Mid Coast Agricultural Water Quality Management Area Plan

February 2024

Developed by the

Oregon Department of Agriculture

and the

Mid Coast Local Advisory Committee

with support from the

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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 603-095-2240). 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

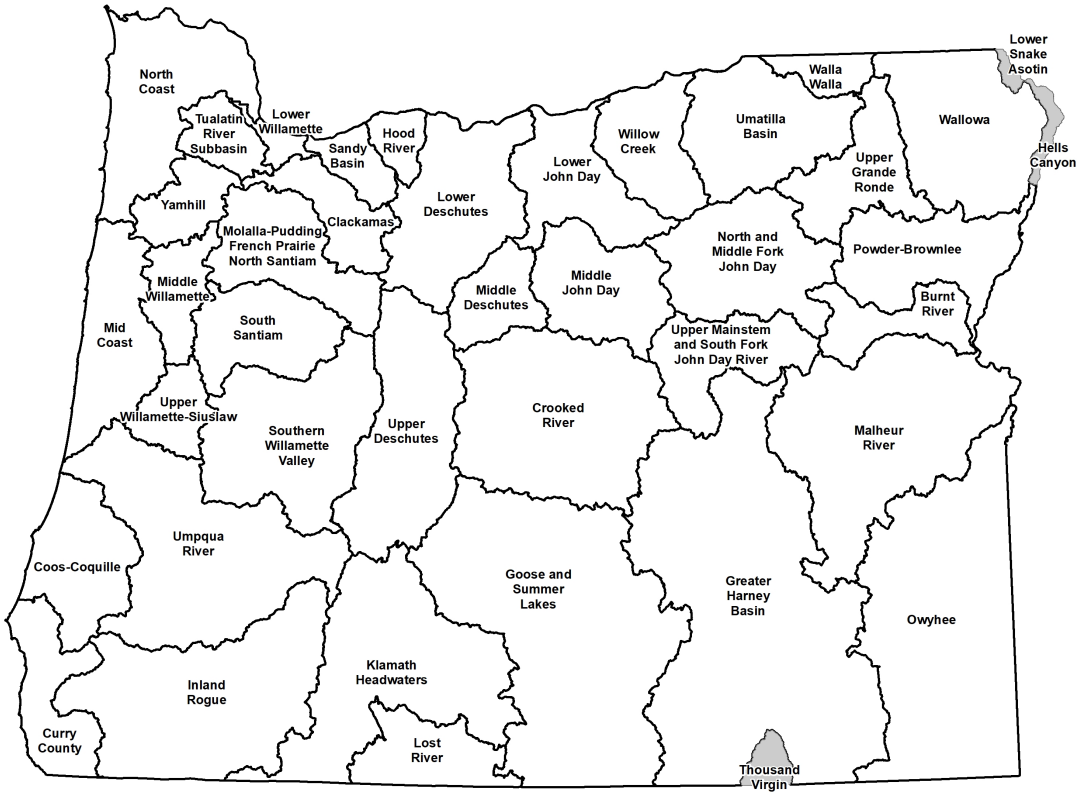
In 1993, the Oregon Legislature passed the Agricultural Water Quality Management Act directing ODA to develop plans to prevent and control water pollution from agricultural activities and soil erosion and achieve water quality standards and to adopt rules as necessary (ORS 568.900 through ORS 568.933). 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.

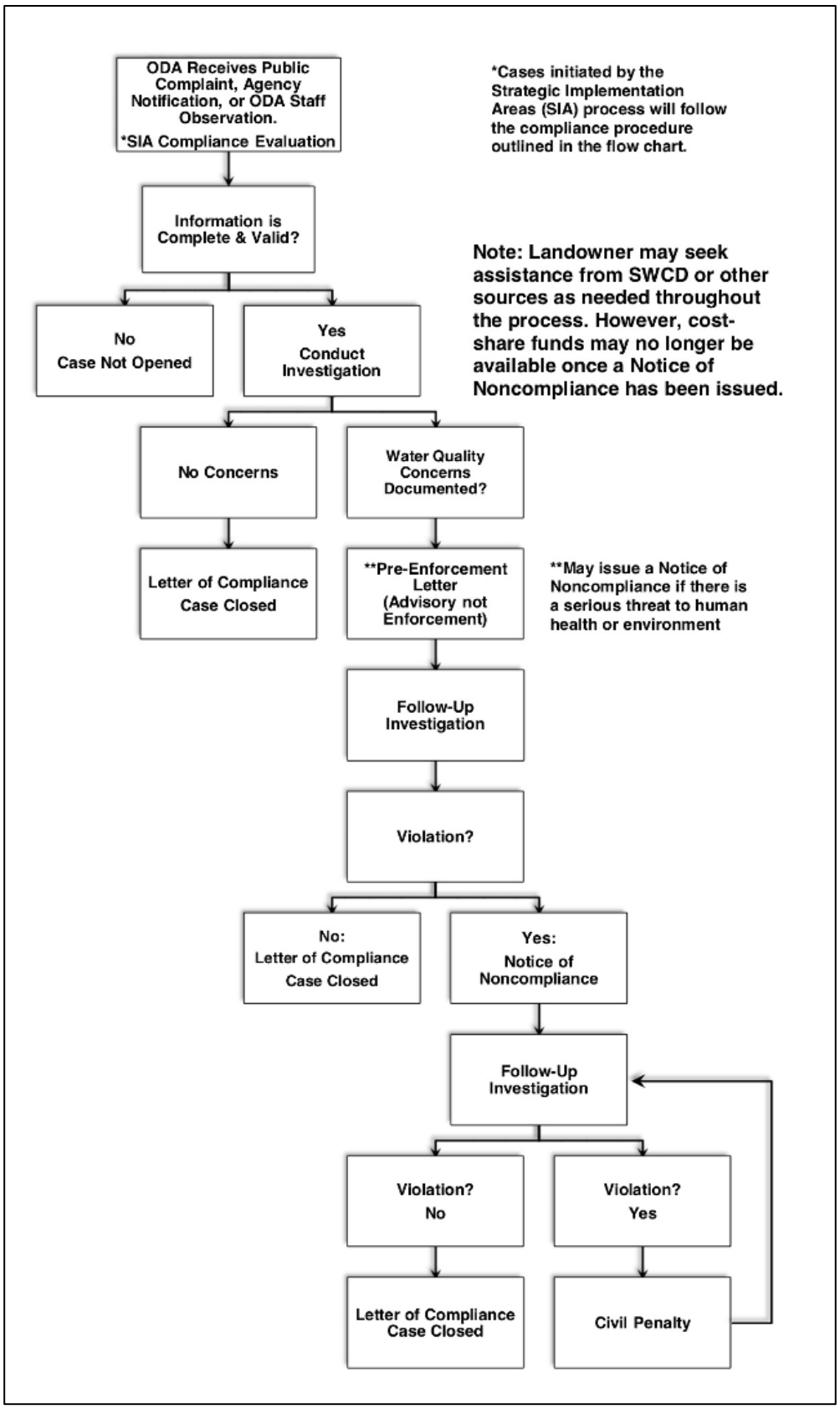
1.3.1.1 ODA Compliance Process

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.

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. 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.

As part of the TMDL process, DEQ identifies Designated Management Agencies and Responsible Persons, which are parties responsible for submitting TMDL implementation plans. TMDLs designate ODA as the lead agency responsible for implementing the TMDL on agricultural lands. ODA uses the applicable Area Plan(s) as the implementation plan for the agricultural component of the TMDL. Biennial reviews and revisions to the Area Plan and Area Rules must address agricultural or nonpoint source load allocations from relevant TMDLs.

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

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

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

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

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

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

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

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

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

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

1.4.5 Streamside Vegetation and Agricultural Water Quality

Across Oregon, the Ag Water Quality Program emphasizes streamside vegetation protection and enhancement. Streamside vegetation can provide three primary water quality functions: shade to reduce stream temperature warming from solar radiation, streambank stability, and filtration of pollutants. Other water quality functions from streamside vegetation include water

storage in the soil for cooler and later season flows, sediment trapping that can build streambanks and floodplains, narrowing and deepening of channels, and biological uptake of sediment, organic material, nutrients, and pesticides. In addition, streamside vegetation provides habitat for numerous species of fish and wildlife. Streamside vegetation conditions can be monitored to track progress toward achieving conditions that support water quality.

Site-Capable Vegetation

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

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

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

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

1.4.6 Soil Health and Agricultural Water Quality

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

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

1.5 Other Water Quality Programs

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

1.5.1 Confined Animal Feeding Operation Program

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

1.5.2 Groundwater Management Areas

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

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

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

1.5.3 The Oregon Plan for Salmon and Watersheds

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

1.5.4 Pesticide Management and Stewardship

ODA's Pesticides Program holds the primary responsibility for registering pesticides and regulating their use in Oregon under the Federal Insecticide, Fungicide, and Rodenticide Act.

ODA's Pesticide Program administers regulations relating to pesticide sales, use, and distribution, including pesticide operator and applicator licensing as well as proper application of pesticides, pesticide labeling, and registration.

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

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

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

ODA led the development and implementation of a Pesticides Management Plan (PMP) for the state of 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.

1.5.6 Oregon's Coastal Management Program

The mission of the Oregon Coastal Management Program is to work in partnership with coastal local governments, state and federal agencies, and other partners and stakeholders to ensure that Oregon's coastal and ocean resources are managed, conserved, and developed consistent with statewide planning goals. Oregon's Coastal Nonpoint Pollution Control Program (CNPCP) has been developed to comply with requirements of Section 6217 of the federal CZARA. The US EPA and the National Oceanic and Atmospheric Administration administer CZARA at the federal level. The federal requirements are designed to restore and protect coastal waters from

nonpoint source pollution and require coastal states to implement a set of management measures based on guidance published by the US EPA. The guidance contains measures for agricultural activities, forestry activities, urban areas, marinas, hydro-modification activities, and wetlands. In Oregon, the Department of Land Conservation and Development and DEQ coordinate the program. The geographic boundaries for the CNPCP include the North Coast, Mid-Coast, South Coast, Rogue, and Umpqua basins. Oregon has identified the ODA coastal Area Plans and Area Rules as the state's strategy to address agricultural measures. The Area Plan and Area Rules are designed to meet the requirements of CZARA and to implement agriculture's part of Oregon's CNPCP. For more information, visit www.oregon.gov/lcd/OCMP/Pages/Coastal-Zone-Management.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 2012 and reviewed and confirmed it in 2018 (www.oregon.gov/ODA/shared/Documents/Publications/NaturalResources/DEQODAmoa.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.

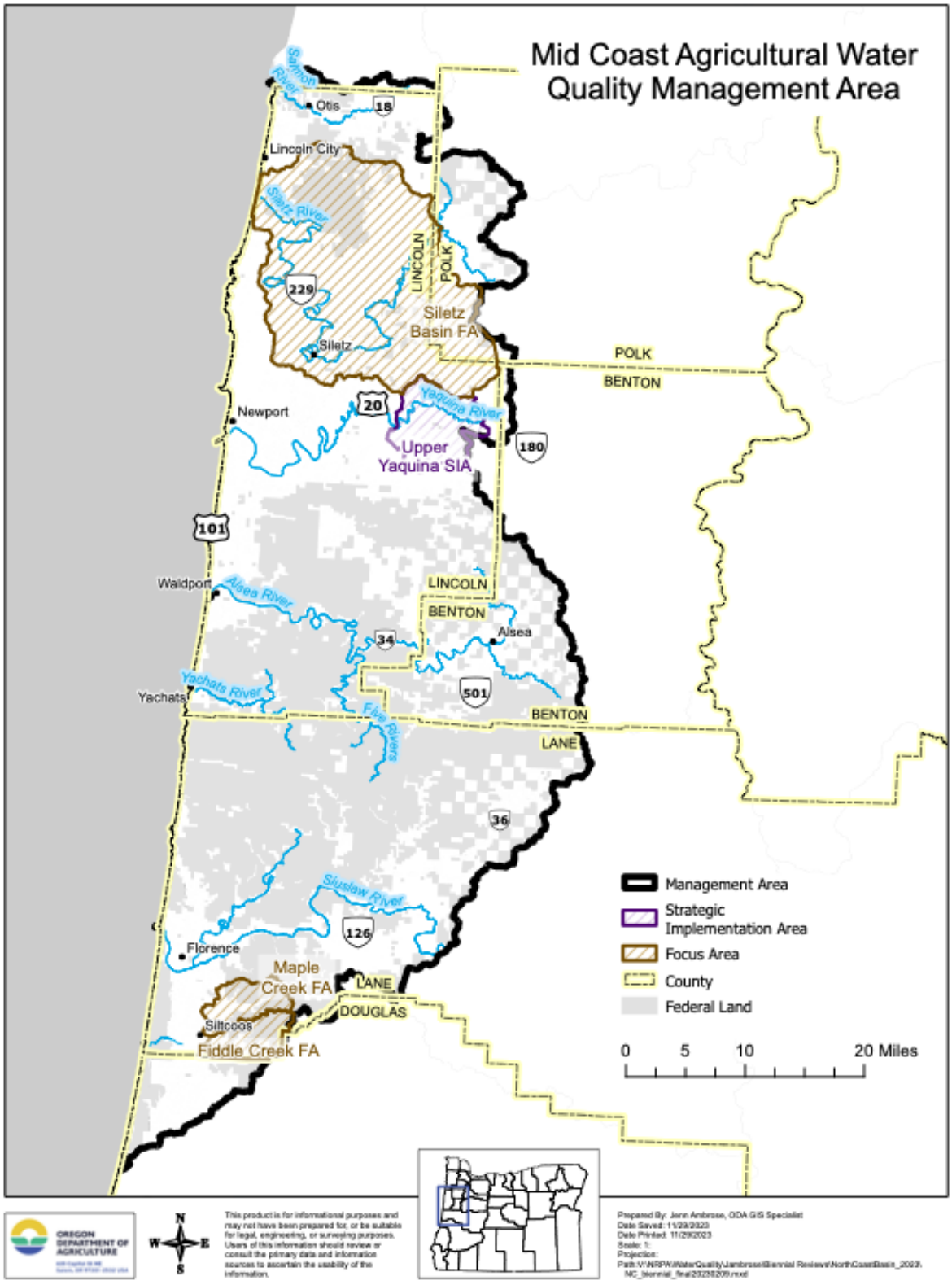
Water quality monitoring efforts in this Management Area are described in Chapter 3, and the data are summarized in Chapter 4.

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 Mid Coast Management Area has range in Douglas, Lane, Benton, Lincoln, and Polk counties. Benton, Siuslaw, and Lincoln SWCDs are the primary SWCDs in the area due to agricultural land distribution. The Salmon and Siletz rivers run through the Management Area as well as the Yaquina, Alsea, Yachats, Five Rivers, and Siuslaw. The map that follows (Figure 2) shows the Management Area boundaries and range. It also contains four major coastal cities: Newport, Waldport, Yachats, and Florence.

Figure 2 Mid Coast Management Area



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
Richard Huff (Chair)	Siltcoos Watershed	Cattle, timber
Howard Pazdral (Vice-Chair)	Siuslaw Watershed	Hay, logging, Percheron horses
Kevin Carroll	Siltcoos Watershed	Farrier, Siuslaw SWCD board
Renee Coxen	Management Area	ODFW Coastal Implementation Coordinator
Alan Fujishin	Siletz Watershed	Blueberries, cattle, Lincoln SWCD board
Joe Steere	Salmon River Watersehd	Cattle, timber, Oregon Small Woodlands Association, Farm Bureau
Margaret Treadwell	McKenzie Watershed	McKenzie River Trust
Lorissa Fujishin (alternate)	Siletz Watershed	Blueberries, cattle, fishery, aquatic science
Vacant		
Vacant		
Vacant		
Vacant		
Vacant		

2.1.2 Local Management Agency

SWCDs implement Area Plans through OWEB capacity grants, with details negotiated between ODA and each SWCD. The resulting Scopes of Work define the SWCDs as the LMAs for implementation of the Ag Water Quality Program in specific Management Areas. The LMAs for this Management Area are Benton, Lincoln, and Siuslaw 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 2002.

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, Water Resources, Land Use, Land Ownership, Agriculture

Physical features

The Alsea, Salmon, Siletz, Siuslaw, Yachats, Siltcoos, and Yaquina rivers are typical coastal streams, with their principal headwaters in the Coast Range. They flow down steep gradients until the lower reaches, where they flatten and meander through relatively narrow valleys. Each river has a broad, shallow bay at its mouth and most have silted estuaries. Many estuaries and coastal wetlands have been modified for agricultural production, municipal use, and other purposes. Modifications include dikes and levees, drainage ditches, and tide gates. Siltcoos and Tahkenitch lakes, along with several smaller lakes near the border between Lane and Douglas counties, were created as dunes blocked the outlets of several coastal streams. Dams were also installed at the outlets of Siltcoos and Tahkenitch lakes in the 1960s.

Table 2.3.1a Acreage and major tributaries of watersheds in the Management Area

Watershed	Acreage	Major Tributaries
Salmon River	49,920	Bear Creek, Little Salmon River, Salmon Creek, Slick Rock Creek, Treat River, Trout Creek
Siletz River	197,120	Cedar Creek, Drift Creek, Euchre Creek, Gravel Creek, North Fork, Rock Creek, Schooner Creek, South Fork, Sunshine Creek
Yaquina River	161,920	Buttermilk Creek, Depot Creek, Elk Creek, Little Elk Creek, Mill Creek, Olalla Creek, Spilde Creek, Thornton Creek, Young Creek
Alsea River	302,720	Canal Creek, Drift Creek, Fall Creek, Five Rivers, Lobster Creek, South Fork
Yachats River	39,040	North Fork, School Fork, Stump Creek
Siuslaw River	494,720	Deadwood Creek, Indian Creek, Knowles Creek, Lake Creek, North Fork, Wildcat Creek
Siltcoos River	82,560	Fiddle Creek, Maple Creek, Tahkenitch Lake, Woahink Lake, Siltcoos Lake

Most of the soils in the area are formed from sedimentary rock. They are highly productive timber soils, fairly unstable, and prone to landslides. Other soils are derived from igneous rock formations. Along streams and rivers in their lower reaches, most soils formed from alluvial deposits (Corliss 1973; Patching 1987; Shipman 1997).

Climate

The climate of the area is typical of the Oregon Coast with wet winters, dry summers, and relatively mild temperatures year-round. Precipitation varies between 60 and 80 inches per year at the Pacific Ocean to between 100 and 120 inches per year at the crest of the Coast Range. Rainfall is the predominant form of precipitation, especially at sea level. Snowfall is infrequent at sea level, but can be significant during the winter in parts of the Coast Range. Temperatures are similar throughout the area during the winter, but typically increase during the summer with distance from the Pacific Ocean. For example, the average daily maximum temperature at the town of Tidewater is 10 degrees higher than at Newport during the summer (Corliss 1973; Patching 1987; Shipman 1997).

By the 2050's temperature is expected to increase in Newport, Oregon by 4.5 F based on Oregon Climate Change Research Institute (OCCRI) climate projections. Annual precipitation is expected to increase by 1.5% in Newport, Oregon by 2050 when compared to historical baseline. However, summer precipitation is projected to decrease by over 16% with the winter precipitation increasing by approximately 7%, resulting in the overall annual increase. Projected percentage change in Newport is representative of changes within the Mid Coast region,

respective of the fact that climate varies greatly along the Oregon Coast. Snow will become even more rare on the coast as temperatures rise while extreme precipitation events are expected to increase in frequency and intensity. Increased winter precipitation can mean an increase in winter stream flow (expected 18% increase) which can result in an increase in flooding events in the area.
https://blogs.oregonstate.edu/occri/oregon-climate-assessments/
https://oregonstate.app.box.com/s/16fssk6i8wci5yhyttmrba60ce2b4maz

Land use/land ownership

Agriculture and forestry
Farming in the Management Area is limited to the narrow valleys along major streams. Concentrations of agricultural land occur near Siletz, Toledo, Alsea, Lobster Valley, Deadwood, Harlan, Florence, and Siltcoos Lake. Farms range from small, 10 to 20-acre parcels with livestock and hay, to ranches of several thousand acres where agricultural products are the primary source of income. Some grazing also occurs on upland meadows in timberlands. Historically, agricultural production in the area included row crops and several small family dairies, but most of the dairies have gone out of business, and row crop production has moved elsewhere. The primary agricultural commodities in the area today are hay and cattle; other products include Christmas trees, nursery stock, blueberries, horses, sheep and wool, goats and goat cheese, pastured port, filberts, oysters, apples, and vegetables.

About 90 percent of the Management Area is in forestland. Major landowners and managers in the Management Area include the Bureau of Land Management, the U. S. Forest Service, industrial timber companies, and smaller acreage timberland owners. Much of the timberland is on highly productive soils on the steep slopes of the Coast Range.

Urban/residential
Most urban lands are along the coastline and have grown along with coastal tourism. Towns and rural-residential communities further inland are mostly located near agricultural areas.

Coastal communities face increasing challenges related to wastewater management as their populations, industries and visitor numbers grow. Small communities may either upgrade existing or build new wastewater treatment facilities. Wastewater treatment facilities must secure permits from DEQ to discharge treated water to waterways, or to prepare biosolids for land application as fertilizer to willing landowner's agricultural and forest properties. For more information on bio-solids, see the Prevention and Control Measure for nutrients and bacteria.

Roads
There is an extensive network of public and private roads in the Management Area. Many of the private roads are on forestlands. Major state and federal public highways include Highways 126, 101, 34, 20, 181, 229, and 18. Most of the major highways in the watershed, as well as many county roads, are located along streams and rivers.

Recreation
The Management Area is an extremely popular region for tourism and recreation. Sport fishing occurs along nearly every major river and stream, and hunting is also popular. Other popular recreation activities include boating, kayaking, hiking, camping, beach walking and sightseeing.

Recreation is a beneficial use impacted by water quality parameters of concern discussed later in this chapter.

Water Resources

Water availability

Most of the surface water supply in the Management Area is provided by rainfall. Only a small portion of surface water is supplied by snowmelt. As a result, there is a great deal of variability in annual flows, with flows in the winter greatly exceeding summer flows. Table 2 shows average summer, winter, and annual flows in several Mid Coast streams.

Table 2.3.1b Average annual, summer, and winter flows in the Alsea, Siletz, Siuslaw, and Yaquina rivers (United States Geological Survey, 2001). Flows are listed in cubic feet per second (cfs).

River	Average Annual Flow (cfs)	Average Summer Flow (cfs)	Average Winter Flow (cfs)
Alsea @ Tidewater	1,488	240	3,400
Siletz	1,526	283	3,211
Siltcoos	330	66	760
Siuslaw	2,010	344	4,520
Yachats	119	28	248
Yaquina @ Chitwood	250	42	560

Table 2.3.1c Water appropriations (in cfs and acre-feet (af)) in the Salmon, Siletz, Yaquina, and Alsea watersheds. (Oregon Water Resources Department, 1990)

Water Use	Salmon River		Siletz River		Yaquina River		Alsea River	
	cfs	af	cfs	af	cfs	af	cfs	af
Irrigation	4	2	13	2	14	1	39	8
Fish and Wildlife	34	6	11	1	9	0.1	70	6
Agriculture	0.03	0	0.06	0.7	0.02	0	5	16
Industrial	0.3	4	35	4,350	36	6,060	0.4	0
Municipal	0.7	0	21	2	1.5	500	7	0

Table 2.3.1d Water appropriations (in cfs and af) in the Yachats, Siuslaw, Siltcoos, and Tahkenitch watersheds. (Oregon Water Resources Department, 1990).

Water Use	Yachats River		Siuslaw River		Siltcoos River		Tahk. Creek	
	cfs	af	cfs	af	cfs	af	cfs	af
Irrigation	1	0	46	17	4	0.5	0	0
Fish and Wildlife	1	0	10	124	0.02	0.02	0	0
Agriculture	0	5	3	25	0	0	0	0
Industrial	0	0	9	515	13	15,070	37	16,580
Municipal	4	0	13	0	1.5	0	0	0

Because of the fine-grained and relatively impermeable rock formations in the Management Area, groundwater supplies are generally low. Sand dunes and alluvial deposits yield the most groundwater.

Water use

Consumptive uses of water in the Management Area include irrigation, quarrying, industrial, domestic and municipal use. Non-consumptive uses include recreation and fish and wildlife habitat. Tables 3 and 4 list water appropriations in the major watersheds in the area.

Biological Resources
A number of species in the Management Area depend on aquatic habitats. Native anadromous fish include Chinook salmon, Coho salmon, chum salmon, steelhead, sea run cutthroat trout, smelt, Pacific lamprey, and white sturgeon. Spawning and rearing grounds for these fish are found throughout the Management Area (Appendix A). Agricultural runoff can also affect water quality in estuaries, which include estuarine-rearing marine fishes such as Pacific Herring, English Sole, Starry Flounder, Red-tailed Surfperch, and Ling Cod as well as Dungeness Crab. Oregon Coastal Coho were listed as threatened under the Endangered Species Act on May 12, 2008. Additional information can be found at: http://www.dfw.state.or.us/fish/CRP/coastal_coho_conservation_plan.asp. Other aquatic vertebrates in the area include seals, cormorrants, geese, terns, gulls, beaver, wood duck, hooded and common merganser, speckled dace, sculpin, Pacific tree frog, red-legged frog, western pond turtle, and Pacific giant salamander. Non-native aquatic species include nutria, shad, bass, perch, and bullfrog. The area is seasonally important for migratory waterfowl and shorebirds. Terrestrial species in the Management Area include mountain lion, black bear, Roosevelt elk, black-tailed deer, coyote, several birds of prey, and a variety of resident and neo-tropical migratory songbirds.

Several of these species are of tremendous importance to the function of terrestrial or aquatic ecosystems, and significantly affect nutrient cycling, type and quality of habitats, populations of other species, and other factors. Presence and variety of aquatic species can indicate watershed health.

2.4 Agricultural Water Quality

2.4.1 Water Quality Issues

Multiple waterbodies in the Mid-Coast Basin are identified as “impaired” through DEQ's Water Quality Assessment and 303(d) list for temperature, bacteria, sedimentation, dissolved oxygen, and weeds/algae. Various parties are working on cooperative projects and taking positive actions to protect and improve water quality in the basin's rivers, tributaries, and lakes.

2.4.1.1 Beneficial Uses

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

2.4.1.2 Water Quality Parameters of Concern

There are several water quality parameters of concern for agriculture listed in the 2022 Integrated Report (https://www.oregon.gov/deq/wq/Pages/epaApprovedIR.aspx). They are as follows:

Nutrients
Nutrients can occur naturally in streams and rivers, but elevated concentrations are often the result of pollution due to human activities. Phosphorus and nitrates have been nationally identified as the most important nutrients to prevent from reaching surface waterbodies and groundwater. Nitrate is the primary form of nitrogen in surface water and groundwater because it readily dissolves in water and is easily transported. Studies conducted by the U.S. Geological

Survey (USGS) National Water Quality-Assessment (NAWQA) Program estimate that about 90 percent of nitrogen and 75 percent of phosphorus originates from nonpoint sources; the remaining percentages are from point sources.

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

Temperature
Water temperature is primarily a summer concern, a season characterized by low flow and high air temperature. The sub-lethal 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.

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 locations of streams.

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 criteria are waived.

For nonpoint sources of stream heating (e.g., vegetation disturbance, stream channel alteration) attributed to agriculture and rural lands, the temperature TMDL establishes thermal goals for on-the-ground conditions that would lead to more natural stream temperature patterns. The TMDL recovery targets call for natural shade-producing vegetation along all streams in the plan area and the removal of stressors that are impeding that attainment of a natural vegetative and channel geometry conditions. In certain areas, shade producing riparian vegetation may not be appropriate due to local site conditions. Site-specific determinations will be made by ODA.

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. Plant and algal growth, and the death and subsequent decomposition of aquatic plants and algae can deplete the water of dissolved oxygen resulting in the death of fish and other aquatic animals. These conditions are usually aggravated by low stream flow. The water quality standard for pH (hydrogen ion concentrations) values range from 6.5 to 9.0 (OAR 340-041-0315(1)).

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, as well as a single sample maximum of 406 *E. coli* organisms per 100 ml. (OAR 340-041-0009)

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.

Biological Criteria
Biological criteria refer to the support of plants and animals that live at least part of the life cycle in water. Factors that affect biological criteria are stream disturbances, excessive heat inputs, and excessive sediment. The biologic condition is assessed through sampling of streambed insects and fish counting.

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).

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.

2.4.1.3 TMDLs and Agricultural Load Allocations

Table 2.4.1.3: Pollutants with Approved TMDLs and Load Allocations for the MA
Total Phosphate and Phosphorous: Applies to all waterbodies in the Clear Lake Watershed. **Load Allocation:** • Collard Lake based on total phosphorous concentration of 14 ug/l. • Clear Lake based on total phosphorous concentration of 7.8 ug/l. **Surrogate:** • Total phosporous **Current TMDL:** Clear Lake TMDL, (DEQ; approved 1991) **TMDL Revisions:** None **For more information:** https://www.oregon.gov/deq/FilterDocs/ClearLakeTMDL.pdf
Bacteria (*E.coli*) and Dissolved Oxygen (solar radiation and phosphorous): Bacteria applies to both the mainstem and contributing watershed tributaries; Dissolved oxygen applies to designated spawning and non-spawning periods for the Upper Yaquina River. **Load Allocation:** For agriculture, forested, developed, and other non-urban land types: • Solar radiation: 76% reduction needed • Phosphorous: 50% reduction needed • Bacteria: 83% reduction needed **Surrogate:** • Temperature: percent effective shade • Total Phosphorous • Bacteria: *E. coli* organisms entering streams per runoff **Current TMDL:** Upper Yaquina River Watershed TMDL – Mid-Coast Basin, (DEQ; approved 2023) **TMDL Revisions:** None **For more information:** https://www.oregon.gov/deq/wq/tmdls/Pages/upperyaquina.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.

Public drinking water systems in the Mid Coast Agricultural Water Quality Management Area utilize groundwater sources to serve approximately 78,650 persons regularly

There are 109 public water systems that obtain drinking water from a combination of surface and groundwater sources in the Management Area. Drinking water is an important beneficial use under the federal Clean Water Act (CWA). When CWA standards are met in source waters, a drinking water treatment plant using standard technology can generate water meeting the Safe Drinking Water Act standards. Land use and ownership within public water system's drinking water source areas in the Management Area primarily include private industrial forests, private rural lands, private urban lands, agriculture, BLM, USFS, and ODF.

An alert for elevated nitrate concentrations is generated by the OHA when nitrate sample results for public water systems exceed 5 mg/L. Within the Management Area, three public water systems had an alert for elevated nitrate results in the past 10 years. None of the public water systems had maximum contaminant level (MCL) violations for nitrate in the past 10 years (the MCL for nitrate is 10 mg/L). Of the soils assessed in the Management Area, most have high nitrate leaching potential, based on the area's slope, precipitation, and land use. Nitrate from

fertilizers and septic systems can readily penetrate aquifers used for drinking water when leaching potential is high. Additionally, bacteria removal through soil filtration can be less effective in sandy soils. Measures to reduce leachable nitrate in soils would reduce risk to groundwater sources of drinking water.

DEQ recommends ODA work with the appropriate SWCDs to implement best management practices (BMPs) in and around private domestic and public drinking water wells to reduce high nitrate levels. BMPs to reduce nitrate levels are beneficial in helping communities reduce long-term costs associated with treatment, operations, maintenance, and sustainability.

2.4.2 Sources of Impairment

There are many natural and human-caused potential sources for the water quality problems identified in the Management Area, including runoff from forest and agricultural lands, runoff from roads, erosion from streambanks and roadsides, wildlife activity, waste disposal sites, discharges from waste water treatment plants, leaking septic systems, application of biosolids, manures and other fertilizers on agricultural lands, and erosion from home building and development.

Rerouting of runoff via road building, construction, and land surfacing (such as parking areas) results in hydro-modification and can lead to excessive erosion or pollutant transport. Increased heat input due to vegetation removal along streams, seasonal flow reduction, changes in channel shape, depth of pools, and floodplain alteration are also potential sources of water quality impairments.

Other water quality concerns exist in the Management Area in addition to 303(d) listed problems. In several waterbodies, lead from fishing lures has become a water quality concern. Some of the lead can dissolve and become bound in organic materials, eventually forming a fine layer on the creek bottom. Oil and fuel spills or improperly disposed petroleum products around roads, residences, industrial sites, and farm buildings are a water quality concern, especially because of the high rainfall in the area and likelihood of runoff to waterbodies. Pesticide application is a concern and current use and legacy pesticides have been detected in some waterbodies**.**

North and South Fork Beaver Creek in the Alsea Subbasin, were included in the 2010 303(d) list for bacteria and dissolved oxygen (DO) impairments. This important salmon watershed has had low reported dissolved oxygen in wetland areas too low to support aquatic life. The rolling average for dissolved oxygen in freshwater reaches of the area, ranges from a high of 11 mg/liter for waterbodies identified as salmon spawning to a low of 8 mg/liter for supporting cold water aquatic life and 6.5 mg/liter in the estuaries. In 2018, DEQ conducted extensive reassessment of both the Alsea and Beaver Creek watersheds for dissolved oxygen and nutrient conditions provided a data analysis report in 2020. Overall, DO status was close to applicable criteria except in wetland segments, indicating that the continuous monitoring approach currently being used is critical to determining DO status.

2.5 Regulatory and Voluntary Measures

A landowner or operator’s responsibility under this Area Plan is to implement measures that prevent and control the sources of water pollution associated with agricultural and rural lands and activities. A landowner or operator is not responsible for conditions caused by other

landowners or for circumstances not within their reasonable control, including unusual weather events.

2.5.1 Area Rules

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 603-095-2240(2) through 603-095-2240(6), are included in this document only as a reference for landowners. Each Area Rule has a border around it and appears in italics. The following, OAR 603-095-2240(1) gives some provisions that apply to the Area Rules that were developed with the LAC.

(1) Waste Management: Effective on rule adoption, no person subject to these rules shall violate any provision of ORS 468B.025 or 468B.050 (see section 1.4.4).

(2) Prevention and Control Measures

OAR 603-095-2240

All landowners or operators conducting activities on lands in agricultural use shall comply with the following critiera. A landowner shall be responsible for only those conditions caused by activities conducted on land controlled by the landowner. A landowner is not responsible for violations of Prevention and Control Measures resulting from actions by another landowner. Conditions resulting from unusual weather events (equaling or exceeding a 25-year, 24-hour storm event) or other exceptional circumstances are not the responsibility of the landowner. Limited duration activities may be exempted from these conditions subject to piror approval by the department.

(3) Riparian/Streamside Management

OAR 603-095-2240

(2) Near-Stream management areas. Effective January 1, 2005:
(a) Agricultural activities must allow for the establishment and development of riparian vegetation consistent with site capability. Vegetation must be sufficient to provide the following riparian functions: shade, streambank integrity during stream flows following a 25-year storm event, and filtration of nutrients and sediment.
(b) Exemptions:
(A) Levees and dikes are exempt from OAR 603-095-2240(2)(a) except for areas on the river-side of these structures that are not part of the structures and that can be vegetated without violating U.S. Army Corps of Engineers vegetation standards.*
(B) Drainage areas where the only connection to other waterbodies is through pumps shall be exempt from OAR 603-095-2240(2)(a).
(C) Access to natural waterways for stream crossings and livestock watering are allowed provided OAR 603-095-2240(2)(a) is met.
(D) Legally constructed drainage and irrigation ditches as defined in Division of State Lands Rules and ditches subject to Division of State Lands fill-removal laws are exempt from OAR 603-095-2240(2).

* The following is a link to the current “Guidelines for Landscape Planting and Vegetation Management at Levees, Floodwalls, Embankment Dams, and Appurtenant Structures”:

http://www.publications.usace.army.mil/Portals/76/Publications/EngineerTechnicalLetters/ETL_1110-2-583.pdf

This Area Rule specifies that "agricultural activities" must allow for riparian vegetation to begin establishing and developing by 2005. Landowners are not responsible for the impacts of browsing activities of elk, geese, beaver, or other wildlife.

(4) Nutrient Management

OAR 603-095-2240
(3) Effective on rule adoption, landowners or operators shall prevent nutrient applications that cause pollution to waters of the state.
OAR 603-095-2240
(4) Effective on rule adoption, no person subject to these rules shall violate any provision of ORS 468B.025 or ORS 468B.050.

ORS 468B.050 identifies the conditions when a permit is required. In agriculture, under state rules, these are referred to as CAFOs and are operations that confine animals on prepared surfaces to support animals in wet weather, have wastewater treatment works, discharge any wastes into waters of the state, or meet the federal definition of a CAFO (40 CFR § 122.23). Permitted facilities are inspected regularly by the ODA.

Bio-solids Applications and Jurisdiction

DEQ regulates bio-solids under OAR 340 Division 50:
https://secure.sos.state.or.us/oard/displayDivisionRules.action?selectedDivision=1467
"Bio-solids" means solids derived from primary, secondary, or advanced treatment of domestic wastewater which have been treated through one or more controlled processes that significantly reduce pathogens and reduce volatile solids or chemically stabilize solids the extent that they do not attract pests. This term refers to domestic wastewater treatment facility solids that have undergone adequate treatment to permit their land application. The term has the same meaning as the term "sludge" in ORS 468B.095, and the term "sewage sludge" found elsewhere in OAR Chapter 340.

The primary elements of the Program are summarized below and more detail is found on DEQ's website and currently includes a specific section addressing activities in the Mid Coast Basin: https://www.oregon.gov/deq/wq/programs/Pages/Biosolids.aspx.

DEQ maintains a webpage for Mid Coast biosolids information:
https://www.oregon.gov/deq/wq/programs/Pages/midcoastbiosolids.aspx.

Bio-solids Management Plan

All domestic wastewater treatment facilities that apply bio-solids to the land must operate under a bio-solids management plan that has been reviewed and approved by DEQ. The plan is specific to each facility and serves as the administrative tool to guide the production, treatment, storage, transportation, and land application of bio-solids for beneficial use. Detailed requirements for bio-solids management plans are found here:
https://www.oregon.gov/deq/Filtered%20Library/biosolids.pdf.

Site Authorization Letter

A site authorization letter is issued by DEQ regional water quality staff and is required prior to land application at a particular site. The letter specifies conditions for land application, including

crop requirements, bio-solids application rates, seasonal restrictions, setback distances to roads, wells, and water sources, and other pertinent site management information.

Site Authorization Documentation Checklist for the Land Application of Bio-solids
Soil information is needed to determine the suitability of a site for bio-solids land application. Information from a soil survey should be attached to the site authorization request.

(5) Soil Erosion

OAR 603-095-2240
(5) Erosion and Sediment Control:
(a) Effective January 1, 2004, agricultural activities will not cause the following visual indicators of erosion where erosion may cause sediment runoff into waters of the state:
(A) Sheet erosion, noted by visible pedestalling, surface undulations, and/or flute marks on bare or sparsely vegetated ground;
(B) Visible active gullies;
(C) Multiple rills, which have the form of gullies, but are smaller in cross-sectional area than one square foot.
(b) This prevention and control measure applies to farm roads and staging areas, pastures, cropland, and other areas where agricultural activities occur.

(6) Irrigation

OAR 603-095-2240
(6) By January 1, 2003, landowners must prevent pollution from irrigation return flow to waters of the state.
OAR 603-095-2240
(3) Effective upon rule adoption, landowners or operators shall prevent nutrient applications that cause pollution to waters of the state.
(5) Erosion and Sediment Control:
(a) Effective January 1, 2004, agricultural activities will not cause the following visual indicators of erosion where erosion may cause sediment runoff into waters of the state:
(A) Sheet erosion, noted by visible pedestalling, surface undulations, and/or flute marks on bare or sparsely vegetated ground;
(B) Visible active gullies;
(C) Multiple rills, which have the form of gullies, but are smaller in cross-sectional area than one square foot.
(b) This prevention and control measure applies to farm roads and staging areas, pastures, cropland, and other areas where agricultural activities occur.

2.5.2 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. Area 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 Area 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 this section, there are five subsections organized by water quality concern: riparian buffers, nutrients and bacteria, fine sediment, irrigation water management, and pesticides. Area Rules are referenced in four of the sections. Area Rules are listed multiple times in some subsections because several Area Rules relate to more than one water quality concern.

In addition to the Area Rules, the approved management measures for CZARA and available management practices that may help landowners achieve compliance and meet the goals and objectives of the Area Plan are included for reference. The approved management measures for CZARA and available management practices are intended as suggestions for landowners and technical advisors as options on how to meet the goals and objectives of 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 Rules.

The approved management measures for CZARA and available management practices that may help landowners achieve compliance are probably not enough for someone who wants to know exactly how to implement an available management practice on their property for a specific purpose.

There are cost-share and other forms of funding available for many of the available management practices that can significantly offset the costs to the producer. Some of the practices that funding is available for include fencing, off-stream water, hardened crossings, supplemental planting of riparian vegetation, and control of invasive vegetation.

Each prevention and control measure relates directly to water quality concerns identified on the 303(d) list in the management area and in the CZARA. The concerns addressed in these prevention and control measures are:

303(d) List parameters:

- Bacteria (Fecal Indicator Bacteria)
- Temperature
- Nutrients
- Biocriteria
- Sedimentation
- Aquatic weeds or algae
- Dissolved oxygen
- Chlorophyll A
- pH

Coastal Zone Act Reauthorization Amendments Measures:

- Riparian area and grazing management
- Erosion and sediment control
- Nutrient management
- Pesticide management
- Irrigation water management
- Wastewater and runoff from CAFO (addressed via ODA’s CAFO program)

2.5.1 Riparian/Streamside Area Management

Issue

A properly functioning riparian buffer provides the water quality functions of shade to help maintain cool water temperatures, filtration of pollutants in runoff before they reach the stream, and protection against unhealthy levels of streambank erosion. In addition to these water quality functions, riparian buffers can provide sources of food and habitat for fish and wildlife.

A riparian buffer is an area next to a stream, which if functional, limits the negative interactions between the stream and managed uplands. Natural factors that may limit the establishment and protection of riparian zones include precipitation, soil types, stream channel morphology, upland topography, adjacent land uses, and current vegetative community including invasive plants. Also, the width of the riparian buffer zone sufficient to provide the stated water quality functions will be site specific, and vary by soils, slope, adjacent land use, size of stream, and other site capability factors.

For many years, researchers have investigated factors that influence stream temperatures. Influences on stream temperature can include upland processes. Several authors emphasize the importance of water stored in the landscape and its importance in maintaining stream temperatures (Krueger et al, 1999; Moore and Miner, 1997; Naiman and Decamps, 1997). Upland conditions strongly influence stream temperatures by affecting the infiltration of precipitation and the storage and release of water. Adequate ground cover in upland areas increases the likelihood of precipitation infiltrating into the soil profile and decreases the possibility of overland flow, soil loss, and resulting sediment delivery to streams. Other influences on stream temperature include stream channel width, stream depth, channel substrate, air temperature, and elevation.

Riparian buffers in the Management Area must provide the water quality functions of shade, streambank stability, and filtration of pollutants. The following should provide these functions:

- Complex vegetation structure and diverse species composition—Riparian areas should be dominated by native species with a diverse age class distribution.
- Vegetation should cover approximately 90 percent of the soil surface, with less than ten percent bare soil or impervious surfaces.
- Width—riparian buffer zone width should be sufficient to fulfill site-specific functions. To calculate buffer width, calculate an area two times the height from the summer low flow to the bank full height plus ten feet (2h + 10') on each side of the stream.
- Stream shading—riparian vegetation should shade 75 percent of a natural waterway where the water body is not too wide and when achievable in the summer.
- Streambank stability—streambanks should be stable without the use of riprap or other artificial structures when feasible. Streambank vegetation is comprised of those plants and plant communities that have root masses capable of withstanding 20 to 25-year storm events.

This prevention and control measure does not prohibit grazing in riparian areas as long as riparian vegetation is allowed to establish and is not degraded by grazing practices. Grazing management should allow for recovery of plants and leave adequate vegetation to ensure streambank stability, reduce sediment or other pollutants from entering the stream and provide streamside shading consistent with the vegetative capability of the site.

Note: In areas where maintenance of irrigation and drainage systems is legal and necessary, care should be taken to allow vegetation to grow that is compatible with maintenance activities (i.e. leaving gaps in woody vegetation to allow access of machinery is okay. It would be expected that the maintenance activities comply with the Area Rules).

Beavers as a Partner in Restoration

Increasingly, restoration practitioners are using beaver to accomplish stream, wetland, and floodplain restoration. This is happening because,

In many cases these effects of beavers on a landscape are the very same outcomes that have been identified for river restoration projects. By constructing dams that impound water and retain sediment, beavers substantially alter the physical, chemical, and biological characteristics of the surrounding river ecosystem, providing benefits to plants, fish, and wildlife. The possible results are many, inclusive of: higher water tables; stream aggradation (a change in the stream grade due to sedimentation); reconnected and expanded floodplains; more hyporheic exchange (between surface and subsurface water); higher summer base flows; expanded wetlands; improved water quality; sediment trapping; greater habitat complexity; more diversity and richness in the populations of plants, birds, fish, amphibians, reptiles, and mammals; and overall increased complexity of the riverine ecosystems.
Thus, by creating new and more complex habitat in degraded systems, beaver dams (and their human-facilitated analogues) have the potential to help restoration practitioners achieve their objectives. Beavers have become our new/old partner in stream restoration.

Yet even though the potential benefits of restoring beaver populations on the landscape are numerous, so, too, is the potential for beaver/human conflicts. These conflicts can arise from an overlap of preferred habitats by both humans and beavers, misunderstandings of how beavers modify their habitats, and a lack of planning or use of adaptive management on restoration projects. Reviewing the information provided in this guidebook will help interested parties approach beaver-based restoration from a more informed perspective, so that they can manage expectations and increase success. For ideas for including beaver as a partner in restoration the USFWS's *The Beaver Restoration Guidebook* (www.fws.gov/oregonfwo/Documents/BRGv.2.0_6.30.17_forpublicationcomp.pdf).

303(d) parameters addressed by this prevention and control measure: Temperature, nutrients, sedimentation, bacteria, dissolved oxygen, aquatic weeds or algae.

CZARA management measures (in italics) and available management activities that promote the growth and establishment of riparian vegetation:

- *Exclude livestock from riparian areas that are susceptible to overgrazing and when there is no other practical way to protect the riparian area when grazing uplands,*
- *Provide stream crossings and hardened access areas for watering,*
- *Provide alternative drinking water locations,*
- *Locate salt and shade away from sensitive riparian locations,*
- *Fence, or where appropriate, herd livestock out of areas for as long as necessary to allow vegetation and streambanks to recover,*
- *Control the timing of grazing to: (1) keep livestock off streambanks where they are most vulnerable to damage, and (2) coincide with the physiological needs of target plant species,* (note: this is an intensive management practice and if not implemented correctly, can negatively impact riparian vegetation and water quality).

- Control or remove invasive species such as reed canary grass, blackberry, or knotweed,
- Plant native vegetation in riparian areas,
- Plant ground cover in areas with bare ground.

2.5.2 Nutrients and Manure Management

Issue
Application of nutrients can be a necessary and highly beneficial agricultural activity. Improper application of nutrients, however, can be expensive and harmful to water quality. For example, applying fertilizer, manure, bio-solids, seafood waste, or other forms of nutrients immediately before heavy rain events, without regular soil testing, or in excess can cause runoff or leaching of fertilizer product and contribute to undesirable algae growth, increased pH, and imbalances in dissolved oxygen levels.

Animal and human wastes are a potential source for many diseases (Terrell and Perfetti, 1989). The most commonly used indicator of biological pollution in a waterbody, the organism *Escherichia coli* (*E. coli*), is a member of a group of fecal coliform bacteria. These bacteria reside in the intestines of warm-blooded animals, including humans, livestock, and wild birds and mammals. The presence of *E. coli* alone does not confirm the contamination of waters by pathogens but it can indicate contamination by sewage or animal manure and the potential for health risks.

Sources of *E. coli* include leakage from failing septic systems, runoff of domestic animal manure from agricultural lands, yards, and other facilities, and runoff of manure from wild animals such as geese and elk. Numerous factors influence the nature and volume of bacteria that reach waterways. Some of these factors are climate, topography, soil types and infiltration rates, and animal species and animal health, as well as travel time from source to the waterbody. *E. coli* has a finite lifespan outside of its human or animal host. Factors that impact *E. coli* survival and persistence in open environments include moisture, exposure to sunlight, temperature, nutrient availability, and competing microbial communities. When bacteria reach a waterway, they may settle into sediments in a streambed and can survive there for an extended period of time. If sediments are disturbed by increased stream turbulence following a runoff event, human or animal traffic, or other means, sediment-bound bacteria may be re-suspended into the water column (Sherer et al 1992).

Livestock manure is a potential source of bacteria, nutrients, and vegetative material. If stored properly and applied to the land at agronomic rates, manure can be a beneficial source of nitrogen and phosphorus, as well as organic matter. Nothing in this prevention and control measure is intended to discourage the use of manure or other amendments; rather, it seeks to ensure that they are applied correctly.

This prevention and control measure does not prohibit grazing in riparian areas. As long as grazing is conducted at appropriate times of year, stocking rates, duration, and intensity, and in compliance with the riparian prevention and control measure, it should not violate this prevention and control measure. However, unlimited or concentrated livestock access to streams resulting in waste accumulations may lead to violations. In addition, winter-feeding areas should be managed to limit access and impacts to streams. Management practices, such as filter strips, should be used to minimize run-off.

Visual indicators that may determine if a landowner is responsible for a violation include the following: presence of livestock with unrestricted access to the stream, lack of ground cover

vegetation, location of heavy use areas in proximity to waters of the state, and manure deposits or piles in locations that are likely to flow into waters of the state.

Landowners with livestock should be aware that rules for CAFO might apply to their facilities if they confine animals for part of the year. Under state rules, these are operations that confine animals for more than 45 days per year and have a wastewater treatment facility. For more information, please contact the ODA or the CAFO website https://www.oregon.gov/ODA/programs/NaturalResources/Pages/CAFO.aspx.

303(d) parameters addressed by this measure: Nutrients, aquatic weeds or algae, chlorophyll a, dissolved oxygen, toxics, sediment, turbidity, and bacteria.

CZARA management measures (in italics) and available management activities that promote control of nutrients and bacteria:

- *Develop, implement, and periodically update a nutrient management plan to: (1) apply nutrients at rates necessary to achieve realistic crop yields, (2) improve the timing of nutrient application, and (3) use agronomic crop production technology to increase nutrient use efficiency. When the source of the nutrients is other than commercial fertilizer, determine the nutrient value and the rate of availability of the nutrients.* ***Determine and credit the nitrogen contribution of any legume crop. Soil and plant tissue testing should be used routinely.***
- *Nutrient management plans contain the following core components:*
    - *Farm and field maps showing acreage, crops, soils, and waterbodies.*
    - *Realistic yield expectations for crop(s) based primarily on the producer's actual yield history, state land grant university-yield expectations for the soil series, or NRCS Soils-5 information for the soil series.*
    - *A summary of the nutrient resources available to the producer, that at a minimum include:*
        - *Soil test results for pH, phosphorus, nitrogen, and potassium;*
        - *Nutrient analysis of manure, sludge, mortality compost (birds, pigs, etc.) or effluent (if applicable);*
        - *Nitrogen contribution to the soil from legumes grown in the rotation (if applicable); and*
        - *Other significant nutrient sources (e.g., irrigation water).*
    - *An evaluation of field limitations based on environmental hazards or concerns, such as:*
        - *Sinkholes, shallow soils over fractured bedrock, and soils with high leaching potential,*
        - *Lands near surface water,*
        - *Highly erodible soils, and*
        - *Shallow aquifers.*
    - *Use of the limiting nutrient concept to establish the mix of nutrient sources and requirements for the crop based on a realistic yield expectation.*
    - *Identification of timing and application methods for nutrients to: provide nutrients at rates necessary to achieve realistic crop yields; reduce losses to the environment; and avoid applications as much as possible to frozen soil and during periods of leaching or runoff.*
    - *Provisions for the proper calibration and operation of nutrient application equipment.*
- Apply nutrients and manure according to soil test results and OSU Extension recommendations,

- Store manure under and tarp or roof and on an impervious surface,
- Establish sacrifice or heavy use areas to reduce seasonal soil compaction and overgrazing,
- Harden animal walkways,
- Do not allow access to pastures when soils are saturated,
- Locate barns and sacrifice areas away from streams,
- Properly store and manage leachate from silage and other vegetative materials,
- Dispose of dead animals properly,
- Install gutters and downspouts in areas with high livestock use,
- Install/maintain diversions or French drains to prevent upslope drainage into barnyards and sacrifice areas.

2.5.3 Soil Erosion Prevention and Control

Issue
Erosion is a natural process, but agricultural activities can accelerate it or help to slow it down. Excessive erosion can result in fine sediment runoff to waters of the state, affecting stream channel substrate, stream width, stream sediment levels, and nutrient levels. Excess fine sediment can also negatively impact stream temperature and dissolved oxygen.

Proper erosion control from agricultural activities retains important soil resources on the farm and minimizes the opportunity for excess fine sediment to enter waterways.

In addition to the concern of erosion of fine sediments there is concern with contaminants associated with soil particles and run-off with the soil. Contaminants of concern include phosphorus, toxics, metals, and pesticides. Erosion control practices should also limit contaminant runoff.

This prevention and control measure addresses soil erosion from upland areas.

303(d) parameters addressed by this measure: Sedimentation, nutrients, aquatic weeds or algae, and dissolved oxygen.

CZARA management measures (in italics) and available management activities that promote control of fine sediment:

- *Apply the erosion component of a resource management system as defined in the Field Office Technical Guide of the U.S. Department of Agriculture, NRCS to minimize the delivery of sediment to surface waters.*
- *Design and install a combination of management and physical practices to settle the settleable solids and associated pollutants in runoff delivered from the contributing area for storms of up to and including a 10-year, 24-hour frequency.*
- Graze pasture plants to an appropriate height; leave a minimum of four-inches of pasture vegetation,
- Utilize rotational grazing to maintain pasture health,
- Provide off-stream water to livestock in each pasture,
- Install water bars to divert runoff to roadside ditches,
- Time road maintenance, ditch cleaning, and tillage practices to avoid runoff events. Consider installing organic or synthetic erosion barrier on projects that disturb soils,

- Plant or maintain appropriate vegetation along ditches; seed bare ditches following construction or maintenance,
- Maintain adequate vegetative riparian buffers to intercept erosion from upland activities,
- Plant cover crops in orchards or nurseries,
- In orchards where canopy closure or harvesting methods prevent planting cover crops, install waterbars or small ditches perpendicular to the slope to convey water off the orchard,
- Apply straw mulch in areas with steep slope or prone to erosion,
- Install underground outlets or grassed waterways in areas where gullies repeatedly appear.

2.5.4 Irrigation

Issue
Most irrigation in the Management Area occurs with sprinklers. Growers should be aware, however, that over-application of irrigation water could result in transport of nutrients, sediment, and/or manure to waters of the state.

303(d) parameters addressed by this measure

Sediment, nutrients, bacteria, chlorophyll a, aquatic weeds, or algae.

CZARA management measures (in italics) and management activities that prevent irrigation water runoff:

- *Operate the irrigation system so that the timing and amount of water match crop water needs. This will require, at a minimum: (a) the accurate measure of soil water depletion and the volume of irrigation applied, and (b) uniform application of water.*
- *When chemigation is used, include backflow preventers for wells, minimize the harmful amounts of chemigated waters from the field, and control deep percolation.*
- *In cases where chemigation is performed with furrow irrigation systems, a tailwater management system may be needed.*
- *In some locations, irrigation return flows are subject to other water rights or are required to maintain stream flow(s). In these special cases, on-site use could be precluded and would not be considered part of the management measures for such locations.*
- *In some locations, leaching is necessary to control salt in the soil profile. Leaching for salt control should be limited to the leaching requirement for the root zone.*
- *Where leakage from delivery systems or return flows support wetlands or wildlife refuges, it can be preferable to modify the system to achieve a high level of efficiency and then divert the "saved water" to the wetland or wildlife refuge. This will improve the quality of water delivered to wetlands or wildlife refuges by preventing the introduction of pollutants from irrigated lands to such diverted water.*
- *In some locations, sprinkler irrigation is used for frost or freeze protection, or for crop cooling. In these special cases, applications should be limited to the amount necessary for crop protection, and applied water should remain on site.*
- Maintain vegetative filter strips downslope from irrigated lands.
- Design and maintain irrigation diversion points and access roads to minimize erosion potential.
- Design and maintain permitted water storage projects for irrigation to mitigate erosion hazards.

2.5.5 Pesticides (including Herbicides)

Issue
If pesticides are not applied according to the product label, they can be transported to waters of the state. Oregon law requires that pesticides be applied according to the label. Additional State or Federal rules may restrict pesticide use patterns in the Management Area. Growers should closely time pesticide applications with favorable weather forecasts. Unfortunately, even when the label is followed and pesticides are applied legally there is still potential for run-off.

Growers should also be aware that a court decision mandated application buffers or "no spray zones" along riparian areas for certain pesticides while the effects of these pesticides to threatened and endangered fish species are evaluated.

For a current list of pesticides affected by the court order, maps of Oregon regions where the buffers apply, and to receive email updates relating to the decision, please visit the ODA Pesticide Division's website at https://www.oregon.gov/oda/programs/Pesticides/Pages/AboutPesticides.aspx.

Some pesticide applicators may be required to obtain a DEQ permit. For information regarding when a DEQ permit is necessary go to:
http://www.oregon.gov/deq/wq/wqpermits/Pages/Pesticide.aspx

Rules related to erosion and sediment control, and nurtrients and bacteria apply to to the potential for pesticides and toxics that could be transported into waters of the state.

303(d) parameters addressed by this measure:
Toxics

CZARA management measures (in italics) and management activities that prevent pesticide runoff:

- *Evaluate the pest problems, previous pest management practices, and cropping history.*
- *Evaluate the soil and physical characteristics of the site, including mixing, loading, and storage areas for potential of leaching or runoff of pesticides. If leaching or runoff is found, steps should be taken to prevent further contamination.*
- *Use integrated pest management (IPM) strategies that:*
    - *Apply pesticides only when an economic benefit to the producer will be achieved (i.e. application based on economic thresholds).*
    - *Apply pesticides efficiently and at times when runoff losses are unlikely.*
    - *When pesticide applications are necessary and a choice of registered materials exists, consider the persistence, toxicity, runoff potential, and leaching potential of products being used.*
    - *Periodically calibrate pesticide spray equipment.*
    - *Use anti-backflow devices on hoses used for filling tank mixtures.*
- Apply pesticides and herbicides according to the label. Use the correct rate and timing. Comply with label restrictions and precautions.
- Triple rinse pesticide application equipment. Apply rinsates to sites. Dispose of or recycle clean containers according to Oregon law.
- Calibrate, maintain, and correctly operate application equipment.
- Store and mix pesticides on leak proof facilities.
- Store surfactants and petroleum products in leak proof containers and facilities; cleanup petroleum products properly.

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 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

To implement and evaluate an outcome-based plan that will protect and improve water quality and promote the continued economic viability of all agricultural operations, large and small, in the Management Area; encourage voluntary conservation with education, outreach and technical assistance; identify and support incentives for good land stewardship; and encourage monitoring and evaluation of local water quality and watershed conditions.

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

In 2024, the LAC, SWCDs, and ODA set the following measureable objectives for this Management Area:

3.1.1.1 Measureable Objective #1

Complete a remote assessment by June 2026, to monitor for the following conditions:

- No significant bare areas due to livestock overgrazing within 50 feet of streams on pasturelands and/or rangelands.
- All active gullies have healed or do not exist on pasturelands.
- All livestock manure is stored under cover and in a location that minimizes risk to surface and groundwater.

3.1.1.2 Measureable Objective #2

Create a monitoring and sampling and analysis plan for monitoring for baseline amounts of total suspended solids (TSS) by June 2026, that covers the entire Management Area

The LAC recommends that ODA and partners perform remote evaluation of the Management Area for the above mentioned conditions, and that a monitoring plan for establishing a TSS baseline is developed. The LAC recommends that these be completed prior to the 2026 LAC meeting.

3.1.2 Focus Areas and Other Coordinated Efforts in Small Watersheds

3.1.2.1 Fiddle Creek and Maple Creek Focus Area

The Fiddle Creek and Maple Creek Focus Area is part of ODA's Focus Area strategic initiative.

The Fiddle Creek and Maple Creek watersheds were originally homesteaded in the late 1800s and both have a long history of agricultural production. Today, both watersheds are still some of the Siuslaw District's most active agricultural areas, consistently yielding cattle, hay, timber, as well as locally grown fruits and vegetables.

From 2013-15 the District performed a Streamside Vegetation Assessment (SVA) on all the agricultural lands along Fiddle Creek. Results showed that 41 percent of the Fiddle Creek watershed was rated as either "Bare Ag" or "Grass Ag," reinforcing an obvious need to restore native vegetation to riparian areas of the drainage basin.

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 Objectives and Associated Milestones:
Objectives associated with this Focus Area included maintaining tree cover acreage (96.71 acres) and increasing the native shrub coverage from 10.72 acres to 27.53 acres by the end of 2023 assessment. No new milestones have been set for the 2023-25 biennium assessment.

3.1.2.2 Siletz Basin Focus Area

The Siletz Bsin Focus Area is part of ODA's Focus Area strategic initiative.

In DEQ's 2018-20 integrated report of impaired waters, released in 2021, several streams in the Focus Area are listed as impaired (Category 5, Table 1C). Increased water temperature is the most common impairment in the watershed. However, *E.coli*, dissolved oxygen, turbidity, and biological criteria also threaten water quality and watershed health. General causes of impairments are changes in land use, lack of riparian vegetation, erosion, and non-point source pollution from agricultural practices and stormwater.

Lincoln SWCD chose the Siletz Basin as a focus area because of the need to improve water quality and the potential for partnerships. Partners are generally interested in restoration work to improve water quality because the Siletz River and Schooner Creek provide drinking water to

the communities of Lincoln City, Newport, Siletz, and Toledo. In addition, the Siletz River watershed provides critical habitat and spawning ground for the ESA listed Coho salmon, as well as coastal cutthroat trout, steelhead, Chinook salmon, chum salmon, rainbow trout, Pacific lamprey, and other aquatic species.

Currently, Natural Resource Conservation Service (NRCS), Oregon Department of Fish and Wildlife (ODFW), and the Mid Coast Watersheds Council (MCWC) are pursuing projects in this area. The Oregon Department of Environmental Quality (DEQ) and Oregon Health Authority (OHA) have both provided funding to Lincoln SWCD to improve water quality in the Siletz River watershed. In addition to the partner organizations, landowners have also expressed interested in collaborating on restoration work.

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 Objectives and Associated Milestones: No measurable objectives or milestones have been developed for this Focus Area for this biennium.

3.1.3 Strategic Implementation Areas (SIA)

Upper Yaquina River SIA (Initiated 2020)

The Yaquina River is an Oregon DEQ 303(d) listed waterbody currently identified as having dissolved oxygen, bacteria (fecal coliform and *E. coli*), and temperature-related impairments. An initial assessment of the SIA by ODA also identified several locations with a lack of riparian vegetation and bare ground, or locations of potential livestock access that may be impacting water quality. Watershed concerns associated with a lack of riparian vegetation include degraded wildlife and aquatic species habitat, excess sediment due to erosion, and increased water temperature through solar input and subsequently decreased levels of dissolved oxygen. DEQ's analysis estimated that the overall effective shade deficiency (shade gap) for the riparian zone within 100 feet of the Yaquina River is approximately 40 perecent in the SIA but is highly variable depending on location.

Additionally, this assessment identified agricultural properties in close proximity to the river as potential opportunities for improvement and reduction in pollutant loads. Potential concerns from agricultural land use practices in the SIA include increased water temperatures due to insufficient riparian vegetation, bacteria and nutrient loading caused by uncontained manure storage or in-stream watering of livestock, and total phosphorus associated with soil additives and agricultural runoff or direct deposition of manure into streams.

Industrial timber practices have also impacted the watershed as another potential source of sediment transport into the Yaquina and its tributaries, and by contributing to an increase in temperature due to a lack of proper riparian vegetation. Historic practices have disrupted the typical successional regimes, allowing opportunities for noxious weeds to establish. In addition, the lack of conifers in the riparian zone has disrupted the ability for the Yaquina to accumulate large woody debris that would slow the water, which can contribute to increased levels of

erosion and sediment, degrade habitat quality for juvenile salmon, and impair gravel bed availability for spawning adults.

Transportation infrastructure conditions also may contribute to water quality degradation in the Yaquina. Railroads and highways run directly adjacent to the Yaquina and Little Elk Creek for much of their length within these watersheds, limiting the ability to establish riparian vegetation and potentially contributing sediment and other chemical pollutants in runoff to adjacent waterways.

SIA Monitoring:
Significant monitoring is being done within this SIA. The Local Monitoring Team has supplemented DEQ data with additional monitoring sites patrolled by the SWCD. Goals of this monitoring plan include assessing storm event impacts on bacteria runoff.

ODA will be completing an overall Implementation Plan for the Upper Yaquina TMDL, which will include monitoring and measurable goals to achieve.

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. For more information see:
www.oregon.gov/oda/shared/Documents/Publications/NaturalResources/SIAProgressReport.pdf

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 June 29, 2025, all 4 tax lots identified as a Potential Violation or a Compliance Opportunity will be downgraded to Restoration Opportunity or Likely in Compliance.

Monitoring: Monitoring for this SIA has been developed in cooperation with ODA.

3.1.4 Pesticide Stewardship Partnerships (PSP)

There are no PSPs in this Management Area.

3.1.5 Groundwater Management Area (GWMA)

There is no GWMA in this Management Area.

3.2 Proposed Activities

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

Table 3.2 Planned Activities for 2024-2029 throughout the Management Area by Lincoln, Siuslaw, and Benton SWCDs, Watershed councils

Activity	6-year Target	Description
Landowner Engagement		
# events that actively engage landowners (workshops, demonstrations, tours)	20	Benton SWCD does not limit events to land owners in one Management area, so this number reflects workshops planned to be hosted by Lincoln SWCD in the next four years. Educational workshops include everything from farm management technical assistance to urban gardening and farming practices that protect water quality.
# landowners participating in active events	1,000	
Technical Assistance (TA)		
# landowners provided with TA (via phone/walk-in/email/booth/site visit)	400	
# site visits	200	
# conservation plans written*	8	
On-the-ground Project Funding		
# funding applications submitted	8	
* 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

The following water quality monitoring occurs in this Management Area: DEQ monitoring and partner SIA monitoring for temperature.

3.3.1.1 DEQ Monitoring

DEQ monitors water quality in the Management Area as part of its ambient monitoring network.

3.3.1.2 Temperature Monitoring

The Lincoln and Siuslaw SWCDs are participating in a state-wide, long-term project spearheaded by ODA to determine whether reduced summer stream temperatures can be documented as a result of streamside vegetation enhancement on agricultural lands. Monitoring started in 2017 and will continue for 20 years. Data are collected on stream temperature, air temperature, stream flows, and streamside vegetation. The Lincoln SWCD selected Yachats Creek because of the temperature TMDL; it is monitoring three sites. Siuslaw SWCD selected Fiddle Creek and Maple Creek because they are the largest tributaries systems in the Siltcoos Lake watershed; it is monitoring 16 sites. Stream temperature data are provided to DEQ annually and are incorporated in its Status and Trends Report. ODA will write the final report.

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 four years (2020-2023). See Chapter 3.1 for background and assessment methods.

4.1.1 Management Area

Table 4.1.1 Management Area

Measurable Objective #1
Complete a remote assessment by June 2026, to monitor for the following conditions: • No significant bare areas due to livestock overgrazing within 50 feet of streams on pasturelands and/or rangelands. • All active gullies have healed or do not exist on pasturelands. All livestock manure is stored under cover and in a location that minimizes risk to surface and groundwater
Current Conditions
This measureable objective was set in 2024, so no progress has been made.

Measurable Objective #2
Create a monitoring and sampling and analysis plan for monitoring for baseline amounts of total suspended solids (TSS) by June 2026, that covers the entire Management Area.
Current Conditions
This measureable objective was set in 2024, so no progress has been made.

4.1.2 Focus Areas and Other Focused Efforts in Small Watersheds

Table 4.1.2.1 Fiddle Creek and Maple Creek Focus Area

Measurable Objective
Fiddle: By 2025, combined tree plus native shrub equals 124.4 acres (60 percent). Maple: By 2025, combined tree plus native shrub equals 107.64 acres (40 percent).
Milestones
Fiddle • Need to plant 16.81 riparian acres of trees plus native shrubs in order to achieve long term measurable objective. Maple • Need to plant 10.5 riparian acres of nrees plus native shrubs in order to achieve long term measurable objective.
Current Conditions
Progress Toward Measurable Objectives and Milestones Fiddle: • Tree = 96.71 acres (46.7%)

• Native shrub = 13.23 acres (6.39%) • Combined tree + native shrub= 109.94 acres (53.09%) Maple: • Tree = 81.14 acres (30.15%) • Native shrub = 16.00 acres (5.95%) Combined tree + native shrub = 97.14 acres (6.10 %)

Activities and Accomplishments	
Community and Landowner Engagement	
# active events that target landowners/ operators	0
# landowners/operators participating in active events	0
Technical Assistance (TA)	
# landowners/operators provided with TA	37
# site visits	34
# conservation plans written	0
Ag Water Quality Practices Implemented in the Focus Area	
Riparian Release	~18.98 acres
Stream Habitat Improvement	~.5 acres
Site Preparation	~5 acres
Fence Construction	~5,400 feet
Riparian Forest Buffer	~5 acres

Fiddle Creek Assessment

	2019 Acres	2023 Acres	Difference	Notes
Ag Infrastructure	3.15	3.11	-0.04	
Bare-Ag	2.61	2.6	-0.01	
Grass-Ag	78.64	73.85	-4.79	Decrease 6%
Not Ag	4.53	4.53	0	
Shrub-Ag	0.13	0.13	0	
Shrub-Invasive	8.65	8.39	-0.26	Decrease 3%
Shrub-Native	9.59	13.23	3.64	Increase 38%
Tree	97.45	96.71	-0.74	Decrease 1%
Tree-Ag	0.48	0.48	0	
Water	8.58	8.58	0	
Total Acres	213.81	211.61		

Table 4.1.2.2 Siletz River Focus Area

Measurable Objective
By 2027, increase tree/shrub 50 acres or 2.5 percent.
Milestones
By 2023, increase tree/shrub 15 acres or 0.76 percent.
Current Conditions
Progress Toward Measurable Objectives and Milestones 19.48 + 7.12 = 526.6 acres

26.7%	
Activities and Accomplishments	
Community and Landowner Engagement	
# active events that target landowners/ operators	4
# landowners/operators participating in active events	32
Technical Assistance (TA)	
# landowners/operators provided with TA	25
# site visits	14
# conservation plans written	0
Ag Water Quality Practices Implemented in the Focus Area	
Tree/Shrub Establishment	24.1 acres
Tree/shrub site preparation	4.5 acres

4.1.3 Strategic Implementation Areas

Table 4.1.3 2020 Upper Yaquina River SIA

Evaluation Results		
As of June 29, 2021, 4 tax lots were identified as either a Potential Violation or a Compliance Opportunity. PV = 0, CO = 4, RO = 56, LC = 89		
Measurable Objective		
As of June 29, 2025, all 4 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		
Activity	**Accomplishment**	**Description**
ODA		
# acres evaluated	37,889	
# stream miles evaluated	160	
# landowners at Open House	20	
# landowners receiving outreach materials	99	
SWCD and Conservation Partners		
# landowners provided with technical assistance	20	
# site visits	8	
# conservation plans written	0	
SIA and Project Funding		
# funding applications submitted	2	$125,000 OWEB Grant for TA and monitoring
# funding applications awarded	0	

4.1.4 Pesticide Stewardship Partnerships

There are no PSPs in this Management Area.

4.1.5 Groundwater Management Area

There is no GWMA in this Management Area.

4.2 Activities and Accomplishments

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

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

Table 4.2a Activities conducted in 2020-2023 throughout the Mid Coast Management Area by Benton, Lincoln, and Siuslaw SWCDs

Activity	4-year results	Description
Landowner Engagement		
# events that actively engage landowners (workshops, demonstrations, tours)	2	
# landowners participating in active events	9	
Technical Assistance (TA)		
# landowners provided with TA (via phone/walk-in/email/booth/site visit)*	224	
# site visits	198	
# conservation plans written**	0	
On-the-ground Project Funding		
# funding applications submitted	6	
# funding applications awarded	0	

* 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 1997-2020 (OWRI data include most, but not all projects, implemented in the Management Area.)

Landowners	OWEB	ODFW	NRCS*	Counties	ODOT	All other sources**
$712,097	$9,433,466	$731,440	$455,796	$1,060,645	$1,029,311	$13,801,539
TOTAL						
						$27,224,294

* This table may not include all NRCS funding due to privacy concerns.
**Includes city, county, tribal, other state and federal programs, and non-profit organizations. There were too many entities to list.

Table 4.2c Miles and acres treated on agricultural lands reported 1997-2020 (OWRI data include most, but not all projects, implemented in the Management Area.)

Activity Type*	Miles	Acres	Count**	Activity Description
Upland		153		
Road	97		1,168	
Streamside Vegetation	298	1,845		
Wetland		369		
Instream Habitat	275			
Instream Flow	50		0 cfs	
Fish Passage	265		257	
TOTAL	**985**	**2,367**		

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

4.3 Additional Agricultural Water Quality and Land Condition Monitoring

4.3.1 Water Quality

DEQ analyzed data for dissolved oxygen, *E. coli*, pH, total phosphorus, temperature, and total suspended solids in the Management Area. (DEQ. 2020 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 in the Management Area (Table 4.3.1), although all of these locations are lower in watersheds with forested headwaters. All are DEQ ambient monitoring sites.

Table 4.3.1 Attainment of water quality standards for 2016-2019, and 2000-2019 trends

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]
Siletz River at Logsden Bridge 11246-ORDEQ	-	-	No	↓-	0.005; 0.005	0.5; 0.5
Siuslaw River below confluence of N S Forks 38329-ORDEQ	No	-	Yes	-	0.03; 0.03	0.5; 0.75
Yaquina River at Hwy 180 (34454-ORDEQ)	-	-	-	No	0.03; 0.11	0.5; 22
Alsea River at Thissell Rd 11263-ORDEQ	Yes	Yes	Yes↑	-	0.02; 0.07	2; 57

[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
↓ Statistically significant, though barely discernable, degrading trend

General status and trends review suggests significant issues with water temperature issues and and E. coli in isolated locations. Temperature is primarily a result of solar radiation reaching the water surface on streams resulting from inadequate site potential shade. The Status and Trends

Report does report temperature data from multiple sites in the forests throughout the Management Area that show nonattainment of temperature standards upstream of agricultural lands.

There are significant E. coli concerns in the Salmon River, Yaquina River, Drift Creek and lower Suislaw River. Water quality modeling in the Upper Yaquina watershed indicates that temperature and phosphorus are the primary factors influencing DO conditions. Each of these factors has anthropogenic sources; temperature is primarily a result of solar radiation reaching the water surface on streams resulting from inadequate site potential shade, and phosphorus loads are often related to nutrient management or rural onsite septic disposal systems.

There are many additional monitoring locations in this Management Area for which data are available but inadequate for DEQ status and trends assessment. It would be helpful to have a comprehensive evaluation of all data, including those not provided to DEQ, and develop and implement a monitoring plan for determining agricultural water quality and identifying issues throughout the Management Area.

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 6, 2024, 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
• Siuslaw SWCD and Lincoln SWCD provided updates on restoration, monitoring, and engagement within their respective districts • Bear Creek has proven to be an opportunity area for Siuslaw SWCD, with many landowners willing to work with the district. • Fiddle Creek landowners have been very open to voluntary monitoring with Siuslaw SWCD because it is essential salmonid habitat • Increased restored acres of agricultural lands in this Management Area by 15 percent in the past 10 years.
Impediments
• It has been extremely challenging to recruit new LAC members in this area. • Maple Creek residents are less open to Focus Area monitoring than Fiddle Creek; lack of district capacity is partially contributing to this hesitancy. Staff longevity can create challenges working with landowners; building trust takes time. • There are not many landowners in either watersheds in the Focus Area, one unwilling landowner can comprise a large portion of the watershed, limiting the area in which we can do conservation and restoration work. • Railway system bisects aquatic habitat, causing challenges to large scale and meaningful restoration projects being possible in the area
Recommended Modifications and Adaptive Management
• In response to the request for help recruiting LAC members for the five vacant spaces, the LAC noted a strong preference for recruiting local landowners and agricultural producers. Members cautioned against losing the local focus of the LAC by having too many organizations/agencies on the LAC. LAC recommends filling remaining five vacant spots with local landowners and agricultural producers to best reflect the desires and challenges of the region.

• Lincoln SWCD noted the importance of pesticide safety and water quality education for the general public.
• SIA projects are not competitive for funding from OWEB. Funding sources for smaller projects are needed.
• SWCD staff capacity is paramount to foster relationships with landowners and encourage voluntary practices:
    a. Increasing funding for Scope of Work funds.
    b. Willing landowners are key to moving projects forward. District staff capacity could help with landowner relations.
• Programs providing funding for landowners to restore streamsides should maintain stream channel maps from original application so that when landowners renew a grant or fund, the standards are not changing on them as the stream naturally moves.
• ODA Monitoring Specialist noted the upcoming TMDL implementation plan for the Yaquina. Next Area Plan review and LAC meeting will review TMDL implementation plan and incorporate it into the Area Plan.
• Pre-Covid, landowners were actively solicited to submit stories about what restoration they are doing and this happening less now. LAC recognized the importance of getting landowners and producers to share personal success stories for positive outreach and potential testimony for statewide policy. Suggest writing/sharing positive news articles on landowner success stories in local newspapers and district newsletters.

Table 4.4b Number of ODA compliance activities in 2020-2023

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	3	4	5	2	1	2	0	0
Within SIA	0	0	0	0	0	0	0	0

Appendix A: Pollution Prevention and Control Program for Oregon's Coastal Waters — Coastal Zone Act Reauthorization Amendments of 1990 Management Practices

Developed to meet the requirements of Section 6217(g) of the Coastal Zone Act Reauthorization Amendments of 1990.

This state program was developed to meet the requirements of Section 6217(g) of the Coastal Zone Act Reauthorization Amendments (CZARA) of 1990. It was submitted to the federal government by the DEQ and the Oregon Department of Land Conservation and Development.

The US EPA explains the history and reasoning for the CZARA in part as follows:

On November 5, 1990, Congress enacted the CZARA of 1990. These Amendments were intended to address several concerns, a major one of which is the impact of nonpoint source pollution on coastal waters.

Nonpoint source pollution is increasingly recognized as a significant factor in coastal water degradation. In urban areas, storm water and combined sewer overflow are linked to major coastal problems, and in rural areas, runoff from agricultural activities may add to coastal pollution.

To address more specifically the impacts of nonpoint source pollution on coastal water quality, Congress enacted section 6217, “Protecting Coastal Waters,” which was codified as 16 U.S.C. -1455b. This section provides that each state with an approved coastal zone management program must develop and submit to EPA and the National Oceanic and Atmospheric Administration for approval a Coastal Nonpoint Pollution Control Program. The purpose of the program “shall be to develop and implement management measures for nonpoint source pollution to restore and protect coastal waters, working in close conjunction with other state and local authorities."

Under “A Pollution Prevention and Control Program for Oregon’s Coastal Waters,” to meet the requirements of the CZARA of 1990 6217(g), the following management measures for agriculture were developed, based upon the original measures provided in the US EPA's "Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters.”

MANAGEMENT MEASURES FOR AGRICULTURE

1. Erosion and Sediment Control Management Measure

Apply the erosion component of a Conservation Management System (CMS) as defined in the Field Office Technical Guide of the USDA NRCS to minimize the delivery of sediment from agricultural lands to surface waters; or

Design and install a combination of management and physical practices to settle the settleable solids and associated pollutants in runoff delivered from the contributing area for storms of up to and including a 10-year, 24-hour frequency.

2. Facility Wastewater and Runoff from Confined Animal Facility Management

Guidance Management Measure (Large Units)

Limit the discharge from the confined animal facility to surface waters by:

1. Storing both the facility wastewater and the runoff from confined animal facilities that is caused by storms up to and including a 25-year, 24-hour frequency storm. Storage structures should:
    a. Have an earthen lining or plastic membrane lining, or
    b. Be constructed with concrete, or
    c. Be a storage tank; and,

2. Managing stored runoff and accumulated solids from the facility through an appropriate waste utilization system.

Guidance Management Measure (Small Units):

Design and implement systems that collect solids, reduce contaminant concentrations, and reduce runoff to minimize the discharge of contaminants in both facility wastewater and in runoff that is caused by storms up to and including a 25-year, 24-hour frequency storm. Implement these systems to substantially reduce significant increases in pollutant loadings to ground water. Manage stored runoff and accumulated solids from the facility through an appropriate waste utilization system.

3. Nutrient Management Measure

Develop, implement, and periodically update a nutrient management plan to: (1) apply nutrients at rates necessary to achieve realistic crop yields, (2) improve the timing of nutrient application, and (3) use agronomic crop production technology to increase nutrient use efficiency. When the source of the nutrients is other than commercial fertilizer, determine the nutrient value and the rate of availability of the nutrients. Determine and credit the nitrogen contribution of any legume crop. Soil and plant tissue testing should be used routinely. Nutrient management plans contain the following core components:

A. Farm and field maps showing acreage, crops, soils, and waterbodies.
B. Realistic yield expectations for the crop(s) to be grown based primarily on the producer's actual yield history, State Land Grant University yield expectations for the soil series, or NRCS Soils-5 information for the soil series.
C. A summary of the nutrient resources available to the producer, which at a minimum include:
    1. Soil test results for pH, phosphorus, nitrogen, and potassium;
    2. Nutrient analysis of manure, sludge, mortality compost (birds, pigs, etc.), or effluent (if applicable);
    3. Nitrogen contribution to the soil from legumes grown in the rotation (if applicable); and
    4. Other significant nutrient sources (e.g., irrigation water).
D. An evaluation of field limitations based on environmental hazards or concerns, such as:
    1. Sinkholes, shallow soils over fractured bedrock, and soils with high leaching potential,
    2. Lands near surface water,
    3. Highly erodible soils, and
    4. Shallow aquifers.
E. Use of the limiting nutrient concept to establish the mix of nutrient sources and requirements for the crop based on a realistic yield expectation.

F. Identification of timing and application methods for nutrients to provide nutrients at rates necessary to achieve realistic crop yields; reduce losses to the environment; and avoid applications as much as possible to frozen soil and during periods of leaching or runoff.
G. Provisions for the proper calibration and operation of nutrient application equipment.

4. Pesticide Management

To reduce contamination of surface water and ground water from pesticides:

A. Evaluate the pest problems, previous pest control measures, and cropping history;
B. Evaluate the soil and physical characteristics of the site including mixing, loading, and storage areas for potential leaching or runoff of pesticides. If leaching or runoff is found to occur, steps should be taken to prevent further contamination;
C. Use integrated pest management strategies that:
    1. Apply pesticides only when an economic benefit to the producer will be achieved (i.e., applications based on economic thresholds); and
    2. Apply pesticides efficiently and at times when runoff losses are unlikely;
    3. When pesticide applications are necessary and a choice of registered materials exists, consider the persistence, toxicity, runoff potential, and leaching potential of products when making a selection;
    4. Periodically calibrate pesticide spray equipment; and
    5. Use anti-backflow devices on hoses used for filling tank mixtures.

5. Grazing Management

I. Riparian Areas: Implement one or more of the following as necessary to protect water quality, streambanks, stream channels, wetlands, estuaries, ponds, lakeshores, and riparian soils and vegetation:
    (A) For privately owned lands, implement (1) or (2) below:
        (1) Implement one or more of the following:
            a) Provide stream crossings or hardened watering access for drinking;
            b) Provide alternative drinking water locations away from the stream channel and sensitive areas;
            c) Locate salt and additional shade, if needed, away from sensitive areas;
            d) Use improved grazing management techniques including the application of scientifically sound grazing systems. The following are some examples of such techniques:
                1. Include riparian areas in separate pastures and manage them under separate objectives and strategies, including periodic rest.
                2. Fence or, where appropriate, herd livestock out of riparian areas for as long as necessary to avoid negative impacts to streambanks.
                3. Control the timing of grazing in riparian areas to (1) protect streambanks when they are most vulnerable to damage; and (2) coincide with the physiological needs of key plant species.
                4. Add rest, as needed, to the grazing cycle to increase plant vigor and encourage more desirable plant species composition.
                5. Limit grazing intensity, frequency, and duration to a level that will maintain desired plant species composition and vigor.
                6. Manage livestock away from riparian areas that are at high risk or with poor recovery potential.
            e) Exclude livestock from sensitive areas.
        (2) Implement a Conservation Management System (CMS) as defined in the Field Office Technical Guide of the USDA Natural Resource Conservation Service (NRCS) by applying the progressive planning approach of the USDA NRCS.

(B) For publicly owned or managed lands, maintain rangelands, pasturelands, and other grazing lands in accordance with plans established by the responsible agency such as the USDI Bureau of Land Management, the USDA Forest Service.

II. Uplands: To protect water quality from grazing impacts on upland areas that are not protected under (I),
(A) For privately owned lands, implement (1) or (2) below:
(1) Implement one or more of the following:
a) Locate livestock watering facilities away from sensitive areas such as springs and seeps;
b) Locate salt and additional shade, if needed, away from sensitive areas;
c) Use improved grazing management techniques including the application of scientifically sound grazing systems. The following are some examples of such techniques:
1. Control the timing of grazing to (1) protect soils and vegetation when they are most vulnerable to damage; and (2) coincide with the physiological needs of key plant species.
2. Add rest to the grazing cycle to increase plant vigor or encourage more desirable plant species composition.
3. Limit grazing intensity, frequency, and duration to a level that will maintain desired plant species composition and vigor.
(2) Implement a CMS as defined in the Field Office Technical Guide of the USDA NRCS by applying the progressive planning approach of the USDA NRCS.
(B) For publicly owned or managed lands, maintain rangelands, pasturelands, and other grazing lands in accordance with plans established by the responsible agency such as the USDI Bureau of Land Management, the USDA Forest Service.

6. Irrigation Water Management

To reduce nonpoint source pollution of surface waters caused by irrigation:

A. Operate the irrigation system so that the timing and amount of irrigation water applied matches crop water needs. This will require, as a minimum: (a) the accurate measurement of soil-water depletion volume and the volume of irrigation water applied, and (b) uniform application of water.
B. When chemigation is used, include backflow preventers for wells, minimize the harmful amounts of chemigated waters that discharge from the edge of the field, and control deep percolation. In cases where chemigation is performed with furrow irrigation systems, a tailwater management system may be needed.

The following limitations and special conditions apply:

A. In some locations, irrigation return flows are subject to other water rights or are required to maintain stream flow. In these special cases, on-site reuse could be precluded and would not be considered part of the management measure for such locations.
B. By increasing the water use efficiency, the discharge volume from the system will usually be reduced. While the total pollutant load may be reduced somewhat, there is the potential for an increase in the concentration of pollutants in the discharge. In these special cases, where living resources or human health may be adversely affected and where other management measures (nutrients and pesticides) do not reduce concentrations in the discharge, increasing water use efficiency would not be considered part of the management measure.

C. In some irrigation districts, the time interval between the order for and the delivery of irrigation water to the farm may limit the irrigator's ability to achieve the maximum on-farm application efficiencies that are otherwise possible.
D. In some locations, leaching is necessary to control salt in the soil profile. Leaching for salt control should be limited to the leaching requirement for the root zone.
E. Where leakage from delivery systems or return flows supports wetlands or wildlife refuges, it may be preferable to modify the system to achieve a high level of efficiency and then divert the "saved water" to the wetland or wildlife refuge. This will improve the quality of water delivered to wetlands or wildlife refuges by preventing the introduction of pollutants from irrigated lands to such diverted water.
F. In some locations, sprinkler irrigation is used for frost or freeze protection, or for crop cooling. In these special cases, applications should be limited to the amount necessary for crop protection and applied water should remain on-site.