OREGON
DEPARTMENT OF
AGRICULTURE

Upper Grande Ronde River Subbasin Agricultural Water Quality Management Area Plan

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Developed by the

Oregon Department of Agriculture

and the

Upper Grande Ronde Local Advisory Committee

with support from the

Union Soil and Water Conservation District

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Acronyms and Terms

Ag Water Quality Program – Agricultural Water Quality Program
Area Plan – Agricultural Water Quality Management Area Plan
Area Rules – Agricultural Water Quality Management Area Rules
CAFO – Confined Animal Feeding Operation
CWA – Clean Water Act
DEQ – Oregon Department of Environmental Quality
GWMA – Groundwater Management Area
HUC – Hydrologic Unit Code
LAC – Local Advisory Committee
LMA – Local Management Agency
Management Area – Upper Grande Ronde River Agricultural Water Quality Management Area
NRCS – Natural Resources Conservation Service
OAR – Oregon Administrative Rules
ODA – Oregon Department of Agriculture
ORS – Oregon Revised Statute
OWEB – Oregon Watershed Enhancement Board
OWRI – Oregon Watershed Restoration Inventory
PSP – Pesticide Stewardship Partnership
SIA – Strategic Implementation Area
SWCD – Soil and Water Conservation District
TMDL – Total Maximum Daily Load
US EPA – United States Environmental Protection Agency

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Foreword

This Agricultural Water Quality Management Area Plan (Area Plan) provides guidance for addressing water quality related to agricultural activities in the Agricultural Water Quality Management Area (Management Area). The Area Plan identifies strategies to prevent and control water pollution from agricultural lands through a combination of outreach programs, suggested land treatments, management activities, compliance, and monitoring.

The Area Plan is neither regulatory nor enforceable (Oregon Revised Statute (ORS) 568.912(1)). The Area Plan refers to associated Agricultural Water Quality Management Area Rules (Area Rules). The Area Rules are Oregon Administrative Rules (OARs) and are enforced by the Oregon Department of Agriculture (ODA).

Required Elements of Area Plans

Area Plans must describe a program to achieve the water quality goals and standards necessary to protect designated beneficial uses related to water quality as required by federal and state law (OAR 603-090-0030(1)).

Plan Content

Chapter 1: Agricultural Water Quality Program Purpose and Background. Presents consistent and accurate information about the Ag Water Quality Program.

Chapter 2: Local Background. Provides the local geographic, water quality, and agricultural context for the Management Area. Describes the water quality issues, Area Rules, and potential practices to address water quality issues.

Chapter 3: Implementation Strategies. Describes activities to make and track progress towards the goals of the Area Plan. Presents goals, measurable objectives, strategic initiatives, proposed activities, and monitoring efforts.

Chapter 4: Progress and Adaptive Management. Describes progress toward achieving Area Plan goals and measurable objectives by summarizing accomplishments and monitoring results.

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Chapter 1: Agricultural Water Quality Program

1.1 Purpose of Agricultural Water Quality Program and Applicability of Area Plans

As part of Oregon's Agricultural Water Quality Program (Ag Water Quality Program), the Area Plan guides landowners and partners such as Soil and Water Conservation Districts (SWCDs) in addressing water quality issues related to agricultural activities. The Area Plan identifies strategies to prevent and control "water pollution from agricultural activities and soil erosion" (ORS 568.909(2)) on agricultural and rural lands within the boundaries of this Management Area (OAR 603-090-0000(3)) and to achieve and maintain water quality standards (ORS 561.191(2)). The Area Plan has been developed and revised by ODA and the Local Advisory Committee (LAC), with support and input from the SWCD and the Oregon Department of Environmental Quality (DEQ). The Area Plan is implemented using a combination of outreach, conservation and management activities, compliance with Area Rules, monitoring, evaluation, and adaptive management.

The provisions of the Area Plan do not establish legal requirements or prohibitions (ORS 568.912(1)).

Each Area Plan is accompanied by Area Rules that describe local agricultural water quality regulatory requirements. ODA will exercise its regulatory authority for the prevention and control of water pollution from agricultural activities under the Ag Water Quality Program's general regulations (OAR 603-090-0000 to 603-090-0120) and under the Area Rules for this Management Area (OAR 603-095-0400 through 603-095-0460). The general regulations guide the Ag Water Quality Program, and the Area Rules for the Management Area are the regulations with which landowners must comply. Landowners are encouraged through outreach and education to implement conservation and management activities.

The Area Plan and Area Rules apply to all agricultural activities on nonfederal and nonTribal Trust land within this Management Area including:

- Farms and ranches,
- Rural residential properties grazing animals or raising crops,
- Agricultural lands that lay idle or on which management has been deferred,
- Agricultural activities in urban areas,
- Agricultural activities on land subject to the Forest Practices Act (ORS 527.610).

Water quality on federal land in Oregon is regulated by DEQ and on Tribal Trust land by the respective tribe, with oversight by the United States Environmental Protection Agency (US EPA).

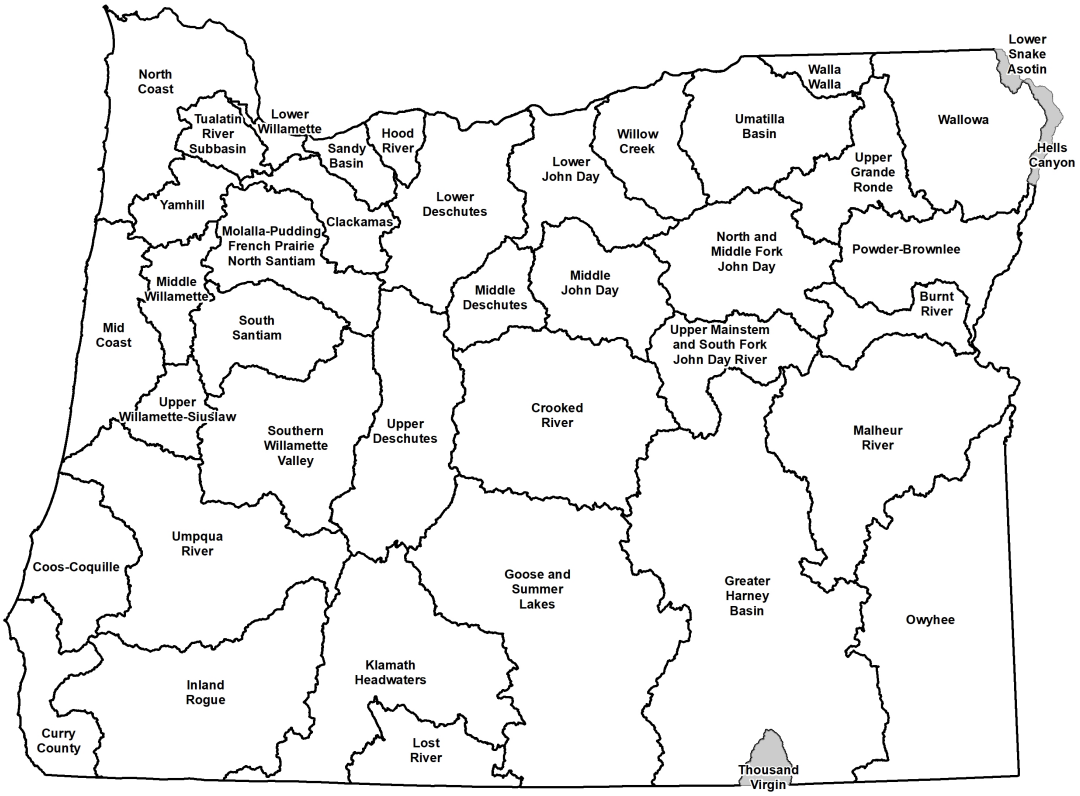
1.2 History of the Ag Water Quality Program

In 1993, the Oregon Legislature passed the Agricultural Water Quality Management Act directing ODA to develop plans to prevent and control water pollution from agricultural activities and soil erosion and achieve water quality standards and to adopt rules as necessary (ORS 568.900 through ORS 568.933). The Oregon Legislature passed additional legislation in 1995 to clarify that ODA is the lead agency for regulating agriculture with respect to water quality (ORS 561.191). The Area Plan and Area Rules were developed and subsequently revised pursuant to these statutes.

Between 1997 and 2004, ODA worked with LACs and SWCDs to develop Area Plans and Area Rules in 38 watershed-based Management Areas across Oregon (Figure 1.2). Since 2004, ODA, LACs, SWCDs, and other partners have focused on implementation including:

- Providing education, outreach, and technical assistance to landowners,
- Implementing projects to improve agricultural water quality,
- Investigating complaints of potential violations of Area Rules,
- Conducting biennial reviews of Area Plans and Area Rules,
- Monitoring, evaluation, and adaptive management,
- Developing partnerships with state and federal agencies, tribes, watershed councils, and others.

Figure 1.2 Map of 38 Agricultural Water Quality Management Areas*



*Gray areas are not included in Ag Water Quality Management Areas

1.3 Roles and Responsibilities

1.3.1 Oregon Department of Agriculture

ODA is the agency responsible for implementing the Ag Water Quality Program (ORS 568.900 to 568.933, ORS 561.191, OAR 603-090, and OAR 603-095). The Ag Water Quality Program was established to develop and implement water quality management plans for the prevention and control of water pollution from agricultural activities and soil erosion. State and federal laws that drive the establishment of an Area Plan include:

- State water quality standards,

- Load allocations for agricultural or nonpoint source pollution assigned under Total Maximum Daily Loads (TMDLs) issued pursuant to the federal Clean Water Act (CWA), Section 303(d),
- Approved management measures for Coastal Zone Act Reauthorization Amendments (CZARA),
- Agricultural activities detailed in a Groundwater Management Area (GWMA) Action Plan (if DEQ has established a GWMA in the Management Area and an Action Plan has been developed).

ODA bases Area Plans and Area Rules on scientific information (ORS 568.909). ODA works in partnership with SWCDs, LACs, DEQ, and other partners to implement, evaluate, and update the Area Plans and Area Rules. If and when other governmental policies, programs, or rules conflict with the Area Plan or Area Rules, ODA will consult with the appropriate agencies to resolve the conflict in a reasonable manner.

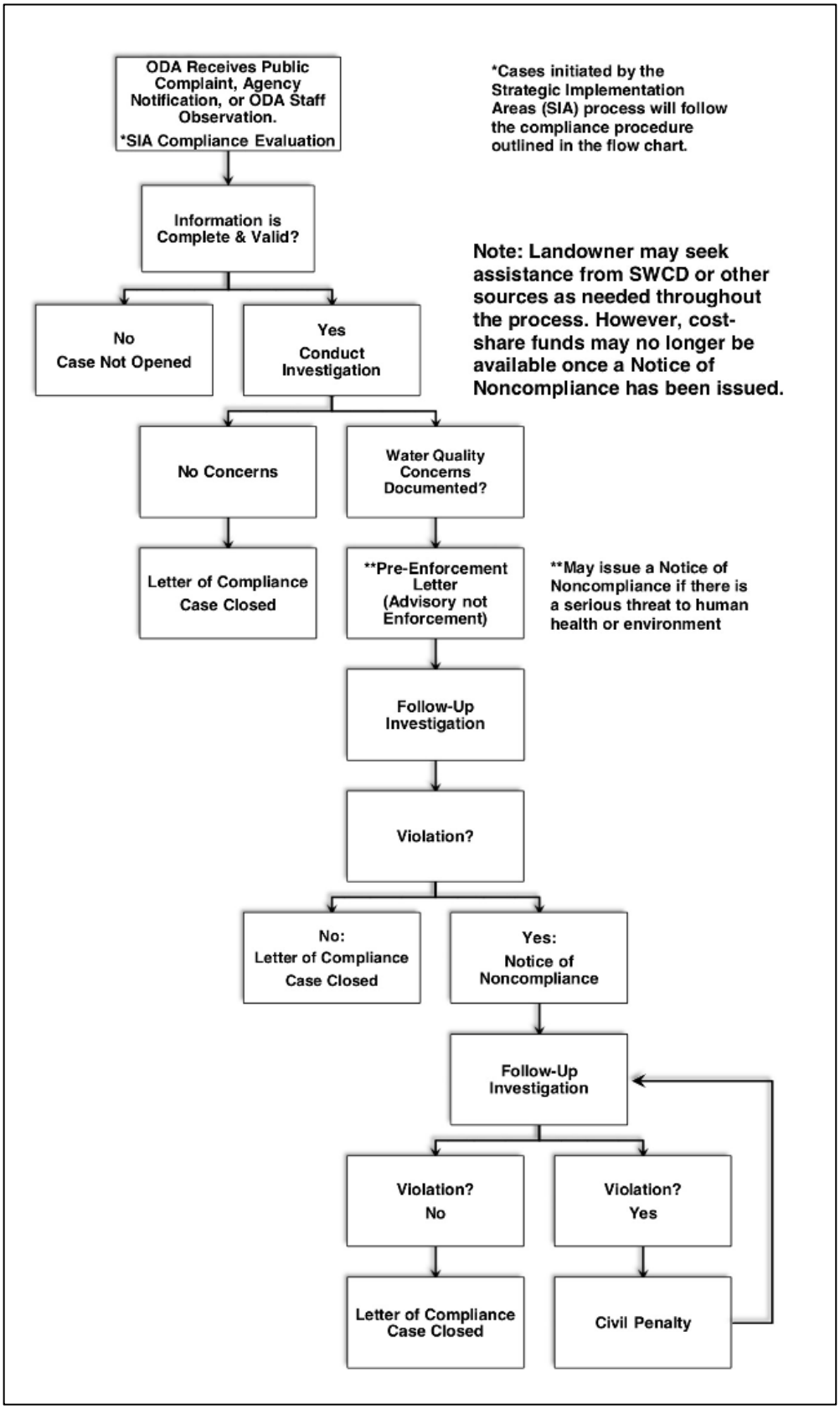
1.3.1.1 ODA Compliance Process

ODA is responsible for any actions related to enforcement or determination of noncompliance with Area Rules (OAR 603-090-0080 through OAR 603-090-0120). ORS 568.912(1) and ORS 568.912(2) give ODA the authority to adopt rules that require landowners to perform actions necessary to prevent and control pollution from agricultural activities and soil erosion.

The Area Rules are a set of standards that landowners must meet on all agricultural or rural lands. “Landowner” includes any landowner, land occupier, or operator per OAR 603-95-0010(24). All landowners must comply with the Area Rules. ODA will use enforcement where appropriate and necessary to achieve compliance with Area Rules. Figure 1.3.1.1 outlines ODA’s compliance process. ODA will pursue enforcement action only when reasonable attempts at voluntary solutions have failed (OAR 603-090-0000(5)(e)). If a violation is documented, ODA may issue a pre-enforcement notification or an enforcement order such as a Notice of Noncompliance. If a Notice of Noncompliance is issued, ODA will direct the landowner to remedy any conditions through required corrective actions under the provisions of the enforcement procedures outlined in OAR 603-090-060 through OAR 603-090-120. If a landowner does not implement the required corrective actions, ODA may assess civil penalties for continued violation of the Area Rules.

Any member of the public may file a complaint, and any public agency may file a notification of a potential violation of the Area Rules. ODA also may initiate an investigation based on its own observation or from cases initiated through the Strategic Implementation Area process (See Figure 1.3.1.1).

Figure 1.3.1.1 Compliance Flow Chart



1.3.2 Local Management Agency

A Local Management Agency (LMA) is an organization designated by ODA to assist with the implementation of an Area Plan (OAR 603-090-0010). The Oregon Legislature intended that SWCDs be LMAs to the fullest extent practical, consistent with the timely and effective implementation of Area Plans (ORS 568.906). SWCDs have a long history of effectively assisting landowners to voluntarily address natural resource concerns. Currently, all LMAs in Oregon are SWCDs.

The day-to-day implementation of the Area Plan is accomplished through an Intergovernmental Grant Agreement between ODA and each SWCD. Every two years, each SWCD submits a scope of work to ODA to receive funding to implement the Area Plan. Each SWCD implements the Area Plan by providing outreach and technical assistance to landowners. SWCDs also work with ODA and the LAC to establish implementation priorities, evaluate progress toward meeting Area Plan goals and objectives, and revise the Area Plan and Area Rules as needed.

1.3.3 Local Advisory Committee

For each Management Area, the director of ODA appoints an LAC (OAR 603-090-0020) with up to 12 members. The LAC serves in an advisory role to the director of ODA and to the Board of Agriculture. The role of the LAC is to provide a high level of citizen involvement and support the development, implementation, and biennial reviews of the Area Plan and Area Rules. The LAC's primary role is to advise ODA and the LMA on local agricultural water quality issues as well as evaluate the progress toward achieving the goals and objectives of the Area Plan. LACs are composed primarily of agricultural landowners in the Management Area and must reflect a balance of affected persons.

The LAC is convened at the time of the biennial review; however, the LAC may meet as frequently as necessary to carry out its responsibilities, which include but are not limited to:

- Participate in the development and subsequent revisions of the Area Plan and Area Rules,
- Recommend strategies necessary to achieve the goals and objectives in the Area Plan,
- Participate in biennial reviews of the progress of implementation of the Area Plan and Area Rules,
- Submit written biennial reports to the Board of Agriculture and the ODA director.

1.3.4 Agricultural Landowners

The emphasis of the Area Plan is on voluntary action by landowners to control the factors affecting water quality in the Management Area. In addition, each landowner in the Management Area is required to comply with the Area Rules. To achieve water quality goals or compliance, landowners may need to select and implement an appropriate suite of measures. The actions of each landowner will collectively contribute toward achievement of water quality standards.

Technical assistance, and often financial assistance, is available to landowners who want to work with SWCDs or other local partners, such as watershed councils, to achieve land conditions that contribute to good water quality. Landowners may also choose to improve their land conditions without assistance.

Under the Area Plan and Area Rules, agricultural landowners are not responsible for mitigating or addressing factors that are caused by non-agricultural activities or sources, such as:

- Hot springs, glacial melt water, unusual weather events, and climate change,
- Wildfires and other natural disasters,
- Septic systems and other sources of human waste,
- Public roadways, culverts, roadside ditches, and shoulders,
- Dams, dam removal, hydroelectric plants, and non-agricultural impoundments,
- Housing and other development in agricultural areas,
- Impacts on water quality and streamside vegetation from wildlife such as waterfowl, elk, and feral horses,
- Other circumstances not within the reasonable control of the landowner.

However, agricultural landowners may be responsible for some of these impacts under other legal authorities.

1.3.5 Public Participation

The public was encouraged to participate when ODA, LACs, and SWCDs initially developed the Area Plan and Area Rules. In each Management Area, ODA and the LAC held public information meetings, a formal public comment period, and a formal public hearing. ODA and the LACs modified the Area Plan and Area Rules, as needed, to address comments received. The director of ODA adopted the Area Plan and Area Rules in consultation with the Board of Agriculture.

ODA, LACs, and LMAs conduct biennial reviews of the Area Plan and Area Rules. Partners, stakeholders, and the general public are invited to participate in the process. Any revisions to the Area Rules will include a formal public comment period and a formal public hearing.

1.4 Agricultural Water Quality

The federal CWA directs states to designate beneficial uses related to water quality, decide on parameters to measure to determine whether beneficial uses are being met, and set water quality standards based on the beneficial uses and parameters.

1.4.1 Point and Nonpoint Sources of Water Pollution

There are two types of water pollution. Point source water pollution emanates from clearly identifiable discharge points or pipes. Point sources are required to obtain permits that specify their pollutant limits. Agricultural operations regulated as point sources include permitted Confined Animal Feeding Operations (CAFOs), and all permitted CAFOs are subject to ODA's CAFO Program requirements. Irrigation return flow from agricultural fields may drain through a defined outlet, but is exempt under the CWA and does not currently require a permit.

Nonpoint-source water pollution originates from the general landscape and is difficult to trace to a single source. Nonpoint water pollution sources include runoff from agricultural and forest lands, urban and suburban areas, roads, and natural sources. In addition, groundwater can be polluted by nonpoint sources including agricultural amendments (fertilizers and manure).

1.4.2 Beneficial Uses and Parameters of Concern

Beneficial uses related to water quality are defined by DEQ for each basin. The most sensitive beneficial uses usually are fish and aquatic life, water contact recreation, and public and private domestic water supply. These uses generally are the first to be impaired because they are affected at lower levels of pollution. While there may not be severe impacts on water quality from a single source or sector, the combined effects from all sources can contribute to the impairment of beneficial uses in the Management Area. Beneficial uses that have the potential to be impaired in this Management Area are summarized in Chapter 2.4.1.1.

Many waterbodies throughout Oregon do not meet state water quality standards. The most common water quality concerns statewide related to agricultural activities are temperature, bacteria, biological criteria, sediment, turbidity, phosphorous, nitrates, algae, pH, dissolved oxygen, harmful algal blooms, pesticides, and mercury. Water quality impairments vary across the state; they are summarized for this Management Area in Chapter 2.4.

1.4.3 Impaired Waterbodies and Total Maximum Daily Loads

Every two years, DEQ is required by the CWA to assess water quality in Oregon, resulting in the "Integrated Report." CWA Section 303(d) requires DEQ to identify "impaired" waters that do not meet water quality standards. The resulting list is commonly referred to as the "303(d) list" (http://www.oregon.gov/deq/wq/Pages/WQ-Assessment.aspx). In accordance with the CWA, DEQ must establish TMDLs for pollutants on the 303(d) list. For more information, visit www.oregon.gov/deq/wq/tmdls/Pages/default.aspx.

In accordance with the CWA, DEQ must establish TMDLs for pollutants on the 303(d) list (www.oregon.gov/deq/wq/tmdls/Pages/default.aspx). DEQ has issued TMDLs for a portion of these waterbodies that identify pollutant reductions needed to meet Oregon's water quality standards. The associated water quality management plans identify responsible entities and document management strategies needed to meet pollutant reduction targets.

A TMDL includes an assessment of conditions (based on water quality data, land condition data, and/or computer modeling) and describes a plan to achieve water quality standards. TMDLs specify the daily amount of pollution a waterbody can receive and still meet water quality standards. TMDLs generally apply to an entire basin or subbasin, not just to an individual waterbody on the 303(d) list. Water bodies are categorized as achieving water quality standards when data show the standards have been consistently attained.

In the TMDL, point sources are assigned waste load allocations that are then incorporated into National Pollutant Discharge Elimination System permits. Nonpoint sources (agriculture, forestry, and urban) are assigned a load allocation to achieve. The agricultural sector is responsible for helping achieve the pollution limit by achieving the load allocation assigned to agriculture specifically, or to nonpoint sources in general, depending on how the TMDL was written.

As part of the TMDL issuance process, DEQ identifies Designated Management Agencies and Responsible Persons, which are parties responsible for submitting TMDL implementation plans. For the agricultural sector, ODA is the Local Management Agency, and the local Area Plans are recognized as the implementation plan for the TMDL. Biennial reviews and revisions to the Area Plan and Area Rules must address agricultural or nonpoint source load allocations from relevant TMDLs.

The 303(d) list, the TMDLs, and the agricultural load allocations for the TMDLs that apply to this Management Area are summarized in Chapter 2.4.1.

1.4.4 Oregon Water Pollution Control Law – ORS 468B.025 and 468B.050

In 1995, the Oregon Legislature passed ORS 561.191. This statute states that any program or rules adopted by ODA "shall be designed to assure achievement and maintenance of water quality standards adopted by the Environmental Quality Commission."

To implement the intent of ORS 561.191, ODA incorporated ORS 468B.025 and 468B.050 into all 38 sets of Area Rules.

ORS 468B.025 (prohibited activities) states that:
"(1) Except as provided in ORS 468B.050 or 468B.053, no person shall:
(a) Cause pollution of any waters of the state or place or cause to be placed any wastes in a location where such wastes are likely to escape or be carried into the waters of the state by any means.
(b) Discharge any wastes into the waters of the state if the discharge reduces the quality of such waters below the water quality standards established by rule for such waters by the Environmental Quality Commission.
(2) No person shall violate the conditions of any waste discharge permit issued under ORS 468B.050."

ORS 468B.050 identifies the conditions when a permit is required. A permit is required for CAFOs that meet minimum criteria for confinement periods and have large animal numbers or have wastewater facilities. The portions of ORS 468B.050 that apply to the Ag Water Quality Program state that:
"(1) Except as provided in ORS 468B.053 or 468B.215, without holding a permit from the Director of the Department of Environmental Quality or the State Department of Agriculture, which permit shall specify applicable effluent limitations, a person may not:
(a) Discharge any wastes into the waters of the state from any industrial or commercial establishment or activity or any disposal system."

Definitions used in ORS 468B.025 and 468B.050:

" 'Pollution' or 'water pollution' means such alteration of the physical, chemical, or biological properties of any waters of the state, including change in temperature, taste, color, turbidity, silt or odor of the waters, or such discharge of any liquid, gaseous, solid, radioactive, or other substance into any waters of the state, which will or tends to, either by itself or in connection with any other substance, create a public nuisance or which will or tends to render such waters harmful, detrimental or injurious to public health, safety or welfare, or to domestic, commercial, industrial, agricultural, recreational, or other legitimate beneficial uses or to livestock, wildlife, fish or other aquatic life or the habitat thereof" (ORS 468B.005(5)).

" 'Water' or 'the waters of the state' include lakes, bays, ponds, impounding reservoirs, springs, wells, rivers, streams, creeks, estuaries, marshes, inlets, canals, the Pacific Ocean within the territorial limits of the State of Oregon and all other bodies of surface or underground waters, natural or artificial, inland or coastal, fresh or salt, public or private (except those private waters which do not combine or affect a junction with natural surface or underground waters), which are wholly or partially within or bordering the state or within its jurisdiction" (ORS 468B.005(10)).

" 'Wastes' means sewage, industrial wastes, and all other liquid, gaseous, solid, radioactive or other substances, which will or may cause pollution or tend to cause pollution of any waters of the state.' (ORS 468B.005(9)). Additionally, the definition of 'wastes' given in OAR 603-095-0010(53) "includes but is not limited to commercial fertilizers, soil amendments, composts, animal wastes, vegetative materials or any other wastes."

1.4.5 Streamside Vegetation and Agricultural Water Quality

Across Oregon, the Ag Water Quality Program emphasizes streamside vegetation protection and enhancement. Streamside vegetation can provide three primary water quality functions: shade to reduce stream temperature warming from solar radiation, streambank stability, and filtration of pollutants. Other water quality functions from streamside vegetation include water storage in the soil for cooler and later season flows, sediment trapping that can build streambanks and floodplains, narrowing and deepening of channels, and biological uptake of sediment, organic material, nutrients, and pesticides. In addition, streamside vegetation provides habitat for numerous species of fish and wildlife. Streamside vegetation conditions can be monitored to track progress toward achieving conditions that support water quality.

Site-Capable Vegetation

The Ag Water Quality Program uses the concept of "site-capable vegetation" to describe the streamside vegetation that can be expected to grow at a particular site, given natural site factors (e.g., elevation, soils, climate, hydrology, wildlife, fire, floods) and historical and current human influences that are beyond the program's statutory authority (e.g., channelization, roads, modified flows, previous land management). Site-capable vegetation can be determined for a specific site based on current streamside vegetation at the site, streamside vegetation at nearby reference sites with similar natural characteristics, Natural Resources Conservation Service (NRCS) soil surveys and ecological site descriptions, and/or local or regional scientific research.

The goal for Oregon's agricultural landowners is to provide the water quality functions (e.g., shade, streambank stability, and filtration of pollutants) produced by site-capable vegetation along streams on agricultural lands. The Area Rules for each Management Area require that agricultural activities allow for the establishment and growth of streamside vegetation to provide the water quality functions equivalent to what site-capable vegetation would provide.

Occasionally, mature site-capable vegetation such as tall trees may not be needed along narrow streams. For example, shrubs and grass may provide shade, protect streambanks, and filter pollutants. However, on larger streams, mature site-capable vegetation is needed to provide the water quality functions.

In many cases, invasive, non-native plants, such as introduced varieties of blackberry and reed canarygrass, grow in streamside areas. This type of vegetation has established throughout much of Oregon due to historic and human influences and may provide some of the water quality functions of site-capable vegetation. ODA's statutory authority does not require the removal of invasive, non-native plants, however, ODA encourages landowners to remove these plants voluntarily. In addition, the Oregon State Weed Board identifies invasive plants that can impair watersheds. Public and private landowners are responsible for eliminating or intensively controlling noxious weeds, as described in state and local laws. For more information, visit www.oregon.gov/ODA/programs/weeds.

1.4.6 Soil Health and Agricultural Water Quality

An increasingly important concept in Oregon and across the United States is soil health. The Ag Water Quality Program promotes soil health to reduce erosion and keep sediment out of surface waters, thereby helping to maintain and improve water quality. Healthy soils have relatively high organic matter and well-formed soil structure. These characteristics may resist erosion and increase water infiltration, leading to less surface runoff and greater groundwater recharge; the resultant groundwater flows in some cases can help moderate stream water temperatures. (Note that the beneficial effects on water quality vary based on factors such as soil type and ecoregion.) According to the NRCS and others, there are four soil health principles that together build highly productive and resilient soils: minimize disturbance; and maximize cover, continuous living roots, and diversity above and below the surface.

Building soil health increases resiliency to extreme weather, protects water quality, and helps keep farms and ranches viable. Incorporating soil health practices can help landowners adapt and reduce risks. For more information, visit www.nrcs.usda.gov/wps/portal/nrcs/detail/or/soils/health.

1.5 Other Water Quality Programs

The following programs complement the Ag Water Quality Program and are described here to recognize their link to agricultural lands.

1.5.1 Confined Animal Feeding Operation Program

ODA is the lead state agency for the CAFO Program, which was developed to ensure that operators do not contaminate ground or surface water with animal manure or process wastewater. The CAFO Program coordinates with DEQ to issue permits. These permits require the registrant to operate according to a site-specific, ODA-approved, Animal Waste Management Plan that is incorporated into the CAFO permit by reference. For more information, visit oda.direct/CAFO.

1.5.2 Groundwater Management Areas

Groundwater Management Areas (GWMAs) are designated by DEQ where groundwater is polluted from, at least in part, nonpoint sources. After designating a GWMA, DEQ forms a local groundwater management committee comprised of affected and interested parties. The committee works with and advises the state agencies that are required to develop an action plan to reduce groundwater contamination in the area.

Oregon DEQ has designated three GWMAs because of elevated nitrate concentrations in groundwater: Lower Umatilla Basin, Northern Malheur County, and Southern Willamette Valley. Each GWMA has a voluntary action plan to reduce nitrates in groundwater. After a scheduled evaluation period, if DEQ determines that voluntary efforts are not effective, mandatory requirements may become necessary.

Any GWMA in this Management Area is described in Chapter 2.4.1.5. Any Measurable Objectives for the GWMA will be described in Chapter 3.1.5.

1.5.3 The Oregon Plan for Salmon and Watersheds

In 1997, Oregonians began implementing the Oregon Plan for Salmon and Watersheds, referred to as The Oregon Plan (www.oregon-plan.org). The Oregon Plan seeks to restore native fish populations, improve watershed health, and support communities throughout Oregon. The Oregon Plan has a strong focus on salmonids because of their great cultural, economic, and recreational importance to Oregonians, and because they are important indicators of watershed health. ODA's commitment to the Oregon Plan is to develop and implement Area Plans and Area Rules throughout Oregon.

1.5.4 Pesticide Management and Stewardship

ODA's Pesticides Program holds the primary responsibility for registering pesticides and regulating their use in Oregon under the Federal Insecticide, Fungicide, and Rodenticide Act. ODA's Pesticide Program administers regulations relating to pesticide sales, use, and distribution, including pesticide operator and applicator licensing as well as proper application of pesticides, pesticide labeling, and registration.

In 2007, Oregon formed the interagency Water Quality Pesticide Management Team to expand efforts to improve water quality in Oregon related to pesticide use. This team facilitates and coordinates activities such as monitoring, analysis and interpretation of data, effective response measures, and management solutions. The team relies on monitoring data from the Pesticide Stewardship Partnership (PSP) program and other federal, state, and local monitoring programs to assess the possible impact of pesticides on Oregon's water quality. Pesticide detections in Oregon's streams can be addressed through multiple programs and partners, including the PSP.

Through the PSP, state agencies and local partners work together to monitor pesticides in streams and to improve water quality (www.oregon.gov/ODA/programs/Pesticides/Water/Pages/PesticideStewardship.aspx). ODA, DEQ, and Oregon State University Extension Service work with landowners, SWCDs, watershed councils, and other local partners to voluntarily reduce pesticide levels while improving water quality and crop management. Since 2000, the PSPs have made noteworthy progress in reducing pesticide concentrations and detections.

Any PSPs in this Management Area are described in Chapter 3.1.4.

ODA led the development and implementation of a Pesticides Management Plan (PMP) for the state of (www.oregon.gov/ODA/programs/Pesticides/water/pages/AboutWaterPesticides.aspx). The PMP, completed in 2011, strives to protect drinking water supplies and the environment from pesticide contamination, while recognizing the important role that pesticides have in maintaining a strong state economy, managing natural resources, and preventing human disease. By managing the pesticides that are approved for use by the US EPA and Oregon in agricultural and nonagricultural settings, the PMP sets forth a process for preventing and responding to pesticide detections in Oregon's ground and surface water.

1.5.5 Drinking Water Source Protection

Oregon implements its drinking water protection program through a partnership between DEQ and the Oregon Health Authority. The program provides individuals and communities with information on how to protect the quality of Oregon's drinking water. DEQ and the Oregon Health Authority encourage preventive management strategies to ensure that all public drinking

water resources are kept safe from current and future contamination. For more information, visit www.oregon.gov/deq/wq/programs/Pages/dwp.aspx.

1.6 Partner Agencies and Organizations

1.6.1 Oregon Department of Environmental Quality

The US EPA delegated authority to DEQ to implement the federal CWA in Oregon. DEQ is the lead state agency with overall authority to implement the CWA in Oregon. DEQ works with other state agencies, including ODA and the Oregon Department of Forestry to meet the requirements of the CWA. DEQ sets water quality standards and develops TMDLs for impaired waterbodies, which ultimately are approved or disapproved by the US EPA. In addition, DEQ develops and coordinates programs to address water quality including National Pollutant Discharge Elimination System permits for point sources, the CWA Section 319 grant program, the Source Water Protection Program (in partnership with the Oregon Health Authority), the CWA Section 401 Water Quality Certification, and Oregon's Groundwater Management Program. DEQ also coordinates with ODA to help ensure successful implementation of Area Plans.

A Memorandum of Agreement between DEQ and ODA recognizes that ODA is the state agency responsible for implementing the Ag Water Quality Program. ODA and DEQ updated the Memorandum of Agreement in 2023 (www.oregon.gov/oda/shared/Documents/Publications/NaturalResources/WaterQualityGoalsMOA.pdf).

The Environmental Quality Commission, which serves as DEQ's policy and rulemaking board, may petition ODA for a review of part or all of any Area Plan or Area Rules. The petition must allege, with reasonable specificity, that the Area Plan or Area Rules are not adequate to achieve applicable state and federal water quality standards (ORS 568.930(3)(a)).

1.6.2 Other Partners

ODA and SWCDs work in close partnership with local, state, and federal agencies and other organizations, including: DEQ (as described above), the NRCS and United States Department of Agriculture Farm Service Agency, watershed councils, Oregon State University Agricultural Experiment Stations and Extension Service, tribes, livestock and commodity organizations, conservation organizations, and local businesses. As resources allow, SWCDs and local partners provide technical, financial, and educational assistance to individual landowners for the design, installation, and maintenance of effective management strategies to prevent and control agricultural water pollution and to achieve water quality goals.

1.7 Measuring Progress

Agricultural landowners have been implementing effective conservation projects and management activities throughout Oregon to improve water quality for many years. However, it has been challenging for ODA, SWCDs, and LACs to measure progress toward improved water quality. ODA is working with SWCDs, LACs, and other partners to develop and implement strategies that will produce measurable outcomes. ODA is also working with partners to develop monitoring methods to document progress.

1.7.1 Measurable Objectives

A measurable objective is a numeric long-term desired outcome to achieve by a specified date. Milestones are the interim steps needed to make progress toward the measurable objective and consist of numeric short-term targets to reach by specific dates. Together, the milestones define the timeline and progress needed to achieve the measurable objective.

The Ag Water Quality Program is working throughout Oregon with SWCDs and LACs toward establishing long-term measurable objectives to achieve desired conditions. ODA, the LAC, and the SWCD will establish measurable objectives and associated milestones for each Area Plan. Many of these measurable objectives relate to land conditions and primarily are developed for focused work in small geographic areas (Chapter 1.7.3). ODA's longer-term goal is to develop measurable objectives, milestones, and monitoring methods at the Management Area scale.

The State of Oregon continues to improve its ability to use remote-sensing technology to measure current streamside vegetation conditions and compare these to the conditions needed to meet stream shade targets. As the State's use of this technology moves forward, ODA will use the information to help LACs and LMAs set measurable objectives for streamside vegetation. These measurable objectives will be achieved through implementing the Area Plan, with an emphasis on voluntary incentive programs.

At each biennial review, ODA and its partners will evaluate progress toward measurable objectives and milestone(s) and why they were or were not achieved. ODA, the LAC, and LMA will evaluate whether changes are needed to continue making progress toward the measurable objective(s) and will revise strategies to address obstacles and challenges.

The measurable objective(s) and associated milestone(s) within the Management Area are in Chapter 3.1 and progress toward achieving the measurable objective(s) and milestone(s) is summarized in Chapter 4.1.

1.7.2 Land Conditions and Water Quality

Land conditions can serve as useful surrogates (indicators) for water quality parameters. For example, because shade blocks solar radiation from warming the stream, streamside vegetation, or its associated shade, generally is used as a surrogate for water temperature. In some cases, sediment can be used as a surrogate for pesticides or phosphorus, which often adhere to sediment particles.

The Ag Water Quality Program focuses on land conditions, in addition to water quality data, for several reasons:

- Landowners can see land conditions and have direct control over them,
- Improved land conditions can be documented immediately,
- Water quality impairments from agricultural activities are primarily due to changes in land conditions and management activities,
- It can be difficult to separate agriculture's influence on water quality from other land uses,
- There is generally a lag time between changes on the landscape and the resulting improvements in water quality,
- Extensive monitoring of water quality would be needed to evaluate progress, which would be expensive and may not demonstrate improvements in the short term.

Water quality monitoring data will help ODA and partners to measure progress or identify problem areas in implementing Area Plans. However, as described above, water quality monitoring may be slower to document changes than land condition monitoring.

1.7.3 Focused Implementation in Small Geographic Areas

Focus Areas
A Focus Area is a small watershed with water quality concerns associated with agriculture. The Focus Area process is SWCD-led, with ODA oversight. The SWCD delivers systematic, concentrated outreach and technical assistance. A key component is measuring conditions before and after implementation to document the progress made with available resources. The Focus Area approach is consistent with other agencies' and organizations' efforts to work proactively in small watersheds.

Focus Areas have the following advantages: a proactive approach that addresses the most significant water quality concerns, multiple partners that coordinate and align technical and financial resources, a higher density of projects that may lead to increased connectivity of projects, and a more effective and efficient use of limited resources.

Any Focus Areas in this Management Area are described in Chapter 3.1.2. SWCDs will also continue to provide outreach and technical assistance to the entire Management Area.

Strategic Implementation Areas
Strategic Implementation Areas (SIAs) are small watersheds selected by ODA, in consultation with partners, based on a statewide review of water quality data and other available information. ODA conducts an evaluation of likely compliance with Area Rules and contacts landowners with the results and next steps. The Oregon Watershed Enhancement Board (OWEB) and other partners make funding and technical assistance available to support conservation and restoration projects. These efforts should result in greater ecological benefit than relying solely on compliance and enforcement. Landowners have the option of working with the SWCD or other partners to voluntarily address water quality concerns. ODA follows up, as needed, to enforce the Area Rules. Finally, ODA completes a post-evaluation to document progress in the SIA.

Any SIAs in this Management Area are described in Chapter 3.1.3.

1.8 Progress and Adaptive Management

1.8.1 Biennial Reviews

The ODA, LAC, LMA, and partners evaluate progress of Area Plan implementation through the biennial review process. At each biennial review, they discuss: 1) Progress toward meeting measurable objectives and implementing strategies, 2) Local monitoring data from other agencies and organizations, including agricultural land conditions and water quality, and 3) ODA compliance activities. As a result of these discussions, ODA and partners revise implementation strategies and measurable objectives in Chapter 3 as needed.

ODA provides information from the Oregon Watershed Restoration Inventory (OWRI) on restoration project funding and accomplishments at biennial reviews and uses the information for statewide reporting. The majority of OWRI entries represent voluntary actions of private landowners who have worked in partnership with federal, state, and local groups to improve

aquatic habitat and water quality conditions. OWRI is the single largest restoration information database in the western United States. For more information, visit www.oregon.gov/oweb/data-reporting/Pages/owri.aspx.

1.8.2 Agricultural Water Quality Monitoring

In addition to monitoring land conditions, ODA relies on water quality monitoring data where available. These data may be provided by other state or federal agencies or local entities; ODA seldom collects water quality samples outside of compliance cases.

As part of monitoring water quality status and trends, DEQ regularly collects water samples every other month throughout the year at more than 130 sites on more than 50 rivers and streams across the state. Sites are located across the major land uses (forestry, agriculture, rural residential, and urban/suburban). Parameters measured include alkalinity, biochemical oxygen demand, chlorophyll a, specific conductance, dissolved oxygen, bacteria (*E. coli)*, ammonia, nitrate and nitrite, pH, total phosphorus, total solids, temperature, and turbidity.

DEQ provides status and trends reports for selected parameters in relation to water quality standards. ODA will continue to work with DEQ to summarize the data results and how they apply to agricultural activities.

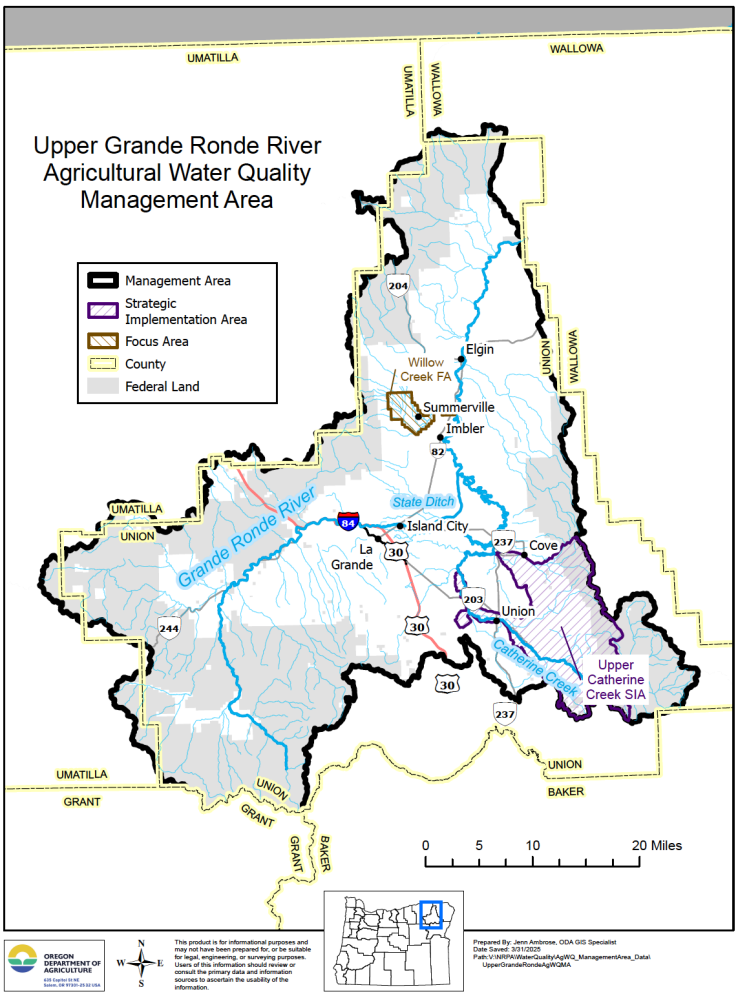
Water quality monitoring efforts in this Management Area are described in Chapter 3, and the data are summarized in Chapter 4.

Chapter 2: Local Background

Chapter 2 provides the local geographic, water quality, and agricultural context for the Management Area. It also describes the water quality issues, Area Rules, and potential practices to address water quality issues.

The Management Area consists of all the lands draining to the Grande Ronde River from its headwaters to the confluence with the Wallowa River at Rondowa, a land area of 1,640 square miles. The Area Plan refers to this area as the Upper Grande Ronde Subbasin (UGR Subbasin) to conform with the US Geological Survey system of naming drainages. The operational boundaries of this Area Plan include all agricultural and rural lands in the Management Area except federally managed land, and lands subject to the Oregon Forest Practices Act.

Figure 2 Upper Grande Ronde River Subbasin Management Area



2.1 Local Roles

2.1.1 Local Advisory Committee

The LAC was formed in 1997 to assist with the development of the Area Plan and Area Rules and with subsequent biennial reviews. Table 2.1.1 lists the current members of the LAC.

Table 2.1.1 Current LAC members

Name	Geographic Representation	Description
Dale Counsell (Chair)	Ladd Creek	Farmer, rancher
Kevin March	La Grande	Member of the public
Wade Bingaman	Imbler	Farmer, rancher
Allen Childs	Management Area	Confederated Tribes of the Umatilla Indian Reservation (fish habitat project leader)
Jed Hassinger	Catherine Creek	Farmer
Curt Howell	La Grande	Farmer, rancher
Dave Ricker	Catherine Creek	Rancher
Maarten Tromp Van Holst	Indian Creek	Rancher
Fred Wallender	Grande Ronde Valley	Farmer, rancher
Vacant		
Vacant		
Vacant		

2.1.2 Local Management Agency

SWCDs implement Area Plans through OWEB capacity grants, with details negotiated between ODA and each SWCD. The resulting Scopes of Work define the SWCDs as the LMAs for implementation of the Ag Water Quality Program. The LMA for this Management Area is the Union SWCD. The Union SWCD was also involved in development of the Area Plan and Area Rules.

The LMA implements the Area Plan by conducting activities detailed in Chapter 3, which are intended to achieve the goals and objectives of the Area Plan.

2.2 Area Plan and Area Rules: Development and History

The director of ODA approved the initial Area Plan and Area Rules in 1999.

Since approval, the LAC has met biennially to review the Area Plan and Area Rules. The biennial review process includes an assessment of progress toward achieving the goals and objectives in the Area Plan.

2.3 Geographical and Physical Setting

The Grande Ronde River flows through the Blue Mountains. Topography within the UGR Subbasin varies from rugged high elevation mountains to broad, nearly flat mountain-enclosed valleys. Elevations range from about 7,800 feet to slightly less than 2,300 feet. Average annual precipitation ranges from 12 to 25 inches below 3,000 feet to more than 50 inches above 5,000 feet. Typical summers are hot and dry, and winters tend to be cold and wet. Peak flows in the main stem of the Grande Ronde River generally occur in April or May when mean monthly flows

usually are around 2,000 cubic feet per second. August and September are months of low flow, and the mean monthly flow for these months is at or below 30 cubic feet per second.

Perhaps the most prominent physical feature in the planning area is the 360 square-mile Grande Ronde Valley. This valley is the heart of agricultural and urban activities in the UGR subbasin. Farmers and ranchers use their land to raise livestock and grow wheat, grass seed, mint, alfalfa, and several other crops. Many ranchers graze their livestock in the summer months on private and publicly owned lands in the mountainous regions of the subbasin.

2.4 Agricultural Water Quality

2.4.1 Water Quality Issues

2.4.1.1 Beneficial Uses

Multiple beneficial uses in the Management Area require clean water, including drinking water, recreational activities, aquatic life, and agriculture (www.oregon.gov/deq/wq/Pages/WQ-Standards-Uses.aspx).

DEQ has determined that cold-water fish species are the most sensitive beneficial use not being adequately supported in the UGR Subbasin. Spring/summer Chinook salmon, summer steelhead, bull trout, rainbow trout, and brook trout are some of the cold-water fish species that use the UGR Subbasin for all or part of their life cycles. There are three endangered species located in parts of the UGR Subbasin: Chinook salmon (*Oncorhynchus tshawytscha*), steelhead trout (*Oncorhynchus mykiss*), and bull trout (*Salvelinus confluentus*).

2.4.1.2 Water Quality Parameters of Concern

According to the 2022 Integrated Report, several stream segments are listed on the 303(d) list throughout the Management Area. The number of stream segments listed for each parameter are shown in Table 2.4.1.2. There are several water quality parameters of concern for agriculture; their descriptions are provided below. More information on specific segments listed can be found here: https://www.oregon.gov/deq/wq/Pages/epaApprovedIR.aspx.

Table 2.4.1.2 Number of stream segments on the 303(d) list by parameter (DEQ, 2022)

Parameter	# Segments
Temperature	61
Sedimentation	37
Habitat modification	24
pH	5
Algae	7
Nutrients	7
Flow modification	8
Dissolved oxygen	5
Bacteria	3
Biocriteria	6

Temperature
According to the 2022 Integrated Report, water temperature is the most widespread concern in the UGR Subbasin. Stream heating can result from various factors, including excess solar

radiation, reduced groundwater interaction, and diminished instream flow. These issues may arise from both natural disturbances and human-related stream modifications such as vegetation disturbance, irrigation withdrawal, and channel straightening. Elevated water temperatures negatively impact the survival of aquatic species. The purpose of temperature criteria is to protect designated temperature-sensitive beneficial uses, including specific salmonid life cycle stages in the state's waters.

Sediment
Sediment includes fine silt and organic particles suspended in the water column, settled particles, and larger gravel and boulders that move at high flows. Sediment movement and deposition is a natural occurrence, but high levels of sediment can degrade fish habitat by filling pools, creating a wider and shallower channel, and covering spawning gravels. Suspended sediment or turbidity in the water can cause physical damage to fish and other aquatic life, modify behavior, and increase stream temperature by absorbing incoming sunlight. Sediment comes from erosion on range, forestland and croplands, erosion from streambanks and streambeds, and runoff from roads and developed areas. Nutrients, pesticides, and toxic substances can also be attached to sediment particles.

Nutrients
Nutrients can occur naturally in streams and rivers, but elevated concentrations are often the result of pollution due to human activities. Nitrogen and phosphorus have been nationally identified as the most important nutrients to prevent from reaching surface waterbodies and groundwater. Nitrate is the primary form in surface water and groundwater because it readily dissolves in water and is easily transported. Studies conducted by the U.S. Geological Survey (USGS) National Water Quality-Assessment Program estimate that about 90 percent of nitrogen and 75 percent of phosphorus originates from nonpoint sources; the remaining percentages are from point sources.

Excess nutrients can promote the growth of algae, which can reduce beneficial uses of the stream. Biological processes (such as algal production) in surface waters are controlled by the availability of temperature, light, and nutrients. Abundant algae cause wide fluctuations in pH and dissolved oxygen, impacting aquatic life. Nuisance algae and plant growth impair aesthetics and can cause odor problems.

Bacteria
Bacteria levels, particularly *Escherichia coli* (*E. coli*) can pose a threat to the health of water contact recreation users and domestic water supplies. Potential sources of these bacteria include animal manure and septic systems.

The DEQ bacteria standard (OAR 340-41-0009(1)(a)) states that organisms of the coliform group commonly associated with fecal sources shall not exceed a 30-day log mean of 126 *E. coli* organisms per 100 ml, based on a minimum of five samples and no single sample shall exceed 406 *E. coli* organisms per 100 ml.

pH and Dissolved Oxygen
Extremes in water pH and low levels of dissolved oxygen can harm fish and other aquatic life. Both conditions can be caused by the availability of nutrients, warm temperatures, and light, all of which stimulate aquatic plant or algae growth. Excessive aquatic plant growth can increase water pH, which may harm fish. The death and subsequent decomposition of aquatic plants can deplete the water of dissolved oxygen resulting in the death of fish and other aquatic animals as well. These conditions are usually aggravated by low stream flow. For waters identified as

providing cold-water aquatic life, the dissolved oxygen shall not fall below 8.0 mg/l unless environmental conditions (barometric pressure, altitude, and temperature) preclude attainment (OAR 340-041-0016). The water quality standard for pH (hydrogen ion concentrations) values may not fall outside the range of 6.5 to 9.0 (OAR 340-041-0156(1)).

Aquatic Weeds and Algae
Both rooted aquatic plants and algae are a natural part of stream systems. They grow by taking in nutrients from the water column and sunlight. When water temperatures are warm enough and sufficient nutrients are present, excessive growth can occur; this can be a problem for both aquatic life and recreational beneficial uses. Excessive growth can affect aquatic life in several ways. During sunlight hours, plants and algae remove carbon dioxide from the water column as part of photosynthesis. With excessive growth, this can result in increased pH (alkaline conditions). During the night, plant growth removes oxygen from water and releases carbon dioxide, resulting in both low pH (acidic conditions) and low dissolved oxygen. In addition, when algae die and decompose, they remove oxygen from the surrounding water. Low dissolved oxygen can lead to decreased fish habitat and even fish kills. Additionally, low dissolved oxygen levels can lead to changes in water chemistry that allow mercury to be more able to enter the food chain. Algal blooms also often create odors and coloration that are objectionable to recreational users.

Harmful algal blooms (HABs) occur when excessive amounts of the naturally occurring blue-green algae, cyanobacteria, reach levels that create toxins that can be dangerous to animals and humans. Cyanobacterial blooms cause taste and odor problems, decreased aesthetics, depleted dissolved oxygen, and harmful toxins. Physical factors that contribute to the creation of HABs include the availability of light, meteorological conditions, alteration of water flow, vertical mixing, and temperature. Chemical factors include pH changes, nutrient loading (principally in various forms of nitrogen and phosphorus), and trace metals.

Biocriteria
Biocriteria refer to the support of plants and animals which live at least part of their life cycle in water. Factors that affect biocriteria are stream disturbances, excessive heat inputs, and excessive sediment.

The standard states, “Waters of the state shall be of sufficient quality to support aquatic species without detrimental changes in the resident biological communities (OAR 340-041-0011).”

2.4.1.3 TMDLs and Agricultural Load Allocations

Temperature, Dissolved Oxygen, pH (Nutrients): The area covered by the Upper Grande Ronde Subbasin TMDL (May 2000) corresponds to hydrologic unit code (HUC) 17060104, which includes all lands that drain to Grande Ronde River upstream of the confluence with the Wallowa River at Rondowa.

Load Allocation
Temperature: For agriculture, forestry, urban, and future sources: no measurable surface water temperature increase resulting from anthropogenic activities is allowed in Oregon waters determined out of compliance with the temperature standard.
Dissolved Oxygen and pH (Nutrients): Percent reductions in instream nutrient concentrations as listed on page 32 in the Upper Grande Ronde Subbasin TMDL (referenced below).

Temperature Surrogate: Solar radiation loads (percent effective shade)

Dissolved Oxygen and pH Surrogate: Nutrients

Sediment and Bacteria Surrogate: Achievement of the temperature, dissolved oxygen, and pH TMDLs.

TMDL: https://www.oregon.gov/deq/FilterDocs/ugrtmdl.pdf

2.4.1.4 Drinking Water

DEQ summarizes drinking water issues in each Management Area prior to biennial reviews. DEQ's full report is available at: https://www.oregon.gov/deq/wq/programs/Pages/Nonpoint-Implementation.aspx.

There are 23 public drinking water systems in the Upper Grande Ronde Management Area that use groundwater and surface water sources to serve approximately 165,077 people.

Two public water systems have had alerts for elevated nitrates in the past 10 years and none of these exceeded the maximum contaminant level (MCL) for nitrate. The drinking water standard for nitrates is 10 mg/L. The Domestic Well Testing Act database (real estate testing data) from 1989-2018 indicates eight significant detections of nitrate (≥ 7 mg/L) in private wells out of 329 total wells included in the database for this area. Of those private wells, six had nitrate concentrations of ≥ 10 mg/L.

E. coli bacteria alerts for public water systems are generated by the Oregon Health Authority when detected in sample results. Within the Management Area, five public water systems have had alerts for detections of *E. coli* in the past 10 years. No MCL violations for *E. coli* have been issued to any public water systems in the area within the past five years.

Contaminants in water supplies potentially related to agriculture occur near human populations, agricultural land uses, and aquifers susceptible to contaminant infiltration. It is recommended that public water systems and domestic well owners utilize source water protection practices to prevent potential contamination to drinking water sources and increase resiliency (https://www.epa.gov/sourcewaterprotection/source-water-protection-practices).

2.4.2 Sources of Impairment

Many agencies and groups have been collecting water quality data in the UGR Subbasin for several years. These data indicate that nonpoint source pollution contributes to water quality problems.

For example, water quality problems begin upstream of the La Grande wastewater discharge point and persist well below both the La Grande and Union discharges.

Nonpoint source pollution is the result of many human activities that occur in a basin. Effects from poor land management, while having a small influence on water quality locally, can accumulate and become significant problems at the watershed level. The opposite is true as well. Sound management may have only a small local effect, but broadly applied practices will lead, in time, to significant improvements overall. For these reasons, this Area Plan applies uniformly to all agricultural lands in the subbasin. It is also important to treat all landowners in the planning area as fairly as possible.
Some general categories related to agriculture that could influence water quality are:

- Soil management
- Nutrient application

- Animal manure management
- Livestock management
- Near-stream management

Agricultural activities do not cause all water quality problems in the UGR Subbasin. For example, the city wastewater discharges are a source of nutrients. Stormwater runoff from the urban areas contributes nutrients as do poorly maintained septic tanks. Poorly maintained roads and bridges increase sediment loads in streams. Forestry activities can cause increases in stream temperatures as well as sediment and nutrient concentrations in streams. Many other activities not listed here can also influence water quality.

Other factors besides human management influence water quality. The geology of the Management Area influences both surface water and groundwater quality. For example, the highly alkaline soils found in the Management Area can increase the pH of surface water and groundwater. This is especially true in the southern end of the Management Area and in the portion of Catherine Creek downstream from the City of Union.

The climate and topography of the Management Area also have a profound influence on water quality. Because the Grande Ronde River originates in low elevation mountains, and eastern Oregon's climate is hot and dry, water temperatures are naturally high, and flows are low late in the summer. Low flows concentrate nutrients, which along with high temperature, increase algae growth. Excessive algae growth is the main cause of the observed dissolved oxygen and pH fluctuations.

Another factor influencing current water quality issues is past management practices. One example is the State Ditch. This ditch captures the Grande Ronde River just downstream from Island City. It has changed what historically was 33 miles of meandering river channel. Most of this old river channel is now supplied with water only from Catherine Creek. The part of the old channel the State Ditch cut off is now farmed and houses and barns have been built in its path.

It should be noted that landowners and agencies have implemented many practices and completed many projects to benefit water quality in this basin. Implementation of this Area Plan will encourage this work to continue and to expand; water quality will improve as a result.

2.5 Regulatory and Voluntary Measures

2.5.1 Area Rules

Upper Grande Ronde River Subbasin (1999)

603-095-0440 Prohibited Conditions
All landowners or operators conducting activities on lands in agricultural use shall be in compliance with the following criteria. A land occupier shall be responsible for only those prohibited conditions caused by activities conducted on land managed by the landowner or occupier. Criteria do not apply to conditions resulting from unusual weather events or other exceptional circumstances, which could not have been reasonably anticipated. Limited duration activities may be exempted from these conditions subject to prior approval by the department.
(1) Soil Erosion: By January 1, 2003
(a) No agricultural land management or soil disturbing activity shall cause sheet or rill erosion in excess of the soil loss tolerance factor (T) on cropland, and no agricultural land management or

soil disturbing activity shall cause active channel erosion that delivers sediment directly into the waters of the state; or
(b) No agricultural land management or soil disturbing activity shall exceed an alternative standard, approved by the Department, that assures protection of water quality; or
(c) No agricultural land management or soil disturbing activity shall cause a discharge of sediment to the waters of the state in excess of water quality standards.

(2) By January 1, 2003, no agricultural land management or soil disturbing activity shall cause streambanks to breakdown, erode, tension-crack, shear or slump beyond the level that would be anticipated from natural disturbances given existing hydrologic characteristics.

(3) By January 1, 2003, nutrient application rates and timing shall not exceed specific crop requirements. Crop requirements will be based on recommendations from the best available data applicable to a specific site.

(4) By January 1, 2003, construction and maintenance of surface drainage field ditches shall not result in sediment delivery to waters of the state from soil erosion caused by excessive channel slope, unstable channel cross-section or placement of disposed soils.

(5) By January 1, 2003, agricultural activities shall allow the development of riparian vegetation to control water pollution by providing control of erosion, filtering of sediments and nutrients, moderation of solar heating, and infiltration of water into the soil profile. Evaluation of riparian vegetation development will consider site specific capabilities and anticipated levels of natural disturbance. Where cropping or resource protection activities have occurred, an adequate vegetative buffer or equally effective pollution control practice must be in place.

(6) Waste discharges: Effective upon adoption of these rules:
(a) No person conducting agricultural land management or earth disturbing practices shall cause pollution of any waters of the state or place or cause to be placed any wastes in a location where such wastes are likely to escape or be carried into the waters of the state by any means.
(b) No person conducting agricultural land management or earth disturbing practices shall discharge any wastes into any waters of the state if the discharge reduces the quality of such waters below the water quality standards established by rule by the Environmental Quality Commission.
(c) No person conducting agricultural land management or earth disturbing practices shall violate the conditions of any waste discharge permit issued pursuant to ORS 468B or 568.

2.5.2 Voluntary Measures

The purpose of the Area Plan is to prevent and control water pollution from agricultural activities and soil erosion in the UGR Subbasin. The LAC, ODA, and the SWCD believe proper agricultural practices and widespread adoption of the following practices will improve water quality. They also believe that ensuring the economic viability of agriculture is necessary to achieve this improvement in water quality. Achieving the goals in the Area Plan, which includes maintaining the economic viability of agriculture, will lead to preserving and protecting beneficial uses.

2.5.2.1 Soil Erosion Prevention and Control

A landowner or operator's responsibility under this Area Plan is to implement measures that prevent and control water pollution from upland agricultural activities and soil erosion. This includes agricultural, rural lands, and road management that may not be in close proximity to waterbodies but have the potential to contribute to water quality degradation by runoff of sediment and wastes.

Upland areas include rangelands, forests, and croplands located upslope from streamside areas. These areas extend to the ridge tops of watersheds. With a protective cover of crops and crop residue, grass, forbs, shrubs, or trees, these areas will capture, store, and safely release precipitation, thereby reducing the potential of excessive soil erosion or delivery of soil or pollutants to the receiving stream or other body of water.

Healthy upland areas provide several important ecological functions, including:

- Capture, storage, and moderate release of precipitation reflective of natural conditions,
- Plant health and diversity that support cover and forage for wildlife and livestock,
- Filtration of sediment,
- Filtration of polluted runoff,
- Plant growth that increases root mass, utilizes nutrients, and stabilizes soil to prevent erosion.

2.5.2.2 Irrigation Management

A landowner or operator's responsibility under this Area Plan is to implement measures that prevent and control water pollution from irrigation, this includes pollution to groundwater and surface water. Diversion of water for irrigation or other uses and the return of that water to the surface or groundwater are activities that have potential for contributing to water quality problems.

Irrigation is done by flooding, drip, or sprinkler application. Water usually is diverted from surface sources, such as streams or ponds, as well as from groundwater. Water withdrawals influence stream flows and thus, indirectly affect water quality. Overirrigating can result in runoff and leaching of agricultural chemicals to surface water and groundwater, directly affecting water quality. Subject to legal water rights, water withdrawals (dependent on surface water characteristics and method of diversion) should be made in a manner to minimize the adverse impacts on stream flows. The efficacy of irrigation water application is generally enhanced by assuring the quantity and timing of application based on the needs of the crop, as determined by soil moisture levels, crop water use budgets, or other monitoring tools.

All irrigators within the region should have an irrigation management plan to match irrigation application quantities, rates to the crop, soil type, and environmental demands. A companion nutrient management plan should match fertilizer and nutrient applications to agronomic demand.

Irrigation management aims at increasing food production and contributes to economic development through improvements in performance, productivity, and sustainability of irrigated agriculture and irrigation systems. Sources of information can be found at the Washington State University Pacific Northwest Irrigation site (irrigation.wsu.edu), the Open ET site (etdata.org) and OSU Extension Service site for irrigation management (https://extension.oregonstate.edu/topic/water/irrigation/resources).

An irrigation management plan should consist of:

- Soil types and map,
- Crop types, acreage, schedules, and critical moisture period,
- Irrigation system types, efficiencies,
- Estimated water use (evapotranspiration-ET) and peak ET, weekly,
- Irrigation rate, frequency and total, weekly.

Characteristics of an irrigation system that has minimal effect on water quality include:

- Operation based on an irrigation and nutrient management plan.
- Delivery of water efficiently to the land within legal water rights.
- Minimal overland return flows.
- Return flow routing that provides for settling, filtering, and infiltration.
- Minimal effect on stability of streambanks and minimal soil erosion.
- Scheduling of water application appropriate to the site including consideration of soil conditions, crop needs, climate, and topography.
- Installation and management of diversion structures that control erosion and sediment delivery and protect the stability of streambanks.
- Diversions that are adequately screened and which provide for fish passage (refer to ORS 498.268 for screening requirements).
- Sediment that is captured from irrigation runoff before it enters rivers and streams.

2.5.2.3 Nutrient Management

Crop nutrient applications, including manure, sludge, commercial fertilizer, and other added nutrient inputs, should always be done at a time and in a manner that reduces the possibility of runoff into any nearby stream or waterway. Fertilizers should be applied in accordance with nutrient budgets developed for each crop using current yield estimates, water analysis, soil tests, tissue tests, and/or other appropriate tests and information. Sources of information are found in the NRCS Field Office Technical Guide (FOTG) (https://efotg.sc.egov.usda.gov/#/state/OR/documents) and OSU Extension Service informational fact sheets for most commercial crops.

A nutrient management plan should consist of:

- Soil and water tests
- Fertilizer type and storage
- N, P, and K fertilizer concentrations
- Field map
- Application equipment and method
- Crop N utilization, by month
- N, P, K application, by month

Surface applied nutrients should not be applied to frozen soil, on snow, or when significant rainfall (more than 1 inch) is predicted as imminent (greater than a 67 percent probability within 24 hours of application) by the National Weather Service. Extra care shall be used when utilizing surface (rill or flood) irrigation to minimize nutrient contamination of tailwater. In no case should chemigated or fertigated irrigation water be allowed to flow directly to streams.

2.5.2.4 Riparian/Streamside Area Management

A landowner or operator's responsibility under this Area Plan is to implement measures that

prevent and control water pollution from agricultural activities. Areas near waterbodies are especially important to water quality and sensitive to management activities.

Vegetation, both in the uplands and in the riparian area, plays a critical role in water quality. Extensive research conducted in eastern Oregon and throughout the west confirms this. “Riparian vegetation” consists of plant communities consisting of plants dependent upon or tolerant of the presence of water near the ground surface for at least part of the year (OAR 603-095-0010(36)).

Generally, healthy plant communities:

- Hold soil in place
- Protect stream banks
- Capture, store and safely release precipitation
- Filter nutrients from both the ground water and surface runoff
- Provide shade to moderate water temperatures.

In addition to the water quality benefits, healthy terrestrial vegetation improves fish habitat. Riparian vegetation protects spawning, rearing, and holding areas by trapping sediment that could smother eggs and improving the recruitment of large woody debris. This debris helps to create pools for fish to rest in, provides hiding cover and habitat diversity. Vegetation provides organic debris to feed aquatic insects. These insects are an essential element in the diets of many fish.

Many factors influence stream temperatures. Some of the most important factors are:

- Volume of water flowing in the stream
- Width-to-depth ratio of the stream
- Ground water recharge
- Shade.

Vegetation affects all these factors. Riparian vegetation can help narrow and deepen stream channels, which protects water from heating by exposing less stream surface area to the surrounding environment. Healthy vegetation in both the uplands and in the riparian area will capture, store, and safely release water later in the season. Releasing water later in the summer will reduce temperatures in two ways. The first is that a higher volume of water requires more energy to heat it. Secondly, infusion of groundwater, usually between 45 and 55°F, can help hold down stream temperatures.

Shade, provided by tall vegetation, blocks solar radiation, and solar radiation is the single most important energy source for heating streams during daytime conditions. Thus, streamside vegetation, via the shade it produces, moderates summertime stream temperatures. In much of the UGR Subbasin, the historic and natural potential streamside vegetation is a natural riparian forest consisting variously of conifers or cottonwood, willow, alder, and other tree species as well as an herbaceous understory. The TMDL targets such “system potential” vegetation to moderate solar heating and promote natural channel form and function that provides for water quality.

Restoring healthy, functioning vegetation communities, especially riparian vegetation, will improve critical fish habitat necessary to support the three endangered fish species in the UGR Subbasin.

2.5.2.5 Livestock Waste Management

A landowner or operator's responsibility under this Area Plan is to prevent the introduction of waste materials into nearby bodies of water. Livestock management (including handling facilities, pastures, rangeland, and confinement areas) should be done in a manner that limits soil erosion and minimizes the delivery of sediment and animal wastes to nearby streams. A grazing management system should promote and maintain adequate vegetative cover for protection of water quality by consideration of intensity, frequency, duration, and season of grazing.

Livestock grazing is allowed to the extent it does not cause conditions that violate state water quality standards and complies with the Prevention and Control Measures in the Area Rules. Livestock facilities located near streams should employ an adequate runoff control system. Compliance with the riparian objectives will help keep wastes from running into waters of the state.

Grazing near streams should be managed to prevent negative impacts to streambank stability, allow for recovery of plants, and leave adequate vegetative cover to ensure protection of riparian functions including shade and habitat. Off-stream watering systems, upland water developments, feed, salt, and mineral placement are examples of methods to be considered as ways to reduce impacts of livestock to streamside areas. Establishment and spread of noxious weeds should be prevented by appropriate weed control practices and grazing management.

Factors used to evaluate effectiveness of management may include:

- Safe diversion of runoff
- Protection of clean water sources
- Off-stream watering systems
- Lot maintenance; smoothing, mounding, seeding
- Structural measures i.e.; filter strips, catch basins, berms
- Waste collection, storage and application methods
- Plant community is neither dominated by invasive annual plant species nor by overgrowth of native woody species
- Plant cover (plants plus plant litter) is adequate to protect site
- Distribution and amount of bare ground does not exceed what is expected for site
- Livestock utilization patterns do not exhibit excessive sustained use in key areas
- Plant vigor levels and regeneration are sufficient to protect long-term site integrity.

Chapter 3: Implementation Strategies

Chapter 3 describes efforts to make and track progress toward the goals of the Area Plan. It presents the goals, measurable objectives, strategic initiatives, proposed activities, and monitoring efforts.

Goal

Prevent and control water pollution from agricultural activities and soil erosion and achieve applicable water quality standards.

Objectives

- Reduce soil erosion from agricultural land in the basin
- Improve bank stability
- Improve riparian conditions
- Improve nutrient, animal waste, and irrigation management.

The following land conditions will help achieve the Area Plan goal and objectives on agricultural lands throughout the Management Area:

- Ongoing, natural recruitment of desirable riparian or upland plant species that provide streambank stability, filtration of overland flow, and moderation of solar heating, consistent with site capability.
- Management activities maintain at least 50% of each year's growth of woody vegetation, both trees and shrubs.
- Management activities minimize the degradation of established native vegetation.
- Maintenance or recruitment of woody vegetation, both trees and shrubs.
- Streambank integrity capable of withstanding 25-year flood events.
- No visible sediment loss from cropland through precipitation or irrigation induced erosion.
- No significant bare areas within 50 feet of streams on pasturelands and/or rangelands.
- Active gullies have healed or do not exist on pasturelands.
- Livestock manure is stored under cover during the winter and in a location that minimizes risk to surface water and groundwater.

LAC Mission

Maintain the economic viability of the agricultural industry, while pursuing ecological integrity through maintenance, restoration, education, and monitoring.

3.1 Measurable Objectives and Strategic Initiatives

Measurable objectives allow the Ag Water Quality Program to evaluate progress toward meeting water quality standards and TMDL load allocations. Any measurable objectives are stated here. Progress is reported in Chapter 4.1.

3.1.1 Management Area

3.1.1.1 Measurable Objective #1

Water quality parameters of concern:
Heat and nutrients

Assessment Method:
Utilize the Oregon Watershed Restoration Inventory (OWRI) database to track progress on the number of streamside vegetation miles and instream habitat miles installed or enhanced on agricultural lands. Highlight projects implemented by the SWCD during biennial reviews.

Measurable Objective and Associated Milestones:

- Increase streamside vegetation installed or enhanced on agricultural lands by 5 miles by 2030.
- Increase instream habitat enhanced by 2 miles by 2030.

3.1.1.2 Measurable Objective #2

Water quality parameters of concern:
Heat and nutrients

Assessment Method:
Use Conservation Reserve Enhancement Program (CREP) data through the SWCD to measure progress on streamside vegetation installation. SWCD staff will work to increase CREP enrollment.

Measurable Objective and Associated Milestones:

- Increase CREP-enrolled acres by 30 acres by 2030.

3.1.1.3 Measurable Objective #3

Water quality parameters of concern:
Heat and nutrients

Assessment Method:
Refer to the Upper Grande Ronde and Catherine Creek Atlas to evaluate the number of completed restoration projects.

Measurable Objective and Associated Milestones:

- Complete 3 Tier III restoration projects by 2030.
- Complete 3 Tier II restoration projects by 2030.
- Complete 3 Tier I restoration projects by 2030.

3.1.2 Focus Areas and Other Coordinated Efforts in Small Watersheds

There are no designated Focus Areas within this Management Area.

Willow Creek Focus Area (closed)

The Willow Creek Focus Area was part of ODA's Focus Area strategic initiative. Willow Creek was selected as a Focus Area in 2017 because of the large amount of agricultural activity, a high level of conservation and restoration opportunities perceived by the SWCD and ODA personnel, interest by planning partners to implement and fund implementation, and interest by landowners and local managers. The Focus Area was closed in 2021 due to lack of participation from landowners and ODA's shift to Strategic Implementation Areas.

3.1.3 Strategic Implementation Areas (SIA)

Upper Catherine Creek SIA (2019)

The Upper Catherine Creek SIA encompasses five subwatersheds (6th field HUCs): Mill Creek, Little Creek, Little Catherine Creek, Milk Creek-Catherine Creek, and Brinker Creek-Catherine Creek. Catherine Creek provides critical habitat for Endangered Species Act- (ESA) listed Chinook, steelhead, and bull trout. Catherine Creek is included in Oregon's 303d List for not meeting state water quality standards for temperature, sediment, phosphorus, pH, dissolved oxygen, and habitat modification. A TMDL has been in place for Catherine Creek since 2000.

The Catherine Creek watershed is a priority area in the UGR Subbasin, and Union SWCD has been leading projects in the Catherine Creek SIA to improve water quality on private property in partnership with the Grande Ronde Model Watershed, Confederated Tribes of the Umatilla Indian Reservation, Oregon Department of Fish and Wildlife, Bureau of Reclamation, Natural Resources Conservation Service, Forest Service, and Trout Unlimited.

SIA Compliance Evaluation Method:
ODA evaluated all agricultural tax lots within the SIA to identify opportunities to improve water quality and ensure compliance with Area Rules. The evaluation considered the condition of streamside vegetation, areas of bare ground, and potential livestock impacts (including manure management). The process involved both a remote evaluation and field verification from publicly accessible areas.

Opportunity levels:

- **Likely in Compliance (LC):** ODA identified no likely agricultural water quality regulatory concerns, and the goals of the Area Plan are likely being achieved.
- **Restoration Opportunity (RO):** ODA identified no likely agricultural water quality regulatory concerns, but there is likely some opportunity for improvement through voluntary measures to reach the goals of the Area Plan.
- **Compliance Opportunity (CO):** ODA identified that agricultural activities may impair water quality or evaluation was inconclusive. There also may be an opportunity for improvement through voluntary measures to reach the goals of the Area Plan.
- **Potential Violation (PV):** During the Field Evaluation, ODA observed a potential violation of the Area Rules. There also may be an opportunity for improvement through voluntary measures to reach the goals of the Area Plan.

Measurable Objective:
By December 3, 2023, all 15 tax lots identified as a Potential Violation or Compliance Opportunity will be downgraded to Restoration Opportunity or Likely in Compliance.

Monitoring:
The Union SWCD is collecting water samples at nine sites throughout the SIA (three sites on Mill Creek, five sites on Little Creek, and one site on Milk Creek). Monitoring began in May 2024 and will continue through October 2025. Continuous water temperature data will be collected at seven sites using the Hobo loggers from May through October. All other the other locations will measure temperature during the collection of dissolved oxygen, conductivity, pH and turbidity sampling that will occur monthly and, if possible, alternate between morning and afternoon recordings at each site. Water grab samples will be collected at six sites monthly and tested for *E. coli*, and nitrate + nitrite.

Monitoring aims to collect baseline data to answer the three following questions:

1. What are the *E. coli* and nitrate/nitrite levels in Little Creek and Mill Creek upstream and downstream of agricultural lands relative to TMDL standards?
2. What are the water chemistry conditions, measured as conductivity, pH, turbidity and dissolved oxygen, in Little, Milk and Mill creeks during the irrigation season?
3. What are the value differences in summer seven-day moving average water temperature between upstream and downstream locations and are the increases reduced following implementation of conservation actions?

Aerial photogrammetry will be used to compare baseline (preproject) riparian vegetative conditions with post-project conditions at high flow, baseflow, and low flow along four project reaches within the SIA. The Union SWCD will contract with the Grande Ronde Model Watershed (GRMW) to conduct drone flights at 80 feet above ground height for 1-foot by 1-foot resolution using multispectral imagery. The GRMW will compile the data and apply a nondifferential vegetation index (NDVI) as a measure of riparian vegetation greenness, density, and health. Aerial photo points will be established within each project reach using the protocols described in OWEB photo point monitoring guidance. Riparian condition measurements using the methods described above will occur prior to project implementation and at two, five, and 10-year post-project intervals.

Monitoring aims to answer the following question:

1. Utilizing aerial photometry, what are the vegetation and ground conditions before and after the implementation of conservation actions regarding 1) bare ground vs. cover, 2) vegetative density of riparian species, and 3) vegetative community health and vigor?

3.1.4 Pesticide Stewardship Partnerships (PSP)

There are no PSPs in this Management Area.

3.1.5 Groundwater Management Area (GWMA)

There is no GWMA in this Management Area.

3.2 Proposed Activities

ODA, the LAC, the LMA, and other partners have identified the following priority activities to track progress toward meeting the goals and objectives of the Area Plan (Table 3.2).

Table 3.2 Planned Activities for 2025-2030 throughout the Management Area by Union SWCD, NRCS, and Grande Ronde Model Watershed

Activity	6-year Target	Description
Landowner Engagement		
# of events that actively engage agricultural landowners (workshops, demonstrations, tours)	50	Public informational meetings, field meetings, and landowner tours.
# of agricultural landowners participating in active events	1,000	
# of agricultural landowners provided with brochures/fact sheets/mailings, etc.	500	Fact sheets and mailings related to watershed restoration and improving water quality.
Technical Assistance (TA)		
# of agricultural landowners provided with TA (via phone/walk-in/email/booth/site visit)	300	Technical assistance for projects related to watershed restoration and improving water quality.
# of on-site TA visits	150	Site visits for projects related to watershed restoration and improving water quality.
# of fund applications submitted for agricultural landowner projects	25	Funding applications submitted for projects related to watershed restoration and improving water quality.
# of fund applications awarded for agricultural landowner projects	12	Funding applications awarded for projects related to watershed restoration and improving water quality.
# of conservation plans written *	1	Conservation plans for projects related to watershed restoration and improving water quality.
# of acres in conservation plans that were written *	30	
* Definition: any written management plan to address agricultural water quality concerns, such as: nutrients, soil health, grazing, irrigation, and streamside vegetation. Can include farm and ranch plans (including small acreages) and NRCS-certified plans. Excludes projects with weak connection to agricultural water quality.		

3.3 Additional Agricultural Water Quality and Land Condition Monitoring

3.3.1 Water Quality

DEQ monitors water quality in the Management Area as part of its ambient monitoring network. Results are presented in Chapter 4.3.

The GRMW operates seven stream gauges in the Management Area in collaboration with partners such as the US Geological Survey (USGS), Idaho Power, and the Oregon Water Resources Department (OWRD). This network of flow gauges has been in operation since the mid 1990s. Baseline data exists, many standard statistics have been generated, and information is readily available.

The GRMW completed a two-year Grande Ronde Basin Water Quality Assessment in 2021-2022 to investigate whether poor water quality plays a role in Chinook salmon smolt mortality in the Grande Ronde Basin. Sampling was completed for conventionals, metals, polycyclic aromatic hydrocarbons (PAHs), herbicides, pesticides, pH, temperature, dissolved oxygen (DO), conductivity, and turbidity. Arsenic, chromium, copper, iron, nickel, zinc, ammonia, alkalinity, sulfide, and chloride were detected at least once during the sampling program. One herbicide (prodiamine) was detected at low concentrations in a multi-residue pesticide/herbicide screen

during one event. Cadmium, lead, selenium, silver, mercury, 18 priority PAHs, total cyanide, and phosphorus were never detected during the sampling program.

Temperatures exceeded the 13.0°C threshold during the August 2021 sampling event at all 10 locations consisting of the Grande Ronde River, Catherine Creek, Willow Creek, and Ladd Creek; at Ladd Creek location during the May 2022 sampling event; and at seven locations in the Grande Ronde River and Catherine Creek during the September 2022 sampling event.

DO was observed below 6.5 mg/L during three sampling events at one location on Ladd Creek during November 2020, April 2021, and May 2022. DO was observed below 6.5 mg/L during two sampling events at one location on Catherine Creek during August 2021 and September 2022.

One location on the Grande Ronde River exceeded the pH limits of 6.5 to 9 in August 2021 with a pH of 9.16

The results indicate water quality in the Grande Ronde Valley is impaired in some areas during portions of the year. The full assessment can be found at https://www.grmw.org/static/documents/data/assessment_documents/Data%20Report-Final_GRMW_GR%20Basin%20WQA_81-54.pdf

3.3.2 Land Conditions

There is no additional land condition monitoring.

Chapter 4: Progress and Adaptive Management

Chapter 4 describes progress toward achieving Area Plan goals and measurable objectives by summarizing accomplishments and monitoring results. Tracking activities is straightforward; monitoring water quality or land conditions takes more effort; relating changes in land conditions to changes in water quality is important but more challenging.

4.1 Measurable Objectives and Strategic Initiatives

The following tables provide the assessment results and progress toward measurable objectives and milestones. See Chapter 3.1 for background and assessment methods.

4.1.1 Management Area Results

4.1.1.1 Measurable Objective #1

Measurable Objective and Associated Milestones:

- Increase streamside vegetation installed or enhanced on agricultural lands by 5 miles by 2030.
- Increase instream habitat enhanced by 2 miles by 2030.

Current Conditions (1997–2023):

- 361 miles of streamside vegetation was installed or enhanced on agricultural lands out of 2,373 total stream miles on agricultural lands in the management area.
- 68 miles of instream habitat improved on agricultural lands out of 2,373 total stream miles on agricultural lands in the management area.

Assessment Results (1997-2023):

- Fifteen percent of total stream miles have had streamside vegetation installed or enhanced on agricultural lands.
- Three percent of total stream miles on agricultural lands have had instream habitat improvements.

Activities and Accomplishments (2019-2024):

- The Union SWCD installed 3.23 acres of riparian buffer and 1,380 feet of riparian fencing.
- The Union SWCD restored 2.5 miles of in stream habitat.

4.1.1.2 Measurable Objective #2

Measurable Objective and Associated Milestones:

- Increase CREP-enrolled acres by 30 acres by 2030.

Current Conditions:

- As of 2025, there are 52 active CREP contracts in Union County.
    - 1,479 acres enrolled of 64,360 eligible acres.

Assessment Results:

- 2 percent of eligible acres enrolled in CREP as of 2025.

Activities and Accomplishments: Specific activities and accomplishments will be reported during the 2030 review. Activities and accomplishments reported could also be duplicate of miles reported in measurable objective 1.

4.1.1.3 Measurable Objective #3

Measurable Objective and Associated Milestones:

- Complete 3 Tier III restoration projects by 2030.
- Complete 3 Tier II restoration projects by 2030.
- Complete 3 Tier I restoration projects by 2030.

Current Conditions:

Table 3.1.1.3 Upper Grande Ronde and Catherine Creek Atlas Implementation

Location	Tier	Completed	Planning and Construction	On Hold	Not Started
Catherine Creek	III	1	2	0	14
	II	1	3	1	9
	I	6	12	2	16
Upper Grande Ronde	III	14	4	0	79
	II	11	2	2	44
	I	11	5	2	23

Note: This table includes activities on private and federal lands.

Activities and Accomplishments:

Specific activities and accomplishments will be reported during the 2030 review. Activities and accomplishments reported could also be duplicate of miles reported in measurable objective 1.

4.1.2 Focus Areas and Other Focused Efforts in Small Watersheds

Willow Creek Focus Area

The Focus Area was closed in 2021 due to lack of participation from landowners and ODA's shift to Strategic Implementation Areas.

Table 4.1.2 Willow Creek Focus Area Activities and Accomplishments

Community and Landowner Engagement	
# of landowners provided with brochures / fact sheets / mailings, etc.	40
# active events that target landowners/ operators	3
# landowners/operators participating in active events	6
Technical Assistance (TA)	
# landowners/operators provided with TA	59
# site visits	49
# conservation plans written	0
Ag Water Quality Practices Implemented in the Focus Area	
# of fund applications submitted for landowner projects	6

4.1.3 Strategic Implementation Areas

Table 4.1.3. Upper Catherine Creek SIA

Evaluation Results		
As of December 3, 2019, 15 tax lots were identified as either a Potential Violation or a Compliance Opportunity. PV = 2, CO = 13, RO = 27, LC = 379		
Measurable Objective		
By December 3, 2023, all 15 tax lots identified as a Potential Violation or a Compliance Opportunity will be downgraded to Restoration Opportunity or Likely in Compliance.		
Post Evaluation		
As of December 3, 2023, 14 tax lots identified as a Potential Violation or a Compliance Opportunity were downgraded to Restoration Opportunity or Likely in Compliance. PV = 0, CO = 1, RO = 38, LC = 382. The measurable objective was not achieved. ODA was unable to contact one landowner after several attempts and that tax lot remains an OPP.		
Adaptive Management Discussion		
The compliance phase of the SIA is closed and monitoring continues. ODA and partners did not meet their measurable objective. One landowner continues to work with the Union Soil and Water Conservation District on property improvements to be completed in 2025.		
Monitoring Activities		
Water samples have been collected monthly since May 2024. Water quality monitoring occurred at five sites on Little Creek and two sites on Mill Creek for temperature and pH, and three sites on Little Creek and two sites on Mill Creek for bacteria (*E. coli*), nitrate and nitrite. Monitoring results to date indicate the following: Little Creek: Over 7.75 miles, summer stream temperatures increased by 5-7° C from upstream to downstream. pH levels also rose downstream, approaching 9, likely due to elevated temperatures and increased photosynthesis (which reduces carbon dioxide in the water). High bacteria levels were detected throughout the monitoring sites. Mill Creek: Over 6.25 miles, Summer stream temperatures increased by 7-15° C downstream. Bacteria levels were generally higher at the lower monitoring sites, with only one sample exceeding the grab sample maximum of 406 organisms/100 mL.		
Activity	**Accomplishment**	**Description**
ODA		
# acres evaluated	41,454	
# stream miles evaluated	61	
# landowners at Open House	N/A*	*Letters were sent because of COVID-19 pandemic.
# landowners receiving outreach materials	11	
SWCD and Conservation Partners		
# landowners provided with technical assistance	19	
# site visits	31	
# conservation plans written	1	Little Creek restoration (270 acres)
# of landowners provided with brochures/ fact sheets/mailings, etc.	104	
# active events that target landowners/ operators	9	Little Creek, Buffalo Flats, Crop and Conservation tour
# landowners/operators participating in active events	491	Little Creek, Buffalo Flats, Crop and Conservation tour

SIA and Project Funding		
# funding applications submitted	5	$125,000 OWEB Grant for TA and monitoring
# funding applications awarded	3	

Catherine Creek Irrigation Project

NRCS has been implementing the Catherine Creek Irrigation Efficiency Project within the SIA since 2022. Through this project, NRCS seeks to address inefficient water use by offering incentives to help landowners and water users with irrigation upgrades and to encourage practices that improve water quality and quantity. In addition, the CIS includes practices to address inadequate livestock water quantity and distribution.

Measurable Objectives:

1. NRCS will optimize the efficient use of irrigation water on 1,300 acres by improving irrigation water savings by 20 percent with improved irrigation systems and irrigation water management to minimize flow alterations during critical flow periods.
2. NRCS will reduce non-point source pollutant inputs (nutrients and bacteria) to surface water from agricultural sources through the implementation of conservation plans on 5,500 acres.

Current Conditions:

1. Objective 1 has been met, as all NRCS applicants have improved irrigation efficiency greater than 30% on 2,106.5 acres.
2. Objective 2 has not been met, and the project has been extended.

4.1.4 Pesticide Stewardship Partnerships

There are no PSPs in this Management Area.

4.1.5 Groundwater Management Area

There is no GWMA in this Management Area.

4.2 Activities and Accomplishments

ODA, the LAC, the LMA, and other partners identified the following priority activities to track progress toward meeting the goals and objectives of the Area Plan.

Future Area Plans will compare results and targets in Table 4.2a.

Table 4.2a Activities conducted in 2019-2024 throughout the Management Area by the Union Soil and Water Conservation District, Natural Resources Conservation Service, and Grande Ronde Model Watershed.

Activity	6-year results	Description
Landowner Engagement		
# of events that actively engage agricultural landowners (workshops, demonstrations, tours)	74	Public informational meetings for restoration projects, soil health improvement, wildfire impacts to water quality, meetings with irrigators to discuss diversion operations and field meetings to present concepts for improved water quality, quantity, and

		fish passage; landowner tours for past and future restoration projects.
# of agricultural landowners participating in active events	1,701	
# of agricultural landowners provided with brochures/fact sheets/mailings, etc.	831	Fact sheets and mailings related to watershed restoration and improving water quality.
Technical Assistance (TA)		
# of agricultural landowners provided with TA (via phone/walk-in/email/booth/site visit)*	644	Technical assistance for improving riparian vegetation conditions and water quality, reducing bank erosion, and improving the riparian plant community, increasing stream shade, and improving livestock management. Including all NRCS contract inventory and evaluation and technical assistance.
# of on-site TA visits	342	Site visits conducted at areas of concerns with landowners and partner organizations.
# of fund applications submitted for agricultural landowner projects	43	Grants written for technical assistance discussed above, and Conservation Stewardship Program (CSP) and Regional Conservation Partnership Program (RCPP).
# of fund applications awarded for agricultural landowner projects	22	Grants awarded for technical assistance discussed above, and CSP and RCPP.
# conservation plans written**	40	NRCS on all land units: crop, range, forest.
# of acres in conservation plans that were written**		

* Number reported likely double-counts some landowners due to tracking methods.
** Definition: any written management plan to address agricultural water quality concerns, such as: nutrients, soil health, grazing, irrigation, and streamside vegetation. Can include farm and ranch plans (including small acreages) and NRCS-certified plans. Excludes projects with weak connection to agricultural water quality.

Table 4.2b and 4.2c summarize information from the OWRI on restoration project funding and accomplishments on agricultural lands in the Management Area. The majority of OWRI entries represent voluntary actions of private landowners who have worked in partnership with federal, state, and local groups to improve aquatic habitat and water quality conditions. OWRI results are provided annually in January after a year of proofing and GIS management.

Table 4.2b Implementation funding (cash and in-kind) for projects on agricultural lands reported 1997-2023 (OWRI data include most, but not all, projects implemented in the Management Area.)

Landowners	OWEB	DEQ	NRCS*	BPA	ODFW	CTUIR	All other sources**
$1,581,601	$6,574,135	$0	$1,103,797	$11,328,481	$779,596	$410,566	$4,102,025
							TOTAL $25,880,201

Acronyms: OWEB (Oregon Watershed Enhancement Board); DEQ (Oregon Department of Environmental Quality); NRCS (Natural Resources Conservation Service); BPA (Bonneville Power Administration); ODFW (Oregon Department of Fish and Wildlife); CTUIR (Confederated Tribes of the Umatilla Indian Reservation)
* This table may not include all NRCS funding due to privacy concerns.
**Includes city, county, tribal, other state and federal programs, and non-profit organizations. There were too many entities to list.

Table 4.2c Miles and acres treated on agricultural lands reported 1997-2023
(OWRI data include most, but not all, projects implemented in the Management Area.)

Activity Type*	Miles	Acres	Count**	Activity Description
Upland		31,555		
Road	3		27	

Streamside Vegetation	361	2,116		
Wetland		1,050		
Instream Habitat	68			
Instream Flow	40		2 cfs	
Fish Passage	103		24	
TOTAL	**575**	**34,721**		

* This table may not include all NRCS projects due to privacy concerns.
** # hardened crossings, culverts, etc.

4.3 Additional Agricultural Water Quality and Land Condition Monitoring

4.3.1 Water Quality

DEQ analyzed data for dissolved oxygen, *E. coli*, pH, total phosphorus, temperature, and total suspended solids in the Management Area. (DEQ. 2022. Oregon Water Quality Status and Trends Report; https://www.oregon.gov/deq/wq/programs/Pages/wqstatustrends.aspx).

Data are from DEQ, US EPA, and USGS databases for 2001 through 2020. DEQ determined status for stations in five-year periods and trends for stations with at least eight years of data collected at the same time of year.

The following locations have sufficient data to calculate recent status and trends and are most likely to help characterize agricultural water quality (Table 4.3.1).

Table 4.3.1 Attainment of water quality standards from DEQ. 2022 Oregon Water Quality Status and Trends Report

Site Description	Parameter					
	E. coli	**pH**	**Dissolved Oxygen**	**Temp.**	**Total Phosphorus (mg/L)**	**Total Suspended Solids (mg/L)**
	Status and Trend					
Grande Ronde River at Hwy 82 (North Elgin)	Yes --	Yes --	Yes --	N/A	0.06;0.2	7.5;20
Grande Ronde River at Peach Lane (Island City)	Yes --	Yes --	Yes --	N/A	0.02;0.12	2;13
Grande Ronde River at Hilgard Park	Yes --	Yes --	Yes --	N/A	0.025;0.09	2;10
Below Indian Lake spillway	N/A	N/A	Yes --	N/A	N/A	N/A

[1] DEQ has no benchmark for total phosphorus in this Management Area; ODA benchmark for potential water quality concerns = 0.08 mg/L
[2] DEQ has no benchmark for total suspended solids in this Management Area
-- Statistically significant improving trend
-- Statistically significant degrading trend
→Steady
-- No significant trend

Temperature: The temperature status and trends in the area consisted of 12 sites: seven are not attaining with no significant trend and one is not attaining with a degrading trend; four are attaining with no significant trend.

4.3.2 Land Conditions

There is no additional land condition monitoring.

4.4 Biennial Reviews and Adaptive Management

ODA, the LAC, the LMA, and other partners met on June 25, 2025, to review implementation of the Area Plan and provided recommendations for the future (Tables 4.4a and 4.4b).

Table 4.4a Summary of biennial review discussion

Progress
Union Soil and Water Conservation District: • Willow Creek and Catherine Creek fish passage and restoration projects: Installed 3.23 acres of riparian buffer,1,380 feet of riparian fence and 2.5 miles of in-stream habitat. • Technical assistance provided to landowners for livestock and riparian area management. • Little Creek: Improved 1.4 miles of stream channel. Project work to create better fish passage at six irrigation diversion dams on little creek. Three have been completed. • Elmer Dam / Catherine Creek: As the gateway to the Catherine Creek watershed, the dam is undergoing major improvements to improve flow management. The project includes extensive irrigation system upgrades and connection of off-channel reservoirs for better water efficiency. • Provided technical assistance to landowners for riparian management and project permitting. • A hydraulic model is being developed for the valley (below the State Ditch) to identify opportunities for improving water quality and land conditions. Large farm field areas frequently flood, and water is unable to return to the main channel. This creates ongoing drainage and land use challenges. **Natural Resources Conservation Service:** • Have been implementing irrigation efficiency projects with landowners in the Catherine Creek area since 2022. Participation has expanded over the years, with a total of 2,106 acres enrolled to date. **Grande Ronde Model Watershed:** • Conducting water quality monitoring in the Grande Ronde Valley to determine whether poor water quality is contributing to the 60 percent mortality rate of juvenile salmon. The first phase, completed in 2023, identified dissolved oxygen issues in Ladd Creek and Catherine Creek. • Currently wrapping up phase 2 of monitoring, which includes running a 24-hour composite sampling unit, collecting sediment samples from the channel, and installing six dissolved oxygen sensors upstream and downstream of areas of concern identified in phase 1. The 24-hour composite samples detected zinc exceedances in the Grande Ronde River at Market Lane in August and alkalinity levels were below criteria at Island City. The dissolved oxygen sensors recorded low dissolved oxygen during summer and fall, although no concerns were observed upstream near the City of Union or downstream at Market Lane. No detections of pesticides or herbicides were observed. • The restoration Atlas will be updated soon.

Impediments
• It is challenging to find funding for streambank erosion caused by flooding unless it can be linked to high priority fish habitat or in-stream benefits. • Restoration funding in the Grande Ronde Valley is limited due to lower priority status. • Landowners struggle with permitting when attempting to complete streambank erosion projects independently. • Local agency offices are currently understaffed.
Recommended Modifications and Adaptive Management
• Increased focus is needed on restoration in the lower Catherine Creek and Grande Ronde areas to improve riparian and floodplain conditions. Levee setbacks and inset floodplains will help support vegetation growth and prevent streambank erosion. • Encourage agencies to streamline permitting processes for flood restoration projects. • More focus may be needed on Ladd Creek to support steelhead spawning. ODFW designated this area as high-quality habitat.

Table 4.4b Number of ODA compliance activities in 2019-2024

Location	Cases		Site Visits	Agency Actions				
				Letter of Compliance		Pre-Enforcement Notification	Notice of Noncompliance	Civil Penalty
	New	Closed		Already in compliance	Brought into compliance			
Outside SIA	4	4	10	2	2	6	0	0
Within SIA	2	1	4	1	0	1	0	0