OREGON DEPARTMENT OF AGRICULTURE

Yamhill River Subbasin Agricultural Water Quality Management Area Plan

February 2025

Developed by the

Oregon Department of Agriculture

and the

Yamhill Local Advisory Committee

with support from the

Yamhill Soil and Water Conservation District and Polk 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 – 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 603-095-0540). 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 non-federal and non-Tribal 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).

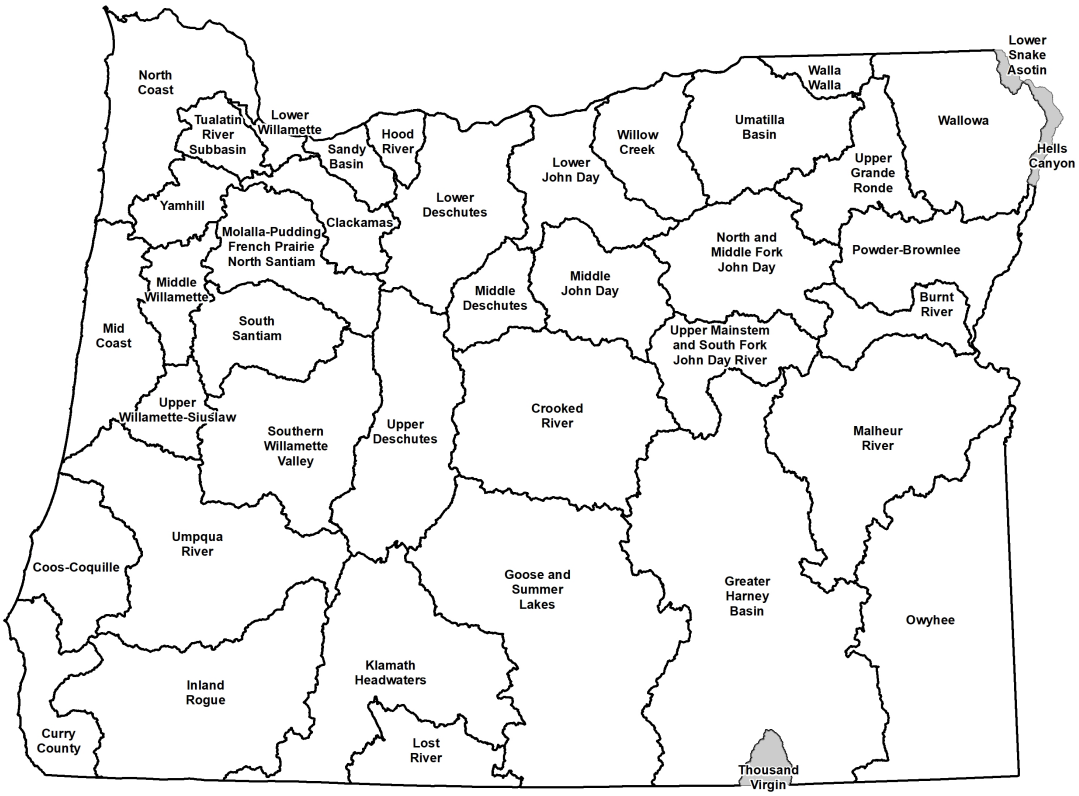
1.2 History of the Ag Water Quality Program

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.

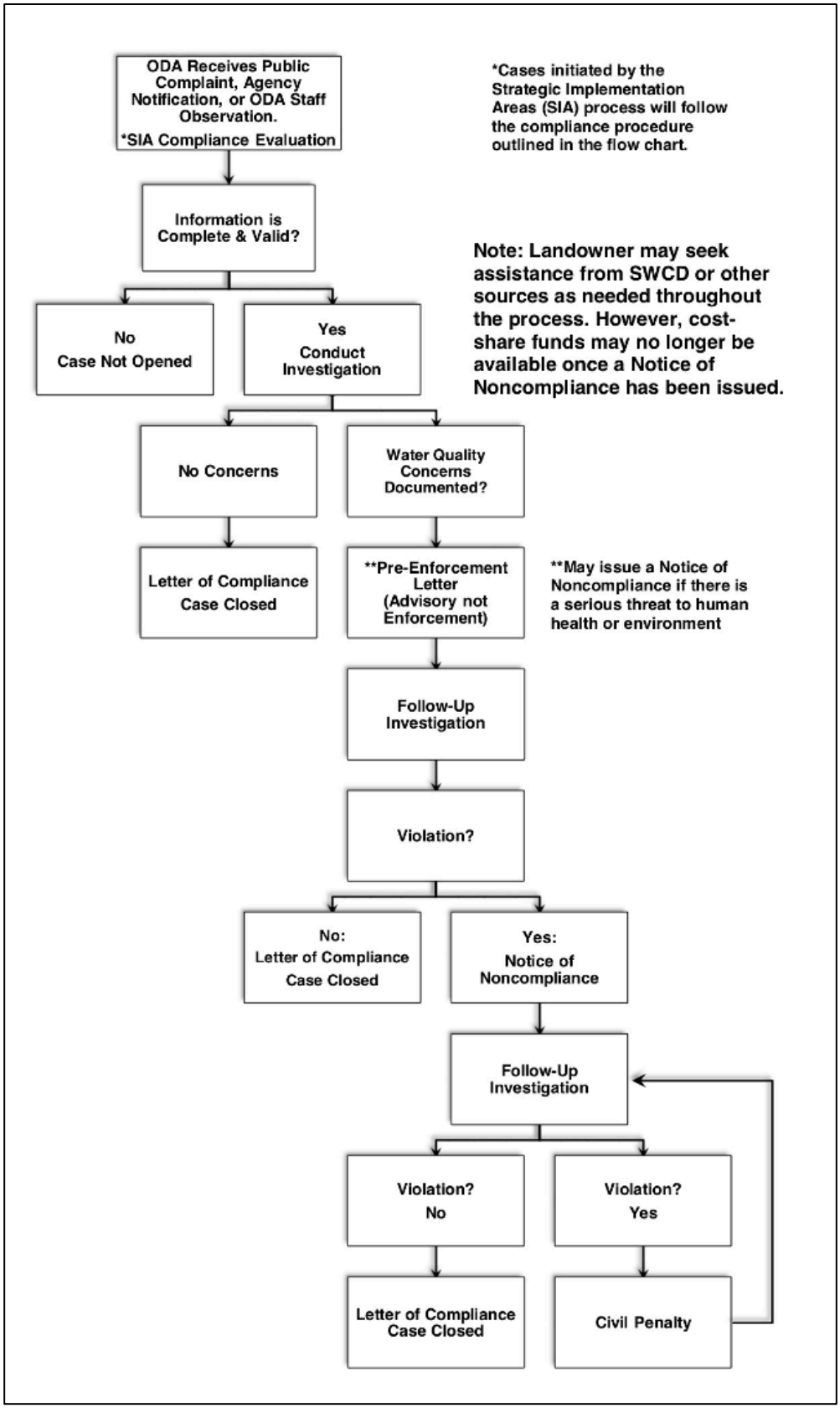
1.3.1.1 ODA Compliance Process

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 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. ODA is the Designated Management Agency for the agricultural sector. ODA will either utilize existing Area Plans or develop TMDL Implementation Plans to 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 Oregon (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 non-agricultural 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.

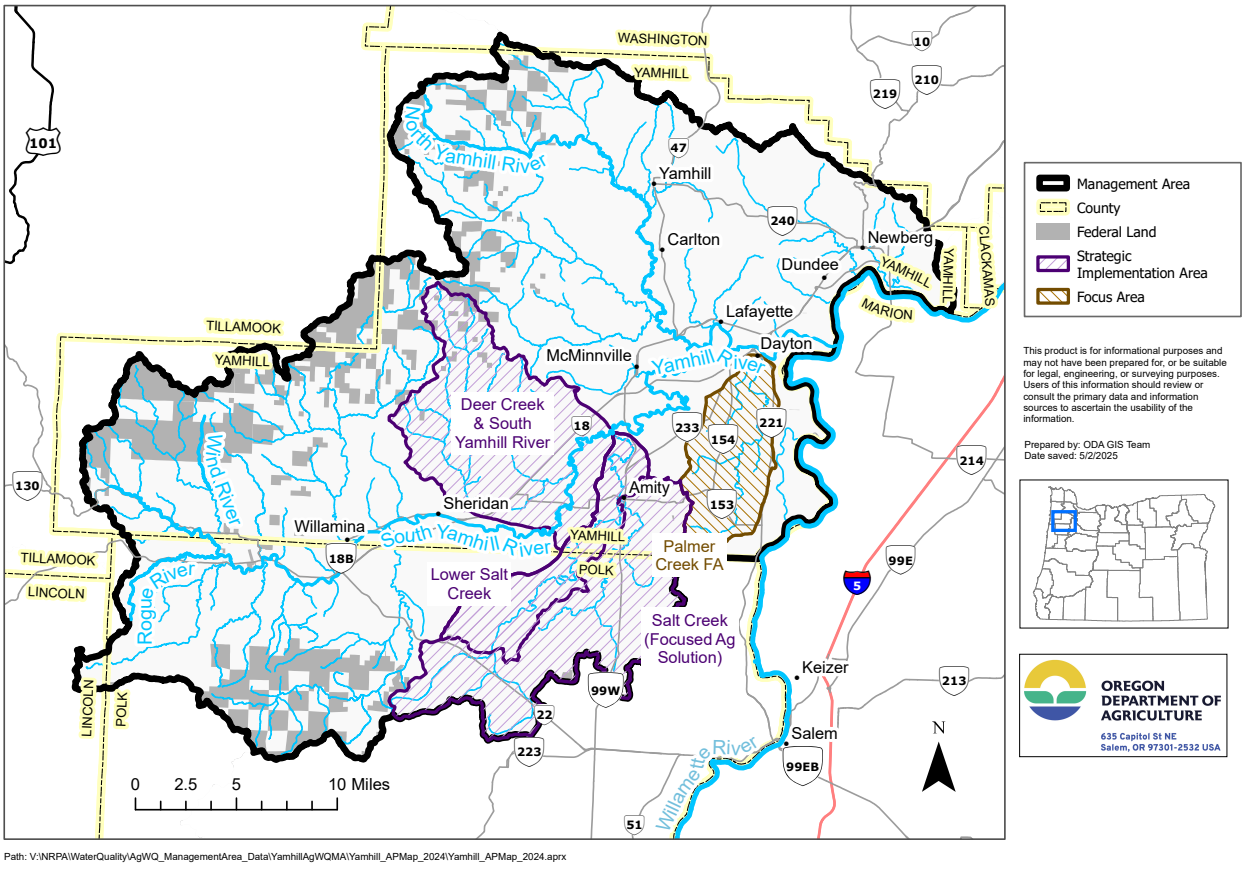
Water quality monitoring efforts in this Management Area are described in Chapter 3, and the data are summarized in Chapter 4.

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 Yamhill River Subbasin Management Area is 548,350 acres (857 square miles) in size and encompasses four counties: Yamhill, Polk, Tillamook, and Lincoln. Two counties comprise most of the Management Area (Yamhill County, 400,251 acres, and Polk County, 141,646 acres).

Figure 2 Yamhill River Subbasin Management Area



Path: V:\NRPA\WaterQuality\AgWQ_ManagementArea_Data\YamhillAgWQMA\Yamhill_APMap_2024\Yamhill_APMap_2024.aprx

2.1 Local Roles

2.1.1 Local Advisory Committee

The LAC was formed 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
Sam Sweeney (Chair)	Dayton	General farming, row crops, Yamhill SWCD board, Palmer Irrigation District
Catie Anderson	McMinnville	Nursery, Bailey Nursery production supervisor
Rich Blaha	McMinnville	Livestock, research biologist
Matt Crawford	Amity	Grass and specialty seed
Lucien Gunderman	McMinnville	Livestock, Yamhill SWCD associate director
Allan Holstein	Dundee	Vineyard, Argyle Vineyard manager
Steve Jones	McMinnville	Wheat, Oregon Wheat League
Tim Pfeiffer	Yamhill	General farming
Ernie Strahm	Carlton	Livestock
Tom Thompson	Dallas	General farming
Rod Volbeda (alternate)	Salem	Dairy, Select Seed, Oregon Wheat League, Oregon Clover Growers
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 in specific Management Areas. The LMAs for this Management Area are Yamhill and Polk SWCDs. These) SWCDs were also involved in development of the Area Plan and Area Rules.

The LMAs implement 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 2000.

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

2.3.1 Location and Land Use

The Yamhill Basin is situated between the Coastal Mountains to the west and the Willamette River to the east. Elevation in the Yamhill Basin ranges from 60 to 3,600 feet. The current population of Yamhill County is approximately 99,193 and Polk County is 75,403 (US Census Bureau, 2010). By 2050, it is projected that Yamhill County's population will increase to approximately 167,300 and 135,877 in Polk County (Oregon Department of Administrative Services, 2013).

Land Use
The predominant land uses in the Yamhill Basin Management Area are agriculture and forestry (Table 2.3.1). Urban development is concentrated to several small cities including Amity, Carlton, Dayton, Dundee, McMinnville, Lafayette, Newberg, Sheridan, Yamhill, and Willamina.

The forested areas are generally found in the western part of the watershed, in the foothills, and upper elevations of the Coastal Mountain Range. Additional forestland occurs in isolated tracts in the Amity-Eola Hills, Red Hills of Dundee, and the Chehalem and Parrett Mountains. Commercial forest is under public and private ownership. Private ownerships are industrial and non-industrial forests and smaller woodlots. The Confederated Tribes of Grand Ronde also own commercial forest in the western part of the watershed.

Table 2.3.1 Land Use in the Yamhill Management Area by State Zoning (Acres)
Data source: https://geohub-oregon-geo.hub.arcgis.com/datasets/oregon-geo::zoning/about

Farm Use	240,761
Mixed Farm Forest	47,083
Commercial	2,009
Forest Federal	31,180
Forest Private	175,797
Indian Reservation	10,269
Industrial	4,057
Mineral and Aggregates	1,869
Parks and Open Space	1,110
Public Use	944
Rural Residential	23,736
Low-High Density Residential	8,930

2.3.2 Agriculture

The Yamhill Basin Management Area is one of the most diverse and agriculturally productive areas in Oregon (Table 2.3.2). In the early settlement days of Yamhill and Polk counties, cattle grazing, and agriculture were introduced for subsistence. Settlement was rapid and overtime cattle were pushed up into the higher elevations and farmers began growing crops in the valley bottoms. A United States Census from 1880 recorded that hay, oats, and wheat comprised 99 percent of agricultural production inthe Management Area. Clover was eventually introduced in the 1880s and was followed by a surge in livestock production. In the early 1900s, dairies began to establish and fruit and nut orchards increased. Commercial production of strawberries and blackberries started in the early 1920s and grass seed production was introduced in the 1930s once fields could be tiled and drained (Hofert-Hay 2000). Since then, agricultural production in the basin has diversified to include irrigated specialty crops, small family farms and ranches, Christmas trees, nursery stock production, as well as a greater variety of dryland crops. Most

recently there has been an expansion of vineyards in Yamhill and Polk counties, making the Yamhill Basin the largest region in Oregon planted with wine grapes and a national leader in growing pinot noir varietals (Yamhill County 2009).

Table 2.3.2 Estimated Agricultural Production in Yamhill and Polk Counties (2022)
2022 US Census of Agriculture: https://www.nass.usda.gov/Publications/AgCensus/2022/index.php (last accessed 11/18/2024). Data in parentheses are comparison values from the 2017 U.S. Census: https://www.nass.usda.gov/Publications/AgCensus/2017/Full_Report/Census_by_State/Oregon/ (last accessed last accessed 11/6/2019.

Production	Yamhill County	Polk County
Total Land in Agricultural Production (acres)	164,347 (169,357)	154,851 (148,905)
Number of Farms	2,000 (2,138)	1,158 (1,243)
Average Size of Farms (acres)	82 (79)	134 (120)
Irrigated land (acres)	29,171 (29,060)	23,616 (20,385)
Total Cropland	113,943 (113,373)	117,938 (107,580)
Total Land in Pasture – All Types (acres)	20,220 (26,089)	13,242 (18,131)
# Farms in the USDA National Organic Program	36 (30)	17 (15)
# Farms enrolled in *USDA Conservation Programs	44 (34)	18 (25)
Acres in No-Till	15,448 (14,796)	13,148 (10,881)
Acres in Conservation Tillage (Excludes No-Till)	9,373 (10,305	28,408 (19,948)
Livestock (# farms with :)		
Beef Cows	344 (392)	230 (306)
Milk Cows	23 (29)	13 (18)
Equine: Horses, Ponies, Mules & Donkeys	468 (530)	288 (307)
Any Poultry (Layers and Broilers)	511 (451)	251 (281)
Goats	200 (221)	112 (125)
Sheep and Lambs	151 (174)	98 (154)
Llamas & Alpacas	56 (109)	44 (40)
Hogs and Pigs	55 (63)	33 (38)
Total Bee Colonies in:	8,950 (1,573)	1,919 (2,883)
Crops (acres)		
Field Seeds/ Grass Seeds/ Hay/ Forage/ Silage	42,673 (41,563)	49,276 (35,762)
Vegetable Row Crops	3,855 (3,543)	3,785 (929)
Cover Crops Planted	9,373 (7,894)	3,616 (4,023)
Orchards (acres)		
Land in Orchards	26,941 (22,002)	11,713 (14,714)
Land in Christmas Tree Production	1,554 (1,302)	8,085 (5,871)
Filbert – Hazelnut Orchards	17,938 (14,710)	5,368 (9,579)
Vineyards, Berries and Nurseries		
**Planted Wine Grapes (#Vineyards/Acres)	898/25,897 (637/19,705)	
Nurseries (greenhouse square feet)	118,067 (115,924)	9,964 (14,388)
Land in Berries	1,788 (2,187)	1,666 (648)

*Conservation Reserve, Wetlands Reserve, Farmable Wetlands, and CREP
**Data from 2017 and 2022 Oregon Vineyard and Winery Reports – North Willamette Valley (Includes Yamhill-Carlton, Chehalem Mountains, McMinnville, Ribbon Ridge, Dundee Hills, and Ecola-Amity Hills American Viticultural Areas.

NOTE: This data is for discussion purposes only. It is not likely that the census results include all operations that meet the definition of a farm or that all those that do meet the definition of afarm respond to the census inquiry. Information could be missing or inaccurate and is a report for all of Yamhill and Polk counties.

The majority of the farmland in the Management Area is in the southern and eastern portions of Yamhill County and the northeastern portion of Polk County. Most of the major crops, such as cereal grains, orchards, and grass seed are grown on the low foothills and the main valley terrace. Irrigated vegetable and specialtycrops such as nursery products, vegetables for processing and fresh market, corn for silage, hay, and alfalfa, are generally grown on the alluvial bottomlands. (A large portion of the agricultural land is artificially drained). Wine grapes grow well in soils that are not suitable for seed crops or orchards.Growing grapes fits well into the low-lying foothills above the valley bottom. Pasturelands are generally located where less productive soils are in the valley bottoms and foothills.

Farming practices in the Yamhill Basin have also undergone changes. Cover cropping in certain perennial crops is becoming an accepted method of reducing soil erosion. Farmers have also begun practicing crop residue management on highly erodible land. Confined Animal Feeding Operations (CAFOs), especially dairy farms, have worked to better contain wastes with manure storage systemsand utilizing waste for nutrients applying at agronomic rates to hay fields.

2.3.3 Soil Resources

In general, the source of the Management Area soils can be grouped into two groups: residual soils (those derived from the process of weathering and decomposition of the underlying consolidated rocks) and sedimentary or alluvial soils. Residual soils are derived from volcanic rock and are mostly found in the uplands but can be found throughout the Management Area. Sedimentary soils were either weathered in place or transported and left as alluvial deposits. The texture of these soil types is described as silty clay loam and silt loam with some units of gravelly silty clay loam or clay. These soil textures are found mainly on the valley floor and in upper terrace positions; gorming the soil mapping units found in the Management Area's agricultural lands. (USDA Soil Survey 1973).

Below is a summary of soil types found in the Management Area. For detailed information about soil in the Yamhill Basin Management Area, refer to USDA NRCS Web Soil Survey for Yamhill and Polk counties at websoilsurvey.sc.egov.usda.gov.

Soils of the Yamhill Basin Management Area Agricultural Lands

Listed below, in general, are five soil groups composed of soil mapping units found most often in the Yamhill Basin Management Area and are primarily agricultural soils. (Soil Descriptions: USDA YamhillArea Soil Survey 1974 and Polk County Soil Survey 1982).

Amity-Dayton: Somewhat poorly drained and poorly drained, nearly level silt loams over silty clay loamand clay. This association is on the broad, nearly level terrace plain that forms the floor of the WillametteValley. It is in the level areas that lead into shallow drainage ways and at the foot of low, rolling hills. Extensive areas are near Hopewell and on the Dayton prairie. Because these soils are wet during the winter, they are used mainly to grow all grain, hay, pasture, and grass and legume seed. There is a claypan at a shallow depth. Erosion is not a problem in this association. A high-water table during winterand spring seriously affects land use.

Chehalis-Cloquato-Newberg (found along the Willamette River and banks of major streams): Well-drained and somewhat excessively drained silty clay loams, silt loams, and fine sandy loams found on recent alluvial bottomlands and floodplains along the larger streams. It has nearly level to gently undulating topography and in places, is traversed by meandering overflow channels. These soils are intensely farmed and well suited for crops. These soils are subject to occasional or frequent flooding in winter. This soil association is well supplied with irrigation water from shallow wells and streams. Winterflooding is a hazard on these soils, although flood-control projects in the Willamette River have reduced this hazard. Low dikes divert the floodwater around this area and allow it to enter at a non-erosive rate.

Jory-Yamhill-Nekia: Well-drained, gently sloping to very steep, clay loams over clay and silt loams over silty clay; formed in basaltic colluvium. This association is on the Eola, Amity, and Dundee Hills, the southern slopes of Chehalem, Mountain, and the foot slopes of the Coast Range from Yamhill to Sheridan. The topography is smooth and gently sloping to very steep. These soils are intensively farmed. Erosion is a severe hazard in this area. The long, smooth slopes have sufficient grade so that the friable topsoil erodes during heavy rains. In many places, moderate depth to hard bedrock limits root penetration.

Wapato-Cove: Poorly drained silty clay loams and clays. This association is on recent alluvial bottom lands and floodplains. These soils occupy small areas along the larger streams and is the major soil types found along small streams. It has a gently sloping to basin like topography and is traversed in places by meandering overflow channels. Because these soils are wet for most of the year they are best suited for hay and pasture. Some soils are improved with tile drainage and surface ditches can remove excess water when adequate outlets are available. Ponding of water in winter is the major hazard in this association. A high-water table persists until late in spring. Open drains and improved channels remove much of the excess water. Low dikes divert the water around the area so that it enters at a non-erosive rate.

Woodburn-Willamette: Moderately well drained and well drained, nearly level to moderately deep silt loams and silt loams over silty clay loam. This association is on the broad, nearly level terrace plain that forms the floor of the Willamette Valley. These soils are intensely farmed and well suited for crops. Erosion is not a serious hazard in most of the association. In some places, slight to severe erosion occurs on the gently to strongly sloping sides of drainage ways.

2.3.4 Water Resources

The Yamhill River Subbasin Management Area is in the greater Willamette River Basin. The basin's climate is marine influenced resulting in extended winter rainy seasons and hot dry summers. The average annual rainfall ranges from 40 inches at the valley bottom to 150 inches at the higher elevations. The Management Area drains approximately 857 square miles and has an estimated 776 stream miles flowing throughout. The Yamhill River is the main river channel flowing through the Management Area and is nearly 65 miles long. The Yamhill River is referred to as two systems: the North Yamhill River and the South Yamhill River. The Willamette River is the eastern boundary of the Management Area. There are eight subwatersheds in the Management Area: Agency Creek, Chehalem Creek, Deep Creek, Mill Creek, North Yamhill River, Salt Creek, South Yamhill River, and Willamina Creek.

Because there is no high elevation snowpack in the Management Area, winter rainfall supplies most of the basin's water supply, which can lead to low or absent base flows in the summer (Table 2.3.4). About 85 percent of the total annual rainfall in the area usually falls during the period of September through April. High and low flows have different impacts on the landscape and resources. The greater amount of water diverted for irrigation during the summer also contributes to the fluctuations in flow.

Appropriated water in the Yamhill Basin is diverted for agricultural, municipal, industrial, and commercial use. The primary use for which water rights are issued in the Management Area is irrigation. The amount of water appropriated in the basin is 8,300 annual acre-feet (one-acre foot covers one acre of land with a foot of water), with 6,423-acre feet of this allocated for irrigation (Oregon Water Resources Department, 1998). There are 22,064 acres of irrigated land in Yamhill County and 101,014 acres in Polk County (Census of Agriculture, 2012). The water used for irrigation comes from several sources in the Yamhill Basin such as impoundments, groundwater, and streams. Additionally, the Palmer Creek Water District Improvement Company diverts water from the Willamette River and excess water is returned to the Yamhill. Presently, there are no

further appropriations of surface water allowed for the Yamhill River, and most other basins are fully appropriated in the summer.

Table 2.3.4 South Yamhill River Surface Water Record Period of Record (POR) from 1994-2021 Drainage Area = 528 square miles USGS Gage 14194150 at South Yamhill River off SE Three Mile Lane. Note data since 2021 is provisional and so not included. www.waterdata.usgs.gov (last accessed November 2024)		
POR Winter Monthly Mean Discharge	December at 4,136 cfs.	January at 4,467 cfs.
POR Summer Monthly Mean Discharge	August at 39 cfs.	September at 68 cfs.
Maximum Discharge on Record	February 9, 1996 at 40,300 cfs.	
Minimum Discharge on Record	September 4, 2003 at 1.45 cfs.	
Highest Annual Average Flow	1996 at 3,175 cfs.	
Lowest Annual Average Flow	2013 at 840 cfs.	
2021 Average Annual Flow: 1,448 cfs.		

Oregon implements its drinking water protection program through a partnership between DEQ and OHA. The program provides individuals and communities with information on how to protect the quality of Oregon's drinking water. Department of Environmental Quality and OHA encourage preventive management strategies to ensure that all public drinking water resources are kept safe from current and future contamination. For drinking water sources in the Management Area, refer to Table 4.

2.3.5 Biological Resources

The diversity and acreage of natural wildlife habitats in the basin has been reduced as land has been converted from natural forest, woodlands, and grasslands to managed forests, orchards, pasture, cropland, nurseries, vineyards, homesteads, and urban areas. Studies estimate that around 40 percent of the original wetlands in the Willamette Valley have been lost (Gabriel, 1993). As a result, some of the ecological functions of wetlands and riparian areas have been impaired. These areas filter contaminants, trap sediment, and provide wildlife habitat. Wetland and riparian vegetation also minimize hydrologic fluctuations by retaining water during high flows. This water may then replenish groundwater or provide shallow subsurface flow to streams. Both flow mechanisms are important for water quality with groundwater providing most of the in-stream water during summertime periods of low precipitation.

The Yamhill Basin hosts several vertebrate species that depend on aquatic habitats. Native, non-game fish include red-side shiner (*Richardsonius balteatus*), northern pike minnow (*Ptychocheilus oregonensis*), largescale (*Catostumus columbianus*) and bridgelip (*Catostumus macrocheilus*) sucker, Pacific lamprey (*Lampetra tridentata*), brook lamprey (*Lampetra richardsoni*), and several species of sculpin (*Cottus spp.*). Also native are winter steelhead (*Oncorhynchus mykiss*) and perhaps the basin's most widely distributed fish, cutthroat trout (*Oncorhynchus clarki*). Although adult Willamette spring Chinook salmon do not spawn in the Yamhill Basin, juvenile spring Chinook salmon (*Oncorhynchus tshawytscha)* have been found to use streams in the lower portion of the basin during the winter months for seasonal rearing (Galovich, 1999). Other aquatic vertebrates in the basin include several amphibians such as the Pacific giant salamander (*Dicamptodon ensatus*), tailed frog (*Ascaphus trueii*), red-legged frog (*Rana aurora*), and Columbia seep salamander (*Rhyacotriton kezeri*). Several mammalian species also depend on the waters of the Yamhill Basin. Beavers (*Castor canadensis*), muskrats *(Ondatra zibethica*), and river otters *(Lutris canadensis*) are common throughout the region. American dippers, green herons, belted kingfishers, and several other bird species also live and feed in the basin's aquatic habitats.

Several of the Yamhill Basin's fish and aquatic vertebrate populations are currently in decline. The Upper Willamette steelhead is listed under the Endangered Species Act. Pacific lamprey (another anadromous, cold-water species) is currently listed as vulnerable on the Oregon Sensitive Species List and is of special concern and cultural importance to tribal communities. The Columbia seep salamander and the Western pond turtle are currently listed as critical on the state Sensitive Species List, while the status of the tailed frog and red-legged frog is vulnerable.

2.4 Agricultural Water Quality

2.4.1 Water Quality Issues

Surface water quality in the Yamhill Management Area varies seasonally. Diversion of water and hydrologic changes (created by activities such as tiling or impoundments) has exaggerated seasonal variations. This reduction in flow and some loss of shading by riparian vegetation have probably contributed to some increases in water temperature. Also, point and nonpoint source wastewater discharges have adversely affected water quality (see Chapter 1.4.1). The purpose of this Area Plan is to address strategies in preventing and controlling non-point pollution from agricultural activities from entering waters of the state.

2.4.1.1 Beneficial Uses

Water quality standards are established to protect beneficial uses of the state's waters. 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).

2.4.1.2 Water Quality Parameters of Concern

The Integrated Report is a reporting of the status of water quality in Oregon and a list of waters considered to be impaired. DEQ releases an updated integrated report every two years. According to the 2022 Integrated Report, there are several waterbodies within the management area that are impaired (https://www.oregon.gov/deq/wq/Pages/epaApprovedIR.aspx). Major pollutantsfrom agricultural land uses that can contribute to impairments are summarized below.

Temperature
Water temperature is primarily a concern in the summer, a season characterized by low flow and high air temperature, for rearing of salmonids including anadromous fish species, resident trout, and bull trout. Water temperatures above 70°F can be immediately lethal to salmonids due to a breakdown in their respiration and circulation systems. Temperatures between the mid-60s°F to 70°F are stressful to salmonids and fish survival is reduced as the salmonids are more susceptible to a variety of other agents. The sublethal effects associated with higher than optimum temperatures are disease, reduced metabolic energy for feeding, and reduced growth or reproductive behavior due to avoidance of areas with high temperatures.

The temperature standard (OAR 340-041-0028) provides numeric and narrative temperature criteria. Maps and tables provided in OAR 340-041-0340 specify where and when the criteria apply. Biologically based numeric criteria, as measured using the seven-day average maximum stream temperature, include:

- 12.0° C (53.6° F) during times and at locations of bull trout spawning and juvenile rearing;
- 13.0° C (55.4° F) during times and at locations of salmon and steelhead spawning;

- 16.0° C (60.8° F) during times and at locations of core cold water habitat identification;
- 18.0° C (64.4° F) during times and at locations of salmon and trout rearing and migration.

Determining whether the stream temperature is above or below the temperature standard is based on the average of the maximum daily water temperatures for the stream's warmest, consecutive seven-day period during the year. Water temperature measurements must be taken with continuous recording temperature sensors in well-mixed and representative stream locations. A one-time measurement above the standard is not a violation of the standard. When stream flow is exceptionally low or air temperature is exceptionally high, the temperature criterion is waived (an example is when the flow is less than the expected 10-year low flow or the air temperature is above the 90th percentile of a seven-day average).

On agricultural lands, inadequate streamside vegetation, irrigation water withdrawals, warm irrigation water return flows, farm ponds, and land management that leads to widened stream channels contribute to elevated stream temperatures. Elevated stream temperatures also contribute to excessive algal growth, which leads to low dissolved oxygen levels and high pH levels.

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 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.

Mercury
Primary sources in the Management Area include atmospheric deposition from global sources, land management activities, and natural conditions that result in runoff or sediment erosion that can transport mercury to streams, and point sources (wastewater, stormwater, and industrial discharges). Mercury is tightly bound to organic matter in soils and has accumulated over long periods of time, resulting in legacy concentrations in soil. Mercury in water comes from erosion of soil that carries naturally occurring mercury (including erosion from agricultural lands and streambanks) and from deposition on land or water from local or global atmospheric sources. Mercury is toxic to humans and aquatic life at high concentrations and can accumulate via the food chain in fish that humans consume.

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 range from 6.5 to 9.0 (OAR 340-041-0315).

Bacteria
Bacteria counts are used to determine the safety for human contact, recreation, and domestic water supplies. High levels of *E. coli* bacteria can cause severe gastric illness and even death. Potential sources of bacteria include animal manure and septic systems. Streams may be listed as violating this criterion during the summer period (the highest use period for water contact recreation), or for the fall-winter-spring period. The DEQ standard sets a maximum level allowable over a 90-day period (126 *E. coli* per 100mL), as well as a single sample maximum of 406 *E. coli* organisms per 100 ml. (OAR 340-041-0009).

Biological Criteria
Biological criteria refer to the support of plants and animals that live at least part of their life cycle in water. Factors that affect biological criteria include stream disturbances, excessive heat inputs, and excessive sediment. The biologic condition is assessed through sampling of streambed insects and fish counting. These organisms are important as the basis of the food chain and are very sensitive to changes in water quality. This designation does not always identify the specific limiting factor (e.g., sediment, nutrients, or temperature).

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).

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 range from 6.5 to 9.0 (OAR 340-041-0315).

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.

Aquatic Life Toxics
Aquatic life criteria are established to protect fish, shellfish, and wildlife. They represent the level of a chemical that can be present in a waterbody without causing harm to plants and animals. There are aquatic life criteria for freshwater and saltwater, and each pollutant has a criterion that applies for short-term (acute) and long-term (chronic) exposures. Toxics include copper, mercury, and some pesticide toxics.

2.4.1.3 TMDLs and Agricultural Load Allocations

Table 2.4.1.3: Pollutants with Approved TMDLs and Load Allocations for the Management Area
Mercury: Applies to all perennial and intermittent streams in the Management Area. **Load Allocation:** For agriculture, forested, developed, and other non-urban land types: Yamhill Subbasin: 88% reduction in mercury. **Surrogate:** Total Suspended Solids. TSS is used as a surrogate because (1) the focus is on controlling soil erosion and (2) sampling mercury is complex and expensive. The target is a 75% reduction in 95th percentile of TSS. **Timeline:** Load reductions must be achieved by 2048; the TMDL provides interim milestones. **Reporting:** ODA will report to DEQ annually, with 5-yr reviews, on progress toward implementing the TMDL for the entire Willamette Basin **Current TMDL:** Willamette Basin Mercury TMDL (issued by DEQ in 2019, finalized by US EPA in 2021); the mercury TMDL was updated to reflect revised water quality standards that (1) establish safe levels of human fish consumption without unacceptable health risks and (2) protect aquatic life **ODA TMDL Implementation Plan:** ODA has created an implementation plan for this TMDL: https://www.oregon.gov/oda/shared/Documents/Publications/NaturalResources/Willamette_Basin_Mercury_TMDL.pdf For more information: www.oregon.gov/deq/wq/tmdls/Pages/TMDLs-Willamette-Basin.aspx
Temperature: Applies to Chehalem Creek. **Load allocation:** Nonpoint sources (agriculture's allocation is not separate): background solar radiation loading based on system potential vegetation near the stream; maximum increase of 0.00°C. Critical period is May 1 – October 31. **Surrogate:** Effective shade **Current TMDL:** Willamette Subbasins Temperature Replacement TMDL. (DEQ, 2024) (https://www.oregon.gov/deq/wq/tmdls/Pages/tmdlRwillamette.aspx
Bacteria (*E. Coli*): Applies to Chehalem Creek. **Load allocation:** 61% (fall, winter, spring) to 95% (summer) reduction for agriculture **TMDL:** Willamette Basin TMDL. Chapters 2, 7, and 14 (DEQ, 2006) (https://www.oregon.gov/deq/wq/tmdls/pages/willamette2006.aspx)

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 59 active public drinking water systems in the Yamhill Agricultural Water Quality Management Area, which utilize groundwater and surface water sources to serve approximately 115,585 persons regularly. Within the past 10 years, 34 public water systems received one or more alerts for exceeding the maximum containment level goal (MCLG) for total coliform bacteria. The MCLG for total coliform bacteria is zero. Of these, three had more than 20 alerts in the past 10 years: Grand Ronde Community Water Association had 58 alerts; Hiland WC – Wilderness had 44 alerts; and the Trappist Abbey had 29 alerts. None of the public water systems received violations for exceeding the maximum contaminant level for total coliform bacteria within the past five years.

Within the past 10 years,10 public water systems received one or more alerts for exceeding the MCLG for *E. coli* bacteria. Only two public water systems exceeded the MCLG within the past five years. Two public water systems had violations with the Oregon Health Authority for *E. coli* bacteria in the past five years: Ewing Young Elementary SD 29J and Hiland WC – Wilderness.
Of the soils assessed in the Yamhill River Subbasin Agricultural Water Quality Management Area, most have moderately high or high nitrate leaching potential, according to the Natural Resources Conservation Service's National Cooperative Soil Survey. One public water system received an alert within the past ten years for nitrate levels that exceed 5 milligrams per liter. The MCLG for nitrates is <10 milligrams per liter.

There are 347 records of private domestic well sample results submitted to Oregon Health Authority's Real Estate Transaction program in the area. Of these, 15 measured nitrate concentrations of ≥5 mg/L, and three measured concentrations of ≥10 mg/L.

2.4.2 Sources of Impairment

Many factors may affect surface water quality in the Management Area. Sources impacting temperature include wastewater treatment plants, industrial operations, removal and/or lack of riparian vegetation, seasonal reductions in stream flow, and stream channel and floodplain alteration. Contributors to bacteria and nutrient concerns include wastewater treatment plant overflows during heavy rains, legal and illegal waste dumping sites, leaching from septic systems, runoff from residential areas, runoff and leaching from agricultural lands, and natural sources such as wildlife. Mercury can enter waterbodies from industrial and municipal wastewater discharges, erosion of soils that naturally contain mercury, runoff of atmospherically deposited mercury, and runoff from abandoned mines.

2.5 Regulatory and Voluntary Measures

The focus of the Agricultural Water Quality Management Program is on voluntary and cooperative efforts by landowners, SWCDs, ODA, and others to protect water quality. However, the Agricultural Water Quality Management Act also provides for a regulatory backstop to ensure prevention and control of water pollution from agricultural sources in cases where landowners or operators refuse to correct problem conditions. Area Rules serve as this backstop while allowing landowners flexibility in how they protect water quality. Rules are goal-oriented and describe

characteristics that should be achieved on agricultural lands, rather than practices that must be implemented.

In its advisory role to the ODA, the LAC developed rules to protect water quality and prevent and control water pollution from agriculture. The LAC recognizes that every farm and situation is different and recommends each situation be considered carefully when the Area Rules are enforced.

In addition to the Area Rules, available management practices that may help landowners achieve compliance and meet the goals and objectives of the Area Plan are included. The available management practices are intended as suggestions for landowners as options on how to meet the goals and objectives the Area Plan and generally maintain and enhance natural resources on their property. Landowners are neither required to cease a specific practice nor implement a particular practice by the Area Plan or Area Rules.

Cost-share and other forms of funding may be available for many of the management practices that can significantly offset the costs to the producer.

The concerns addressed in these prevention and control measures are:

- Bacteria (*E. coli* and fecal coliform)
- Temperature
- Nutrients (surrogate for Phosphorus, Chlorophyll, pH)
- Turbidity
- Dissolved oxygen
- Chlorophyll a
- pH
- Biological criteria
- Iron
- Manganese
- Mercury

This Area Plan serves as a guidance document and as stated in the foreword, does not establish provisions for enforcement. The Area Rules developed with the LAC, OAR 603-095-0540(1) through 603-095-0540(7) and are included in this document only as a reference for landowners.

2.5.1 Area Rules

Yamhill River Subbasin
OAR 603-095-0540
Prevention and Control Measures

(1) Erosion prevention and sediment control:
(a) Landowners or occupiers shall prevent sheet and rill erosion in excess of four times the tolerable soil loss (T) leaving the property or being transported to streams.
(b) By January 1, 2005, landowners or occupiers shall prevent sheet and rill erosion in excess of two times the tolerable soil loss (T) leaving the property or being transported to streams.
(c) Sediment from sheet and rill, gully, or drainage way erosion shall not reduce the quality of waters below the water quality standards established by rule for such waters by the Environmental Quality Commission.
(d) Indicators of non-compliance for (a) through (c) above are:
(A) Visible soil deposition that could enter natural stream areas;

(B) Visible sloughing from drainage ways as a result of livestock grazing, tillage, or human destruction of riparian vegetation; or
(C) Underground drainage tile outlets either improperly installed or maintained allowing soil or bank erosion to actively occur.

(2) Landowners or occupiers shall not apply irrigation water in a manner that results in irrigation water discharge entering waters of the state. Indicator of non-compliance is irrigation water discharge entering waters of the state

(3) Placement, Delivery, or Sloughing of Wastes:
(a) Effective upon adoption of these rules:
(A) Except as provided in ORS 468B.050, no person conducting agricultural land management shall:
(i) 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 be carried into the waters of the state by any means.
(ii) 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 for such waters by the Environmental Quality Commission.
(B) No person shall violate the conditions of any waste discharge permit issued pursuant to ORS 468B.050 or 568.
(b) Indicators of non-compliance are:
(A) Runoff flowing through areas of high livestock usage and entering waters of the state; or
(B) Livestock waste located in drainage ditches or areas of flooding.

(4) Landowners or occupiers shall prevent crop nutrient applications that result in adverse impacts to waters of the state. Indicators of non-compliance are: (a) Nutrients applied to open water; or (b) Visible trail of compost, ash, or bio-solids to waters of the state.

(5) Landowners or occupiers shall prevent the application of chemicals in combination with irrigation water that results in transport into waters of the state. Indicator of non-compliance is chemigated water flowing into waters of the state.

(6) Roadways, staging areas, farmsteads, and heavy use areas shall be constructed and maintained to prevent sediment or runoff contaminants from reaching waters of the state. All roads on agricultural lands not subject to the Oregon Forest Practices Act (OFPA) are subject to this regulation. Public roads are excluded from this prevention and control measure. Indicators of non-compliance are:
(a) Surface runoff from farmsteads, roads, and staging areas that pick up contaminants and flow to waters of the state; or
(b) Visible gully erosion in roads or staging areas.

(7) Landowners or occupiers shall manage streamside areas to allow the establishment, growth, and/or maintenance of riparian vegetation appropriate to the site. Vegetation must be sufficient to provide shade and to protect the streamside area such that it maintains its integrity during high stream flow events such as those events which are reasonably expected to occur following a 25-year, 24-hour storm event.
(a) If any agricultural activity degrades riparian vegetation, the landowner or occupier shall replant or restore the disturbed area to an adequate cover as soon as practical.
(b) Indicator of non-compliance is active streambank sloughing or erosion as a result of tillage, grazing, or destruction of vegetation by the landowner or occupier.

2.5.2 Voluntary Measures

2.5.2.1 Soil Erosion and Sediment Control

A landowner or operator's responsibility under this Area Plan is to implement measures that prevent and control water pollution from erosion on agricultural and rural lands. Erosion occurs when soil particles detach and move due to the impacts of water, wind and agricultural activities. Eroded soil particles can carry contaminants along with them, such as bacteria, mercury and pesticides. These particles, either with or without attached contaminants, can move to waterways, and create water quality problems. Soil erosion reduces the long-term productivity of farmland.

Conservation practices should prevent existing drainages and channels from being damaged, destabilized or otherwise eroded with excessive volumes of flow and/or high energy discharges. Ditches, culverts, and other drainage structures are designed to handle a maximum flow volume and should not be relied upon to carry volumes of water beyond this maximum. Designed drainages also have a limit to the power (or energy) of flow they can handle without being damaged by scour or other erosion processes. Natural channels have formed in response to certain flow volumes andenergies and cannot handle flows beyond these maximums without eroding and/or becoming unstable.

Following are examples of conservation practices related to erosion and sediment:

- Utilize soil health principles and avoid leaving your soil bare. Plant a cover crop. USDA Soil Health Website: www.nrcs.usda.gov/wps/portal/nrcs/main/national/soils/health/,
- Under certain farming conditions and climates, consider switching from conventional tillage to conservation tillage or no till,
- Plant or till perpendicular to slope following elevation contour lines,
- Under certain farming and soil conditions sub-soiling or deep ripping a field can improve water infiltration,
- Properly designed and maintained conservation strategies such as strip cropping, catch basins, grass-lined waterways/ field and road ditches, vegetative filter strips, straw bales, and other erosion control methods can be very effective in retaining sediment.
- Employ a grazing management plan that maintains healthy vegetation cover and minimizes bare ground.
- Plan farm road development with erosion in mind, taking steps to factor erosion into road designs, consider slope stability, employ proper grading, and include/protect vegetation along roadsides.

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.

Irrigated lands are lands either riparian, floodplain, or upland upon which water is applied for the purpose of growing crops. Diversion of water from a waterbody to be applied on land for the purpose of growing crops is a recognized beneficial use of water. Irrigation water use is regulated by the OWRD in the form of water rights, which specify the rate, duty, and season that water can be

applied to a particular parcel of land. Refer to OWRD Rules (OAR 690 and ORS 536 through 543) for more details.

Irrigation in this basin is done by flooding or sprinkler application. Water usually is diverted from surface sources (stream or pond) and from groundwater sources. Water withdrawals influence stream flows and thus, indirectly affect 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.

In general, flood irrigation utilizes 50 percent more water than a sprinkler system; an effort to increase the conversion from flood to sprinkler irrigation should be encouraged due to increased water temperatures and availability.

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.

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,
- Efficient delivery of water 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,
- Appropriate scheduling of water application to the site including consideration of soil conditions, crop needs, climate and topography,
- Diversion structures that are installed and managed to control erosion and sediment delivery, and protect the stability of streambanks. If funding becomes available, temporary diversions, which must be reinstalled every year, should be replaced with suitable permanent diversions (i.e., pumping stations, infiltration galleries, dams).
- Diversions that are adequately for fish protection and provide for fish passage (refer to ORS 498.301).

Effective water quality management practices for prevention and control of impacts from irrigation:

- Irrigation scheduling based on crop needs, soil type, climate, topography, and infiltration rates,
- Irrigation system efficiency and uniformity monitoring,

- Diversion maintenance including push-up dam management, screens and fish passage,
- Return flow management to prevent pollution from entering streams,
- Backflow devices to prevent well contamination,
- Flow measuring devices to assure legal and efficient water usage,
- Cover crops to reduce soil erosion.

2.5.2.3 Waste Management

Oregon's water quality standard for bacteria was established to protect the most sensitive beneficial use affected by bacteria levels, which is water contact recreation. Within the Management Area, Cosper Creek, Turner Creek, Rock Creek, Cozine Creek, Baker Creek, Yamhill Creek, Panther Creek, and the South Yamhill River are listed as impaired for *E. coli,* and Mill Creek, Salt Creek, Deer Creek, and the North and South Yamhill River are listed as impaired for fecal coliform.

A landowner or operator's responsibility under this Area Plan is to implement measures that prevent and control water pollution by ensuring that potentially concentrated nutrients and pathogens associated with higher livestock density areas are not readily transported to waters of the state. Producers should be aware that in addition to these practices, other laws regulate the management of animal waste. Many livestock operations are required to have a CAFO permit. Also, ORS 468B.025 prohibits activity that causes pollution of any waters of the state or places or causes to be placed any wastes in a location where such wastes are likely to escape or be carried into waters of the state by any means.

Following are examples of conservation practices related to waste management:

- Waste management – clean water diversions; waste collection, storage, and utilization; facilities operation and maintenance,
- Pasture management/prescribed grazing,
- Vegetative buffer strips,
- Apply manure to cropland at rates that do not exceed agronomic needs for nitrogen and phosphorus based on soil and/or tissue tests for the crop to be grown,
- Schedule timing and amounts based on expected rainfall to avoid runoff,
- Manage livestock access to streams, wetlands, and riparian areas using off-stream watering facilities, exclusion (temporary or permanent), and seasonal grazing.

2.5.2.4 Nutrient Management

Landowners or operators should always apply crop nutrients at a time and in a manner that limits overapplication of nutrients to field, vegetable, and berry crops; nurseries; vineyards; and orchards. Over application of nutrients may result in nutrient runoff and leaching into waters of the state. This may cause nuisance algal growth, high pH, bacterial growth, and a decrease in dissolved oxygen. This PCM encourages growers to adopt sound agronomic practices to guide their crop nutrient applications.

Crop nutrients are elements taken in by a plant that are essential to its growth, and which are used by the plant in the production of its food and tissue. These elements include nitrogen, phosphorus, potassium, calcium, magnesium, Sulphur, zinc, iron, manganese, copper, boron, molybdenum, and chlorine. The two nutrients of prime concern for water quality in the Yamhill Basin are nitrogen and

phosphorus. Sources of crop nutrients include irrigation water, chemical fertilizers, animal manure, compost, bio-solids, and leguminous and nonleguminous crop residues.

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 as well as leaching to groundwater. Fertilizers should be applied according to a nutrient management plan. A nutrient management plan should consist of:

- Soil and water tests
- Use of currently accepted fertilizer guidelines
- Fertilizer type and storage
- N, P, and K fertilizer concentrations and timings
- Field map
- Application equipment and method
- Crop N utilization, by month
- N, P, K application, by month
- Use of currently accepted fertilizer guidelines,
- Setting realistic yield goals,
- Regular calibration of fertilizer application equipment
- Appropriate application timing,
- Periodic soil testing and plant tissue analysis,
- Periodic nutrient analysis of manure and/or compost products that are applied
- Managing irrigation to prevent nutrient loss through leaching and/or surface runoff,
- Carefully managing nutrient applications,
- Accounting for “nonfertilizer” sources of nutrients such as manure, compost, biosolids, and leguminous and non-leguminous crop residues.

2.5.2.5 Pesticides Management

Landowners or operators should minimize off-site transport and maximize on-site retention of pesticide materials. Overapplication of pesticides can lead to runoff into waters of the state and leaching, which may result in an increase in toxics and a decrease in biological organisms in water bodies and groundwater.

Read the label. As required by ORS 634.372(2) and (4), follow label recommendations for both restricted and non-restricted use pesticides. Pesticides can have a wide range of application methods and rates depending on soil type, crop type, season, and geographic location of the crop. Rain/irrigationaffects different materials different ways. For example, some pesticides require a rain/irrigation event tobe activated, while others can be washed off and rendered useless during the same event. Following label guidelines (which can change over time) is not only required by federal and state of Oregon laws but will help to insure optimum results as well.

Following are examples of conservation practices related to pesticides management:

- Calibrate, maintain, and correctly operate application equipment. Spray rigs need to be calibrated each time application rates or materials change. Verify that a particular rpm range/gear/tire combination provides the intended ground speed. Nozzles need to be replaced often, particularly if abrasive pesticide formulations (such as wettable powders) are used.

Sprayers need to be operated in the correct pressure range (dictated by the material and nozzle combination used), to prevent excess drift to non-target areas (i.e., waters of the state).

- Limit sediment movement off the property. Once applied, many pesticide materials attach to soil particles. If soil is moving off the property, pesticides will accompany it.
- Adopt integrated pest management (IPM) practices. IPM promotes a diverse, multi-faceted approach to pest control. This includes variety selection, field/orchard sanitation and cultural practices, field scouting, the establishment of an economic threshold for control actions, beneficial insect release, the use of biological pesticides, and the use of chemical pesticides. While IPM does not exclude the use of chemical pesticides, it does seek to reduce their use. A reduction in chemical pesticide use reduces the chance that these materials will make contact with waters of the state.
- Establish appropriate vegetative buffer strips. Buffer strips will help to retain soil (which may have absorbed pesticides) and prevent surface runoff (which may have dissolved pesticides) from making contact with waters of the state.
- Store, handle and dispose of pesticide materials correctly. Storage and handling facilities should be secure and include a leak-proof pad with curbing for mixing and loading. An alternative to a permanent concrete pad is to always mix pesticides in the field frequently moving sites to prevent chemical build-up. Wash/rinse water should be directly applied to the appropriate crop.

2.5.2.6 Chemigated Irrigation Water Management

Landowners or operators need to take steps to address the rate and concentration of chemically treated irrigation water applications to farm or ranch land. Chemicals such as pesticides and fertilizers, as dissolved product or in suspension,should be carefully applied so that they do not move off the property to other bodies of water. This could occur via surface and subsurface transport. Irrigation systems used to chemigate must have appropriate backflow prevention devices installed and properly maintained.

Following are examples of conservation practices related to chemigated irrigation water management:

- Irrigation water management,
- Vegetative buffer strips,
- Nutrient management,
- Tailwater management,
- Integrated pest management.

2.5.2.7 Roads, Staging Areas, and Farmsteads

All operations need to address non-cropped areas that may be sources of sediment or contaminant input to streams. These include roads, staging areas, barn lots, stream crossings, and heavy use areas.Many management methods are available for constructing and maintaining roads to increase their stability and reduce erosion. A single poorly maintained road can comprise the vast majority of one farm’s sediment output.

Following are examples of conservation practices related to roads, staging areas, and farmsteads:

- Appropriate culvert construction and design,

- Plant and maintain grass cover where appropriate,
- Water bars,
- Grading roads.

2.5.2.8 Streamside Areas

A landowner or operator's responsibility under this Area Plan is to implement measures that prevent and control water pollution from agricultural activities. These measures will allow landowners to develop a flexible streamside area management strategy while providing:

- Shade to reduce solar radiation reaching the water,
- A buffer to filter sediment, organic material, nutrients, and pesticides in surface runoff,
- Native species and wildlife habitat, and
- Stable streambanks.

It is also anticipated that these measures will minimize the impact of livestock on riparian vegetation andmaintain stable streambanks while ensuring livestock access to water. A healthy streamside area provides adequate vegetation to trap sediment, prevents flood debris from depositing on fields, and protects pasture and cropland from bank erosion. Protecting vegetation along smaller streams helps reduce solar radiation reaching the water and provides wildlife habitat.

Although native vegetation affords benefits over exotic species, it is not necessarily recommended that exotic, non-invasive species be removed to replant an area with native plants. Native species may be more resistant to diseases and pests. Still, non-native species in the near stream area may also provide valuable shade, stabilize the streambank, and provide cover for wildlife.

To protect and/or restore ecological functions in riparian and wetland areas to improve watershed health, consider the following:

- Plant native trees and shrubs and control undesirable vegetation,
- Allow snags (dead trees) to remain standing unless safety factors indicate otherwise,
- Allow fallen trees to remain on the ground or in the stream unless removal is essential for traffic, navigation, or serious flooding reasons,
- Allow marginally productive lands in floodplains/poorly drained riparian areas to revert to riparian/wetland status.

To reduce erosion and sedimentation:

- Establish buffer zones and filter strips,
- Establish grassed waterways,
- Protect streambanks,
- Livestock exclusion from riparian area,
- Off-channel watering facilities.

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.

The LAC established these objectives to achieve the Area Plan goal:

- Prevent runoff of agricultural wastes: agricultural activities will not discharge any wastes or place waste where it is likely to run off into waters of the state.
- Prevent and control upland and cropland soil erosion using practical and available methods.
- Control active channel erosion to protect against sediment delivery to streams.
- Prevent bare areas due to livestock overgrazing near streams.
- Allow streamside vegetation along streams on agricultural properties to establish and grow to provide streambank stability, filtration of overland flow, and moderation of solar heating.

The following conditions on agricultural lands contribute to good water quality in this Management Area:

1. Sufficient site-capable vegetation is established along streams to stabilize streambanks, filter overland flow, and moderate solar heating,
2. Crop lands are covered throughout the year with either production crops, crop residues, or cover crops,
3. Pastures have minimal bare ground,
4. Irrigation runoff does not deliver sediment, nutrients, or chemicals to streams,
5. Leachate and residues from livestock manure are not entering streams or groundwater.

LAC Mission

The mission of the Yamhill Agricultural Water Quality Management Area Plan is to promote sound agricultural conservation within a framework of economic profitability and agricultural viability. The Area Plan is designed to achieve applicable chemical, physical, and biological water quality standards.The goal of this Area Plan is to prevent and control water pollution from agricultural activities and soil erosion and to achieve applicable water quality standards.

The Yamhill LAC used the following guiding principles in the development of this Area Plan:

- Control pollution as close to its source as possible,
- Base actions on scientifically based conservation planning,
- Promote a variety of conservation practices to address individual situations,
- Recognize the need for landowners, operators, or occupiers to maintain agricultural profitability,
- Protect beneficial uses of water in the Yamhill Basin.

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

ODA is working with SWCDs and LACs throughout Oregon toward establishing long-term measurable objectives to achieve desired conditions. Currently, ODA and the SWCDs are using Focus Area and SIA measurable objectives to show progress in this Management Area. These are described below. There are currently no Management Area-wide measurable objectives in the Yamhill River Subbasin Management Area.

3.1.2 Focus Areas and Other Coordinated Efforts in Small Watersheds

3.1.2.1 Palmer Creek Focus Area (closed)

The Palmer Creek Focus Area is part of ODA's Focus Area strategic initiative. The Focus Area (Figure 2) is predominantly in agricultural production and is divided into two parts, the main stem and the west branch of Palmer Creek. The main stem is impaired for dissolved oxygen and the west branch is impaired for temperature, dissolved oxygen, and chlorpyrifos. The area consists of a fairly large irrigation district, so the flow of this system, especially in the summer, is largely controlled and pumped from the Willamette River. The Focus Area was closed in 2021.

Assessment Method: Streamside vegetation was evaluated with ODA's Streamside Vegetation Assessment (SVA) to characterize the type of ground cover within 35 feet of the stream. The metric is the number and percent of acres of different types of land cover viewed on aerial photographs. Categories are agricultural infrastructure; water; and bare ground, grass, shrubs, and trees (designated as agricultural or not).

Initial Conditions and Milestones
2017 Condition: As of July 1, 2017, there were 122.26 total acres in the Bare, Bare Ag, Grass, and Grass Ag SVA mapping categories; 31% of the assessed area.
2017-2019 Milestone: By June 30, 2019: Decrease Bare, Bare Ag, Grass, and Grass Ag acreage along agricultural streams in the Palmer Creek subwatershed by 7.74 acres (2%) and reduce to 114.52 Grass Ag and Bare Ag acres; 29% of the assessed acreage.
2019-2021 Milestone: By June 30, 2021: Decrease Bare, Bare Ag, Grass, and Grass Ag acreage along agricultural streams in the Palmer Creek subwatershed by 7.74 acres (2%) and reduce to 114.52 Grass Ag and Bare Ag acres; 29% of the assessed acreage.

3.1.2.2 Lower Salt Creek Focus Area

The Lower Salt Creek Focus Area (approximately 19,000 total acres) begins just north of Highway 22 near Cross Creek Golf Course in Polk County and extends to just west and north of Whiteson, a small community in Yamhill County. Salt Creek originates in Polk County and flows into the South Fork Yamhill River just west and north of Whiteson. Agricultural areas of the watershed consist mostly of grass seed, nurseries, and hazelnuts. Water quality concerns in the watershed include 303(d) water quality impaired listing for bacteria, dissolved oxygen, chlorophyl *a*, temperature, and phosphorus. Varying portions of the Salt Creek watershed were selected as a

Focus Area in 2017, 2019, 2021, and 2023, and was one of ODA's Strategic Implementation Areas implemented in 2016. Following the SIA process, landowners throughout the Lower Salt Creek expressed increased interest in addressing watershed issues beyond agricultural water quality compliance, including flooding. To work with the community in developing solutions while also addressing agricultural water quality concerns, the SWCD chose Salt Creek to continue Focus Areas. There was momentum, interest, and complex issues that require a long-term, holistic, and grassroots solution building approach, and the Polk SWCD was motivated to continue work in this area to address these concerns. To build on that, Polk SWCD will continue work in the Salt Creek watershed in coordination with ODA and OSU Extension through a Focused Ag Solutions project that was initiated in 2024. The project will engage land managers and partners to set goals, implement innovative agricultural practices to reduce sediment, offer technical assistance to provide alternative solutions to issues such as flooding, and continue monitoring of water quality.

Assessment Method: Streamside vegetation was evaluated with ODA's Streamside Vegetation Assessment (SVA) to characterize the type of ground cover within 35 feet of the stream. The metric is the number and percent of acres of different types of land cover viewed on aerial photographs. Categories are agricultural infrastructure; water; and bare ground, grass, shrubs, and trees (designated as agricultural or not).

Measurable Objective: By June 30, 2021: Decrease Bare, Bare Ag, Grass, and Grass Ag acreage along agricultural streams in the Lower Salt Creek sub-watershed by 27 acres (5.3%) and reduce to 187.7 acres of Bare, Bare Ag, Grass, and Grass Ag; 36.9% of the assessed acreage.

2019 Condition: As of July 1, 2019, there were 214.71 total acres in the Bare, Bare Ag, Grass, and Grass Ag SVA mapping categories; 42.2% of the assessed area.

Progress Toward Measurable Objective To Date: The Focus Area milestone was not achieved. Conditions measured at the beginning of the biennium has remained the same through the completion of the biennium. Plans to redo the Streamside Vegetation Assessment and determine new milestones to achieve a long-term measurable objective were not accomplished.

3.1.3 Strategic Implementation Areas (SIA)

3.1.3.1 Lower Salt Creek SIA (became Lower Salt Creek Focus Area in 2017)

In 2015, the Lower Salt Creek watershed was selected as an SIA. The Lower Salt Creek watershed flows through a portion of both Polk and Yamhill counties, the SIA area contains approximately 19,000 total agricultural acres. Agricultural areas in the watershed consist primarily of grass seed, nurseries, and hazelnuts. Water quality concerns in the watershed include nutrients, but there is limited data available.

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 October 21, 2019, all 36 tax lots identified as a Potential Violation or Compliance Opportunity will be downgraded to Restoration Opportunity or Likely in Compliance.

Progress Toward Measurable Objective: As of December 4, 2019, all 36 tax lots identified as a Potential Violation or a Compliance Opportunity were downgraded to Restoration Opportunity or Likely in Compliance. PV = 0, CO = 0, RO = 75, LC = 378. The measurable objective was achieved.

Monitoring: No monitoring plan developed.

3.1.3.2 Deer Creek and South Yamhill River SIA (Initiated 2020)

In 2020, Deer Creek and South Yamhill River watershed was selected as an SIA. This encompasses four subbasins: Upper Deer Creek, Lower Deer Creek, Muddy Creek, and South Yamhill River (Blue Heron Reservoir) that total approximately 49,000 acres. Agricultural areas in the watershed consist primarily of grass seed, hazelnuts, nurseries, hay, and pastureland. Water quality concerns include dissolved oxygen, temperature, phosphorus, fecal coliform, and mercury. The SIA will expire at the end of 2025, at which point a Focused Ag Solutions project will begin in this area.

SIA Compliance Evaluation Method: See description for Lower Salt Creek SIA (3.1.3.1)

Measurable Objective: By June 30, 2025, all 29 tax lots identified as a Potential Violation or Compliance Opportunity will be downgraded to Restoration Opportunity or Likely in Compliance.

Monitoring: A sampling and analysis plan (SAP) was developed as a monitoring strategy to characterize baseline water quality conditions for total suspended solids (TSS) and temperature in the South Yamhill River watershed, and specifically within the SIA of Deer Creek, Muddy Creek, and South Yamhill (Blue Heron reservoir) watersheds.

3.1.4 Pesticide Stewardship Partnerships (PSP)

Yamhill PSP

The PSP Program uses water quality monitoring data to inform and focus voluntary, collaborative actions to reduce pesticides in Oregon waters. There are currently PSP projects in nine watersheds in Oregon, including the Yamhill Subbasin. The Greater Yamhill PSP project was

initiated in 2007, with DEQ, Greater Yamhill Watershed Council, Yamhill SWCD, OSU Extension, and ODA as the principal partner to monitor agricultural pesticide contributions to nearby waterways. Monitoring results are summarized in 4.1.4.

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 Polk SWCD (in bold) and Yamhill SWCD (in italics).

Activity	6-year Target	Description
Landowner Engagement		
# events that actively engage landowners (workshops, demonstrations, tours)	**8** *6*	Engage partners, land managers and landowners to set goals for the Focused Ag Solutions (FAS) project; in-field workshops/tours to promote practices that can reduce soil erosion or capture sediment; and presentations to describe water quality monitoring results and project outcomes.
# landowners participating in active events	**50** *60*	Varies considerably depending on the event. Could be hundreds when including tabling events.
Technical Assistance (TA)		
# landowners provided with TA (via phone/walk-in/email/booth/site visit)	**240** *400*	Provide advice and/or materials about: Native plants, invasive species control, channel erosion control, NRCS programs/agricultural practices; ditch maintenance; flood reduction alternatives, etc.
# site visits	**45** *300*	Pertaining to topics above.
# conservation plans written*	**8** *100*	NRCS writes the conservation plans for Yamhill SWCD.
On-the-ground Project Funding		
# funding applications submitted	**8** *12*	Difficult to estimate.

* 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. Yamhill SWCD monitors for temperature and total suspended solids (TSS) and temperature as part of the Deer Creek and South Yamhill River SIA. Since 2017, Polk SWCD has monitored for temperature, phosphorus, nitrate, pH, turbidity, TSS, and dissolved oxygen throughout Upper and Lower Salt Creek, including Ash Swale at as many as 21 locations within the varying Focus Area boundary. Recently, the SWCD has scaled back monitoring for all parameters to just six sites.

3.3.2 Land Conditions

There is no additional land condition monitoring.

Results of these additional monitoring activities are presented in Chapter 4.3.

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 in the past five years (2020-2024). See Chapter 3.1 for background and assessment methods.

4.1.1 Management Area

At this time, there are no Management Area-wide Measurable Objectives.

4.1.2 Focus Areas and Other Focused Efforts in Small Watersheds

4.1.2.1 Palmer Creek Focus Area (closed 2021)

Table 4.1.2.1 Palmer Creek Focus Area

Initial Conditions and Milestones	
2017 Condition: As of July 1, 2017, there were 122.26 total acres in the Bare, Bare Ag, Grass, and Grass Ag SVA mapping categories; 31% of the assessed area. **2017-2019 Milestone:** By June 30, 2019: Decrease Bare, Bare Ag, Grass, and Grass Ag acreage along agricultural streams in the Palmer Creek sub-watershed by 7.74 acres (2%) and reduce to 114.52 Grass Ag and Bare Ag acres; 29% of the assessed acreage. **2019-2021 Milestone:** By June 30, 2021: Decrease Bare, Bare Ag, Grass, and Grass Ag acreage along agricultural streams in the Palmer Creek sub-watershed by 7.74 acres (2%) and reduce to 114.52 Grass Ag and Bare Ag acres; 29% of the assessed acreage.	
Current Conditions: Progress Toward Milestones	
2021 Current Condition: As of June 30, 2021, there were 122.26 total acres in the Bare, Bare Ag, Grass, and Grass Ag SVA mapping categories; 31% of the assessed area. No progress was made toward the milestone.	
Activities and Accomplishments: 2019 to 2021	
Community and Landowner Engagement	
# landowners receiving outreach materials	**200**
# active events that target landowners/ operators (workshops, demonstrations, tours)	**0**
# landowners/operators participating in active events	**0**
Technical Assistance (TA)	
# landowners/operators provided with TA (via phone/walk-in/email/site visit)	**16**
# site visits	**7**
# conservation plans written*	**0**
Ag Water Quality Practices Implemented in the Focus Area	
Hedgerow	**1 acre**

Adaptive Management Discussion
No progress was achieved on the milestone. Riparian buffer work recruitment can be challenging for several reasons. In Palmer Creek, there are a lot of farms on high value irrigated land with expensive infrastructure for hazelnuts, nursery and irrigated grass seed. It can be very difficult to recruit landowners to expand buffers when this infrastructure already is in place. The PSP outreach efforts prior and during COVID had been halted. ODA wanted to work with the SWCD on strategic planning for the PSP area, but that hasn't materialized. Water testing for pesticides is still scheduled and progressing but translating that to outreach has been difficult. Long-term measurable objectives were not written for earlier FAs; however, ODA will work with the SWCD to determine a long-term measurable objective.

4.1.2.2 Salt Creek Focus Area (closed 2024 with transition to Salt Creek Focused Ag Solutions initiative)

Table 4.1.2.2 Salt Creek Focus Area

2019 Condition	
As of July 1, 2019, there were 214.71 total acres in the Bare, Bare Ag, Grass, and Grass Ag SVA mapping categories, 42.2% of the assessed area.	
Measurable Objective	
By June 30, 2021: Decrease Bare, Bare Ag, Grass, and Grass Ag acreage along agricultural streams in the Lower Salt Creek sub-watershed by 27 acres (5.3%) and reduce to 187.7 acres of Bare, Bare Ag, Grass, and Grass Ag, 36.9% of the assessed acreage.	
Progress Toward Achieving Measurable Objective: The Focus Area milestone was not achieved. There is no evidence that the percentage of assessed area has changed.	
Activities and Accomplishments	
Community and Landowner Engagement	
# active events that target landowners/ operators	**4**
# landowners/operators participating in active events	**60**
Technical Assistance (TA)	
# landowners/operators provided with TA	**70**
# site visits	**19**
# conservation plans written	**0**
Adaptive Management Discussion	
Measurable progress in vegetating streamsides was not achieved due to capacity limitations at Polk SWCD. To build on its the relationships with land managers in the Focus Area boundary over years, Polk SWCD will work with ODA and Oregon State University Extension to implement a Focused Ag Solutions project that was initiated in 2024. As a result, the Salt Creek Focus Area is now officially closed.	

4.1.3 Strategic Implementation Areas

Table 4.1.3.1 2015 Lower Salt Creek SIA (closed 2019)

Evaluation Results
As of October 21, 2015, 36 tax lots were identified as either a Potential Violation or a Compliance Opportunity. PV = 7, CO = 29, RO = 75, LC = 378
Measurable Objective
As of October 21, 2019, all 36 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 4, 2019, all 36 tax lots identified as a Potential Violation or a Compliance Opportunity were downgraded to Restoration Opportunity or Likely in Compliance. PV = 0, CO = 0, RO = 75, LC = 378. The measurable objective was achieved.
Adaptive Management Discussion
This was a challenging summary to create in 2024 due to multiple staffing changes since 2017. Documents indicate 33 SWCD/landowner interactions in 2016 as a result of the SIA process initiated by ODA. Of these, the issues of concern included five about lack of streamside vegetation, 23 about riparian vegetation, seven about manure piles, and one about field erosion. Landowners were mildly to very irritated by the process. Some landowners worked with the district to formulate improvement plans, while others were concerned about potential extra expense. Some complained that the letters received from ODA were too vague. There was an apparent reduction in funding available to assist landowners with improvement projects which led to frustration. Or the timing for applying for funding was insufficient – not allowing enough time to gain interest, design the project and apply. This process likely heightened awareness of the expectations about ag practices and reducing impacts to surface water quality. A new process of preliminary engagement and cost share funding should improve outcomes and willingness to participate.
Monitoring Activities
Monitoring continues within the Lower Salt Creek Focus Area boundary.

Activity	Accomplishment	Description
ODA		
# acres evaluated	18,153	
# stream miles evaluated	41	
# landowners at Open House	23	
# landowners receiving outreach materials	257	
SWCD and Conservation Partners		
# landowners provided with technical assistance	33	
# site visits	33	
# conservation plans written	0	
SIA and Project Funding		
# funding applications submitted	0	
# funding applications awarded	0	

Table 4.1.3.2 2020 Deer Creek and South Yamhill River SIA

Evaluation Results
As of June 30, 2021, 29 tax lots were identified as either a Potential Violation or a Compliance Opportunity. PV = 7, CO = 22, RO = 187, LC = 631
Measurable Objective
By June 30, 2025, all 29 tax lots identified as a Potential Violation or a Compliance Opportunity will be downgraded to Restoration Opportunity or Likely in Compliance.
Adaptive Management Discussion
SIA is open and SIA work is continuing. An adaptive management discussion will be available at the next biennial review.

Monitoring Activities		
General trends: With high flows, TSS levels tend to be high; at low flows, TSS levels are generally low. Water temperature peaks above tolerable levels for salmonids during the summer.		
Activity	**Accomplishment**	**Description**
ODA		
# acres evaluated	2,774	
# stream miles evaluated	30	
# landowners at Open House	10	
# landowners receiving outreach materials	156	
SWCD and Conservation Partners		
# landowners receiving outreach materials	3,592	SIA/NRCS programs newsletter and fact sheets; no-till drill rental handouts; NRCS orchard erosion handouts
# landowners provided with technical assistance	30	Cover crops; riparian plantings; manure storage; field buffers; pasture management; roadside erosion
# site visits	25	Cover crops; riparian plantings; manure storage; field buffers; pasture management; roadside erosion
# conservation plans written	0	Riparian planting
SIA and Project Funding		
# funding applications submitted	1	$125,000 OWEB Grant for TA and monitoring; OWEB Small Grant
# funding applications awarded	1	

4.1.4 Pesticide Stewardship Partnerships

Pesticide monitoring in the Greater Yamhill basin began initially in 2005 (limited duration) and became routine in 2007. Water quality monitoring begins in March and continues through June, and again in September and continues through November. During the time frame of July 1, 2015, through June 30, 2019, water quality samples were collected from six locations: five within the watershed and one additional site at the Palmer Creek Irrigation district intake.

Water quality monitoring conducted during the timeframe July 1, 2015, through June 30, 2017, indicated the presence of a significant number of pesticides at high concentrations and frequency, a majority of which is attributed to agricultural land use. Ten pesticides were detected at levels of high concern, while seven were detected at levels of moderate concern.

Water quality monitoring conducted during the timeframe July 1, 2017, through June 30, 2019, indicated the presence of pesticides above benchmark exceedances occurred for seven pesticides. They are atrazine, bifenthrin, chorothalonil, chlorpyrifos, diazinon, imidacloprid, and simazine. Of note, chlorpyrifos levels declined in the 2015-2017 biennium, but increased during the 2017-2019 biennium.

Water quality monitoring conducted during the timeframe July 1, 2019, through June 30, 2021, decreased from six to five locations. Positive trends were observed with the number of pesticide detections and number of exceedances decreasing. No detections of chlorpyrifos were detected in 2021, as it was banned in 2020.

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 Polk SWCD (in bold) and Yamhill SWCD (in italics)

Activity	6-year results	Description
Landowner Engagement		
# events that actively engage landowners (workshops, demonstrations, tours)	**4** *12*	**2019 – Salt Creek Collaborative to discuss alternatives to address flooding issue; 2020 – To describe the ag channel cleaning bill that was recently passed; 2021 – Zoom meeting about the new channel maintenance program;** **2024 – Polk SWCD w/ OSU Ext. hosted Salt Creek land managers at an event to present information about water quality monitoring results, Mercury TMDL, and ag practices and funding opportunities that reduce sediment.** *Booths at partner events, native plant sale, nut growers society, local work group meetings, 2 local events on water quality for Chehalem area and Grand Island area residents.*
# landowners participating in active events	**60** *320*	
Technical Assistance (TA)		
# landowners provided with TA (via phone/walk-in/email/booth/site visit)*	**70** *241*	Areas of assistance includes native plants, pasture management, stream erosion issues, grass hay ground restoration, channel maintenance, flood and erosion issues, irrigation efficiency, conservation cover, alternatives to reduce flooding, ditch vegetation, and other ag water quality concerns.
# site visits	**19** *198*	
# conservation plans written**	**2** *137*	NRCS develops and writes conservation plans.

On-the-ground Project Funding		
# funding applications submitted	**1** *5*	**Focused Ag Solutions five-year project.** *OWEB Small grant projects, mostly riparian restoration.*
# funding applications awarded	**1** *5*	

* 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	USFWS	NRCS*	ODFW	1		All other sources**
$262,959	$1,553,747	$464,344	$778,402	$113,055	$361,564		$1,836,019
						TOTAL	**$5,370,090**

* 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.
1 Willamette Industries, Inc.

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		5,421		
Road	59		491	
Streamside Vegetation	20	615		
Wetland		442		
Instream Habitat	2			
Instream Flow	0		0 cfs	
Fish Passage	21		37	
TOTAL	**102**	**6,478**	**528**	

* 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

4.3.1.1 DEQ Monitoring

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 4.3.1.1).

Table 4.3.1.1 Agricultural Water Quality Concerns: Surface Water

Site Description	Parameter					
	E. coli	pH	Dissolved Oxygen	Temperature	Total Phosphorus (mg/L)	Total Suspended Solids (mg/L)
	Attainment Status and Trend				median; maximum[1]	median; maximum[2]
N Yamhill at Poverty Bend Rd - 10929-ORDEQ	**No**	Yes	Yes↑	N/A	0.1;0.1;0.1	0.5;8;207
Yamhill River at Dayton – 10363-ORDEQ	**No**	Yes↓	Yes↑	N/A	0.1;0.1;0.2	0.5;6.5;106
S. Yamhill River at Highway 99W (McMinnville) – 10948-ORDEQ	No	Yes	Yes↑	N/A	N/A	1;8.5;114

[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

There are few continuously monitored stations within the Yamhill Subbasin to draw accurate generalizations of water quality.

Dissolved oxygen is generally attaining and improving, and pH is attaining but showing a downward trend in two of the five stations monitored with sufficient data. Temperature is not attaining in the one station that has enough data to be analyzed.

E.coli is both not attaining and in a downward trend, with total suspended solids also having some high excursions. This is in line with the Willamette Mercury TMDL, in which soil erosion is the primary concern.

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 February 26, 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
• Districts maintain good relationships with landowners. • Cooperation between the county roads department and Yamhill SWCD is good and needed for roadside ditch problems. • The Agricultural Drainage Channel Maintenance Program is good and needs to be better advertised and promoted. • Roadside seeding is helping reduce erosion. • Erosion is collectively recognized as a serious problem and landowners are open to finding solutions. The Area Plan contains good information and guidance on voluntary measures. It just needs to be made more accessible to landowners.
Impediments
• Roadside ditches are full. Ditch maintenance is not getting the attention it needs. • Landowners are not using the Area Plan or they are too afraid to know whether their current practices are in compliance. • Need a Management-Area wide measurable objective for reducing erosion. Focused Ag Solutions project could help build that. • Need more/better data and information exchange between districts and Natural Resources Conservation Service (NRCS). • Conservation objectives can't keep changing; if they do, then reporting agencies don't capture the good work is happening for objectives that are no longer a priority.
Recommended Modifications and Adaptive Management
• Need to make the Area Plan more accessible for landowners because they are not reading it as it is. • Need to better pair solutions to Area Rules. • More funding, attention and equipment (i.e., brush mower) is needed for roadside ditch maintenance. • Need to match objectives with available capacity, resources, and funding.

Table 4.4b Number of ODA compliance activities in 2020-2024

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	18	13	52	2	9	22	6	0
Within SIA	7	6	13	0	4	8	1	0

References

Hoffert-Hay, Denise. 2000. Yamhill Basin Council. Lower South Yamhill-Deer Creek Watershed Assessment.

Oregon Water Resources Department. 1998. Water Rights Information System.