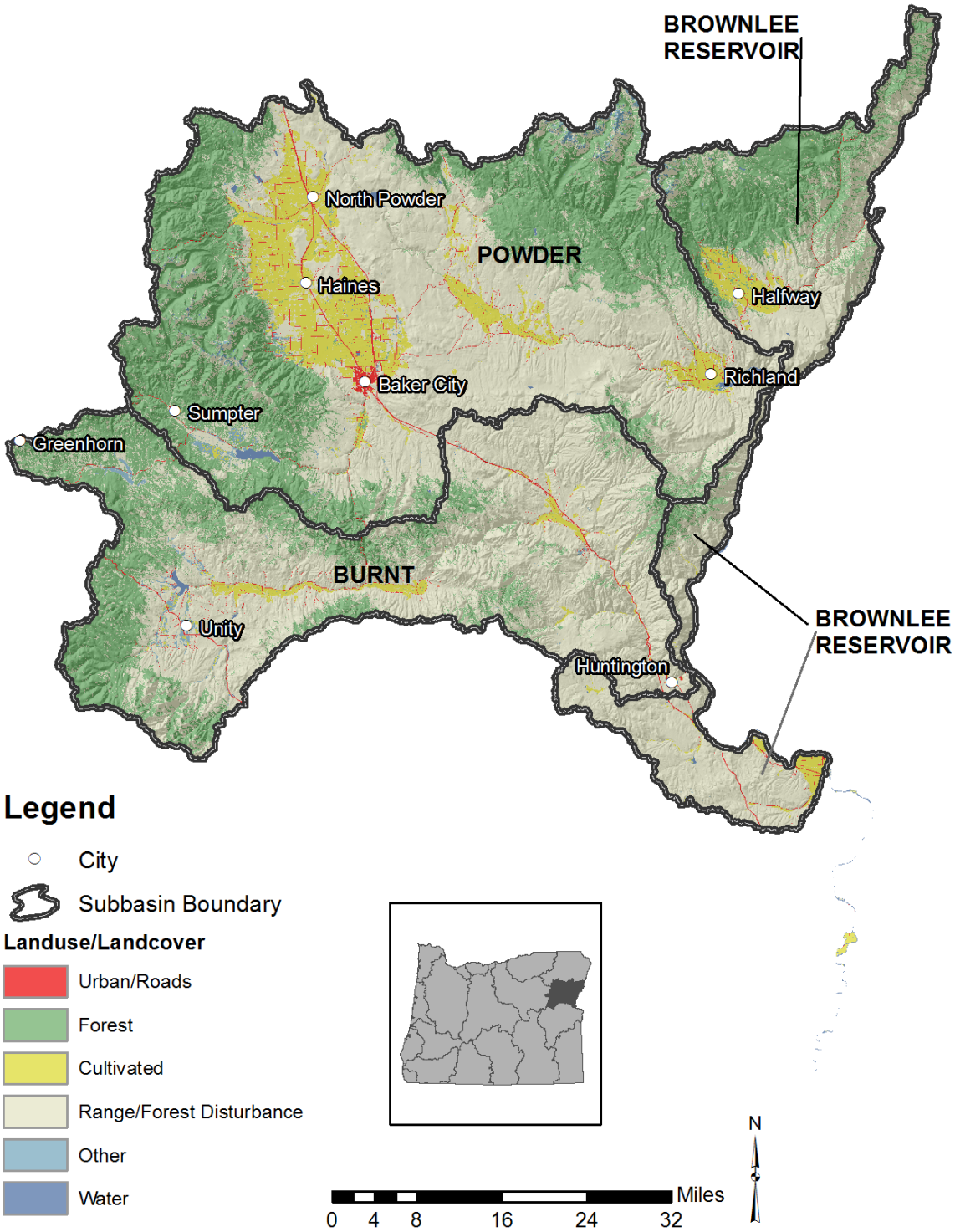

Figure L-1: Land use in the Powder administrative basin.

1.1 Basin Contacts

Table L-2: Oregon DEQ basin contact.

Administrative Area	DEQ Basin Coordinator
Powder River Basin	John Dadoly: 541-241-0076: john.dadoly@deq.oregon.gov

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 2018/2020 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

Parameter	Assessment units without a TMDL	Assessment units with a TMDL
Temperature	60	2
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 2021. Note this section does not identify or include projects proposed and awarded a grant in 2021. 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 2021 see Section 3.6.2 of the main report.

In 2021 there were no 319 projects with reported outputs in the Powder.

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 2021.

In 2021 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 2021.

In 2021 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 2021.

In 2021 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 11 OWEB funded projects completed in 2020 with a total cash and in-kind budget of

$1,258,550. 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-4: Summary of OWEB grant funded upland projects completed in 2020, the most recent year data is available in the OWEB OWRI database.

Subbasin	Irrigation system improvement (Acre)
Brownlee Reservoir	80
Powder	532

Table L-5: Summary of OWEB grant funded upland projects completed in 2020, 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)
Burnt	2216	8	2216	3.4
Powder	NA	9	NA	NA

Table L-6: Summary of OWEB grant funded upland projects completed in 2020, the most recent year data is available in the OWEB OWRI database.

Subbasin	Upland invasive plant control (Area treated)
Powder	99.2

3.6 USFS Data

The US Forest Service catalogs special restoration related projects in their central database that have been provided by each National Forest. These projects differ from their standard BMPS implemented as part of their management plans (e.g. buffer widths) and include projects such as road decommissioning, large wood placement, and riparian planting, among others. DEQ has provided this information in Appendix T of this report. Please note the caveats for this restoration data within the “Caveats” section of the document.

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

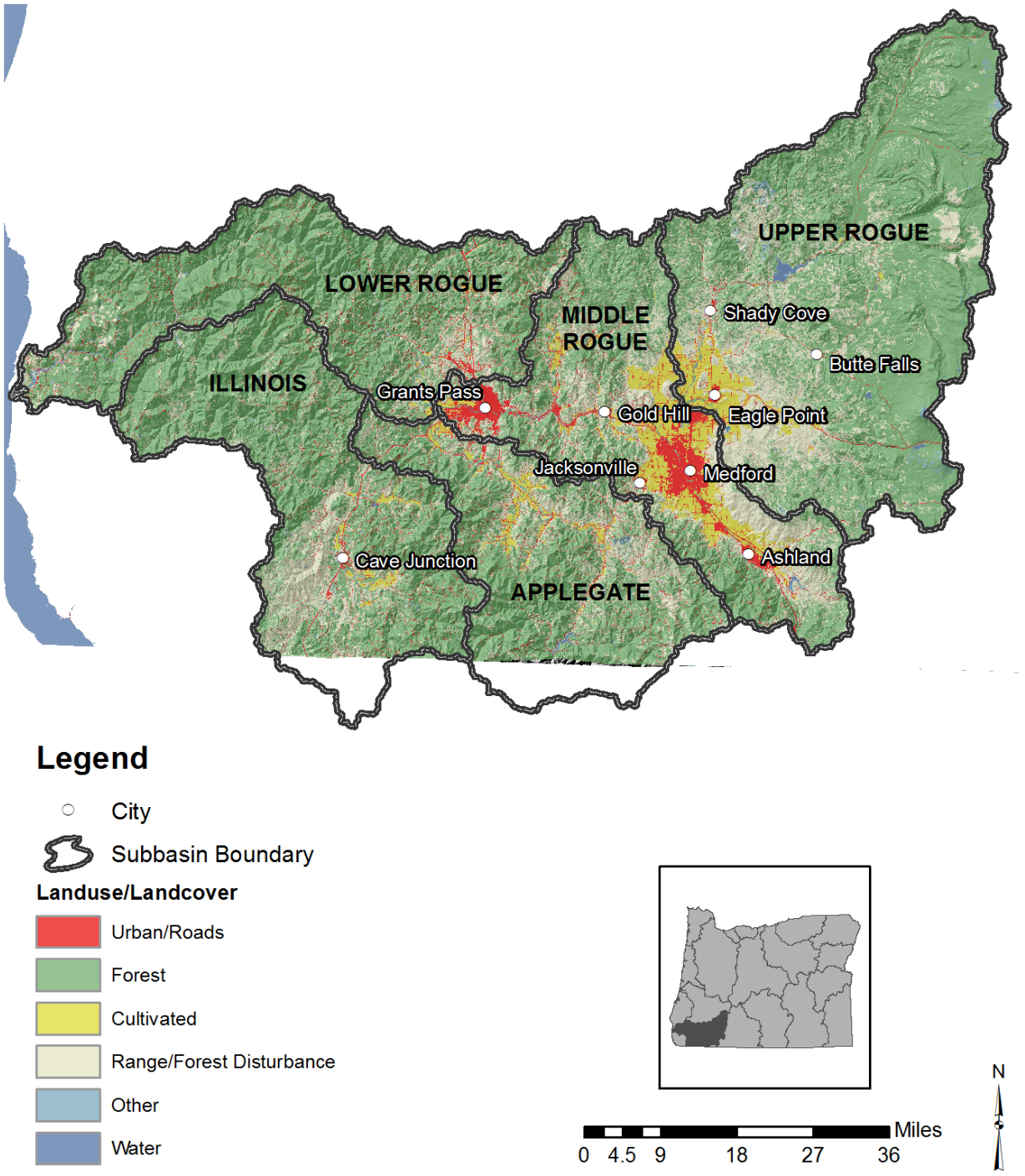

Figure M-1: Land use in the Rogue administrative basin.

1.1 Basin Contacts

Table M-2: Oregon DEQ basin contact.

Administrative Area	DEQ Basin Coordinator
Rogue Basin	Bill Meyers: 541-776-6272: bill.meyers@deq.oregon.gov
Rogue Basin	Sarah Sauter: 541-774-5906: sarah.sauter@deq.oregon.gov

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 2018/2020 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 2021. Note this section does not identify or include projects proposed and awarded a grant in 2021. 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 2021 see Section 3.6.2 of the main report.

In 2021, there were two 319 projects active that reported project outputs and accomplishments to DEQ. Combined the projects have a total grant budget of NA. Table M-5 describes the projects and the reported outputs.

Table M-5: Project outputs reported in 2021 for Section 319 pass through grants.

Project Name	Grantee	Project Description	Reported Outputs
Bear Creek TMDL Effectiveness Monitoring Analysis	NA	NA	NA
Antelope and Little Butte Creek WQ Improvement Project	Jackson Co SWCD	This project is part of a much larger, multi-year watershed effort to improve water quality in streams and rivers impacted by agricultural irrigation runoff. In this project, 129 acres will be placed under pivot irrigation, a highly efficient and effective irrigation system, in order to prevent runoff. In previous years, approximately two-thirds of the runoff from this field dumped directly into Antelope Creek, a tributary of Little Butte Creek. The other third first emptied into an irrigation canal and was re-used to flood irrigate another property prior to emptying into Quarter Creek, which is a tributary of Antelope Creek just upstream of where Antelope Creek empties in Little Butte Creek. Although 77 acres of the field were planted into hemp last year, as the landowner transitions back to hay due to a declining hemp market, the goal is to ensure the land stays under a highly efficient irrigation system that prevents runoff and protects water quality in nearby waterways.	
The proposed management activity is to convert this field	to a pivot irriga	tion system. Pivot irrigation systems are highly efficient and allow high-level irrigation water management. They are also a much more permanent system than other options, which helps ensure the benefits of the conversion are long-lasting. Property designed and managed sprinkler irrigation systems completely eliminate tailwater returns because the application rate matches soil infiltration rate, which prevents polluted water from returning to the stream – resulting in improved water quality. A flow meter is already installed at the head gate, so Jackson SWCD can measure flow rate and volume onto the field.	

Project Name	Grantee	Project Description	Reported Outputs
The goal of the project is to improve water quality in th	ese important wate	rbodies by eliminating tailwater runoff. Still waiting for the final report. Most of the project was completed in 2021.	

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 2021.

In 2021 there were no nonpoint source related Clean Water State Revolving Fund projects with reported outputs in the Rogue.

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 2021.

In 2021 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 $142,553. Table M-6 describes the projects and the reported outputs.

Table M-6: Nonpoint source Drinking Water Source Protection program projects and outputs for 2021.

Project Name	Grantee	Project Description	Reported Outputs
Rogue Basin Post-Fire Watershed Monitoring for Drinking Water Protection	City of Grants Pass	Two wildfires burned through portions of the Rogue watershed in 2020, the Obenchain fire in an undeveloped area and Almeda fire in a commercial/residential area. This project is designed to install monitoring equipment, collect and analyze grab samples to share data	In 2021, the partners contracted with Business Oregon and purchased monitoring equipment.

Project Name	Grantee	Project Description	Reported Outputs
		among local partners to gain a better understanding of post-fire impacts and conditions and to help prioritize areas for water quality restoration.	
North Ashland Drinking Water Protection Plan Phase I and II	Bear Creek MHP (00050)	Address regional elevated nitrate concentrations and coliform detections by developing a preliminary drinking water protection plan including formation of a drinking water protection team, enhancing the inventory of potential contaminant sources, providing pubic education and best management practice information, and a contingency plan.	Drinking water protection planning team met several times in 2021 to identify and prioritize risks, discuss management strategies, and discuss and develop emergency response and contingency plan actions. Plan was completed and DEQ certified the plan.
Rogue Drinking Water Partnership Spill Prevention & Response	Medford Water Commission	Develop a Geographic Response Plan for drinking water source areas in the Middle and Upper Rogue Basin to help reduce the impacts of hazardous or toxic spills. Tasks include: identify data gaps and gather spatial data; conduct emergency response and hazard assessment GIS risk analysis; hold stakeholder workshop and identify critical at-risk resources; develop site-specific spill response strategies and priorities; develop a prototype geographic response plan; and conduct local emergency response training and/or drills.	In 2021, the partners focused on identifying data gaps and gathering spatial data, analyzing hazard risks, and establishing relationships including seeking stakeholder input from emergency responders, landowners, agencies, and river users. The next phase, to be completed in 2022, will include an emergency response and hazard assessment, a GIS risk analysis, and development of relevant maps. A stakeholder workshop will be held in spring, 2022.

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 2021.

In 2021 there was one Drinking Water Providers Partnership project active that reported project outputs and accomplishments to the DWPP. Combined the projects have a total budget of $50,000. Table M-7 describes the project and the reported outputs.

Table M-7: Drinking Water Providers Partnership projects and outputs for 2021.

Project Name	Grantee	Project Description	Reported Outputs
S Fk Little Butte RM 7.6 Ecological Restoration	Rogue River Watershed Council	The Rogue River Watershed Council and Medford Water Commission will enhance secondary stream channels; place large wood in strategic locations, rehabilitate riparian forest, and construct wildlife-friendly livestock exclusion fence near river mile 7.6. These actions will restore stream processes and floodplain interaction that improve water quality, stream temperature and fish habitat.	In 2021, the project partners enhanced 0.35 miles of winter, secondary channels; placed large wood at 12 strategic locations throughout 0.65 miles of the project length; rehabilitated of 9.4 acres of riparian forest to recover the native plant community through noxious weed control, natural recruitment of native species, and planting of native nursery stock; and constructed 700 linear feet of wildlife-friendly livestock exclusion fence to add to the existing 0.4 miles of fence to protect the riparian forest and creek and expand the riparian buffer.

Figure M-2: Example of large wood placement on South Fork Little Butte Creek

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 13 OWEB funded projects completed in 2020 with a total cash and in-kind budget of $1,427,681. 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-8: Summary of OWEB grant funded fish passage projects completed in 2020, the most recent year data is available in the OWEB OWRI database.

Subbasin	Fish Passage Crossing improvement (Number of treatments)
Middle Rogue	1

Table M-9: Summary of OWEB grant funded instream projects completed in 2020, the most recent year data is available in the OWEB OWRI database.

Subbasin	Stream bank stabilized (Miles)
Lower Rogue	0

Table M-10: Summary of OWEB grant funded instream projects completed in 2020, the most recent year data is available in the OWEB OWRI database.

Subbasin	Instream habitat: Boulder placement (Number of treatments)	Instream habitat: Large wood placement (Number of treatments)	Instream habitat: Structure placement (Number of treatments)
Applegate	55	24	NA
Upper Rogue	NA	268	2

Table M-11: Summary of OWEB grant funded riparian projects completed in 2020, the most recent year data is available in the OWEB OWRI database.

Subbasin	Riparian fencing (Area treated)	Riparian fencing (Stream sides treated)
Upper Rogue	21	1

Table M-12: Summary of OWEB grant funded riparian projects completed in 2020, 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)
Applegate	NA	0.2	NA	NA	NA
Lower Rogue	0.5	NA	1	0.1	1

Table M-13: Summary of OWEB grant funded road projects completed in 2020, the most recent year data is available in the OWEB OWRI database.

Subbasin	Road decommission (1 station or 100 Feet)
Illinois	10

Table M-14: Summary of OWEB grant funded upland projects completed in 2020, the most recent year data is available in the OWEB OWRI database.

Subbasin	Irrigation system improvement (Acre)
Upper Rogue	51

Table M-15: Summary of OWEB grant funded upland projects completed in 2020, 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)
Illinois	7.0	0.5	0.2
Lower Rogue	4.9	NA	NA

3.6 TMDL Implementation Highlights

TMDL implementation actions taken by Designated Management Agencies (DMAs) or third parties are described in the table below. Most of these actions were summarized from annual reports submitted by DMAs to DEQ in calendar year 2021.

Table M-16: TMDL implementation activities reported in 2021 by Designated Management Agencies or third parties.

TMDL	DMA	Reported Actions
Rogue River Basin	City of Butte Falls	The Rogue Basin DMAs continue to work together to implement clean water projects across the watershed. In 2021 Butte Falls continues to collect water quality samples from Hukil Creek, Butte Creek and Ginger Creek to ensure that this small community is not a source of water quality impacts to local creeks. Testing includes total coliform, E-coli, pH, dissolved oxygen, and chlorine residual. Year-round land application has been granted for treated waste water to further protect Big Butte Creek for accidental releases from outflow #001. Storm drains in this small town have all been labelled.
Rogue River Basin	City of Cave Junction	The Rogue River Basin DMAs continue to work together to implement clean water projects across the watershed. Back in 2020 the city began to implement an LID manual - implementation continues in 2021. The city has also implemented a stormwater fee program which will provide minimal funding to their very small stormwater program. Street sweeper covered over 140 miles of streets within the city and collected 25 tons of debris. Maintained 3 dog poop stations in parks and provided over 500 bags
Rogue River Basin	Curry County	The Rogue Basin DMAs continue to work together to implement clean water projects across the watershed. Highlights for 2021 Curry County include the riparian restoration project on Wilson Creek in the Harbor area triggered by the CCZO riparian requirements. The county also hired and additional code enforcement officer in 2020 and they continue to aid in code violation inspections and follow-up.
Rogue River Basin	City of Eagle Point	The Rogue Basin DMAs continue to work together to implement clean water projects across the watershed. In 2021 although Covid-19 has eliminated all in-person meetings the city has maintained and increased electronics and written opportunities for education and outreach. This includes letters to council and the community (Friday Letter). City website also links to Stream Smart.

TMDL	DMA	Reported Actions
Rogue River Basin	Eagle Point Irrigation District	The Rogue Basin DMAs continue to work together to implement clean water projects across the watershed. In 2021 the irrigation district reached out to its 541 patrons via newsletter to offer trips, discuss water quality and the TMDL requirements. District was able to clean and repair leaks and remove invasive species along 125 mile of ditch, clean 29 headgates and 725 feet of pipe was installed resulting in less leakage and improved water quality. The district's website continues to provide information to the public. Work with Jackson County watermaster regarding measuring devices that will assist with water quality and quantity
Rogue River Basin	City of Gold Beach	The Rogue Basin DMAs continue to work together to implement clean water projects across the watershed. In 2021 the City of Gold Beach 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 collaborates with the Lower Rogue Watershed Council and OSU Extension Service of Gold Beach to monitor and maintain water quality and reports to DEQ annually. The City of Gold Beach Public Works prides itself on the consistent street sweeping which cleans up our streets and catches various debris before it has a chance to enter any waterways. City and Gold Beach Main Street recently coordinated the annual SOLV beach cleanup. The City houses and co-sponsors the employment of the Business Outreach Coordinator for GBMS. The beach cleanup helps remove a large amount of debris and garbage from the beach that could otherwise enter the Rogue River in a storm event.
Rogue River Basin	City of Gold Hill	The Rogue DMAs continue to work together to implement clean water projects across the watershed. 2021 highlights for Gold Hill include receiving staff training for implementing new systems and procedures for stormwater maintenance, removing 11 acres of blackberries form the Sports Park area, cleaning up litter in Beach Park making it less inviting to transients who camp and litter the beach, maintaining all pet waste stations.
Rogue River Basin	City of Grants pass	The Rogue River TMDL DMAs continue to work together to implement clean water projects across the watershed. In 2021 the City of Grants Pass worked with Dutch Brothers crews to manages invasive species along the Rogue River (41 attendees), identified and prioritized 10 new sites along the Rogue River for Restoration, provided support to volunteers who removed 15 cubic yards of trash from the river, continues to promote and participate in the salmon watch program, and logged restoration sites on Survey 1-2-3. The city also continues to promote the Stream Smart program via the website and newsletters.
Rogue River Basin	Grants Pass Irrigation District	This DMA continues to work together to implement clean water projects across the watershed. Highlights reported by Grants Pass Irrigation District for the 2020-2021 reporting period: Highline Lateral- Jerome Prairie Siphon- 88' of 18" PVC Pipe to replace pipe that was seeping resulting in water quantity and quality benefits.

TMDL	DMA	Reported Actions
		Gravity- 3325 Upper River Rd- installed 160' of 6" PVC Pipe installed from the North side of Upper River Road to the South side of Upper River Rd under the road by saw cutting the asphalt. $14,485.44 this was a major repair. The District maintains and open door policy with patrons to discuss any issues including water quality. Ditch walkers are also available to answer any questions patrons or the public may have.
Rogue River Basin	Jackson County	The Bear Creek DMAs continue to work together to implement clean water projects across the watershed. In 2021 Jackson County focused Coordinated 2,819 volunteer hours for volunteers performing erosion control, riparian cleanup, and restoration activities following the catastrophic Almeda Fire. 40,000 pounds of restoration seed mix was spread along Bear Creek banks, 784 bales of weed free straw were dispersed, and four miles of wattles were installed as part of erosion control. 152 bags of trash and miscellaneous items including tires, appliances, mattresses, and furniture were picked up from the Bear Creek Greenway (mostly in the riparian area) and disposed of at the dump.
Rogue River Basin	Josephine County	The Rogue DMAs continue to work together to implement clean water projects across the watershed. Highlights from 2021 from Josephine County Public Works include: followed up on 15 enforcement actions related to watershed protection and addressed the issues identified in the complaints. The county also sponsored the Rogue River clean-up on 5/25/21 and promoted the event and outreach in the Grants Pass Daily Courier.
Rogue River Basin	City of Rogue River	Rogue Basin DMAs continue to work together to implement clean water projects across the watershed. 2021 highlights as reported by the City of Rogue River included street sweeping the entire town every 3 weeks throughout the year. Disposed of almost 100 tons of debris. Annual cleaning of storm drains and catch basins with a vac truck. River Ranger Presentation to counsel members 5/20/21. Made every attempt to present River Rangers in the school but were unable to due to COVID restrictions and distance learning. Leaf pick up Nov & Dec 2021. Information and notices re: water quality and conservation sent out in monthly newsletter and annual CCR. Maintained 6 public Pet Waste Stations and re-stocked over 62,000 bags. New water quality signage at Fleming Park.

3.7 USFS Data

The US Forest Service catalogs special restoration related projects in their central database that have been provided by each National Forest. These projects differ from their standard BMPS implemented as part of their management plans (e.g. buffer widths) and include projects such as road decommissioning, large wood placement, and riparian planting, among others. DEQ has provided this information in Appendix T of this report. Please note the caveats for this restoration data within the "Caveats" section of the document.

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

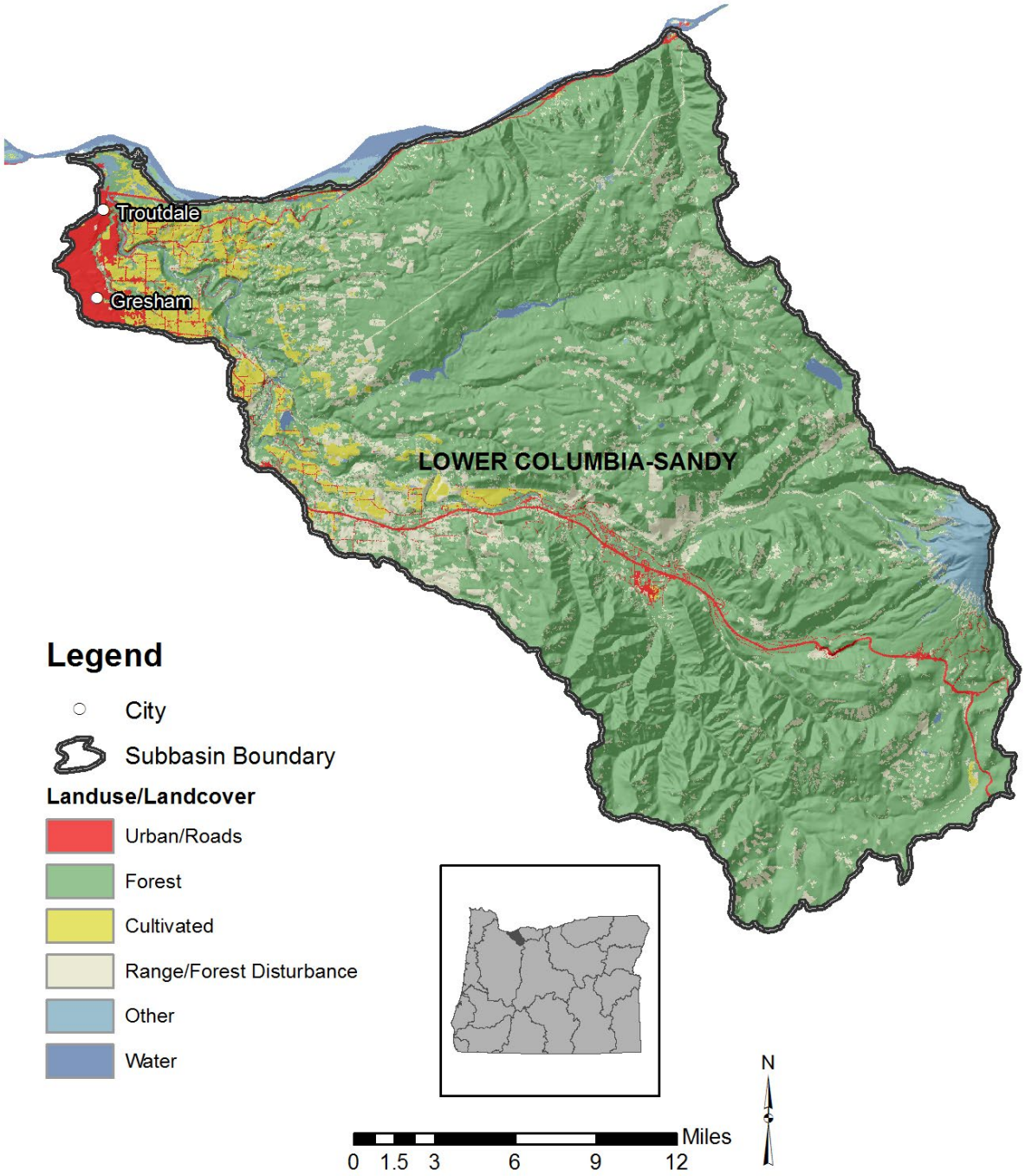

Figure N-1: Land use in the Sandy administrative basin.

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 2018/2020 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

Parameter	Assessment units without a TMDL	Assessment units with a TMDL
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 2021. Note this section does not identify or include projects proposed and awarded a grant in 2021. 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 2021 see Section 3.6.2 of the main report.

In 2021 there were no 319 projects with reported outputs in the Sandy.

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 2021.

In 2021 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 2021.

In 2021 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 2021.

In 2021 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 was one OWEB funded project completed in 2020 with a total cash and in-kind budget of $3,800,000. 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-5: Summary of OWEB grant funded fish passage projects completed in 2020, the most recent year data is available in the OWEB OWRI database.

Subbasin	Fish Passage Crossing improvement (Number of treatments)
Lower Columbia-Sandy	1

Table N-6: Summary of OWEB grant funded urban projects completed in 2020, the most recent year data is available in the OWEB OWRI database.

Subbasin	Sustainable stormwater management (Area treated)	Sustainable stormwater management (Number of treatments)
Lower Columbia-Sandy	2.1	11

3.6 USFS Data

The US Forest Service catalogs special restoration related projects in their central database that have been provided by each National Forest. These projects differ from their standard BMPS implemented as part of their management plans (e.g. buffer widths) and include projects such as road decommissioning, large wood placement, and riparian planting, among others. DEQ has provided this information in Appendix T of this report. Please note the caveats for this restoration data within the "Caveats" section of the document.

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

Subbasin	Watershed Area (km2)	% Urban/Roads	% Forest	% Cultivated	% Range/Forest Disturbance	%Other
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

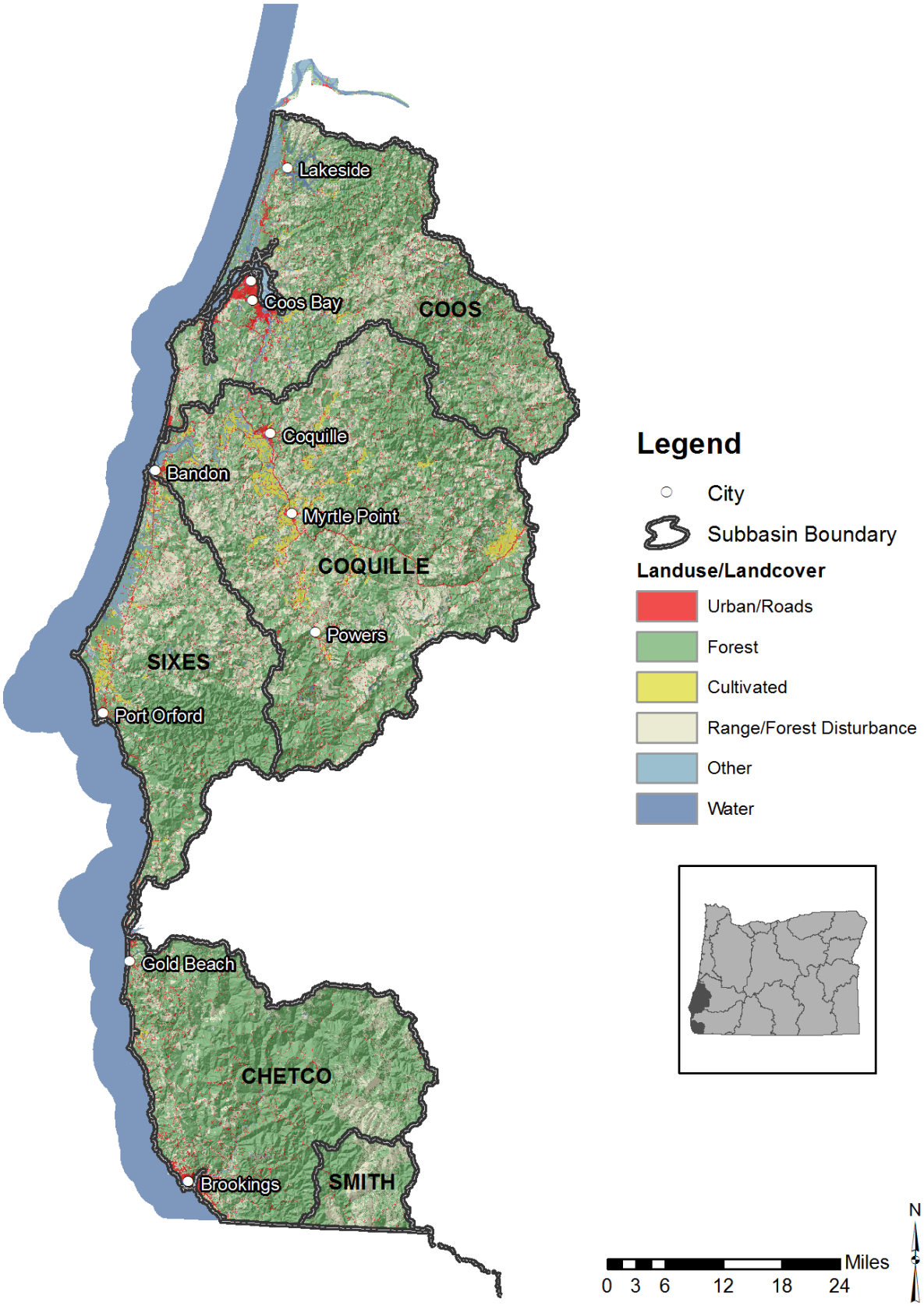
Lakeside
Coos Bay
COOS
Coquille
Bandon
Myrtle Point
COQUILLE
Powers
SIXES
Port Orford
Gold Beach
CHETCO
Brookings
SMITH
Legend
City
Subbasin Boundary
Landuse/Landcover
Urban/Roads
Forest
Cultivated
Range/Forest Disturbance
Other
Water
N
Miles
0 3 6 12 18 24

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: 503-367-3400: bryan.duggan@deq.oregon.gov
South Coast Basin	Heather Tugaw: 503-702-0812: heather.tugaw@deq.oregon.gov

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 2018/2020 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

Parameter	Assessment units without a TMDL	Assessment units with a TMDL
Methylmercury	4	0
pH	6	0
Sedimentation	0	6
Shellfish Toxins	56	0
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 2021. Note this section does not identify or include projects proposed and awarded a grant in 2021. 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 2021 see Section 3.6.2 of the main report.

In 2021 there were no 319 projects with reported outputs in the South Coast.

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 2021.

In 2021 there were no nonpoint source related Clean Water State Revolving Fund projects with reported outputs in the South 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 2021.

In 2021 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 $90,000. Table O-5 describes the projects and the reported outputs.

Table O-5: Nonpoint source Drinking Water Source Protection program projects and outputs for 2021.

Project Name	Grantee	Project Description	Reported Outputs
Watershed Invasive Species Management and Control	City of Port Orford (00670)	City of Port Orford is partnering with the Port Orford Watershed Council, Curry Wildfire Preparation Team, the South Coast Watershed Council, the Curry Soil Water Conservation District, and other partners, to eradicate invasive gorse and replant trees and native shrubs in strategic areas of the North Fork Hubbard Creek	In Spring 2021, Curry SWCD received Legislative Emergency Board (E-Board) funding through the Oregon Department of Forestry (ODF) to reduce gorse fuels in Curry County. These funds were used to supplement (match) treatment work related to the ongoing control efforts and the actions expected to be included in

Project Name	Grantee	Project Description	Reported Outputs
		watershed. Overall this project will treat approximately 256 acres of city owned property and will help prevent the spread of gorse and potential wildfire in the drinking water source area. Work specifically funded by the DW SPF includes clearing gorse from a minimum of 5 acres of previously untreated land, monitoring 37 acres of previously treated land, and developing a written plan to specify treatment for remaining areas.	the Wildfire Risk Reduction Plan currently being developed for the City as part of the Watershed Invasive Species Management and Control Project funded by the DW SPF grant. A total of 8.087 acres were treated in May of 2021. Mowing with mulching head attachments was done on 5.31 ac. The areas mowed were the old access road and a ridge line that were part of the earlier treatments and fire breaks. In the northeast corner of the subject parcel 2.78 acres planted with spruce in 2014 were hand released from gorse regrowth using weed eaters and chainsaws.
Forest Management Planning in Hubbard Creek Watershed.	City of Port Orford (00670)	Contract with a sustainable forestry consultant to develop forest management plan for properties owned by the City within the drinking water source area and one that will be purchased from The Conservation Fund. Outreach and education to residents in the area about drinking water source for the City and protection.	Limited work in 2021 as City is working on contracting with Business Oregon. City met with partners and Clean Water SRF staff to discuss elements for inclusion in the forest management plan that will help meet SRF loan requirements.
Lower North Fork Riparian Restoration	City of Myrtle Point	This project is designed to restore riparian areas including livestock exclusion fencing, invasive weed removal, and bank stabilization within parcels near the North Fork Coquille River, the drinking water source for City of Myrtle Point.	Project contracted with Business Oregon in September 2021. Riparian planting occurred in November 2021, however a severe winter storm in January 2022 overtopped the bank, removed new plantings, and exacerbated the bank erosion. Project scope has been adjusted to provide preliminary design for structural bank stabilization. To date, 4,125 feet of livestock-exclusion fencing has been installed along 1.2 stream miles on sites 3 and 4 during the summer 2021. 1,100 native species have been planted on site 3 and about 2,900 native species have been planted on site 4 during

Project Name	Grantee	Project Description	Reported Outputs
			November and December 2021. This project is currently protecting approximately 8.7 acres of riparian ecosystem. Future actions will include protecting an additional 9 acres of riparian habitat that will also undergo weed treatment and native riparian planting and fencing.

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 2021.

In 2021 there were five Drinking Water Providers Partnership projects active that reported project outputs and accomplishments to the DWPP. Combined the projects have a total budget of $200,001. Table O-6 describes the projects and the reported outputs.

Table O-6: Drinking Water Providers Partnership projects and outputs for 2021.

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	Following the road and noxious weed surveys that were completed in 2020, a survey report was compiled in 2021. Noxious weeds were prioritized for treatments in 2021 and focused on BLM lands. In total, 38 acres of noxious weeds were treated in 2021. Outreach activities were also conducted at this time. An outreach brochure was drafted and sent out to over 50 Fairview residents and left at local businesses. Restoration actions that were completed during the 2021 in-water-work-period included placing large

Project Name	Grantee	Project Description	Reported Outputs
		coordination meetings between the partners and landowners to facilitate the future implementation of restoration projects identified this year.	wood at 16 sites, sediment proofing the valley bottom road, and removing four fish culverts that we are allowing to overwinter for one year before replacement. A local contractor was hired for this work through a competitive bidding process. The World Newspaper toured the restoration project during construction, interviewed project partners, and wrote an article about the project during this time.
Floras Creek Sediment Abatement and Riparian Management	Curry SWCD	Curry Soil and Water Conservation District and multiple partners have engaged in a multi-year effort to improve watershed conditions. In this phase, sediment delivery to the creek will be abated by treating gullies, including plantings. Riparian habitat will also be restored and invasive weeds such as English ivy, Himalaya blackberry, and reed canary grass will be treated to allow native trees and shrubs to grow freely. This project benefits the drinking water for Langlois Water District.	The project partners continue to expand riparian habitat restoration along the Floras Creek mainstem channel and strategic tributaries, resulting in the implementation of gully stabilization projects that are within 1.3 river miles of Langlois' municipal water intake. The work in 2021 included maintaining existing seedlings and interplanting additional seedlings as well as rock treating gullies to provide stabilization and soil retention.
Woodward Creek	Coquille Watershed Association	Coquille Watershed Association and the City of Myrtle Point are working to reduce risks to source water based on an assessment from 2016. Previously awarded DWPP funds allowed for the identification of sediment inputs from roads. The current award funds design corrections to a road segment contributing a significant amount of sediment to the drinking water source stream and critical habitat for Oregon coast coho salmon. In addition, other road improvements and restoration activities will be prioritized.	Funds from this grant agreement have not been spent yet, however, many objectives have been accomplished for the overall Woodward Creek Restoration Project. This includes noxious weed treatments, outreach, installing LWD at 16 sites, sediment proofing the valley bottom road, and removing four undersized fish culverts. This specific grant seeks to hire an engineer to redesign a section of riparian road that is failing. Sites visits and partner meetings on this topic have occurred during 2021 to plan for this phase of the project. Currently, a request for

Project Name	Grantee	Project Description	Reported Outputs
			bids has been sent out to potential engineering firms and a pre-bid tour occurred on December 17, 2021. A firm will be hired by mid-January 2022. Final designs are planned to be due by Fall 2022.
Lower NFK Coquille Riparian Restoration	Coquille Watershed Association	The Coquille Watershed Association is working to restore ecosystem processes by restoring 8.7 acres of riparian ecosystem with 5 acres to undergo weed treatment and supplemental riparian planting. Grant funding will support fencing and planting materials in order to protect riparian corridors and native plants from livestock. Reducing nutrient inputs is important to improve drinking water for 2,500 residents of Myrtle Point and also supports clean drinking water for the City of Coquille. There is a 5-year maintenance plan so plants can reach a free-to-grow stage using match funding from the Oregon Watershed Enhancement Board (OWEB).	Excluded livestock from accessing the North Fork Coquille River, reducing nutrient load from entering stream. Enhanced riparian area protections and established native plants to restore ecological function and aquatic and riparian linkages, improving both habitat and water quality. So far, 4,125 feet of livestock-exclusion fencing has been installed along 1.2 stream miles and 700 native species have been planted on site 3. Another 2,900 native species will be planted this winter on site 4. Project improves 8.7 acres and benefits native fish and other aquatic species, as well as drinking water quality.
EF Coquille River Sediment Abatement Project	Coquille Watershed Association	The Coquille Watershed Association, Bureau of Land Management and Forest Investment Associates are working to reduce sediment from entering streams by improving road drainage and infrastructure. Four undersized and failing culverts will be removed and replaced with larger culverts that are properly aligned. Road fill will be removed to reduce the risk of sediment delivery to Steel Creek. Work in these tributaries to Coquille River enhances drinking water quality for the Cities of Myrtle Point and Coquille.	This project resulted in upsizing four culverts on a forest timber road to prevent sediment input directly into the stream and protect road infrastructure from catastrophic failure. This project has complemented previous project actions such as aquatic habitat improvement and road decommissioning.

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 29 OWEB funded projects completed in 2020 with a total cash and in-kind budget of $10,555,007. 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-7: Summary of OWEB grant funded fish passage projects completed in 2020, 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)
Chetco	1	NA
Coos	5	NA
Coquille	7	2

Table O-8: Summary of OWEB grant funded instream projects completed in 2020, the most recent year data is available in the OWEB OWRI database.

Subbasin	Stream bank stabilized (Miles)	Main stream channel modified / created (Feet)	Main stream channel modified / created (Number of treatments)	Spawning gravel placed (Cubic Yard)
Coos	0	350	1	35
Coquille	NA	2500	1	NA

Table O-9: Summary of OWEB grant funded instream projects completed in 2020, 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	247	84
Coquille	36	NA

Table O-10: Summary of OWEB grant funded riparian projects completed in 2020, the most recent year data is available in the OWEB OWRI database.

SubbasinActual	Voluntary riparian tree retention (Acres)	Voluntary riparian tree retention (Miles)
Coos	1.9	0.1
Coquille	2.7	0.9
Sixes	0.4	0.1

Table O-11: Summary of OWEB grant funded riparian projects completed in 2020, the most recent year data is available in the OWEB OWRI database.

Subbasin	Livestock stream access/crossing created or improved (Area treated)	Livestock stream access/crossing created or improved (Number of treatments)	Riparian fencing (Area treated)	Riparian fencing (Length of treatment)	Riparian fencing (Stream sides treated)	Water gap development (Area treated)	Water gap development (Number of treatments)
Coos	NA	NA	NA	2.0	NA	1	8
Coquille	0.6	5	0.8	1.5	1	NA	NA

Table O-12: Summary of OWEB grant funded riparian projects completed in 2020, 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)
Chetco	NA	0.2	NA	2	NA	2
Coos	10.2	4.8	1	NA	0.5	NA
Coquille	NA	8.0	NA	1	NA	1

Table O-13: Summary of OWEB grant funded road projects completed in 2020, 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)
Coos	2	NA	106
Coquille	NA	1	1

Table O-14: Summary of OWEB grant funded upland projects completed in 2020, the most recent year data is available in the OWEB OWRI database.

Subbasin	Off-channel livestock or wildlife watering (Number of treatments)
Sixes	13

Table O-15: Summary of OWEB grant funded upland projects completed in 2020, the most recent year data is available in the OWEB OWRI database.

Subbasin	Upland invasive plant control (Area treated)
Chetco	99.6

Subbasin	Upland invasive plant control (Area treated)
Coos	5.2
Coquille	5.7
Sixes	12.6

Table O-16: Summary of OWEB grant funded instream projects completed in 2020, 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	NA	2
Coquille	0.2	NA

3.6 TMDL Implementation Highlights

TMDL implementation actions taken by Designated Management Agencies (DMAs) or third parties are described in the table below. Most of these actions were summarized from annual reports submitted by DMAs to DEQ in calendar year 2021.

Table O-17: TMDL implementation activities reported in 2021 by Designated Management Agencies or third parties.

TMDL	DMA	Reported Actions
Tenmile Lakes TMDL	Department of State Lands	DSL staff continued DMA partnership conversations about DMA implementation planning and collaborative projects.

3.7 USFS Data

The US Forest Service catalogs special restoration related projects in their central database that have been provided by each National Forest. These projects differ from their standard BMPS implemented as part of their management plans (e.g. buffer widths) and include projects such as road decommissioning, large wood placement, and riparian planting, among others. DEQ has provided this information in Appendix T of this report. Please note the caveats for this restoration data within the “Caveats” section of the document.

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

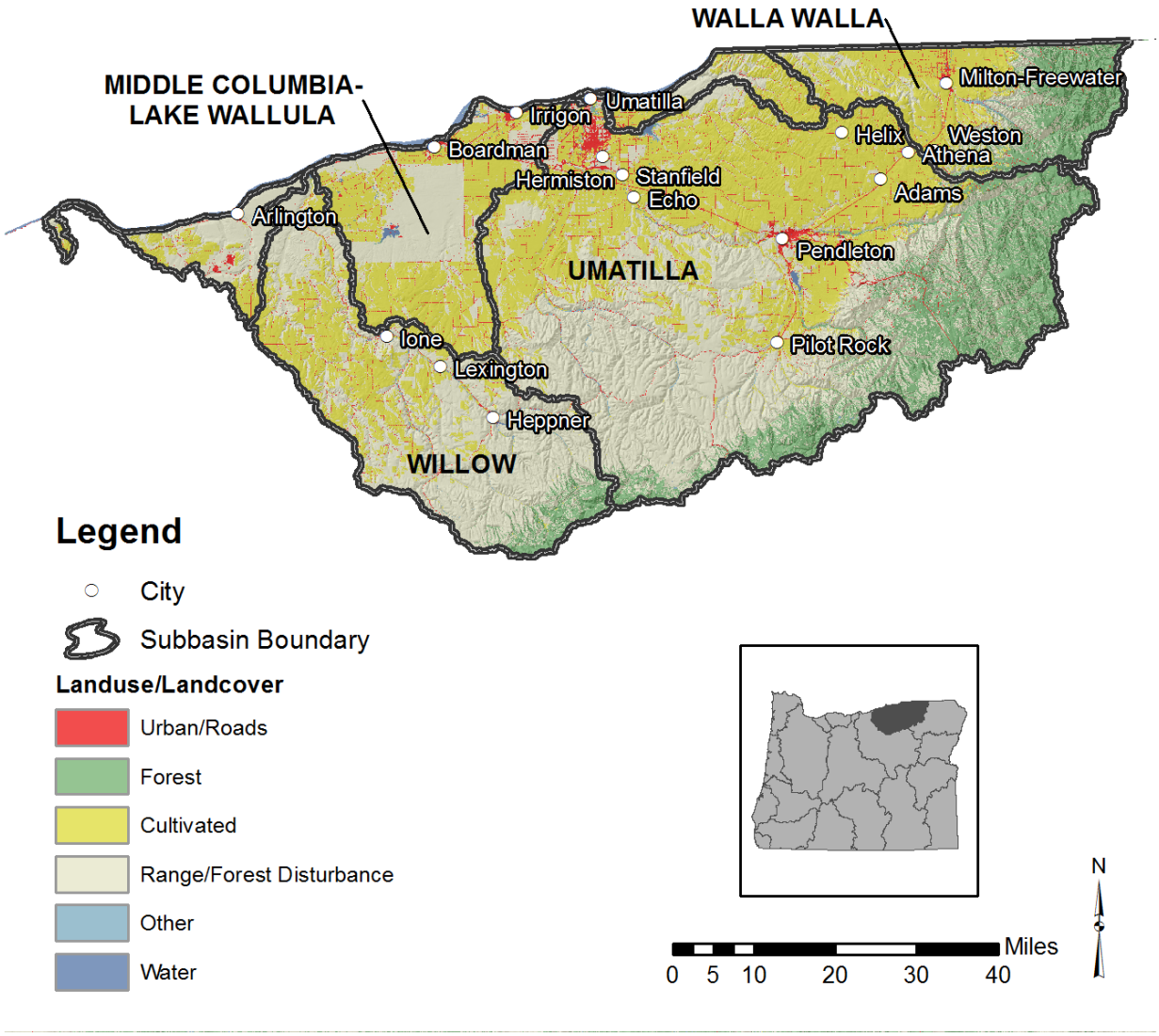

Figure P-1: Land use in the Umatilla administrative basin.

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

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 2018/2020 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

Parameter	Assessment units without a TMDL	Assessment units with a TMDL
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 2021. Note this section does not identify or include projects proposed and awarded a grant in

2021. 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 2021 see Section 3.6.2 of the main report.

In 2021, there were four 319 projects active that reported project outputs and accomplishments to DEQ. Combined the projects have a total grant budget of $64,055. Table P-5 describes the projects and the reported outputs.

Table P-5: Project outputs reported in 2021 for Section 319 pass through grants.

Project Name	Grantee	Project Description	Reported Outputs
South Fork and Mainstem Walla Walla River Heat Source Water Temperature Modeling, Part 2	Walla Walla Basin Watershed Council	The project will collect field data to characterize the South Fork and main stem Walla Walla Rivers to update a HeatSource temperature Model for the Walla Walla River Basin. The updated model results will be compared against temperature modeling done for the 2005 TMDL to provide insight on impacts of implemented restoration projects.	Project was completed and all allocated 319 funds were used. Data were collected in 2018 and 2019 to populate the HeatSource model but a 100 year flood event occurred in 2020 that altered channel morphology and vegetative conditions. New data will have to be collected to update the HeatSource model. WWBC is planning future funding requests for this work.
Remote Sensing & Source Water Inventory for the S. Fork Walla Walla R.	Walla Walla Basin Watershed Council	The project will protect groundwater and essential aquatic habitat by filling a data gap about the current status of water sources feeding the Walla Walla River. Walla Walla Basin Watershed Council (WWBWC) and project partners will review available source water data including historical spring locations, water quantity, and water quality conditions. LiDAR will be collected for the Upper and Middle South Fork Walla Walla River basin and a hydrologic map will be developed for the watershed using LiDAR and historical data. Field work will be done to inventory spring locations and water samples will be collected for stable isotope and tritium analysis by USGS. Field visits will be used to ground truth and update the map. Project data will	LiDAR data was collected and field training was conducted to prepare for the springs inventory in the SF Walla Walla watershed. No 319 funds were spent.

Project Name	Grantee	Project Description	Reported Outputs
		be used by partners to develop a strategy for protecting watershed functions relating to natural basalt aquifer recharge, flow, and water temperature in the upper watershed. This information will be summarized in a technical report that will be followed up by community outreach and education.	
Upper Willow Creek Basin BMPs Program	Morrow County Soil & Water Conservation District	The Upper Willow Creek Basin Best Management Practices (BMPs) Program aims to reduce heat pollution in the Upper Willow Creek watershed by implementing a cost-sharing program for private agricultural landowners to install BMPs. This program will assist the efforts of ODA and Morrow SWCD's 2019 Upper Willow Creek Basin Strategic Implementation Area (SIA). The SIA funds are being used to provide technical assistance, outreach, and monitoring to address water quality concerns in the Upper Willow Creek watershed. Project goals include the reduction of instream water temperatures and agricultural nutrient inputs through the development of best management practices such as the development of riparian buffer zones and off stream stock watering areas.	Morrow SWCD has begun outreach efforts to local landowners in the SIA boundary. No 319 funds were spent.
Walla Walla Basin Water Quality Education and Outreach	Walla Walla Basin Watershed Council	Walla Walla Basin Watershed Council (WWBWC) will implement a water quality focused education and outreach effort for youth and adults in the Walla Walla Basin. With a collection of lecture and hands-on educational experiences, the program reaches 600+ students and 100+ adults each year in the Umatilla and Walla Walla	WWBWC participated in two educational events in 2021 that reached 300+ 4th and 5th grade students. Educational activities focused on human impacts on water quality and watershed restoration. WWBWC also purchased an iPad that will be used to

Project Name	Grantee	Project Description	Reported Outputs
		Basins, largely in the Milton-Freewater area, but also various other locations, including activities in the cities of Athena and Walla Walla. This project will support two environmental stewardship volunteer events, place-based environmental education programs for several school districts, environmental presentations and informational events at various community events, WWBWC project tours, and development of short outreach videos. Educational goals include improving awareness and understanding of water quality problems in surface and ground water and how protection and restoration efforts can aid in restoring healthy hydrological and ecological systems.	capture and edit educational outreach videos.

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 2021.

In 2021 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 2021.

In 2021 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 2021.

In 2021 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 17 OWEB funded projects completed in 2020 with a total cash and in-kind budget of $3,133,975. 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 2020, 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)
Umatilla	1	1
Walla Walla	NA	1
Willow	NA	1

Table P-7: Summary of OWEB grant funded instream projects completed in 2020, the most recent year data is available in the OWEB OWRI database.

Subbasin	Engineered structures installed (Number of treatments)
Willow	13

Table P-8: Summary of OWEB grant funded instream projects completed in 2020, the most recent year data is available in the OWEB OWRI database.

Subbasin	Instream habitat: Boulder placement (Number of treatments)	Instream habitat: Structure placement (Number of treatments)
Walla Walla	10	NA
Willow	NA	79

Table P-9: Summary of OWEB grant funded instream flow projects completed in 2020, the most recent year data is available in the OWEB OWRI database.

SubbasinActual	Other irrigation practice improvement (for instream flow) (acre-foot)
Walla Walla	9000

Table P-10: Summary of OWEB grant funded riparian projects completed in 2020, the most recent year data is available in the OWEB OWRI database.

Subbasin	Riparian fencing (Length of treatment)
Umatilla	0.1

Table P-11: Summary of OWEB grant funded riparian projects completed in 2020, the most recent year data is available in the OWEB OWRI database.

Subbasin	Riparian invasive plant control (Area treated)	Riparian invasive plant control (Stream sides treated)	Riparian vegetation management (Length of treatment)	Riparian vegetation planting (Area treated)	Riparian vegetation planting (Length of treatment)	Riparian vegetation planting (Stream sides treated)
Umatilla	NA	NA	NA	0.4	NA	2
Walla Walla	0.9	2	NA	NA	NA	NA
Willow	NA	NA	1.9	NA	1.3	NA

Table P-12: Summary of OWEB grant funded upland projects completed in 2020, the most recent year data is available in the OWEB OWRI database.

Subbasin	Irrigation system improvement (Acre)
Willow	8

Table P-13: Summary of OWEB grant funded upland projects completed in 2020, 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)
Umatilla	NA	2
Willow	900	3

Table P-14: Summary of OWEB grant funded upland projects completed in 2020, 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)
Umatilla	1239	NA	NA
Walla Walla	13	NA	NA
Willow	600	4086	200

3.6 USFS Data

The US Forest Service catalogs special restoration related projects in their central database that have been provided by each National Forest. These projects differ from their standard BMPS implemented as part of their management plans (e.g. buffer widths) and include projects such as road decommissioning, large wood placement, and riparian planting, among others. DEQ has provided this information in Appendix T of this report. Please note the caveats for this restoration data within the “Caveats” section of the document.

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

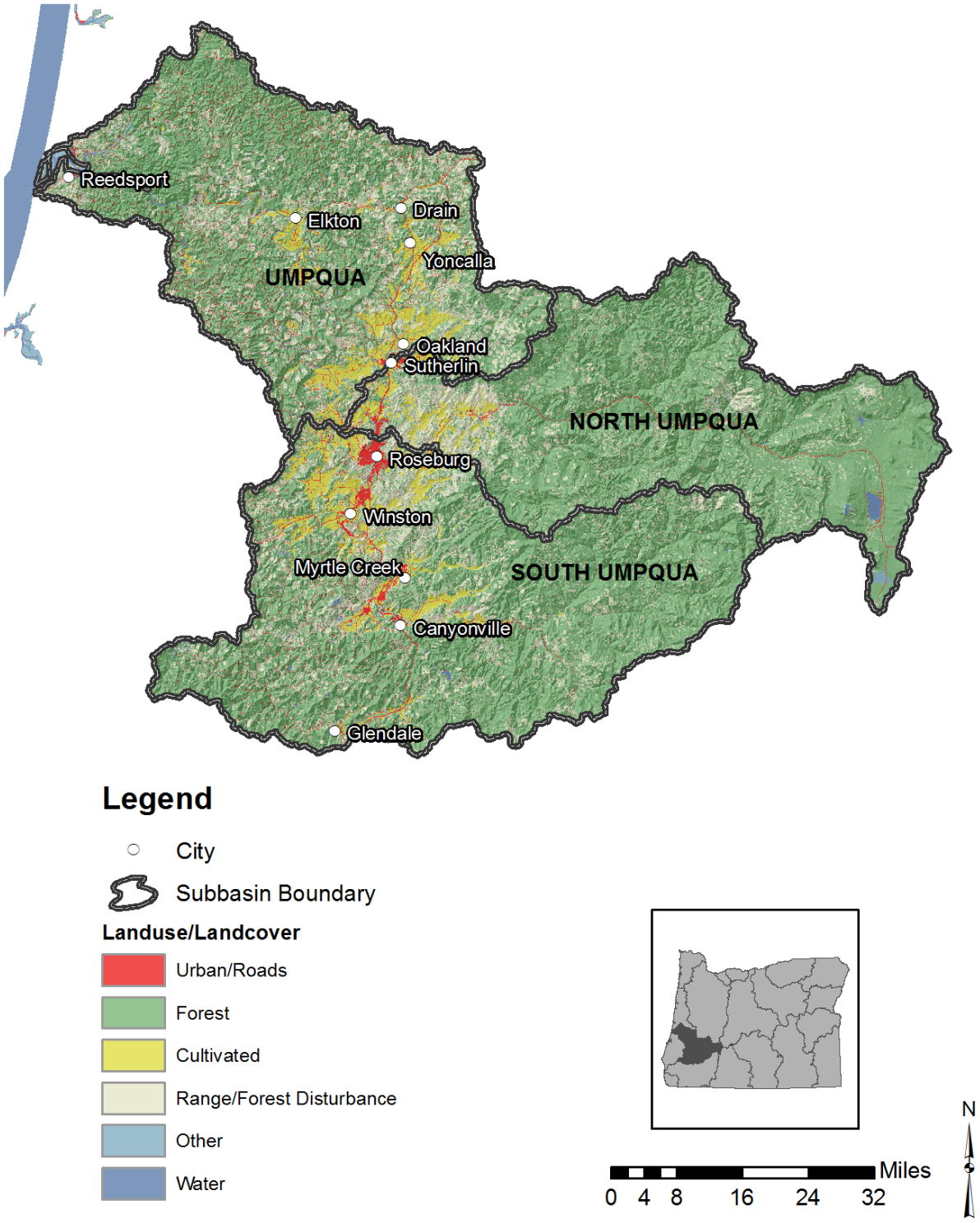

Figure Q-1: Land use in the Umpqua administrative basin.

1.1 Basin Contacts

Table Q-2: Oregon DEQ basin contact.

Administrative Area	DEQ Basin Coordinator
Umpqua Basin	Heather Tugaw: 503-702-0813: heather.tugaw@deq.oregon.gov

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 2018/2020 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

Parameter	Assessment units without a TMDL	Assessment units with a TMDL
Manganese	1	0
Mercury (total)	1	0
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
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 2021. Note this section does not identify or include projects proposed and awarded a grant in 2021. 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 2021 see Section 3.6.2 of the main report.

In 2021, there was one 319 project active that reported project outputs and accomplishments to DEQ. Combined the projects have a total grant budget of $51,285. Table Q-5 describes the project and the reported outputs.

Table Q-5: Project outputs reported in 2021 for Section 319 pass through grants.

Project Name	Grantee	Project Description	Reported Outputs
North and South Umpqua Basins Non-Point Turbidity, Nitrate, and Phycocyanin Source Monitoring Assessment	Partnership for Umpqua Rivers (PUR)	This project consists of additional turbidity, nitrate, and phycocyanin (blue-green algae indicator) sampling in the South and North Umpqua to begin identifying areas in the basin that might be sources of sediment and nutrients and resultant waterway contamination. Recipient will work with willing water treatment plants to obtain data on raw water turbidity levels, such as concentrations found at water intakes and time of year, in addition to other pertinent water quality data they might have. With this data, Recipient can work to prioritize sampling locations. Recipient currently has 14 reference sites located in the South Umpqua that staff monitor monthly for turbidity and a suite of other parameters. This Agreement will allow Recipient monitoring program staff to use this data and data obtained from drinking water plants, to select a set of new sites to be investigated, including fire-impacted areas in the	Continuing evaluation of existing data and summary of trends; identification of priority monitoring sites; storm sampling. 2021 work includes monthly monitoring at 18 sites using OWEB match; high flow turbidity tracking in the South Umpqua; analyzing data from PUR and water treatment plants.

Project Name	Grantee	Project Description	Reported Outputs
		North Umpqua. The timing may be adjusted depending on what is gleaned from the water treatment plant data. Recipient will analyze samples at each site over a period of up to two years, develop recommendations for subsequent project work, and share findings and develop final report.	

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 2021.

In 2021 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 2021.

In 2021 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 $27,330. Table Q-6 describes the project and the reported outputs.

Table Q-6: Nonpoint source Drinking Water Source Protection program projects and outputs for 2021.

Project Name	Grantee	Project Description	Reported Outputs
Clarks Branch Water Association Source Inlet Protection and Ongoing South	Clarks Branch Water Association	Erect fence and accompanying warning signage and illumination near intake to deter or prevent ongoing illegal dumping. Install source water analysis/detection	Work in 2021 included installation of monitoring equipment and resolving issues with filter/strainer capacity. Rest of work,

Project Name	Grantee	Project Description	Reported Outputs
Umpqua River Cooperative Contaminant Reduction		equipment with early warning threshold shut-down capacity. Share data with other South Umpqua water systems.	including installation of signage and auto-illuminating lights was completed by end of 2021.

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 2021.

In 2021 there was one Drinking Water Providers Partnership project active that reported project outputs and accomplishments to the DWPP. Combined the projects have a total budget of $35,000. Table Q-7 describes the project and the reported outputs.

Table Q-7: Drinking Water Providers Partnership projects and outputs for 2021.

Project Name	Grantee	Project Description	Reported Outputs
Flood Creek AOP Project	South Umpqua Rural Community Partnership	The South Umpqua Rural Community Partnership will replace two undersized and failing culverts that are currently blocking adult and juvenile fish on Flood Creek, a tributary to the South Umpqua River. Replacing the culverts removes the risk of 400 cubic yards of road fill being washed out downstream impacting water quality and opens 0.8 miles of aquatic habitat for salmon, trout and lamprey. This project benefits drinking water quality for the USFS Tiller Ranger Station as well as downstream water systems.	Initiated Phase I design project to replace two undersized and failing culverts which are currently blocking fish passage for both adult and juvenile fish on Flood Creek, a tributary on the upper South Umpqua River and drinking water supply for the USFS Tiller Ranger Station and other downstream community water providers. The upper AOP (FS Road 2814-100) will be a bottomless Arch design that is currently at the 75% design level, and a bridge will be constructed for the lower AOP (FS Road 28) which is close to the 30% design level. Designs are planned to be completed by June 2022 and construction is anticipated on occur in 2023.

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 57 OWEB funded projects completed in 2020 with a total cash and in-kind budget of $920,087. 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 2020, the most recent year data is available in the OWEB OWRI database.

Subbasin	Fish Passage Crossing improvement (Number of treatments)
South Umpqua	2
Umpqua	2

Table Q-9: Summary of OWEB grant funded instream projects completed in 2020, the most recent year data is available in the OWEB OWRI database.

Subbasin	Instream habitat: Large wood placement (Number of treatments)
South Umpqua	70
Umpqua	261

Table Q-10: Summary of OWEB grant funded riparian projects completed in 2020, the most recent year data is available in the OWEB OWRI database.

Subbasin	Voluntary riparian tree retention (Acres)	Voluntary riparian tree retention (Miles)
South Umpqua	10.5	1.4
Umpqua	40.4	3.3

3.6 TMDL Implementation Highlights

TMDL implementation actions taken by Designated Management Agencies (DMAs) or third parties are described in the table below. Most of these actions were summarized from annual reports submitted by DMAs to DEQ in calendar year 2021.

Table Q-11: TMDL implementation activities reported in 2021 by Designated Management Agencies or third parties.

TMDL	DMA	Reported Actions
Umpqua Basin TMDL	Douglas County	Developed five-year implementation plan and approved by County Commissioners.

TMDL	DMA	Reported Actions
Umpqua Basin TMDL	Canyonville	Developed five-year implementation plan and approved by City Administrator.
Umpqua Basin TMDL	Drain	Developed five-year implementation plan and approved by City Administrator.
Umpqua Basin TMDL	Elkton	Developed five-year implementation plan and approved by City Administrator. Developed and distributed educational materials related to stormwater and stormwater treatment.
Umpqua Basin TMDL	Glendale	Developed five-year implementation plan and approved by Public Works Lead. Purchased a street sweeper.
Umpqua Basin TMDL	Myrtle Creek	Developed five-year implementation plan and approved by City Administrator.
Umpqua Basin TMDL	Oakland	Developed five-year implementation plan and approved by Mayor. Organizing regional grant applications.
Umpqua Basin TMDL	Reedsport	Developed five-year implementation plan and approved by Public Works Director.
Umpqua Basin TMDL	Riddle	Developed five-year implementation plan and approved by Public Works Director.
Umpqua Basin TMDL	Roseburg	Developed five-year implementation plan and approved by Public Works Director.
Umpqua Basin TMDL	Sutherlin	Developed five-year implementation plan and approved by Public Works Director.
Umpqua Basin TMDL	Winston	Developed five-year implementation plan and approved by Public Works Superintendent.
Umpqua Basin TMDL	Yoncalla	Developed five-year implementation plan and approved by City Administrator.

3.7 USFS Data

The US Forest Service catalogs special restoration related projects in their central database that have been provided by each National Forest. These projects differ from their standard BMPS implemented as part of their management plans (e.g. buffer widths) and include projects such as road decommissioning, large wood placement, and riparian planting, among others. DEQ has provided this information in Appendix T of this report. Please note the caveats for this restoration data within the “Caveats” section of the document.

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

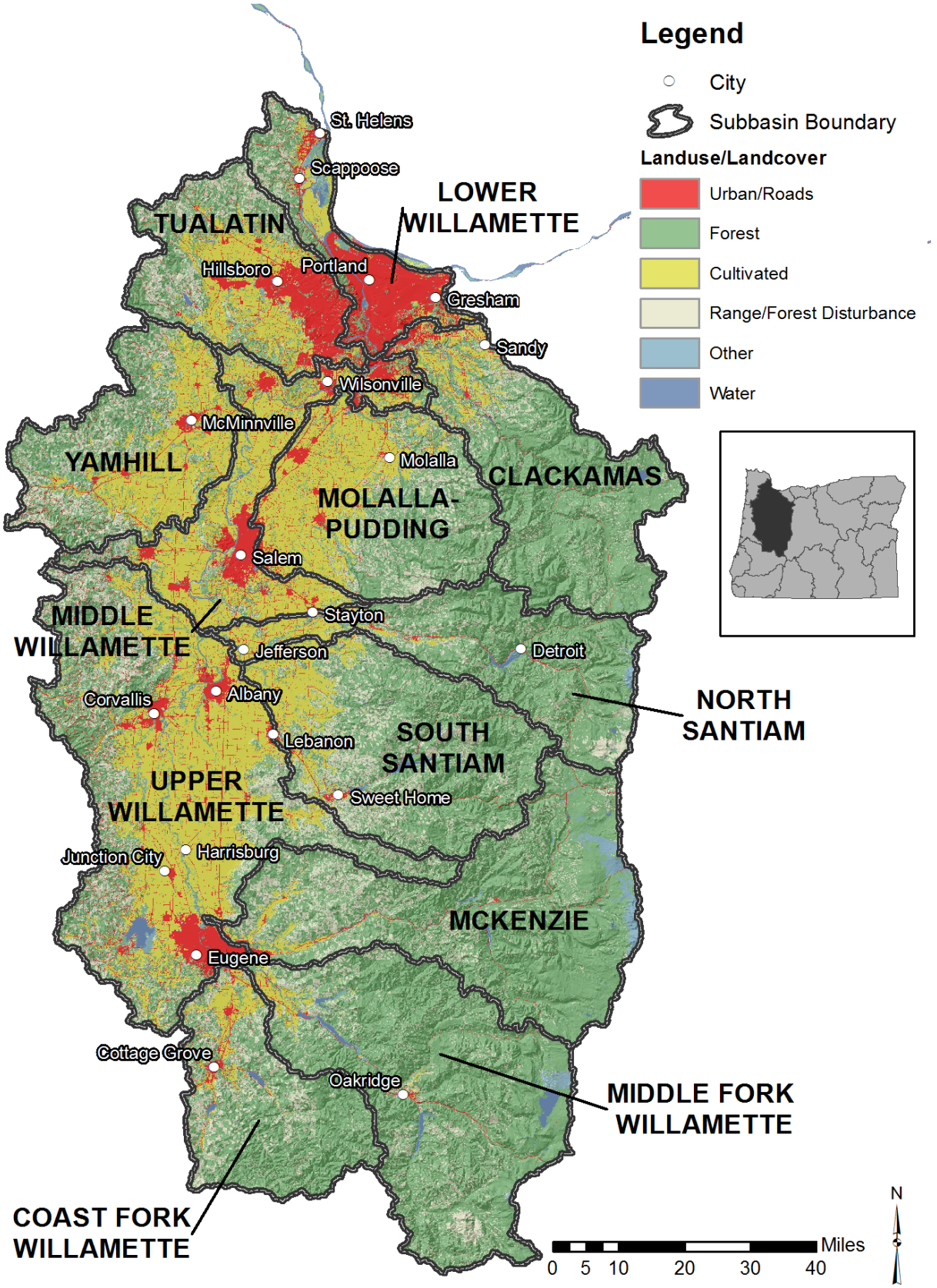
Legend
City
Subbasin Boundary
Landuse/Landcover
Urban/Roads
Forest
Cultivated
Range/Forest Disturbance
Other
Water
St. Helens
Scappoose
LOWER WILLAMETTE
TUALATIN
Hillsboro
Portland
Gresham
Sandy
Wilsonville
McMinnville
YAMHILL
Molalla
CLACKAMAS
MOLALLA-PUDDING
Salem
MIDDLE WILLAMETTE
Stayton
Jefferson
Detroit
NORTH SANTIAM
Corvallis
Albany
Lebanon
SOUTH SANTIAM
UPPER WILLAMETTE
Sweet Home
Junction City
Harrisburg
MCKENZIE
Eugene
Cottage Grove
Oakridge
MIDDLE FORK WILLAMETTE
COAST FORK WILLAMETTE
Miles
0 5 10 20 30 40
N

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.oregon.gov
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: nancy.h.gramlich@deq.oregon.gov
Coast Fork, McKenzie, Middle Fork Willamette, and South Santiam Subbasins	Priscilla Woolverton: 541-687-7347: priscilla.woolverton@deq.oregon.gov
Upper Willamette Basin	Sarah Sauter: 541-774-5905: sarah.sauter@deq.oregon.gov

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 2018/2020 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

Parameter	Assessment units without a TMDL	Assessment units with a TMDL
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
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

Parameter	Assessment units without a TMDL	Assessment units with a TMDL
Indeno(1,2,3-cd)pyrene	1	0
Iron (total)	32	4
Malathion	1	0
Mercury (total)	0	4
Methylmercury	0	18
Nitrates	1	1
Pentachlorophenol	0	2
pH	12	1
Phosphorus	3	20
Polychlorinated Biphenyls (PCBs)	6	1
Polycyclic Aromatic Hydrocarbons (PAHs)	3	0
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 Mercury TMDL	Mercury
Willamette Basin TMDL and WQMP	Bacteria (water contact recreation), DDT, dieldrin, Dissolved Oxygen, Mercury, Temperature, Turbidity

3. Implementation Highlights

3.1 Section 319 Grants

Federal Section 319(h) funds are provided annually through the EPA to states for the development and implementation of each state's Nonpoint Source Management Program. In Oregon a portion of 319 grant funding is "passed through" to support community or partner projects that address Oregon's nonpoint source program priorities. Generally, DEQ requires grantees to report annually on the progress made implementing their grant project. This section highlights those outputs and accomplishments reported to DEQ in 2021. Note this section does not identify or include projects proposed and awarded a grant in 2021. 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 2021 see Section 3.6.2 of the main report.

In 2021, there were three 319 projects active that reported project outputs and accomplishments to DEQ. Combined the projects have a total grant budget of $72,531. Table R-5 describes the projects and the reported outputs.

Table R-5: Project outputs reported in 2021 for Section 319 pass through grants.

Project Name	Grantee	Project Description	Reported Outputs
Storm and Drinking Water Improvements on Urban and Ag Lands	Long Tom Watershed Council	This project expands Recipient's Trout Friendly Landscape (TFL) Program with urban business owners on a voluntary basis and newly to the agricultural sector. All work improves water quality impacts through integrating on-site stormwater management and best management landscape and farming practices. Focus will be on the development of voluntary urban stormwater projects on prioritized properties impacting Amazon Creek watershed in Eugene and agricultural water quality improvements in the Amazon, Bear, Ferguson, and lower Long Tom sub-watersheds, all of which impact the City of Monroe's drinking water. The main causes of impaired water quality are untreated stormwater runoff in urban areas and reduced canopy cover, insufficient riparian buffers, and livestock access to streams in rural areas. Match for this project is provided by City of Eugene.	The primary goals were to 1) work with businesses, schools, and places of worship to retrofit water quality improvement measures to reduce impervious surfaces and increase vegetation, especially trees, and 2) work with agricultural land owners to install grassed waterways where they would intercept agricultural runoff. Outreach to agricultural did not result in potential projects, so focus shifted to the urban program within the Amazon Creek basin. This grant project was completed in 2020 and culminated in six different entities (four businesses, school, place of worship) completing various steps of SW management, including feasibility study, SW facility design, and installation. Efforts were above and beyond what is required by state and local regulatory agencies.
Bacteria & Temperature. Monitoring/BMP Implementation in Bear and Ferguson Creek Basins	Long Tom WSC	The Recipient (Long Tom Watershed Council (LTWC)) proposes to monitor E. coli, temperature, and pesticides in tributaries of the lower Long Tom watershed. The City of Monroe gets their	Not active in 2021

Project Name	Grantee	Project Description	Reported Outputs
		drinking water from the Long Tom River, and this project will collect data and analyze inputs that have the potential to adversely impact their drinking water intake by sampling on three major Long Tom tributary streams. All three sampling streams (Amazon, Bear, and Ferguson) include significant areas of livestock land use. Since 2011, LTWC has collected pesticide data from Amazon Creek as part of the "Pesticide Stewardship Partnership," which includes a collaboration with the Oregon DEQ, Oregon Department of Agriculture, the City of Eugene, and local stakeholders. Pesticide data collection supported by this project will help LTWC determine what chemicals are impacting water quality – and drinking water quality – and prioritize outreach and project development with businesses to improve stormwater runoff. Grants from the Oregon Health Authority have supported LTWC's efforts to focus on improving stormwater with an eye toward improving downstream drinking water quality through the installation of voluntary green stormwater facilities. Additionally, LTWC has collected temperature data in Bear and Ferguson	

Project Name	Grantee	Project Description	Reported Outputs
		Creek since 2010, and currently has support from ODA to monitor stream temperature on agricultural areas. Project match will be provided through the ODA Pesticide Stewardship Program, ODA long-term temperature monitoring project, LTWC fundraising, and volunteer assistance.	
COMMUNITY GW PROTECTION EDUCATION	Oregon State University	High nitrate concentrations have been found in some parts of the state as a result of non-point source pollution from fertilizers and human and animal waste. DEQ has declared three (3) Groundwater Management Areas (GWMAs) after confirming widespread nitrate contamination. This Project is designed to implement education and outreach strategies identified in the Southern Willamette Valley Groundwater Management Area Action Plan. This Projects primary effort will occur within Southern Willamette Valley Groundwater Management Area, which is located in the Upper Willamette River Basin and encompasses 230 square miles. Land use within the GWMA include small cities and rural communities, agriculture and forestry. Groundwater protection education to promote public active	This project was designed to implement education and outreach strategies identified in the Southern Willamette Valley Groundwater Management Area (SWVGWMA) Action Plan. OSU Extension Service staff employed proven outreach methods such as well water clinics, classes for residents/youth, and answering client questions via phone and e-mail. Due to COVID-19 restrictions, OSU Extension Service transitioned their outreach program into an online format with limited in-person offerings including a Rural Living Basics – Living with your Well & Septic System Webinar and Living on the Land. They conducted targeted outreach to residents within the SWV GWMA encouraging residents in Linn, Lane, and Benton County to bring in well samples for nitrate testing. They placed several articles in the OSU Extension Service paper newsletter – GROWING. They also provided technical assistance through electronic and social media for domestic well owners by maintaining, updating, and hosting wellwater.oregonstate.edu

Project Name	Grantee	Project Description	Reported Outputs
		engagement is the primary purpose of this Project as outreach is a priority action identified in the GWMA action plan. This Project will allow Recipient to effectively focus a successful outreach program to identified areas of concern within the GWMA. The Project will employ the successful outreach methods that have been designed by the Recipient Extension Service, including well water clinics, classes for residents/youth, and answering client questions via phone and email. Programming will be focused in the Southern Willamette Valley Groundwater Management Area to reduce the overall amount of nitrate found in the regions aquifers. Project goals include; Increase awareness of the Southern Willamette Valley groundwater issues and promote behavior changes that result in less nitrate entering the aquifer, and Provide residents with the tools and knowledge necessary to identify household risks to drinking water quality, evaluate groundwater protection strategies and adopt sustainable management practices.	

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 2021.

In 2021 there were no nonpoint source related Clean Water State Revolving Fund projects with reported outputs in the Willamette.

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 2021.

In 2021 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 $71,300. Table R-6 describes the projects and the reported outputs.

Table R-6: Nonpoint source Drinking Water Source Protection program projects and outputs for 2021.

Project Name	Grantee	Project Description	Reported Outputs
Jackson Creek Water Association private well decommissioning	Jackson Creek Water Association 00977		
(groundwater) Decommission an inadequately constructed well that is within 2-Year Time-of-Tra	vel zone.	Decommissioned an inadequately constructed well that is within 2-Year Time-of-Travel zone.	
City of Gates Emergency Post-Fire Watershed Monitoring for	City of Gates	The Beachie Creek and Lionshead wildfires burned through portions of the watershed in 2020. This project consists of renting and installing temporary monitoring	Installed temporary monitoring equipment in coordination with USGS and collected grab samples for laboratory analysis to gain a better understanding of post-

Project Name	Grantee	Project Description	Reported Outputs
Drinking Water Protection		equipment (coordinated with USGS), collecting grab samples, and then analyzing and sharing the data to gain a better understanding of post-fire impacts and conditions and to help prioritize areas for water quality restoration. Partners include USGS, North Santiam Watershed Council, and DEQ. Data will be shared with other North Santiam water providers.	fire impacts and conditions and to help prioritize areas for water quality restoration.
City of Monroe Surface Water Protection Via Upstream Voluntary Green Infrastructure Projects	City of Monroe (U21004)	The City is contracting with Long Tom Watershed Council to increase outreach and education efforts to business owners in the Amazon Creek Basin within Monroe's drinking water source area. The project will help reduce pesticides and other pollutants, as well develop and install voluntary stormwater management approaches to reduce pollutants. Supplemental funds are from City of Eugene.	The partners have been active on multiple sites in 2021. At the Western Pneumatics site, a Design Development meeting was had with all of the decision makers who are excited and engaged with the project and the Watershed Council moved forward with construction documents to get bids that will inform a phasing plan. At the Pacific Corrugated Pipe site, an infiltration planter was designed in collaboration with Monroe's engineer. A conceptual plan for voluntary stormwater & new tree planting was completed for 15 acre site at intersection of HWY 99 & Clear Lake Road where their stormwater travels via open roadside ditch to Amazon Creek proper. A planting plan has been developed for a voluntary rain garden that would manage the site's parking area. At the Eugene Waldorf School, work is moving forward with two design charettes completed.

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 2021.

In 2021 there were three Drinking Water Providers Partnership projects active that reported project outputs and accomplishments to the DWPP. Combined the projects have a total budget of $143,517. Table R-7 describes the projects and the reported outputs.

Table R-7: Drinking Water Providers Partnership projects and outputs for 2021.

Project Name	Grantee	Project Description	Reported Outputs
Clackamas Wetlands Habitat Restoration Phase I and II	Bark	This project is a partnership between BARK, Portland State University, and the North Clackamas County Water Commission to increase resiliency to climate change impacting water quantity and habitat for salmon. The project objective is to increase "natural infrastructure" for water storage through beaver-created wetlands. DWPP funds will be used to update wetland mapping (including field verification and classification) and using those data to identify sites with high potential for beaver habitat restoration and/or relocation activities.	In 2021, the project partners established photo points at 13 sites (for a total of 43 sites between 2020-2021); completed beaver and wetland verification surveys at 10 sites (for a total of 23 sites between 2020-2021); constructed 21 water table wells (for a total of 27 between 2020-2021); set up 6 hydrological monitoring points with infrastructure (for a total of 12 sites between 2020-2021, 5 sites of which were ultimately located within the perimeter of the Riverside Fire); established 19 monitoring wells with data loggers, 2 measuring posts, and 17 manual measurement points (for repeat water level measurements) at 6 sites (for totals of 25 wells with data loggers, 7 monitoring posts, and 20 manual monitoring points established between 2020-2021); collected 117 water level measurements across all monitoring points; planted approximately 400 willow cuttings at the Sam Creek meadow site;

Project Name	Grantee	Project Description	Reported Outputs
			installed 7 remote cameras within the Riverside fire burn area; collected drone imagery at 7 sites; trained approximately 65 volunteers and completed 35 field days, 20 hours of wetland and conducted outreach and education through Bark's email newsletters, social media, website, and events.
Finn Rock Reach Floodplain Restoration Project	McKenzie River Trust	The project will restore they hydrology of a disturbed side channel of the McKenzie River. Gravel extraction and other past management has resulted in the side channel being disconnected to the floodplain and transformed a historically depositional system to a transport reach. The project will result in a regrading of the floodplain and the installation of large woody debris. This work will increase the area wetted in baseflow conditions, creating a multi-channeled low-velocity stream with high surface roughness and habitat complexity. These conditions are ideal juvenile rearing habitat for Chinook salmon. The restoration of a depositional environment is also expected to yield water quality benefits listed above.	Phase I was completed in 2021 and included the hauling and placement of logs to implement floodplain restoration improvements.
Finn Rock Reach Floodplain Restoration Project - Phase 1	McKenzie River Trust	The McKenzie River Trust, Eugene Water and Electric Board, USFS and McKenzie Watershed Council are partnering to restore this river section to be hydrologically connected series of channels and wetlands to restore floodplain function. Phase I will remove barriers, regrade areas, install large woody debris, replant and reseed areas impacted by the 2020 Holiday Fire, and create island habitat. Reconnected wetlands and floodplains will help	Phase I of the Fin Rock Reach Floodplain restoration was completed in 2021 and included removing barriers, regrading areas, installing large woody debris, replanting and reseeding areas impacted by the 2020 Holiday Fire, and creating island habitat. Reconnected wetlands and floodplains help filter fire-ash and sediment for the Holiday Farm Fire and improve water quality and

Project Name	Grantee	Project Description	Reported Outputs
		filter fire-ash and sediment, improve water quality and provide juvenile fish rearing habitat.	provide juvenile fish rearing habitat.

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 43 OWEB funded projects completed in 2020 with a total cash and in-kind budget of $4,793,962. 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-8: Summary of OWEB grant funded fish passage projects completed in 2020, the most recent year data is available in the OWEB OWRI database.

Subbasin	Fish Passage Crossing improvement (Number of treatments)	Fish Passage Non-crossing improvement (Number of treatments)
Lower Willamette	3	1
Middle Willamette	1	NA
North Santiam	3	NA
Upper Willamette	2	NA

Table R-9: Summary of OWEB grant funded instream projects completed in 2020, 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)
Lower Willamette	NA	1
Middle Fork Willamette	1584	1

Table R-10: Summary of OWEB grant funded instream projects completed in 2020, the most recent year data is available in the OWEB OWRI database.

Subbasin	Instream habitat: Large wood placement (Number of treatments)	Instream habitat: Structure placement (Number of treatments)
Lower Willamette	59	NA
Middle Fork Willamette	853	NA
South Santiam	70	NA
Upper Willamette	NA	30

Table R-11: Summary of OWEB grant funded riparian projects completed in 2020, the most recent year data is available in the OWEB OWRI database.

Subbasin	Riparian fencing (Length of treatment)
South Santiam	0.2

Table R-12: Summary of OWEB grant funded riparian projects completed in 2020, the most recent year data is available in the OWEB OWRI database.

Subbasin	Riparian invasive plant control (Area treated)	Riparian invasive plant control (Length of treatment)	Riparian invasive plant control (Stream sides treated)	Riparian vegetation planting (Area treated)	Riparian vegetation planting (Length of treatment)	Riparian vegetation planting (Stream sides treated)
Coast Fork Willamette	NA	NA	NA	NA	0.7	NA
Lower Willamette	3.5	10.1	4	NA	0.1	NA
McKenzie	2.4	NA	1	NA	NA	NA
Middle Fork Willamette	11.0	NA	3	NA	NA	NA
Middle Willamette	NA	NA	2	NA	NA	NA
South Santiam	NA	NA	NA	2.5	NA	1
Tualatin	NA	0.1	NA	0.5	NA	NA
Upper Willamette	NA	NA	NA	0.8	NA	1
Yamhill	0.6	NA	2	NA	NA	NA

Table R-13: Summary of OWEB grant funded road projects completed in 2020, the most recent year data is available in the OWEB OWRI database.

Subbasin	Road relocation (1 station or 100 Feet)	Surface drainage improvement (1 station or 100 Feet)	Surface drainage improvement (Number of treatments)
Molalla-Pudding	NA	14.3	3
North Santiam	3.9	56.5	15

Table R-14: Summary of OWEB grant funded upland projects completed in 2020, the most recent year data is available in the OWEB OWRI database.

Subbasin	Irrigation system improvement (Acre)	Upland erosion control (Acre)
McKenzie	NA	0.1
Tualatin	0.7	NA
Upper Willamette	NA	0.1

Table R-15: Summary of OWEB grant funded upland projects completed in 2020, the most recent year data is available in the OWEB OWRI database.

Subbasin	Nutrient/manure management (Acre)	Nutrient/manure management (Number of treatments)
McKenzie	0.1	1
Upper Willamette	0.1	1

Table R-16: Summary of OWEB grant funded upland projects completed in 2020, 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)
Lower Willamette	24.2	1.8	NA	1.8
Middle Fork Willamette	25.0	NA	16.0	10.0
Middle Willamette	8.3	NA	8.3	8.3
Tualatin	9.1	8.6	NA	9.9
Upper Willamette	179.9	NA	179.9	179.9
Yamhill	25.5	NA	NA	1.0

Table R-17: Summary of OWEB grant funded urban projects completed in 2020, the most recent year data is available in the OWEB OWRI database.

Subbasin	Sustainable stormwater management (Area treated)	Sustainable stormwater management (Number of treatments)
Upper Willamette	0.3	2

Table R-18: Summary of OWEB grant funded instream projects completed in 2020, 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)
Lower Willamette	NA	NA	NA	1
North Santiam	NA	36	NA	NA
Upper Willamette	6	16	116	117
Yamhill	NA	19	NA	19

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 2021.

Table R-19: TMDL implementation activities reported in 2021 by Designated Management Agencies or third parties.

TMDL	DMA	Reported Actions
Willamette Basin and Columbia Slough TMDLs	Portland	The city developed and completed an inventory of Portland's watershed restoration projects to track information such as cost, location, project goals, and outcomes. This public-facing web tool for sharing the inventory content is found at https://pdx.maps.arcgis.com/apps/webappviewer/index.html?id=807ed51bb0314f9cbd31815c73ff9b6e
Willamette Basin and Columbia Slough TMDLs	Port of Portland	The Port of Portland planted 600 trees and native plants in the Columbia Slough Natural Area, which is a 2-acre site in the Parkrose neighborhood in Northeast Portland. This property is surrounded by historically marginalized neighborhoods of Cully, Argay, and Roseway. Two events engaged 10 Portland Opportunities Industrialization Center Youth Leaders.

TMDL	DMA	Reported Actions
Molalla-Pudding	City of Aurora	Nov 2021 five-year report 2016-2021 highlights- 3 riparian restoration projects; 900 linear feet of riparian corridor restored; Qualified inspector for construction site erosion control; Process for sites needing DEQ 1200C permit and erosion control requirements for sites not needing a DEQ permit; Stormwater conveyance map for non-MS4 DEQ Permit; Implementing pollution prevention and education, outreach and public involvement stormwater control measures
Willamette and Molalla-Pudding	Marion County	Nov 2021 five-year report 2016-2021 highlight- 150 linear feet of riparian corridor restored; BMP manual to control stormwater runoff (soil stabilization, vegetation management, spills); Implementing public education, outreach, and involvement programs countywide
Willamette and Molalla-Pudding	Salem	Nov 2021 five-year report 2016-2021 highlights -1560 linear feet of riparian corridor restored; 6 acres restored along riparian corridor; 13 riparian restoration projects; 1000 linear feet of riparian corridor restored; Implementing extensive pollution prevention and education, outreach and public involvement stormwater control measures within city and outside of city.
Molalla-Pudding	Scotts Mills	Nov 2021 five-year report 2016-2021 highlights- 1 riparian restoration projects; Through regulatory mechanism require at all construction sites erosion control, sediment control, waste materials management
Molalla-Pudding	Silverton	Nov 2021 five-year report 2016-2021 highlights - 1 acre restored along riparian corridor; 1 riparian restoration project; Implementing pollution prevention and education, outreach and public involvement stormwater control measures
Molalla-Pudding	Woodburn	Nov 2021 five-year report 2016-2021 highlights - Stormwater mapping with GIS; Ongoing review and update stormwater conveyance map; Requirement for review and approval of erosion and sediment control for projects not needing DEQ 1200C permit; Collaboration with the Pudding Watershed Council; Implementing pollution prevention and education, outreach and public involvement stormwater control measures
Molalla-Pudding	Gervais	Nov 2021 five-year report 2016-2021 highlights - Inspection of construction sites for illicit dischargers; Process for sites needing DEQ 1200C permit and erosion control requirements for sites not needing a DEQ permit.
Molalla-Pudding	Donald	Nov 2021 five-year report 2016-2021 highlights - Inspection process and inspection of construction sites; Process for sites needing DEQ 1200C permit and erosion control requirements for sites not needing a DEQ permit; A list of approved structural stormwater controls (e.g., bioswales, planter boxes, vegetated filter strips) including information on their application, conditions limiting their use, operation & maintenance procedures, maintenance schedule, and design and specifications.
Molalla-Pudding	Mt Angel	Nov 2021 five year report 2016-2021 highlights - Development of a stormwater conveyance map; A list of approved structural stormwater controls (e.g., bioswales, planter boxes, vegetated filter strips) including information on their application, conditions limiting their use, operation & maintenance procedures, maintenance schedule, and design and specifications; A requirement for the maintenance of privately-owned stormwater controls discharging into your jurisdiction's stormwater system; Integrated pest

TMDL	DMA	Reported Actions
		management policy for the public works department and/or parks department; Implementing pollution prevention and education, outreach and public involvement stormwater control measures
Tualatin	Clean Water Services (CWS)	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	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,	West Linn	SOLVE, a non-profit volunteer organization, finished multiple projects within the City at several parks. 1,698 volunteers removed over 102,350 square feet of invasive species and planted about 1,500 trees and shrubs. West Linn is a partner in the Regional Coalition for Clean Rivers and Streams.
Tualatin	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	Washington County	Washington County managed open space to prevent sediment and nutrients from entering waterways. The County promoted water quality protection through educational and outreach programs.
Willamette Basin Mercury TMDL	Lane County	The Board of Commissioners approved funding for a multi- year contract with a consultant to assist with a Stormwater Utility Feasibility Study.
Willamette Basin Temperature TMDL	Benton County	The county completed a riparian assessment to determine potential development impacts to a priority riparian corridor.
Willamette Basin Bacteria TMDL	City of Cottage Grove	The city completed a video geospatial map of the City and opened an RFP for installing and monitoring flow meters on the existing storm-sewer system. This data in conjunction with the information gathered in the mapping effort will be used for drafting and adopting a storm-sewer masterplan.
Willamette Basin Temperature	Clackamas River Basin Council	The Council has initiated a temperature monitoring study.

TMDL	DMA	Reported Actions
Willamette Basin	Portland General Electric	PGE contracted with the Clackamas River Basin Council to implement a multi-year tree planting program to provide shade in the lower 30 miles of the Clackamas River and its tributaries. The final project report was filed with DEQ in 2021. PGE implemented two side-channel habitat enhancement projects downstream of the River Mill Dam to increase shade and improve groundwater. To address the reduction in sediment supply below River Mill Dam, PGE implements a gravel augmentation program below the dam to help alleviate the temperature impacts created by low alluvial sediment in the river. Each year they place gravel on the streambank, timed with a seasonal high flow event to be captured and moved downstream.
Willamette Basin	City of Turner	The City is implementing education and outreach and public involvement strategies under the TMDL implementation plan including partnership with the Jane Goodall Environmental Middle School and Turner Elementary, monthly newsletters, and a direct mailer to builders about new construction erosional control program. The City is managing streamside park lands – including the new 15-acre park along Mill Creek. The parklands have the potential to function as natural floodplain and provide riparian protection.

3.7 USFS Data

The US Forest Service catalogs special restoration related projects in their central database that have been provided by each National Forest. These projects differ from their standard BMPS implemented as part of their management plans (e.g. buffer widths) and include projects such as road decommissioning, large wood placement, and riparian planting, among others. DEQ has provided this information in Appendix T of this report. Please note the caveats for this restoration data within the “Caveats” section of the document.

Appendix S
USFS Activity Data

Appendix S is a tabular spreadsheet that summarizes restoration activities and other BMP projects completed on USFS lands in calendar year 2020. The spreadsheet is available for downloaded from DEQ's nonpoint source program website or by contacting DEQ.

Appendix T
Section 319 Funding Priorities for Fiscal Year 2021

1. 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 or an Alternative Watershed Plan as outlined in Section C. 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.

1.3 Eastern Region Project Priorities

Table B-1

Watershed Name (HUC)	Pollutant	Eligible Project Areas	Project Need
John Day River Basin (170702)	Bacteria, Temperature	Entire watershed	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

Watershed Name (HUC)	Pollutant	Eligible Project Areas	Project Need
			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.
Imnaha Subbasin (17060102) Lower Grande Ronde Subbasin (17060106) Wallowa Subbasin (17060105)	Temperature	Private agricultural lands and within the City of Enterprise	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.
Bully Creek Subbasin (17050118) Lower Malheur Subbasin (17050117) Middle Snake-Payette Subbasin (17050115) Upper Malheur Subbasin (17050116)	Total Phosphorus	Private agricultural lands	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).

Watershed Name (HUC)	Pollutant	Eligible Project Areas	Project Need
Willow Creek Subbasin (17050119)			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.
Umatilla Subbasin (17070103)	Temperature	Entire watershed	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.

Watershed Name (HUC)	Pollutant	Eligible Project Areas	Project Need
Sprague River Subbasin (18010202) Williamson River Subbasin (18010201)	Temperature, Total Phosphorus	Private agricultural lands	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.
Upper Klamath Lake Subbasin (18010203)	Total Phosphorus	Private agricultural lands	
Walla Walla Subbasin (17070102)	Temperature	Entire watershed	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).

Watershed Name (HUC)	Pollutant	Eligible Project Areas	Project Need
			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.
Eightmile Creek Watershed (1707010502) Fifteenmile Creek Watershed (1707010503) Mill Creek-Columbia River Watershed (1707010504) Mosier Creek-Columbia River Watershed (1707010511)	Temperature	Private agricultural lands	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.

Watershed Name (HUC)	Pollutant	Eligible Project Areas	Project Need
			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.
Eagle Creek – Columbia River Watershed (1707010512) East Fork Hood River Watershed (1707010505) Hood River Watershed (1707010507) Mosier Creek – Columbia River Watershed (1707010511) West Fork Hood River Watershed (1707010506)	Temperature	Entire watershed	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.
Willow Creek Subbasin (17070104)	Temperature	Private agricultural lands and in Willow Creek Reservoir	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

Watershed Name (HUC)	Pollutant	Eligible Project Areas	Project Need
			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.

1.4 Western Region Project Priorities

Table B-2

Watershed Name (HUC)	Pollutant/Parameter	Eligible Project Areas	Project Need,
Little Butte Creek Watershed (1710030708)	Bacteria	Entire watershed	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
Butte Creek-Pudding River Watershed (1709000902) Rock Creek Watershed (1709000903) Senecal Creek-Pudding River Watershed (1709000905) Upper Little Pudding River Subwatershed (170900090108) Lower Little Pudding River Subwatershed (170900090109) Howell Prairie Creek-Pudding River Subwatershed (170900090110)	Dichlorodiphenyltrichloroethane (DDT), Dieldrin, Chlordane, and Total Suspended Solids	City of Aurora, City of Gervias, City of Hubbard, City of Mt Angel, City of Salem, City of Scott Mills, City of Silverton, City of Woodburn, Oregon Parks and Recreation Areas, private agricultural lands, private forest land, and all unincorporated non-federal lands in Marion County.	Implementation of efforts identified in water quality implementation plans or water quality management plan.
McKenzie Subbasin (17090004)	Temperature	Entire watershed	Implementation of efforts identified in water quality implementation plans

Watershed Name (HUC)	Pollutant/Parameter	Eligible Project Areas	Project Need,
			or water quality management plan.
North Santiam Subbasin (17090005)	Temperature	Entire watershed	Implementation of efforts identified in water quality implementation plans or water quality management plan.
Southern Willamette Valley Ground Water Management Area Marys River Watershed (1709000305) Muddy Creek Watershed (1709000302)	Nitrate	Southern Willamette Valley Ground Water Management Area	Implementation of efforts identified in the Southern Willamette Valley GWMA Action Plan that will reduce nitrate and other pollutant loading to groundwater.
Tenmile Creek-Frontal Pacific Ocean Tenmile Lakes Watershed (1710030404)	Sediment, Total Phosphorus	Entire watershed	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

Watershed Name (HUC)	Pollutant/Parameter	Eligible Project Areas	Project Need,
			restoration, and riparian protection and restoration.

1.5 Upper Willamette Project Priorities

Table B-3

Watershed Name (HUC)	Parameter	Applicable Watershed Planning Documents	Project Need
Long Tom River Watershed (1709000301)	Elevated bacteria loads	City of Eugene, Oregon: NPDES Storm Water Monitoring Plan City of Eugene, Oregon: Total Daily Maximum (TMDL) Implementation Plan Long Tom Watershed Council: Conservation Strategy Lane County, Oregon: Total Daily Maximum (TMDL) 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	Implementation of efforts identified in water quality implementation plans or water quality management plans. TMDL implementation planning and implementation, particularly targeting stormwater management and riparian buffers. Agricultural practices that improve manure management, and practices that reduce erosion, runoff, and riparian degradation. Analysis of water quality status and trends to assess effectiveness of implementation actions **Examples:** Stormwater treatment or other projects that address runoff, sediment and erosion, bacteria impairments. Riparian projects with livestock exclusion fencing, off channel watering, manure management or other projects that address sources of bacteria. Analysis of water quality status and trends in relation to sequences of management practice implementation.

1.6 Northwest Region Project Priorities:

Table B-4

Watershed Name (HUC)	Pollutant	Eligible Project Areas	Project Need
Lower Johnson Creek Watershed (170900120103) Upper Johnson Creek Watershed (170900120101)	Temperature	Private agricultural lands and within the City of Portland and City of Gresham	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. 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
Nehalem River Subbasin (17100202) Wilson / Trask / Nestucca Subbasin (17100203)	Bacteria, Temperature	Entire watershed	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. Restoration projects due to wildfire impacts 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

Watershed Name (HUC)	Pollutant	Eligible Project Areas	Project Need
			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.aspxfor locations)

1.7 Statewide Project Priorities:

Table B-5

Watershed Name (HUC)	Pollutant	Project Need
All watersheds with a Temperature focus identified in Table B-1 through Table B-3.	Temperature	*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.
All watersheds identified in Table B-1 through Table B-3.	See Tables Table B-1 through Table B-3	*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 Development of alternative monitoring and assessment

2. Wildfire Project Eligibility and Priorities

Eligible 2020 wildfire implementation funding activities must meet the following criteria:

1. Be located within any of the 2020 wildfire perimeters identified in Table C-1 and shown in maps located at https://www.oregon.gov/oem/emops/Pages/RAPTOR.aspx.
2. Address any of the of the following pollutant parameters:
    - section 303d listed parameters;
    - indicator parameters of wildfire impacts including dissolved oxygen, pH, conductivity, temperature, sedimentation, or turbidity);
    - conventional and potentially toxic pollutants associated with runoff from wildfire impacted landscapes.
3. Address natural resources recovery; impact assessment and other high priority recovery activities including any of the following:
    - Assessment of water quality conditions or landscape conditions (near-stream & areas at high risk for erosion, debris flow) in areas affected by wildfire;
    - Development of BMP projects (design, technical assistance, project, coordination) to address higher risk conditions that may impact beneficial uses;
    - Coordination with local, state and federal partners in assessment and/or BMP project development;
    - Implementation of BMP projects designed to reduce pollutant load to impaired or affected waterbodies.
    - Projects in areas contributing to or within designated drinking water source areas (DWSAs) will be prioritized.

Projects may also consider:

- Forest Service Burned Area Emergency Response (BAER) program
- Erosion Threat Assessment and Reduction Team (ETART) documents https://www.oregon.gov/deq/wildfires/Documents/ETARTwqReportF.pdf
- ODEQ - Public drinking water source area Wildfire Mapbook & Data
- Local assessments conducted post-wildfire
- Approved watershed based plans, or other alternative plans

Additional criteria and ranking factors include those in OWEB announcements.

Table C-1. 2020 wildfires in Oregon. See map at https://www.oregon.gov/oem/emops/Pages/RAPTOR.aspx. Source NWCC.

Fire Name	Fire Number	Fire Code	Complex	County
Alameda Drive	OR-711S-025921	NKS4		Jackson
Anderson Crossing	OR-VAD-000154	NFZ1		Malheur
Archie Creek	WA-SPD-000436	NC67		Douglas
Baldy	OR-VAD-000155	NF1M		Malheur
Beachie Creek	OR-WIF-200299	NFN5		Clackamas, Linn, Marion
Ben Young	OR-982S-200196	NAM5		Lake
Brattain	OR-FWF-200406	NKK3		Lake
Buckhorn Creek	OR-952S-020139	NDT0		Wheeler
Burns Rd	OR-581-581041	NK7E	North Cascade Complex	Clackamas
Canyon Creek	OR-BUD-002088	NDV6		Harney
Crane	OR-FWF-200345	NFL7		Lake
Doe Creek	OR-FWF-200139	EK2B		Klamath
Dowty	OR-581-581041	NK7E	North Cascade Complex	Clackamas
Dragon Rock	OR-LAD-200254	NB4A		Lake
Echo Mountain Complex	OR-553S-553018	NKT8		Lincoln
Fir Mountain	OR-954S-000514	NC5D		Wasco, Hood River
French Creek	OR-733S-000296			Douglas

Fire Name	Fire Number	Fire Code	Complex	County
Frog 0657 RS	OR-OCF-000657	EK2G		Crook
Green Ridge	OR-DEF-000684	NFU8		Jefferson
Grizzly Creek	OR-711S-000238	NJ22		Jackson
Hager Ridge	OR-UMF-000891	NGE5	Meacham Complex	Umatilla
Hog Ridge 0739 PR	OR-PRD-000739	NF7L		Wheeler
Holiday Farm	OR-WIF-200430	NKJ7		Lane, Linn
Horse	OR-UMF-000900			Umatilla
Horseshoe Ridge	OR-UMF-000896		Meacham Complex	Umatilla
Indian Creek	OR-VAD-000153	NFH4		Malheur
Krumbo	OR-MAR-002055	NA0F		Harney
Laurel 0741 PR	OR-PRD-00063	NF88		Wheeler
Leslie Gulch	OR-VAD-000239	NQL8		Malheur
Lionshead	OR-WSA-000077	NFV7		Clackamas, Jefferson, Linn, Marion, Wasco
Little Mud Creek	OR-BUD-002115	NF59		Harney
Marsh	OR-KLR-200138	M479		Klamath
Matlock	OR-UMF-000530	NB7J		Morrow
Milepost 91	OR-WSA-000045	M89P		Wasco
Mosier Creek	OR-954S-000022	NE2U		Wasco
Mud Creek	OR-BUD-002074	NDN9		Harney

Fire Name	Fire Number	Fire Code	Complex	County
Neals Hill	OR-BUD-002079	NDP1		Harney
P515	OR-WSA-000075	NFP1		Jefferson
Pine Creek 0480 RN	OR-RFPN-000480	NBP4		Jefferson
Putnam Springs	OR-UMF-020264	NGH 7		Grant
Ritter	OR-952S-020354	NL3S		Grant
Riverside	OR-MHF-000859	NKP2		Clackamas
Rock Creek 0103 RN	OR-PRD-000103	M22 U		Gilliam
Rose Creek	OR-VAD-000226	NN63		Malheur
Rosland Road 0429 NE	OR-DEF-000429	M94 G		Deschutes
Slater	CA-KNF-007035			Josephine
Sodhouse	OR-MAR-002006	M0S W		Harney
South Obenchain	OR-711S-026621	NKT7		Jackson
Steet Mountain	OR-952S-020279	NGA 2	Steet Mountain Complex	Grant
Sweet Creek MP 2	OR-781S-000037	NJB5		Lane
Teller Flat 0281 OD	OR-951S-000281	M7JP		Jefferson
Thielsen	OR-UPF-000441	NKN 6		Douglas
Trout Creek	OR-BUD-002108	NFV6		Harney
Two Four Two	OR-981S-076521	NKJ8		Klamath

Fire Name	Fire Number	Fire Code	Complex	County
Unger Rd Fire	OR-581-581041	NK7E	North Cascade Complex	Clackamas
War Canyon	OR-952S-020144	ND0R		Grant
Whilhoit Rd	OR-581	NK7E		Clackamas
White River	OR-MHF-000681	EK2F		Wasco
Wickiup	OR-VAD-000189	NKE4		Malheur
Wildcat	OR-BUD-002112	NF1T		Malheur
Worthington	OR-711S-010221			Jackson