OREGON DEPARTMENT OF AGRICULTURE

Curry County Agricultural Water Quality Management Area Plan

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Developed by the

Oregon Department of Agriculture

and the

Curry County 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 603-095-3540). 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

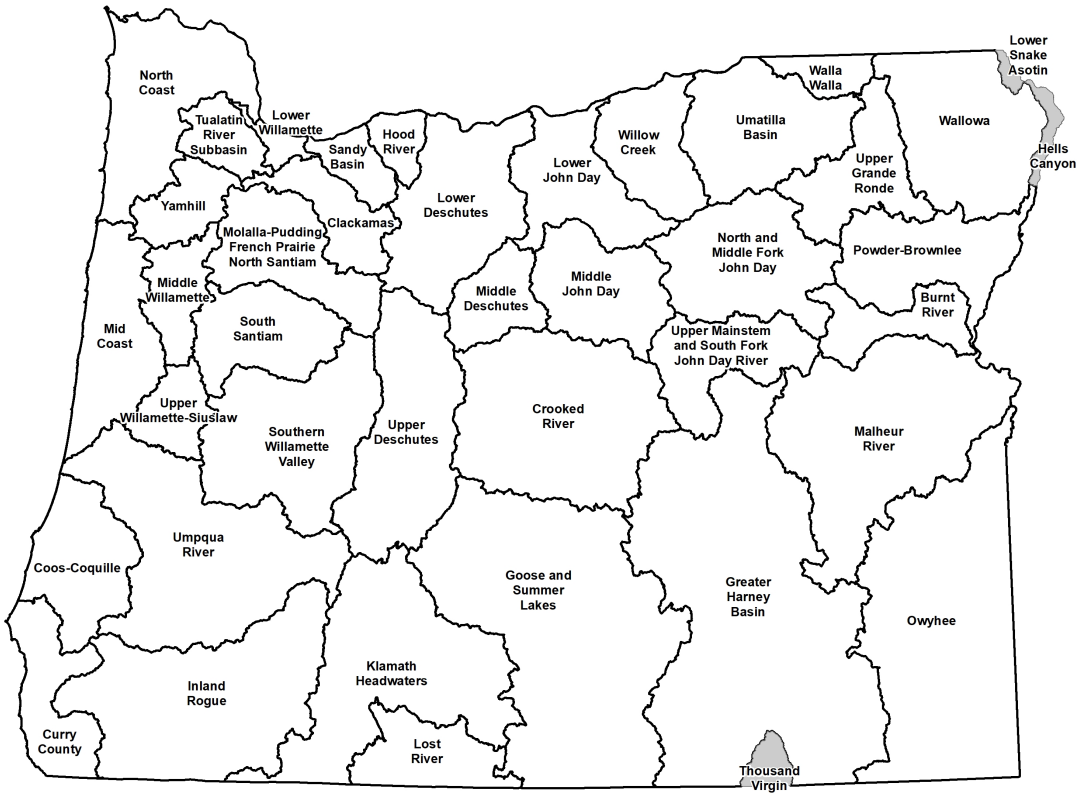
In 1993, the Oregon Legislature passed the Agricultural Water Quality Management Act directing ODA to develop plans to prevent and control water pollution from agricultural activities and soil erosion and achieve water quality standards and to adopt rules as necessary (ORS 568.900 through ORS 568.933).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

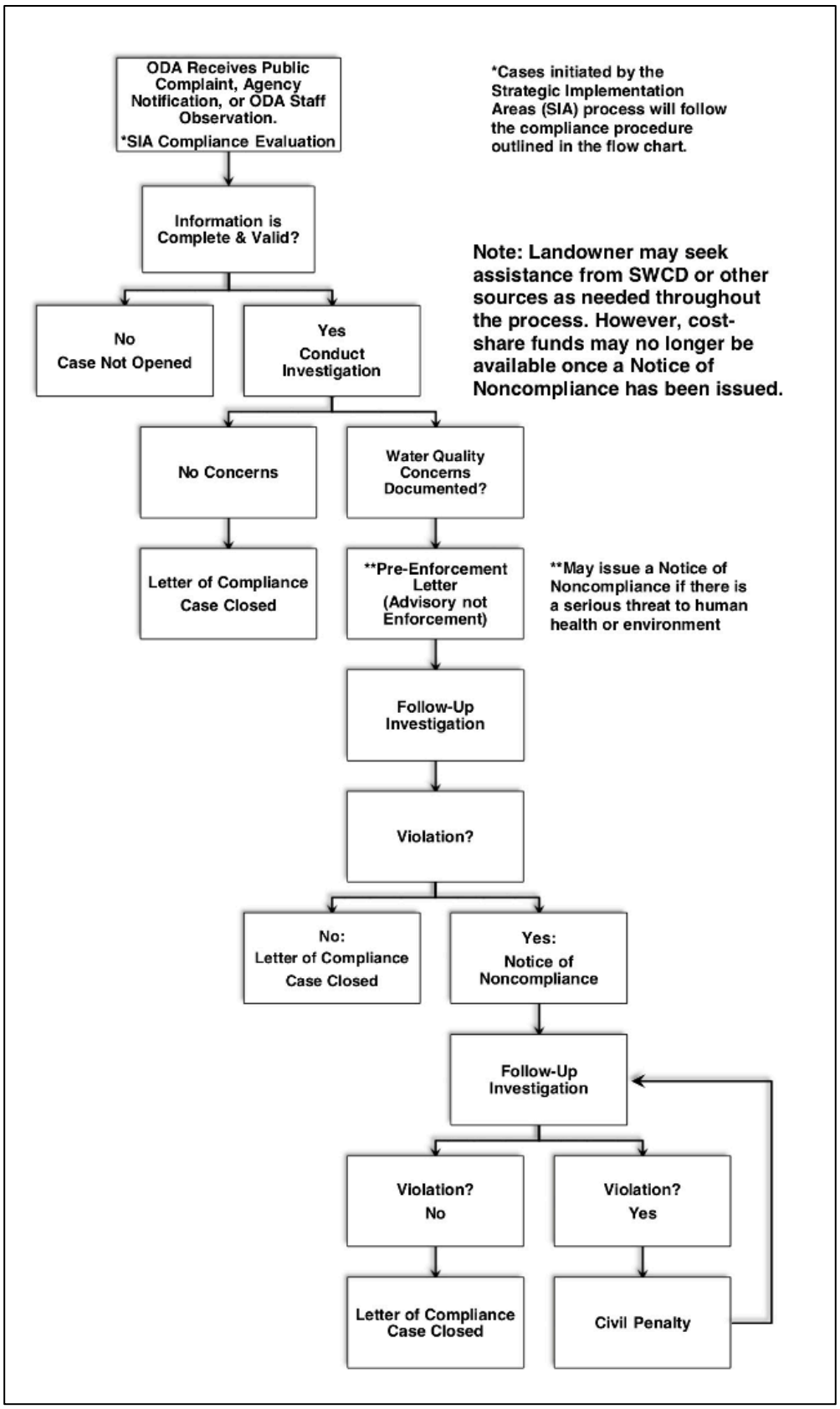
1.3.1.1 ODA Compliance Process

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 http://www.nrcs.usda.gov/conservation-basics/natural-resource-concerns/soil.

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.

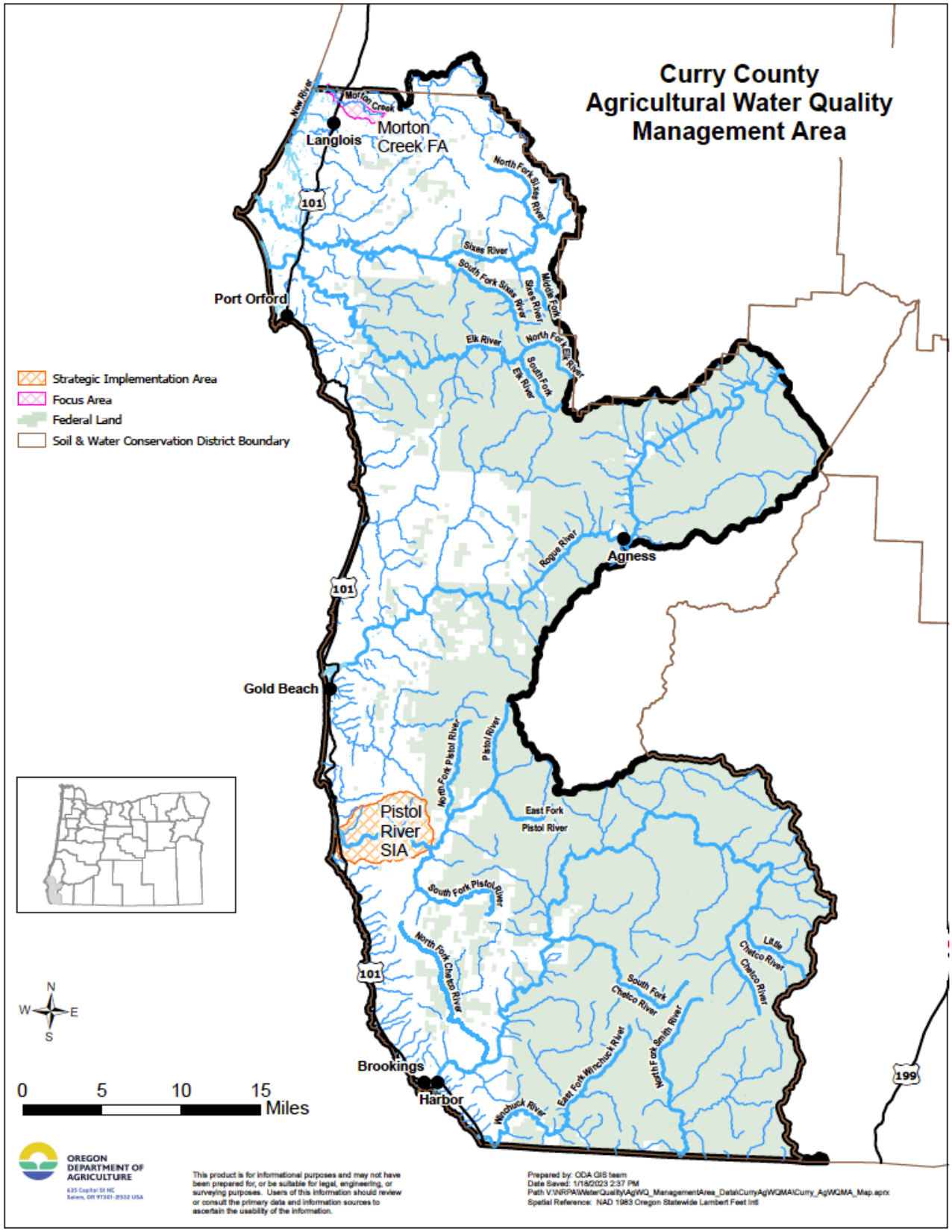
Water quality monitoring efforts in this Management Area are described in Chapter 3, and the data are summarized in Chapter 4.

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 Curry County Area Plan boundaries include the California border to the south, Josephine County boundary to the east, the Pacific Ocean on the west, and the southern watershed boundaries of the Coos and Coquille Management Area on the north. The northern boundary of the Curry County Plan includes parts of the county line but includes all of the Morton Creek and none of the Two Mile Creek and Four Mile Creek drainages.

Figure 2 Curry County 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
Jim Kamph	Langlois	Cattle
Robert McKenzie	Sixes	Cranberries
Joe Pestana	Sixes	Cattle, cranberries
Lee Riddle	Brookings	Lily bulbs
Mary Wahl	Elk River	Sheep
Shirley (Tooz) Wahl	Elk River	Sheep
Lynne Dewald	Winchuck River	Cattle
Steve Mazur	Curry County	Fisheries
Becky Crockett	Brookings	Agriculture
Michael Roberts	Pistol River	Cattle, sheep, goats
Vacant		
Vacant		

Previous LAC members:

Walt Schroeder, former chair	George Fleming
Knute Andersson	Frank Burris
Earl Lang	Mike Knapp
Jim Donaldson	Rick McKenzie
Bruce Follansbee	Angie Dillingham
Norm Yock	Joe Brown
Ted Fitzgerald	Harry Harms

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 LMA for this Management Area is Curry SWCD. This SWCD was also involved in development of the Area Plan and Area Rules.

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

2.2 Area Plan and Area Rules: Development and History

The director of ODA approved the initial Area Plan and Area Rules in 2004.

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 Agriculture, Fisheries, Watershed as an Ecosystem, Climate, Physical Settings of Curry County Watersheds

Agriculture

The first evidence of agriculture in Curry County was in 1851 when Captain William Tichenor, the founder of Port Orford, brought six horses and some swine and established a settlement at that place. The livestock and associated crops, as well as gardens to provide vegetables for the increasing number of settlers, increased rapidly.

The rich virgin soils in Curry County, year-round grazing, and mild climate were ideal for raising livestock and some crops. By 1880, the assessment roles showed 22,000 sheep and close to 4,000 cattle grazing the lush mountain prairies and river bottomlands. Close to 800 hogs ranged through the forests and mountain prairies feeding on roots and mast (Tanoak acorns and Myrtle nuts). Lightning fires had burned much of the area. Some had been burned by the Native Americans to provide habitat for deer and elk. These open mountain prairies were ideal for raising sheep and cattle.

The river bottom lands and associated hill-grazing lands made dairy farming the number one farm enterprise in the county. Cheese factories in almost every community manufactured cheese and butter to ship to San Francisco and other markets. A nationally famous Blue Cheese factory was located in Langlois until it was destroyed by fire in 1957. Close to 400 dairy herds were existing in the county in 1938, though at that time, many were small herds that could be hand milked by the farmer and his children. Now there are no dairy herds in the entire county.

The early sheep were raised primarily for their wool. Curry wool was prized for its consistent growth and long fiber. In the 1930s, Curry listed 25,000 head of mature sheep. But soon, with cross breeding and better management, the market lamb industry provided additional income to sheep producers. In recent years, predators and low prices for lamb and wool have closed down many sheep operations. Several sheep operations are now devoted only to cattle.

During World War II, the Easter lily enterprise greatly expanded when bulbs were no longer available from Japan. Hundreds of farmers and gardeners got into the lily business. The industry started in the Bandon area but over the years it centered on the rich deep soils and climate of the Harbor Bench and nearby Smith River delta in northern California. Due to various factors, Easter lily farming has significantly declined over the past two decades. As of 2023, there is one farm producing Easter lilies in Curry County.

Cranberries were introduced to the south coast in 1885 at Hauser in Coos County and expanded to south Coos County in the Bandon area. Soon, the most rapid cranberry acreage being developed was in north Curry County. In 1996, Curry County accounted for 25 percent of the production in Oregon. Cranberry production uses water for frost protection, irrigation, weed and pest control, temperature control, and for harvest. The preferred harvest method is to flood the beds and beat the vines to separate the berries from the vines. The berries float and are corralled for loading onto trucks. Dry harvest is also used but it is not a preferred method. Cranberry growers possess water rights to apply water and most have constructed reservoirs to hold surplus winter rainfall. A majority of growers recycle water through a series of beds at slightly different elevations, reducing the use of water from springs and creeks.

The cranberry industry continues to experience low prices paid for its crop. Cranberry growers are adapting by diversifying in multiple ways. These economic concerns are in addition to the fluctuating yields resulting from weather and other factors.

Several other crops are grown on the rich soils of the county including hydrangeas, rhododendrons and blueberries. The largest hydrangea farm in the world is located on the Harbor Bench in Southern Curry County.

The agricultural history of northern Curry County is unique. Small streams in the lower portion of the watersheds were channelized and straightened from the mid 1920s through the 1950s. This work was done through various federal programs (such as Swampbuster) and by private landowners. The reason for stream alteration was to capitalize on the rich bottomlands that supported the many large dairies and livestock operations in North Curry. The affected streams include Langlois Creek, Morton Creek, Bethel Creek, Croft Lake outlet, New Lake outlet (Bono Ditch), and portions of Willow Creek. The lower portions of these streams function as agriculture drains. Historically, they have been cleaned and maintained as needed by the individual landowners.

Commercial licensing of recreational marijuana production became legal in 2016. Hemp production became legal nationwide in 2018. Since that time there has been an increase in the number of cannabis operations in Curry County. The state and ODA consider legal cannabis production to be an agricultural activity. Illegal cannabis operations are under the jurisdiction of law enforcement. Cannabis operations are required to be in compliance with the Inland Rogue Agricultural Water Quality Rules. Water quality concerns related to cannabis operations in Curry County include illegal damming of streams for irrigation water, improper storage and disposal of fertilizers and pesticides, removal of riparian vegetation, sedimentation in waterways from land clearing, and road building.

Approximately two-thirds of the Curry County is publicly owned by the following: U.S. Forest Service (USFS), Bureau of Land Management (BLM), state of Oregon, and Curry County. With limited privately owned land in the county, pressure from development is causing concern as homes and other structures are infringing on farmland.

Fisheries and Wildlife

The Oregon Department of Fish and Wildlife (ODFW) has led the effort to develop fisheries recovery or conservation plans and the Oregon Conservation Strategy in all the watersheds in the Management Area. The conservation and recovery plans can be found at https://www.dfw.state.or.us/fish/CRP/conservation_recovery_plans.asp and describe limiting factors, population health, climate change impacts, and research and monitoring needs. The Oregon Conservation Strategy can be found at https://www.oregonconservationstrategy.org. Local watershed councils, the Curry Soil and Water Conservation District (SWCD), and ODFW Salmon Trout Enhancement Program are working to enhance most of these streams and address impacts created by past land use practices. Local agricultural producers have worked with these groups to enhance riparian and upland areas and proactively improve watershed health.

Changes in some native salmonid populations have occurred in Curry County. Limiting factors influencing the changes can be found in the conservation plans and vary between species and river systems.

Salmonids adapted in ecosystems that historically had a high degree of stream complexity including large woody debris, floodplains, good spawning gravel reserves, estuaries and wetland refugia, meandering stream courses, and in some cases lake systems in the watershed. Human activities had altered some of this traditional salmonid freshwater habitat.

Long-term patterns in climate (e.g., extended drought or wet cycles) and ocean productivity can have discernible effects on the productivity of anadromous salmonid populations. Because these aspects of the environment are largely beyond the control of management activities, the condition of freshwater habitats can become critically important. Agricultural operators' actions can have important impacts on these freshwater habitats and these actions will be discussed in detail in this plan.

The Watershed as an Ecosystem

An ecosystem is an interdependent community of living and non-living organisms/elements including humans. Ecosystems do not always have defined boundaries. An ecosystem is a natural system composed of living and non-living elements working together to maintain conditions that support life.

A watershed is any area of land that drains water to a specific point such as a lake, river, or ocean. Like ecosystems, watersheds may be as large as the basin of the Mississippi River or as small as the water that flows into a pond. All land is in a watershed. In the hydrologic cycle, precipitation falls everywhere and drains somewhere. Energy inputs of sunlight, wind, and the hydrologic cycle interact with the landforms and the living species in ways that affect both the quality and quantity of water.

In an ideal condition, water is captured by infiltration into the spongy layer of duff and topsoil in the watershed. Some is held and by capillary *action* is available to plants. The remainder percolates down through the soil profile to recharge groundwater supplies. The primary watershed process is the capture, storage, and slow release of water. This process helps to prevent excessive flooding during heavy winter rainfall and provides water in times of low rainfall. Where there is no topsoil, or where topsoil has been compacted, eroded, covered over by asphalt, buildings or concrete, or over-saturated, water is not captured but is allowed to run off over the surface of the ground and into watercourses. Flooding and turbidity are increased, and water may not be available when needed during drier times of the year. The quality of water is improved by passage through the topsoil, which acts as a filter and serves as storage to increase base flow in summer.

Different landscape types within the watershed have different roles in the capture, storage, and slow release of water. Wetlands and floodplains slow down the movement of water allowing time for groundwater recharge. Wetlands also serve the purpose of filtering out possible contaminants. Vegetation helps hold topsoil in place and is an important source of humus in the form of decaying plant material. Healthy topsoil is not only our source of food; it also helps provide clean and abundant water.
Major fires historically occurred in the Klamath mountains eco-region on about 50-year intervals. Native Americans and ranchers both used fires to maintain grasslands and prairies. From the 1920s to 1987, the USFS adopted a policy to aggressively fight forest fires. Recent fires include the 1987 (Silver Fire), 2002 (Biscuit Fire), and 2017 (Chetco Bar Fire).

Climate

Temperatures in Curry County are mild throughout the year because of the moderating influence of the Pacific Ocean. Along the coast, the difference between January and August average temperatures is only 14°F.

Annual rainfall averages vary from 75 to 80 inches along the coast to more than 100 inches on the upper slopes of the Coast Range. More than 70 percent of the annual precipitation falls between November and March, with an average of only 3 inches of rain falling during June, July, and August. During the winter, storms can produce intense rainfall; at least once per year, nearly 4 inches of rainfall can be expected during a 24-hour period.

Along the coast, there is less than 1 inch per year average snowfall. Inland, as many as 12 inches of snow have been recorded in a year, but there is frequently little to no snow accumulation. Snow usually melts within a few hours or days.

Strong winds occur frequently in Curry County. Peak gusts between 60 and 100 miles per hour can be expected a few times every year. During the summer, strong easterly winds bring warm, dry air to parts of the county, depleting soil moisture and often creating severe fire danger (Buzzard and Bowlsby, 1970).

Physical Settings of Curry County Watersheds (north to south)

Floras Creek: The Floras Creek watershed is an 83-square-mile area located at the northern edge of Curry County. Floras Creek crosses Highway 101 immediately south of the community of Langlois. Floras Creek provides the public water supply at Langlois as well as stock and irrigation water for the agricultural activities in the lower portion of the watershed. The upper portion of the watershed, most of the area east of Highway 101, is devoted to timber production and livestock grazing. Agricultural activities in the watershed area include livestock grazing, a dairy operation, and cranberry production. More than 90 percent of the land in the watershed is privately managed. BLM manages 5 percent and the state of Oregon manages 1 percent.

The Floras Creek system includes five tributaries and Floras Lake. Boulder Creek, Willow Creek, Joe Cox Creek, Dwyer Creek, and White Rock Creek feed the north, east, and main forks of Floras Creek. Rainfall ranges from 70 to 80 inches along the coast and 90 to 115 inches at the higher elevations. Most of the rainfall comes as short intense storms from November through March. Less than 10 percent of the rainfall occurs during the summer. These rainfall patterns, relatively small watershed, and limited water storage capacity result in large fluctuations in stream flow.

Extreme flooding is a defining feature of the watershed with floods occurring on a regular basis. High-intensity rainfall events caused major floods in 1955, 1964, and 1983 and again in late 1996. The mouth of Floras Creek fluctuates in location almost annually. In recent years the BLM actively manages several artificial breaches to reduce flooding. Floras Creek hits a foredune and flows north from 0 to 9 miles before breaching the foredune and exiting to the ocean. The fluctuating outlet location and the high-flow events have contributed to severe separation of the stream (down-cutting) from its riparian area in the lower portion of the watershed. This separation and high-flow events have contributed to streambank erosion, the cutting of wide stream cross-sections, and excessive deposition of gravel bars. The stream fluctuates between a meandering gravel-sand bed stream to a straight entrenched stream. During the dry summer

months, these same highly eroded stream channels result in a relatively small stream flowing in a large channel.

A large portion of the Floras Creek watershed is managed for timber and regulated under the Oregon Forest Practices Act. Most of this land was logged within the past 40 years and consists of younger timber stands. Douglas fir is the most common tree used in reforestation and plantations. Some of these areas were left to naturally regenerate, resulting in alder-dominated stands. Some of the upland areas are managed for livestock grazing and these practices encourage vegetated cover throughout the year. There are also a few rural home sites.

Soils in the uplands are naturally steep, highly erodible, and prone to landslides. These natural geologic conditions in combination with historic logging practices and road construction (prior to Forest Practices Act), and various historic state, county, and private land and road management have contributed to an overall sediment load in the system. Present forest practices and other land and road management minimize upland erosion. The newly adopted Private Forest Accord will add greater protection to natural resources and provide regulatory certainty to private and nonfederal forests. See https://www.oregon.gov/odf/pages/private-forest-accord.aspx

The lower portion of the watershed tends to be coarse- to medium-textured soils that are level and used for agricultural production. Extensive areas of these soils are allocated to improved pastures for ranching. Cranberries and some row crops are also grown. The highly erodible alluvial material presents streambank erosion problems for local landowners.

Some cranberry production exists in the Floras Lake subwatershed and lower mainstem of Floras Creek. Cranberry production requires irrigation in the summer and flooding at harvest time in October. Both groundwater and surface water are used. The producers build storage ponds and recycle as much water as possible.

Sixes River: The Sixes River is one of the larger watersheds in the Southern Oregon coastal area, draining approximately 85,650 acres or 134 miles. Elevations in the watershed range from sea level to 3,315 feet. Major tributaries include the North, Middle and South forks, and Dry, Edson, and Crystal creeks. The upper portion of the basin is characterized by steeply sloped forested land with narrow valleys and tributary streams that have moderately steep to very steep gradients. The predominant land use in the middle and upper portions of the watershed is commercial timber production. The lower few miles of the river are relatively low gradient coastal floodplain. Rural residential development, grazing, and other agricultural uses are the dominant land uses in the lower basin.

Approximately 92 percent of the Sixes River watershed is located in the Southern Oregon Coastal Mountains ecoregion, which is characterized by complex geology; steep, high gradient streams; and seasonally abundant precipitation. Watersheds in this ecoregion have high stream densities due to heavy precipitation during winter months. Extensive erosion can result from fractured geology, extremely variable stream flows, and a naturally high incidence of landslides in this ecoregion. The remaining 8 percent of the Sixes River drainage is located in the Coastal Lowlands ecoregion and is characterized by low gradient streams that are predominantly underlain by marine terrace deposits and flow through deep soils that range from silty clay loams to sandy loams. Streams in the Coastal Lowlands ecoregion are also susceptible to high erosion rates due to extreme fluctuations between summer and winter stream flows, easily eroded soils, incised channels, and historic loss of riparian vegetation.

The predominant vegetation types found in the Sixes River watershed are listed in Table 2.3.1 below. Natural disturbances that are capable of removing vegetation range from relatively frequent high winds and floods to relatively infrequent forest fires, and even less frequent earthquakes. Potential riparian vegetation on low gradient lands may include dense thickets of wind-stunted shore pine, Sitka spruce, and other brush species. Beaver are commonly found in low-gradient channels of the Sixes River and may significantly alter both vegetation and channel morphology.

Table 2.3.1 Predominant vegetation types found in Sixes River watershed

Conifers	Sitka spruce, shore pine, grand fir, Douglas fir, western hemlock, Port Orford cedar and Monterey cypress
Hardwoods	Red alder, bigleaf maple, myrtle, and madrone
Shrubs	Rhododendron, holly, wax myrtle, willows, and Ceanothus spp.
Understory	Azalea, Ribes spp, iris, sea watch, huckleberry, salal, ferns, skunk cabbage, rushes, sedges, and grasses
Noxious	Gorse, Himalayan blackberry, tansy, scotch broom, European beach grass, and thistles

The Sixes River watershed has the greatest diversity of channel habitat types and more miles of low and moderate gradient channels than any watershed surveyed in Curry County. However, 41 percent of the watershed is composed of steep to moderately steep gradient channels. The risk ratings for increased erosion from roads within the Sixes River watershed range from low to high, with Dry Creek having the highest proportion (100 percent) of roads on slopes greater than 50 percent of any drainage on the south coast of Oregon.

Approximately 69 percent of the land in the Sixes River basin is in private ownership, with 42 percent of the land owned and managed by private industrial timber companies and 27 percent owned by small-acreage, private landowners. Public lands compose almost 29 percent of the lands in the basin, with management responsibility for these lands falling mostly on the U.S. Forest Service. Less than 3 percent of the land in the Sixes River watershed is in state, city, or county ownership.

Forestry is the dominant land use in the Sixes River watershed, accounting for 93 percent of the total land area. The remaining 7 percent of the watershed is used for agriculture, animal range, and rural residential development. Rangelands are managed for livestock grazing, with cows and sheep representing the majority of livestock grazed.

Riparian habitats in Sixes River are characterized by a scarcity of large conifers near the surveyed channels and a relatively low incidence of bank erosion. Aquatic habitat complexity is low, primarily because of the lack of secondary channels and large wood throughout the drainage.

An estimated 1,373 acres of wetlands have been assessed in the Sixes River drainage. Most of the wetlands in the drainage are found in the lower gradient sections along the lower mainstem of Sixes River. Approximately 124 of these acres have been highly modified, 837 acres have been moderately modified, and the remaining 412 acres are not significantly altered. Wetlands within the Sixes River watershed are bordered primarily by forest and agricultural land, with a small proportion bordering rural residential and other developed lands.

Elk River: The Elk River watershed encompasses 59,520 total acres. The area has a maritime climate with annual precipitation from 90 inches at Anvil Creek to 130 inches in the headwaters. Approximately 80 percent of the precipitation occurs from October to March and 4 percent during June, July, and August. A small portion of the watershed lies between 2,400- and 4,600-feet elevation, within a transient snow zone. Elk River and/or its tributaries are 303d listed for the parameter temperature. EPA proposes to add a 303d listing for biological criteria.

The Elk River leaves the Siskiyou National Forest through a broad valley and enters the ocean through a small estuary. Coastal lowlands make up 11 percent of the basin. Gradients are fairly low, fog and strong winds are common, and rainfall averages 60 to 90 inches per year. The average annual water yield is estimated to be 267,000-acre feet. Low mean monthly flows of 20 to 100 cfs occur between June and October, and high flows of 1,000 to 6,000 cfs occur between November and April. Peak flows of a magnitude greater than the 10-year return interval occurred in 1944, 1955, 1964, 1971, 1982, and 1995-96. The December 1964 flow was estimated to have an 80- to 150-year interval.

The Elk River watershed is composed of Rocky Point sandstones and siltstones, Humbug Mountain conglomerate, shales of the Galice Formation, diorite intrusions, and ultramafic rocks. Vegetation in the watershed includes forested land with a hardwood/conifer mixture of Douglas fir, western hemlock, Port Orford cedar, Jeffrey pine, Sitka spruce, tanoak, red alder, madrone, myrtle, and bigleaf maple. The understory is huckleberry, salal, rhododendron, vine maple, willow swordfern, poison oak, and others. The major plant communities vary in age from early seral stages to old growth.

Hubbard Creek: Hubbard Creek is located 1 mile southeast of Port Orford, Oregon. The watershed encompasses approximately 5,340 acres or 8.34 square miles and is the primary water source for the city of Port Orford.

Basin Description:

- Boundaries: Elk River watershed on the north and east
- Garrison Lake watershed on the north and west
- Rocky Point on the south
- Pacific Ocean on the southwest
- Elevation: Sea level to 1,200 feet

Hubbard Creek is composed of three main branches: the north, middle, and south forks. The south fork is the longest having a reach of approximately 5 miles. The south fork joins the middle fork approximately 1 mile from the mouth, which then becomes the mainstem and the north fork joins the mainstem approximately one-quarter mile from the mouth.

The north fork, at approximately 1 mile from the mainstem, has an impoundment, which serves as a reservoir for the city of Port Orford. This is the primary water source for this municipality (Maguire, 2001d).

Euchre Creek: Euchre Creek is only 14 miles long and drains from one of the smallest watersheds of any river in south coastal Oregon (23,831 acres/37 miles). Elevations in the watershed range from sea level to approximately 3,080 feet. Major tributaries include Cedar and Boulder creeks. The upper portion of the basin is characterized by steeply sloped forested land with narrow valleys and tributary streams that have moderate to very steep gradients. The predominant land use in the middle and upper portions of the watershed is commercial timber

production. The lower few miles of the river are relatively low gradient coastal floodplain. Rural residential development, grazing, and other agricultural uses are the dominant land uses in the lower basin.

Approximately 75 percent of the Euchre Creek watershed is located in the Southern Oregon Coastal Mountains ecoregion, which is characterized by complex geology; steep, high gradient streams; and seasonally abundant precipitation. Watersheds in this ecoregion tend to have high stream densities due to the potential for heavy precipitation during the winter months. Extensive erosion can result from fractured geology, high peak stream flow rates, and a high incidence of landslides in this ecoregion. The remaining 25 percent of the Euchre Creek drainage is located in the Coastal Uplands ecoregion and is characterized by moderate to low gradient streams which are generally underlain by sandstone, and flow through predominantly deep silt loam soils. Although peak precipitation rates are slightly lower than in the Southern Oregon Coastal Mountains, streams in the Coastal Uplands ecoregion are also susceptible to high erosion rates due to extreme fluctuations between summer and winter stream flows, easily eroded soils, and the prevalence of diked and channelized stream reaches. The risk ratings for increased erosion from roads within the Euchre Creek watershed ranged from moderately low to moderate.

More than three-fourths of the land in the Euchre Creek basin is in private ownership, with almost 49 percent of the land owned and managed by private industrial timber companies, and 29 percent owned by small-parcel, private landowners. Public lands compose almost 22 percent of the lands in the basin, with management responsibility for these lands split almost evenly between BLM and the USFS. There are only 25 acres of state land in the Euchre Creek watershed.

Forestry is the most dominant land use in the Euchre Creek watershed, accounting for 94 percent of the total land area. The remaining 6 percent of the watershed is used for agriculture, animal range, and rural residential development. Rangelands are mostly managed for livestock grazing, with cows being the primary type of livestock grazed. To a lesser extent, sheep, llamas, goats, horses, and other small animals also use rangeland.

Riparian habitats in Euchre Creek are characterized by a scarcity of large conifers near the surveyed channels and a relatively low incidence of bank erosion. Shade is within or very close to the desirable range for all reaches. Aquatic habitat complexity is low, primarily because of the lack of large wood. Euchre Creek is 303d listed for the parameter temperature.

An estimated 90 acres of wetlands have been assessed in the Euchre Creek drainage. Most of the wetlands in the drainage are found in the lower gradient sections along the lower mainstem of Euchre Creek. Approximately 40 of these acres have been highly modified, 17 acres have been moderately modified, and the remaining 33 acres are not significantly altered. Wetlands within the Euchre Creek watershed are bordered primarily by agricultural land, but are bordered to a lesser extent by forested, rural residential, and other developed lands.

Rogue River: The Rogue River basin extends from the west slope of Crater Lake on the east to the northernmost portion of California on the south to the Pacific Ocean on the west. The Basin covers 5,160 square miles and lies in the Klamath Mountain Province. The Rogue River is the third largest river in Oregon and is approximately 200 miles long. This Plan covers that portion of the basin that lies within Curry County.

Precipitation ranges from 80 inches per year at the coast to 130 inches at Signal Buttes. Before 1977, the annual discharge of the Rogue was 5.66 million acre-feet. After the completion of the

Lost Creek Dam in 1977 and the Applegate Dam in 1980, the annual discharge fell to 3.97 million acre-feet. At the Agness gauge, the highest recorded flow was 290,000 cfs in 1964 and the lowest was 608 cfs in 1968.

The Rogue estuary extends from the ocean to Ferry Hole (RM 5) with several sloughs and multiple channels found in this reach. The substrate is primarily gravel with some areas of sand or mud bottom. There is almost no large woody debris present in the estuary because of the stream power. The river mouth and the Port of Gold Beach are protected by jetties constructed in 1960. Many wetlands and riparian terraces in the lower 15 miles of the river canyon have been converted to agriculture since 1850 when European settlers began arriving in the county.

The majority of the watershed consists of steep, forested slopes that are used for timber production. Grazing livestock on the meadows scattered through the forest was formerly common but is now confined primarily to the coastal area. Ownership is primarily USFS in the interior with a fairly narrow strip of private lands along the coast and the river below Agness. Of that portion of the watershed between Agness and the mouth, 44,600 acres (54 percent) is USFS, and the remaining 38,000 acres are private (timber companies, rural residential, urban, and county lands).

The human population of the Lower Rogue watershed is concentrated in the towns of Gold Beach (population 2000), Agness (population approximately 500), and in rural residential along the lower 10 miles of the Rogue and on Squaw Creek. The Rogue River continues to support a thriving recreational and commercial fishery as well as other aquatic activities (Weinhold, 1995).

Hunter Creek: The watershed encompasses 44.4 square miles or 28,405 acres. The watershed is divided between public (38 percent) and private lands (62 percent). The public lands are administered by the USFS, the BLM, and the state. Ownership of the private lands is dominated by approximately 81 percent ownership by forest industry. Forestry uses account for 97 percent of the land in the watershed on both private and public lands. The remaining three percent of the watershed is divided between urban, agriculture/range and rural residential uses.

Precipitation ranges from 80 inches per year at the coast to 130 inches per year in the interior mountains. The majority of the watershed receives approximately 110 inches per year. Elevations range from sea level in the Lower Hunter mainstem sub-watershed to 3,558 feet on Sugarloaf Mountain in the Upper Hunter mainstem sub-watershed and 3,512 feet near Signal Buttes in the North Fork Hunter sub-watershed.

The majority of the watershed consists of steep, forested slopes that are used for timber production. Grazing livestock on the meadows scattered through the forest was formerly common but is now confined primarily to the coastal valley area. Ownership is primarily USFS, BLM, and private timberlands in the interior.

Pistol River: The Pistol River watershed drains approximately 67,275 acres or 105 square miles of land. Pistol River, situated entirely within Curry County, is an average-sized watershed on the Southern Oregon Coast. Flowing in a westerly direction, Pistol River crosses Highway 101 and drains into the Pacific Ocean about ten miles south of the community of Gold Beach. Elevations in the watershed range from sea level to approximately 4,220 feet on Snow Camp Mountain. Major tributaries include the North Fork, East Fork, and South Fork. The upper portion of the watershed is characterized by steeply sloped forested areas with narrow valleys and tributary streams that have moderately steep to very steep gradient. Forestry is the dominant land use in the upper portion of the watershed.

At one time, there were six active lumber mills in the Pistol River area; a series of dairies in the lowlands; and a cheese factory. During the past sixty years, some of these industries have left the area, but ranching, rural residential development, and other agricultural uses still thrive in the lower portion of the watershed. Over 55 percent of the watershed is in public ownership. Southern Oregon Coastal Mountains make up 14 percent of the watershed with steep to very steep gradients, high rates of erosion, and high stream densities. Rainfall averages 79-140 inches per year.

The Coastal Siskiyous make up 82 percent of the watershed, with habitat very similar to Southern Oregon Coastal Mountains. Coastal Uplands cover less than one percent of the watershed and roughly follow the historic Sitka spruce distribution. High and low gradient habitats are present, with slow moving earth flows common on the hill slopes.

Approximately 177 acres of wetlands are found in this watershed. All the wetlands in the Pistol River watershed are in the Lower mainstem.

The Pistol River mainstem is listed on the 303(d) list for fecal coliform, pH, and water temperature. Temperatures range from the mid-to-high 60s in the mainstem Pistol River above East Fork, the East Fork, North Fork and Deep Creek. Temperatures range from high 60s to low 70s in the mainstem Pistol River above the South Fork, Crook Creek, and the South Fork Pistol. Temperatures range from mid to high 70s at the Oregon Department of Fish and Wildlife (ODFW) trap on the mainstem Pistol River.

Chetco River: The Chetco River is the second largest coastal watershed south of the Coquille drainage, and drains approximately 352 square miles, or 225,000 acres. It flows west out of the Siskiyous and empties south into the Pacific Ocean about six miles north of the California/Oregon state line between the cities of Brookings and Harbor, Oregon. The mainstem of the Chetco River is about 56 miles long, with the first 28 miles located within the Kalmiopsis Wilderness area. Elevations in the watershed range from 5,098 feet to sea level, and much of the watershed is characterized by steeply sloped forested valleys with moderately steep to very steep gradient. More than 80 percent of the watershed is public land, and the primary land manager is the USFS. Private land only occurs in the lowest 11 miles of the river, and the predominant land use is industrial and non-industrial forestry. Agriculture/grazing, rural residential development, and urban development together occupy less than three percent of the land use in the Chetco River drainage. The Chetco River estuary is short (< 2 miles in length) and is highly modified from its original condition by construction of a boat basin and jetties that extend into the Pacific Ocean.

Precipitation in the Chetco River watershed is lowest near the coast and increases to the north and east. Annual precipitation on the coast averages 75 inches, whereas the peaks in the Coast Range receive as much as 170 inches. Flows in the Chetco River are highly variable due to the seasonality of precipitation in southwestern Oregon and because there is little snowmelt to boost the river's flow in the spring and summer. Summer flows are often less than 100 cfs, whereas winter flows have exceeded 40,000 cfs in five of the last 30 years. Rain-on-snow events are common during the winter in the high steep mountains in the headwaters of the Chetco River and can result in large day-to-day variability in flows. Due to minimal winter snowpack and the warm southwestern climate, the Chetco is consistently warmer than 65 degrees in the summer. DEQ modeling efforts confirm this.

Major fires historically occurred in the Klamath Mountains ecoregion on about 50-year intervals. Native Americans and ranchers both used fires to maintain grasslands and prairies. Prior to

2002, modern fire suppression policy had severely reduced the incidence of wildfire in this region leading to the 2002 Biscuit fire. Severe windstorms occur regularly in the Chetco basin and can topple large patches of mature trees. High intensity rainfall events on steep slopes can result in many landslides and earth flows into the Chetco River.

Forestlands and their charred remains account for 97 percent of the Chetco watershed. Urban use accounts for almost one percent of the land use in the Chetco River basin but is confined to the lower few miles of the river. The remaining two percent of the watershed is used by rural residential development, animal range, and a small amount of agriculture. Rangelands are managed for livestock grazing, whereas agricultural lands are primarily used for producing hay or gardening. The majority of the livestock on grazing lands are sheep and cattle. To a lesser extent, rangelands are also used by llamas, goats, horses, and other small animals.

The Chetco River has been placed on the 303d list for the parameter temperature. Even though water flowing directly from the Kalmiopsis wilderness exceeds the temperature criteria, downstream tributaries contribute cooler water.

The out-of-stream water rights for the Chetco River total approximately 59 cfs. The majority (60 percent) of these water rights are allocated to municipal water use, and 73 percent of the rights are junior to the in-stream water right (80 cfs) established by the ODFW for wildlife in 1964. Water storage rights total 370 acre-feet in the Chetco watershed, with the majority of those rights allocated to municipal water storage. Out-of-stream water rights currently exceed flows in the Chetco River from July to October, and no additional water rights are available during those months. Water allocated for livestock and irrigation comprise less than 11 percent of the total out-of-stream water rights for the Chetco River.

An estimated 93 acres of wetlands have been assessed in the Chetco River watershed, with most of them found in the lower gradient sections along the lower mainstem, Jack Creek, and North Fork Chetco River.

Winchuck River: The Winchuck River watershed is one of the smaller watersheds on the Southern Oregon coast. The Winchuck flows into the Pacific Ocean just north of the Oregon-California border. Its watershed is primarily within Curry County with some tributaries in California's Del Norte County (South Fork, Middle Winchuck mainstem, and upper Bear Creek).

The Winchuck River drains approximately 45,600 acres (71.25 square miles of land). Steep forested areas and narrow valleys characterize the upper portion of the basin. Approximately 70 percent of the Winchuck watershed is in public ownership (USFS and some state parks).

The lower basin receives 50 to 70 inches of annual rainfall, and the upper basin can receive 100 to 150 inches with winter snow accumulations. Rain-on-snow runoff occurs frequently and can have an influence on peak flow periods. Tidal movements affect the lower 1.5 miles of the Winchuck River. However, this river system has a very short estuarine system for juvenile salmonid rearing and exhibits sandbar closings at the mouth during late summer months.

The majority of the watershed is in timberland (95 percent) and is managed as a late successional reserve. The Winchuck system was heavily logged in the 1950s and 1960s. Present logging on private land includes Douglas fir thinning, alder management, and reversion back to fir stands.

Agricultural uses in the basin are livestock grazing (cattle) and some lily bulb production and are limited to the lower Winchuck River mainstem and South Fork. The agricultural uses involve less than 500 acres.

Rural residential areas account for less than 2 percent of the private lands and have been increasing in recent years. Water uses within the basin include residential, limited irrigation, livestock management, and in-stream uses (fish, wildlife, etc.). Residential landowners utilize groundwater wells, springs, and surface water holding tanks.

The Winchuck system is on the 303(d) list for temperature impairment and spawning period dissolved oxygen. EPA proposes to add additional 303d listings for biological criteria and juvenile rearing dissolved oxygen.

Wetland areas in the lower Winchuck basin are estimated at 42 acres. Approximately 88 percent of these wetlands have a moderate to high degree of alteration with 61 percent located near residential development and 27 percent adjacent to agriculture (Maguire, 2001i).

Agricultural presence in Curry County is not new to the human population of this area. Cattle, dairy operations, and some row crops have been present in the Curry County basins for more than 125 years. Today, actual agricultural acreage has dramatically declined, and human populations and residential watershed impacts have increased. In no way does the following discussion single out agriculture as the sole contributor to water quality problems in Curry County. On the contrary, agricultural management can have a positive impact on water quality relative to many other potential land uses in these coastal basins.

2.4 Agricultural Water Quality

2.4.1 Water Quality Issues

While this Area Plan applies to all agricultural water pollution, the objectives and strategies currently emphasize parameters on the 303(d) list and those with an approved TMDL.

Nonpoint pollution is characterized by the difficulty in identifying its source. While it is possible to monitor nonpoint source accumulations, it is generally economically unfeasible to identify its origin on anything larger than the tributary scale in the watershed. The intent of this Area Plan is to help landowners identify and reduce potential pollution due to current agricultural land conditions.

Multiple waterbodies in the Curry County management area are identified as “impaired” through DEQ’s Water Quality Assessment and 303(d) list for temperature, biocriteria, dissolved oxygen, fecal coliform, alkalinity, and chloride. 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 Other Contributing Factors

By definition, nonpoint sources of pollution are divergent and difficult to source within a watershed; watershed impacts are the result of both human land uses and the geology, geomorphology, and meteorological forces at play in the background. Harmful bacteria and viruses reside in streamside soils and wildlife feces. Air temperatures and direct sunlight can

warm water temperature. Sediment and bank erosion are part of the natural hydrologic and geologic system. Nutrients, such as phosphorus, can be dissolved from parent rock material. Background sources of pollutants can be hard and costly to identify and distinguish from management related sources, especially in an area as diverse as Curry County.

Population increases, declining agriculture acreage, and resulting environmental impacts have changed the face of several Curry County systems over the past 50 years. Changes in fire frequency, the severity of peak and low stream flows, waste inputs, flood plain encroachment, degraded riparian areas, and airborne pollutants are all consequences of human population expansion into aquatic and terrestrial habitat. These are consequences that can be buffered but never eliminated.

Impacts to water quality can sometimes be attributed to a single, definable act or land use activity. More often than not, however, the cumulative effects within the entire watershed put the burden on all of the inhabitants of the watershed to live on the land in a manner consistent with the ideals of conservation and stewardship. The residents of the basin can address cumulative effects. The contributions to water pollution of a single inhabitant may not seem significant, but the cumulative effects of all the inhabitants do have a significant impact. Residents of the watershed should adapt their resource use and impact in such a way as to lessen even minor contributions, as there is no substitute for the stewardship of committed individuals.

Another significant contributor to impaired water quality is the lack of financial resources and incentives to accomplish the education and land use management changes necessary to address the economic realities of the landowners in the basin. The public can petition for legislation to establish incentives for landowners in the form of grants, tax breaks, low interest loans, and/or community volunteer labor. Incentives must be commensurate with reduction of production value for land or water conserved to be effective. It is equally important to quickly and reasonably address perceived disincentives in current water rights law and county tax code.

2.4.1.2 Beneficial Uses

Beneficial uses describe the activities that a water body supports. Water quality standards are established to protect the most sensitive beneficial uses of the state's waters. Multiple beneficial uses in the Curry County Management Area require clean water, including drinking water, recreational activities, aquatic life, and agriculture (OAR 340-041-0300) https://www.oregon.gov/deq/Regulations/Pages/OARDiv41.aspx

While there may not be severe impacts on water quality from a single source or activity, the combined effects from all sources may contribute to the impairment of beneficial uses.

Table 2.4.1.2 DEQ Designated Beneficial Uses, South Coast Basin

Table 300A
Designated Beneficial Uses
South Coast Basin
(OAR 340-041-0300)
(November 2003)

Beneficial Uses	Estuaries & Adjacent Marine Waters	All Steams & Tributaries Thereto
Public Domestic Water Supply[1]		X
Private Domestic Water Supply[1]		X
Industrial Water Supply	X	X
Irrigation		X
Livestock Watering		X
Fish & Aquatic Life[2]	X	X
Wildlife & Hunting	X	X
Fishing[3]	X	X
Boating	X	X
Water Contact Recreation[3]	X	X
Aesthetic Quality	X	X
Hydro Power		X
Commercial Navigation & Transportation	X	

[1] With adequate pretreatment (filtration & disinfection) and natural quality to meet drinking water standards.

[2] See also Figures 300A and 300B for fish use designations for this basin.

[3] For coastal water contact recreation and shellfish harvesting uses, see also Figures 300C (Coos Bay) and 300D (Coquille River Estuary).

2.4.1.3 Water Quality Standards

DEQ uses water quality standards to assess whether the quality of Oregon's rivers and lakes is adequate for fish and other aquatic life, recreation, drinking, agriculture, industry, and other uses. DEQ also uses the standards as regulatory tools to prevent pollution of the state's waters. The Clean Water Act requires states to adopt water quality standards designating beneficial uses of the state's waters and setting criteria designed to protect those uses. States submit their standards to the USEPA federal for approval.

Oregon water quality standards include statewide narrative criteria established in OAR 340-041-0007. Oregon water quality standards for specific pollutants are established in OAR 340-041-0009 (bacteria) through OAR 340-041-0036 (turbidity). These standards often are accompanied by information regarding how many samples are needed to apply the standard. Oregon water quality standards for specific pollutants can be found at: https://www.oregon.gov/deq/wq/Pages/WQStandards-Conventional-Parameters.aspx.

2.4.1.4 Water Quality Parameters of Concern

According to the 2022 Integrated Report, temperature, bicriteria, and dissolved oxygen are the primary water quality parameters of concern in the Curry Management Area. (https://www.oregon.gov/deq/wq/Pages/epaApprovedIR.aspx). Other primary water quality impairments in the Curry Management Area include fecal coliforms, *E. coli*, alkalinity, and chloride. Water quality standards are intended to protect the most sensitive beneficial uses in a waterbody. These pollutants and others affect the most sensitive beneficial uses of water in the South Coast Basin including fish and aquatic life, drinking water and water contact recreation.

A number of waterbodies within the Management Area are water quality limited (do not meet water quality standards) for one or more parameters. DEQ is required to submit a list of impaired waterbodies to the USEPA every two years under section 303(d) of the Federal Clean Water Act. This list is commonly referred to as the "303d list".

While this Area Plan applies to all agricultural nonpoint water pollution, it focuses specifically on parameters on the 303d list in the Management Area.

Temperature
Warm stream temperatures are the greatest limitation to water quality within the Curry Management Area. The temperature standard that applies to the Curry Management Area protects salmon and trout throughout their life histories: spawning, rearing, and migration. DEQ has designated fish-bearing streams as either core cold-water habitat or rearing and migration habitat. Historical land use decisions and current management practices have led to non-point sources of thermal pollution including the removal of streamside trees and other vegetation, channel modification, warm water discharges from irrigation canals, and flow modification. TMDLs are required to be developed for the South Coast Basin that require actions to limit thermal loading to the waterbodies. Reducing stream temperature and restoring instream flows are important because excessive summer water temperatures threaten the survival of fish and other aquatic organisms.

Dissolved Oxygen/pH/Nutrients
The Sixes, SF Hunter, SF Pistol and Winchuck rivers in the Curry Management Area are water quality limited due to low dissolved oxygen concentrations. Excess nutrients found in urban and agricultural runoff can cause prolific algal growth. When algae decompose in the water column oxygen is depleted. Low dissolved oxygen levels are harmful or fatal to aquatic life. Warm stream temperatures can also result in low dissolved oxygen levels. pH levels are a measure of the hydrogen ions in water and determine the solubility of water. Garrison Lake is the only pH-limited waterbody for the Curry Management Area.

Flow/Habitat
While flow and habitat modifications are not considered pollutants, they directly impact instream temperatures and fish and aquatic life. Quantity and quality of water are closely linked, yet these two aspects of water accessibility are often dealt with separately. The definition of "water quantity" often relates only to discharge and water mass, but equally important is the way water flow varies spatially and temporally. This variation in flow is as crucial to freshwater ecosystems as discharge and water mass and has considerable impact on physical as well as chemical quality aspects of water. Habitat modifications, such as the straightening of stream channels to facilitate drainage, simplifies aquatic habitat and often does not allow adequate slowing of the water to facilitate bacterial die-off times.

BioCriteria
The presence, condition, and numbers of types of fish, insects, algae, plants, and other organisms provide important information about the health of aquatic ecosystems. Biological criteria are a way of describing the qualities that must be present to support a desired condition in a waterbody and serve as the standard against which assessment results are compared. Warm stream temperatures and low dissolved oxygen can limit the presence and abundance of certain aquatic life that in turn limits the available food resources for sensitive salmon and trout species.

Bacteria
Escherichia coli (E. coli) and fecal coliform concentrations are measured to determine the risk of infection and disease to people. *E. col*i is a subset of fecal coliform bacteria that are found in the feces of humans and other warm-blooded animals such as pets and livestock. High concentrations of bacteria in the South Coast Basin can result from runoff from streets, lawns, agricultural lands, and other sources of bacteria. The lower SF Pistol River to tidewater is impaired for fecal coliforms, while both Crystal Creek and the Morton/New River watersheds are impaired for high *E. coli* concentrations. Fecal coliform bacteria by themselves are not pathogenic but are a good indicator that disease-causing organisms are present such as illness causing bacteria, viruses, and parasites.

Alkalinity
Alkalinity is a measure of the water's ability to neutralize acidity. When thinking about water quality, alkalinity is much more important than pH. pH tells you whether the water is acidic, neutral or basic, but not the buffering capacity of the water. Buffering capacity is the ability of water (or compound) to resist a change in pH. Alkalinity tells you the buffering capacity in the basic pH range of the water. Alkalinity impairments were assessed in 2022 for both Floras Creek and the Winchuck River.

Chloride
Generally associated with de-icing salt and water softner salt for urban roads and water treatment strategies, chloride exceedances for a forested/agriculture landscape can be a bit challenging to source. Elevated levels can be associated with oil/gas drilling, saltwater intrusion, fertilizers, septic system effluent, and even from the weathering of rocks. The presence of chloride increases the potential corrosivity of water. High amounts of chloride are toxic to fish, aquatic bugs, and amphibians. Chloride can negatively affect the fish and insect community structure, diversity, and productivity, even at lower levels. The Sixes River is the only Curry Management Area waterbody impaired for elevated levels of chloride.

Table 2.4.1.4 Curry Management Area 2022 303(d) listed Category 5 waterbodies

Waterbody	Temperature	Dissolved Oxygen	BioCriteria	Fecal Coliform	E. Coli	Alkalinity	Chloride
Morton Cr-New River	X				X		
Conner Cr.	X						
Bethel Cr.	X						
Croft Lk.	X						
Floras Lk.	X	X					
Floras Cr.	X		X			X	
SF Floras Cr.	X						
EF Floras Cr.	X						
NF Floras Cr.	X						
Willow Cr.	X						
Crystal Cr.	X				X		
Edson Cr.	X						
Sixes Ri.	X	X	X				X
Elk Ri.	X						
Upper Elk Ri.			X				
Euchre Cr.	X						
Cedar Cr.	X						
Hunter Cr.	X	X					
Upper Hunter Cr.	X						
SF Pistol Ri.	X	X		X			
EF Pistol Ri.	X						
Crook Cr.	X						
Chetco Ri.	X		X				
NF Chetco Ri.	X						
Little Chetco Ri.	X						
Boulder Cr.	X						
Winchuck Ri.	X	X				X	
EF Winchuck Ri.	X						
Chrome Cr.	X		X				

Other impairments listed on the Oregon 303(d) list needing a TMDL are for pH and aquatic weeds in Garrison Lake, iron exceedances in Floras Lake, habitat modification in the Elk River, and chlorophyll a exceedance in Floras Lake. Currently there are no developed and approved TMDLs for the Curry Management Area other than the Rogue River TMDL (2008).

2.4.1.5 TMDLs and Agricultural Load Allocations

Currently the Rogue Basin Total Maximum Daily Load (TMDL) is the only developed and approved TMDL for the Curry Management Area. South Coast TMDLs are currently not listed on the Oregon TMDL priority list through to 2028. Even without TMDL load allocations for existing impairments it remains important that watershed partners work together to reduce nonpoint source pollution loading through best management practice strategies.

Many waterbodies in Oregon do not meet water quality standards for various pollutants at certain times of the year. In the Rogue Basin, bacteria, temperature, sedimentation, pH, and

dissolved oxygen have been identified as water quality impairments. The TMDL for each pollutant is determined by scientific data collection and analysis to determine how much of a pollutant a waterbody can receive and still meet water quality standards. Water quality standards are intended to protect the most sensitive beneficial uses in a waterbody.

Waterbodies that do not meet water quality standards are placed on a state list of impaired waterbodies. Rivers, streams, or lakes that are on the list require the development of a TMDL.

The most recent 303(d) listings for the Curry Management Area can be found at: https://www.oregon.gov/deq/wq/Pages/epaApprovedIR.aspx

In the Rogue Basin, the TMDL process began in 1992 with the development of the Bear Creek TMDL. Since that time, TMDLs have been developed for Upper and Lower Sucker Creek (1999, 2001), the Lobster Creek watershed (2002), the Applegate subbasin (2004), additional parameters in the Bear Creek watershed (2007), and the remainder of the Rogue Basin (2008) (See Table 2.4.1.5).

Lower Rogue tributary streams are assigned generalized load allocations based on potential vegetation and effective shade curves. Site-specific load allocations were developed for the Lower Rogue mainstem upstream of river mile 5.3.

Table 2.4.1.5 TMDLs in the Inland Rogue Basin – Parameters and Adoption Dates

Basin	Temperature	Bacteria	Sedimentation	Phosphorous and Dissolved Oxygen and pH	EPA Approval Date
Applegate Subbasin	X		X		2/11/2004
Bear Creek Watershed				X	1992
Bear Creek Watershed	X	X	X		10/2/2007
Illinois Subbasin – Upper Sucker Creek	X				5/4/1999
Illinois Subbasin - Lower Sucker Creek	X				5/30/2002
Lower Rogue - Lobster Creek Watershed	X				6/13/2002
Rogue Basin	X	X			12/29/2008

ODA has recently initiated annual reporting to DEQ for agricultural water quality implementation related to TMDLs. See Chapter 4.2 (Table 4.2d) for results for this Management Area.
Despite the best and most earnest efforts, natural events may interfere with or delay attainment of the TMDL and/or its associated surrogates. Such events could be but are not limited to flood, fire, insect infestations, and drought. Under the prevention and control measures in the Area Rules, landowners are not responsible for mitigating or dealing with factors that do not result from agricultural activities.

Monitoring and evaluation of the Plan's effectiveness in meeting agricultural load allocations will include a review of applicable load allocations as found in Rogue Basin TMDL and the progress being made toward reaching applicable load allocations.

2.4.1.6 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.

Forty-seven public water systems obtain domestic drinking water from groundwater and surface water sources to serve approximately 16,148 people in the Management Area.

Twelve public water systems in the Management Area have recent alerts (past 10 years) for detections of *E. coli* bacteria. The locations are as follows: Port of Gold Beach – Huntley Park Campground, Oregon Parks and Recreation Department (OPRD) Cape Blanco State Park, Agness RV Park, Whaleshead Beach RV Park, Sea Crest Motel, Salmon Run Golf Course, USFS Lobster Creek Campground, Old Sheep Ranch Water Association, Rainbow Rock Village Mobile Home Park, OPRD Humbug Mountain Camp, Paradise Lodge, and Curry County Park Lobster Creek.

Nitrate alerts (generated when nitrate exceeds 5 mg/L) exist for no public water systems. The drinking water maximum contaminant level (MCL) for nitrates is 10 mg/L.

Of the soils assessed in the Management Area, most have high nitrate leaching potential, according to the National Cooperative Soil Survey, based on slope, precipitation, and land use. Nitrate from animal waste, fertilizers, and septic systems can readily penetrate to the aquifers used for drinking water when leaching potential is high, and bacteria removal through soil filtration can be less effective in sandy soils.

Oregon Health Authority rated some of the public water system wells in the Management Area for contaminant susceptibility for land use impacts to drinking water sources based on Source Water Assessments, aquifer characteristics, and well locations and construction. The majority of evaluated public water system wells rate as high or medium susceptibility. Measures to reduce leachable nitrate in soils would reduce risk to groundwater sources of drinking water.

DEQ only addresses drinking water issues identified for public water systems. A query of Oregon Water Resources' water rights database for private surface water domestic points of diversion identified 252 private domestic water rights in the Management Area. There are also numerous private groundwater wells for domestic use. The Domestic Well Testing Act database (real estate transaction testing data) for 1989-2019 indicates 14 results are ≥3 mg/L, nine results are ≥5 mg/L, two results are 7mg/L, and one is ≥10mg/L out of 199 total results included in the database.

There are recent alerts (2022, 2021) for lead, copper, sodium, total haloacetic acids (HAA5), and total trihalomethanes (TTHM) at several public water systems. HAA5 and TTHM are disinfection byproducts that form when chlorine compounds that are used to disinfect water react with other naturally occurring chemicals in the water. Excess sediment in source water can lead to the creation of these disinfection byproducts, which can be harmful to human health.

Table 2.4.1.6 Curry Management Area Public Water System (PWS) Alerts Summary

PWS ID	PWS Name	Drinking Water Source	Other Alerts
4101062	Rainbow Rock Village Mobile Home Park (GU)	2 wells	HAA5
4105860	Old Sheep Ranch Water Assoc	1 well	Lead and Copper (usually a pH/treatment issue, not source water)
4100466	Langlois Water District	Floras Creek SW intake (no groundwater	Sodium
4101361	Rainbow Rock Service Association	Unnamed Creek	TTHM
4100670	Port Orford	Hubbard Creek	TTHM, HAA5, Sodium

2.4.2 Sources of Impairment

As stated earlier, the background pollutant loading that occurs within the Curry Management Area not attributable to human land uses, however there are numerous human activities that do impact water quality on the South Coast. Where applicable, all efforts to identify and manage pollutant sources is an integral component of successful water and land management activities. All people who live within a watershed share the responsibility for clean water. The chief land uses for the Curry Management Area include forestry, agriculture, and rural residential uses. No individual landowner or land use is solely responsible for water quality impairments, it is the cumulative impacts from riparian clearing, road building, livestock management, and residential discharges that can limit water quality on a watershed scale. As land managers we must take into consideration all of these sources from point and nonpoint sources of pollution to target and reduce excess pollutant loading.

The following broad categories as potential sources of agricultural pollution in this area:

- Drainage and runoff
- Livestock management
- Vegetation management
- Irrigation
- Croplands
- On-farm storage

The following narrative, tables, and lists focus on the mandate of the Ag Water Quality Program legislation. Agriculture activities are only a small part of the land use in these basins. The conditions identified by the farmers and ranchers of the LAC will meet the stewardship and conservation needs on private agricultural lands to help alleviate the cumulative effects of human impacts in all Curry County basins.

2.5 Regulatory and Voluntary Measures

2.5.1 Area Rules

The focus of the Ag Water Quality Management Program is on voluntary and cooperative efforts by landowners and others to protect water quality. However, the program also provides for a regulatory backstop to ensure prevention and control of water pollution from agricultural sources in cases in which 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.

ODA appointed the LAC to assist in developing Area Rules (prevention and control measures) to protect water quality and prevent and control water pollution from agriculture. On an 8-4 vote, the LAC submitted a riparian rule to ODA. The rule submitted was not consistent with legislative direction, so it was left to ODA to develop the rules that apply to the Curry Management Area. To do this, ODA looked to work developed by other LACs in similar planning areas for a model rule to address riparian conditions. The Rules listed below are modified to reflect the unique circumstances found in Curry County.

OAR 603-095-3540
(1) All landowners or operators conducting activities on lands in agricultural use must comply with the following criteria. A landowner is responsible for only those conditions resulting from activities controlled by the landowner. A landowner is not responsible for conditions resulting from actions by another landowner on other lands. A landowner is not responsible for conditions resulting from unusual weather events or other exceptional circumstances that could not have been reasonably anticipated. A landowner is not responsible for natural increases in nutrient or temperature loading.

Definitions

Oregon Administrative Rule 603-095-0010(4) defines agricultural use as “the use of land for the raising or production of livestock or livestock products, poultry or poultry products, milk or milk products, fur-bearing animals, or for the growing of crops such as, but not limited to, grains, small grains, fruit, vegetables, forage grains, nursery stock, Christmas trees, or any other agricultural or horticultural use or animal husbandry or any combination thereof. Wetlands, pasture, and woodlands accompanying land in agricultural use are also defined as in agricultural use.”

The following Rules apply to any agricultural use exceeding 10,000 square feet in area, including, but not limited to, tilling, clearing, grading, excavating, grazing, and feedlot usage and excluding minor land disturbing activities such as home gardens and individual landscaping and maintenance (OAR 603-095-0010(43)).

Statutes Addressing Water Pollution

In 1995, the Oregon Legislature recognized potential confusing authorities that belonged to both ODA and DEQ regarding the enforcement of water quality statutes. To clarify authorities granted to ODA in Senate Bill (SB) 1010, the Legislature passed SB 502, which was codified into ORS 561.191. This statute states that ODA shall develop and implement any program or rules that

directly regulate farming practices that are for the purpose of protecting water quality. A 1996 opinion from the Oregon Attorney General's office states that **ODA has the statutory responsibility to regulate agriculturally related water pollution**. That same opinion also recognized the need to define that authority by developing water quality plans and rules that specifically address agricultural practices and land conditions and achieve the standards adopted by the Environmental Quality Commission.

2.5.2 ORS 468B – Waste Rule

To implement SB 502, ODA incorporated ORS 468B.025 and ORS 468B.050 into all of the basin Agricultural Water Quality Management Administrative Rules in the state. ORS 468B.025 and ORS 468B.050 were incorporated by including the following language in individual basin administrative rules:

OAR 603-95-3540
(2) Effective on rule adoption, no person subject to these rules shall violate any provision of ORS 468B.025 or ORS 468B.050.

Upon adoption of this Rule, ODA assumed responsibility for implementing ORS 468B.025 and 468B.050.

This Rule references current State Law (ORS 468B.025 and ORS468B.050). ORS 468B.025 states that no person shall:

(1)(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) Violate the conditions of any waste discharge permit issued under ORS 468B or ORS 568.

ORS 468B.050 refers to situations when permits are required, such as for certain confined animal feeding operations (CAFOs).

Compliance with this Rule ensures that concentrated nutrients, pathogens associated with high animal density areas, high sediment concentrations in run-off, toxics, or other potential pollutants are not readily transported to waters of the state.

Livestock wastes can include manure from pastures draining to or bisected by irrigation ditches and any other situations not already covered by Oregon's CAFO laws. Indicators of potential noncompliance include: 1) runoff flowing through areas of livestock usage and entering waters of the state, 2) livestock waste located in drainage ditches or areas of flooding, or 3) *E. coli* counts that exceed state water quality standards. Livestock facilities located near streams should employ an adequate runoff control and waste management system.

Wastes can also include excess sediment discharges. Indicators of potential noncompliance with Rule (3) include: 1) visible active erosion scars, 2) sediment-laden runoff, or 3) obvious deposits of sediment on the stream or canal bottom that can be traced to a specific source.

Definitions:

Wastes include manure, commercial fertilizers, soil amendments, composts, vegetative materials, or any other substances that will or may cause water pollution (ODA's OAR 603-095-0010(53)). Therefore, 'wastes' also include sediment.

Waste discharge means the discharge of waste, either directly or indirectly, into waters of the state (ODA's OAR 603-095-0010(54)).

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 (state statute for water quality: ORS 468B.005(7)).

Waters of the state include lakes, bays, ponds, impounding reservoirs, springs, wells, rivers, streams, creeks, marshes, inlets, canals, and all other bodies of surface or underground waters, natural or artificial, public or private (except those private waters which do not connect to natural surface or underground waters) within Oregon (from state statute for water quality: ORS 468B.005(8)).

2.5.3 Riparian Areas

OAR 603-95-3540
(3) Effective June 3, 2007, agricultural management activities in the riparian area of perennial streams will be conducted in a manner that allows for the establishment, growth, and maintenance of riparian vegetation consistent with vegetative site capability so as to provide streambank stability and shade.
(a) Exemptions from OAR 603-095-3540(3) are:
(A) Stream crossings, access for irrigation equipment and other accepted water dependent agricultural uses when conducted in a manner that minimizes impacts on streambank stability
(B) Streams that do not support native trout and are inaccessible to anadromous fish because of barriers at their junction with the Pacific Ocean.
(C) This rule is not intended to prohibit riparian grazing where it can be done while meeting the above vegetative conditions.

This Rule was developed to clearly show that landowners are not required to have mature riparian vegetation immediately but only that they must allow for the establishment, growth, and maintenance. Streamside area condition can improve several water quality parameters by providing shade (temperature, aquatic weeds / algae, and dissolved oxygen) and streambank stability (mercury, pesticides, and dissolved oxygen).

This Rule specifies that "agricultural activities" must allow for riparian vegetation to develop to make it clear that landowners are not responsible for the impacts of browsing activities of wildlife such as elk, geese, and beaver.

Definitions:

A ***riparian area*** is an edge or bank of a river, tributary, or other body of water.

Site capability means the ability of a site to provide for the development of potential structural and functional properties. Structural properties include, among other things, vegetation and soil characteristics. Functional properties include processes such as energy and nutrient flow. Capabilities to produce and sustain these properties are site specific (Barrington et al, 2001). For additional references on site capability and related concepts, please consult the following in the references section: Gregory et al, 1991; Hunsaker and Levine, 1995; Leonard et al, 1992; Montgomery, 1999; Palik et al, 2000; Prichard, 1998; Winter, 2001; Winward, 2000.

ODA is responsible for determining site capability. This determination is based on soils, topography, climate, and other site characteristics that are described in U.S. Department of Agriculture soil surveys and through on-site visits.

2.5.4 Role of Upland Vegetation to Prevent and Control Pollution

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

Healthy upland areas provide several important water quality and ecological functions, including:

- Capture, storage, and slow release of precipitation reflective of natural conditions.
- Plant health and diversity that support cover and forage for wildlife and livestock.
- Filtration of sediment and polluted runoff.

Plant growth that increases root mass, utilizes nutrients, and stabilizes soil to prevent erosion.

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.

Goals

Goal of the Committee

To set forth agricultural management opportunities that result in the continued protection of water quality in the watersheds of Curry County.

Area Plan Goal

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

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

1. To raise public awareness of agriculture's contribution in protecting water quality;
2. To provide public involvement opportunities to share information about positive agricultural management practices;
3. To have a plan that is developed locally, supported by the local people, implemented voluntarily, and which achieves regulatory water quality mandates for agricultural practices;
4. To protect water quality by limiting, to the extent feasible, undesirable contributions from agricultural practices.

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

1. Sufficient site-capable vegetation established along streams to stabilize streambanks, filter overland flow, and moderate solar heating;
2. Crop lands covered throughout the year with either production crops, crop residues, or cover crops;
3. Pastures with minimal bare ground;
4. Minimal or no irrigation runoff to streams. Only clean water without excess sediment, nutrients, or chemicals is relayed to waterways;
5. Manure management takes place away from streams, piles are covered where feasible, other BMPs limit runoff and contamination of groundwater.

3.1 Measurable Objectives and Strategic Initiatives

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

3.1.1 Management Area

ODA is working with SWCDs and LACs throughout Oregon toward establishing long-term measurable objectives to achieve desired conditions. Currently, ODA and the Curry SWCD are using Focus Area measurable objectives and the Pistol River SIA to show progress in this Management Area. These are described below.

3.1.2 Focus Areas

A local prioritization team met in 2011 to prioritize watersheds for the Focus Area process. Members included representatives from Curry SWCD, local watershed councils, the water quality monitoring coordinator for the SWCD and watershed councils, OSU Extension, the local DEQ basin coordinator, and ODA. The Curry SWCD water quality monitoring coordinator compiled extensive spreadsheets on water quality data to assist with the process. The group used four parameters to score each 5th field watershed: 1) current water quality conditions; 2) potential willingness of landowners to work with the SWCD; 3) prior work in watershed; and 4) number of beneficial uses. The final result was that two neighboring watersheds, Floras and New River, were identified as being highest priority and interlinked.

The North Langlois Creek and Langlois Creek subwatersheds were chosen as the top priority areas. *E. coli* and elevated levels of nitrogen and phosphorus were identified as the highest water quality concerns for the priority area. Livestock exclusion, management of lateral ditch systems, and upland pasture management were determined by the group to have the most impact on the water quality parameters and would be the focus of the district's and watershed councils' efforts.

Morton Creek Focus Area

The Morton Creek Focus Area closed in June 2021 when ODA made Focus Areas optional for SWCDs across the state. Langlois Creek was discontinued July 1, 2017.

A summary of the results from the Morton Creek Focus Area are included in Chapter 4. The Curry SWCD and Curry Watersheds Partnership are continuing to make progress in the Morton Creek subwatershed, beyond the Focus Area process.

Morton Creek is an 1,850-acre subwatershed of New River that comprises coastal plain, stream valley, and hillslope topography. Land use consists of agriculture (approximately 93 percent), nonindustrial forestry (approximately 5 percent), rural residential (2 percent), and rock quarrying (less than 0.01 percent). Approximately 10 landowners are engaged in dispersed livestock production (cattle and sheep ranching), which accounts for nearly 99 percent of the agricultural activity in the watershed, and one landowner operates an approximately 20-acre cranberry farm. Within the watershed there are approximately 17.5 miles of perennial and intermittent stream channel, of which 15.8 miles are on agricultural lands. The SWCD assessed 192.41 acres along streams on agricultural lands to track improvements.

The local prioritization process described above ranked Morton Creek as the second highest priority subwatershed behind North and South Langlois Creeks. The Curry SWCD is helping willing landowners install exclusion fencing and/or plant native riparian vegetation. Implementation of these types of projects will address temperature, bacteria, sediment, and nutrient parameters in the Morton Creek Focus Area. Additionally, Curry SWCD is working with

landowners to address pasture gullies that contribute to elevated turbidity levels during intense runoff events.

Assessment Method: Streamside vegetation was evaluated with ODA's Streamside Vegetation Assessment (SVA) to assess the type of vegetation within 35 feet of both banks of perennial and intermittent streams. 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: In 2014, the Curry SWCD completed the SVA for the Morton Creek subwatershed. Streamside areas were analyzed using GIS aerial photos and results were then ground-truthed from public vantage points, such as public roads. Streamside vegetation conditions were classified using 11 SVA Map Categories: Ag Infrastructure, Bare, Bare Ag, Grass, Grass Ag, Not Ag, Shrub, Shrub Ag, Tree, Tree Ag, Water.

Condition of 192.41 agricultural acres within 35 feet of a stream

- 2015: [Grass-Ag + Bare-Ag] = 44.80 acres
- 2017: [Grass-Ag + Bare-Ag] = 44.66 acres

Focus Area Milestone:
By June 30, 2019: Reduce [Grass-Ag + Bare-Ag] by 2.5 acres to 42.16 acres

3.1.3 Strategic Implementation Areas (SIA)

Pistol River SIA (Initiated 2017)

The Pistol River SIA is in central Curry County, approximately 10 miles south of the city of Gold Beach. The SIA encompasses the Pistol River watershed from the confluence of the South Fork Pistol River to the Pacific Ocean. Land use in the 13,050-acre SIA is dominantly timber (52 percent) and forestry grazing (44 percent). The eastern two-thirds of the SIA are open range. Agricultural areas consist mostly of pasture and livestock. Water quality concerns are temperature, bacteria, nutrients and dissolved oxygen, based on limited available data. Aquatic species including the Southern Oregon/Northern California Coast (SONCC) coho salmon, Chinook, steelhead, cutthroat trout, and pacific lamprey use the mainstem, tributaries, and estuary of the Pistol River watershed.

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 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.

- **Compliance Opportunity (CO):** 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.
- **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 January 23, 2023, all 5 tax lots identified as a Potential Violation or a Compliance Opportunity will be downgraded to Restoration Opportunity or Likely in Compliance.

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 2023-2026 throughout the Management Area by Curry SWCD, Curry Watersheds Partnership, CREP, and NRCS

Activity	4-year Target
Landowner Engagement	
# events that actively engage landowners (workshops, demonstrations, tours)	8
# landowners participating in active events	100
Technical Assistance (TA)	
# landowners provided with TA (via phone/ walk-in/email/booth/site visit)	110
# site visits	280
# conservation plans written*	30
On-the-ground Project Funding	
# funding applications submitted	70
* 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.	

Additional focused efforts that are likely to improve agricultural water quality in the Curry County Management Area over the next four years include the Sixes Focused Investment Partnership, the Elk River Coho Strategic Action Plan, and implementation of the Langlois Drinking Water Protection Plan.

3.3 Additional Agricultural Water Quality and Land Condition Monitoring

3.3.1 Water Quality

3.3.1.1 DEQ Monitoring

DEQ monitors water quality in the Management Area as part of its ambient monitoring network. There are six DEQ ambient monitoring stations located in Curry County for Floras Creek, and the Sixes, Elk, Pistol, Chetco and Winchuck rivers. Additional information on the status of these stations can be found in Chapter 4.3.1.

3.3.1.2 SIA Monitoring

The Curry SWCD conducted water quality monitoring in the lower Pistol River watershed as part of the Strategic Implementation Area process. Summer water temperature was monitored at six sites (five in Crook Creek, one in Deep Creek) using continuous temperature loggers. Winter turbidity, specific conductivity, and *E. coli* were monitored by collecting grab samples at 14 locations in Pistol River, Crook Creek, Homestead Creek, Deep Creek, and two unnamed tributaries. The sampling plan was designed such that there is a sampling point located upstream of agricultural activities for each stream. This affords an opportunity to determine whether or not agricultural activities are having an impact on water quality. Monitoring was conducted between July 2020 and March 2022.

These efforts were designed to answer the following monitoring questions:

- If agricultural practices are contributing a detectable amount of sediment, bacteria, and temperature pollutants to tributaries of lower Pistol River, can that contribution be measurably reduced through the implementation of best management practices?
- Does water quality in the tributaries of lower Pistol River measurably affect water quality in the Pistol River mainstem?

3.3.1.3 ODA Temperature Monitoring

The Curry County SWCD is participating in a statewide, 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 SWCD selected Morton Creek because it had been a Focus Area with 2 miles of streamside plantings that should mature over time. They are monitoring six sites; stream temperature data are provided to DEQ annually and are incorporated in DEQ's Status and Trends Reports. 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 (2019-2022). See Chapter 3.1 for background and assessment methods.

4.1.1 Management Area

ODA is working with SWCDs and LACs throughout Oregon toward establishing long-term measurable objectives to achieve desired conditions. Currently, ODA and the Curry SWCD are using Focus Area measurable objectives and the Pistol River SIA to show progress in this Management Area.

4.1.2 Focus Areas

The Morton Creek Focus Area closed in June 2021 when ODA made Focus Areas optional for SWCDs across the state.

Table 4.1.2 Morton Creek Focus Area: 2019-2021

Measurable Objective and Milestone	
Increase trees and shrubs in the assessed riparian area by 2.5 acres through riparian planting projects.	
Progress Toward Measurable Objectives and Milestones	
The milestone was set based on what Curry SWCD thought it would accomplish on Property 2; however, progress has been slower than expected. The owner of Property 2 is new to working with the SWCD and deciding on a project design has involved a lot of discussion with the landowner, the SWCD, and ODFW. The Curry Watersheds Partnership continues to move toward progress in the Morton Creek area. A large extensive stream remeander project with extensive riparian planting, fencing, and offstream watering is in the engineering phase. Implementation will likely occur in 2024.	
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	7
# site visits	13
# conservation plans written	2
Ag Water Quality Practices Implemented in the Focus Area	
Livestock Offstream Watering Facilities	10

4.1.3 Strategic Implementation Areas

Table 4.1.3 2017 Pistol River SIA

Evaluation Results	
As of January 23, 2019, 5 tax lots were identified as either a Potential Violation or a Compliance Opportunity. PV = 0, CO = 5, RO = 5, LC = 97	
Measurable Objective	
As of January 23, 2023, all 5 tax lots identified as a Potential Violation or a Compliance Opportunity will be downgraded to Restoration Opportunity or Likely in Compliance.	
Post Evaluation	
As of March 12, 2019, 4 tax lots identified as a Potential Violation or a Compliance Opportunity were downgraded to Restoration Opportunity or Likely in Compliance. PV = 0, CO = 1, RO = 9, LC = 97. The measurable objective was not achieved. ODA was unable to contact one landowner after several attempts and that tax lot remains a Compliance Opportunity.	
Adaptive Management Discussion *Was measurable objective achieved?*	
SIA is closed and ODA's work is completed. ODA and partners did not meet their measurable objective due to one unresponsive landowner. The property has since changed ownership. Cattle currently graze the pastures and are having less of an impact on Crook Creek than the previous horses were. The Curry SWCD contracted with River Design Group to produce a hydraulic model of the lower Pistol River watershed. The modeling showed how the river would behave at varying flows, with varying alterations, and revealed a suite of potential viable restoration actions on agricultural land in the SIA. The Curry SWCD worked with a landowner in the SIA to install 3,800 feet of livestock exclusion fence along an oxbow channel on grazing land in the lower watershed. OWEB Small Grant Program funds were utilized for the project. The Curry SWCD continues to work in this area. The SIA process led to landowner contacts and project concepts and designs for which the SWCD continues to seek implementation funding. The Pistol River area was chosen in part because the SWCD had not focused as much effort in this area as in other portions of the district. It takes time to develop relationships and trust with landowners, develop projects, secure funding, and implement on-the-ground projects. The Pistol River SIA effort will likely continue to lead to progress to improve water quality and aquatic habitat into the future.	
Activity	**Accomplishment**
# acres evaluated	4,078
# stream miles evaluated	31
# landowners at Open House	20
# landowners receiving outreach materials	71
SWCD and Conservation Partners	
# landowners provided with technical assistance	6
# site visits	44
# conservation plans written	0
SIA and Project Funding	
# funding applications submitted	9
# funding applications awarded	6

4.1.4 Pesticide Stewardship Partnerships

There are no PSPs in this Management Area.

4.1.5 Groundwater Management Area

There is no GWMA in this Management Area.

4.2 Activities and Accomplishments

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

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

Table 4.2a Activities conducted in 2019-2022 throughout the Management Area by Curry SWCD, Curry Watersheds Partnership, CREP, and NRCS

Activity	4-year results	Description
Landowner Engagement		
# events that actively engage landowners (workshops, demonstrations, tours)	5	Every year NRCS holds a local work group meeting that determines the local resource concerns.
# landowners participating in active events	25	
Technical Assistance (TA)		
# landowners provided with TA (via phone/walk-in/email/booth/site visit)	107	Assistance with planning, project design, seeking grant funding, implementation, etc.
# site visits	274	Site visits on agricultural land to provide technical assistance to landowners.
# conservation plans written**	31	
On-the-ground Project Funding		
# funding applications submitted	68	Grant applications submitted to fund agricultural water quality projects.
# funding applications awarded	56	Grant applications funded for agricultural water quality projects.
** 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.		

Tables 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.

ODA has recently initiated annual reporting to DEQ for agricultural water quality implementation related to TMDLs. See Table 4.2d.

Table 4.2b Implementation funding (cash and in-kind) for projects on agricultural lands reported 1997-2021 (OWRI data include most, but not all projects, implemented in the Management Area.)

Landowners	OWEB	DEQ	NRCS*	All other sources**	TOTAL
$1,020,973	$2,176,522	$185,815	$168,242	$2,748,562	$6,300,114

* 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		1,141		
Road	42		258	
Streamside Vegetation	122	597		
Wetland		21		
Instream Habitat	24			
Instream Flow	0		0 cfs	
Fish Passage	29		39	
TOTAL	**217**	**1,759**	**297**	

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

Table 4.2d AgWQ practices implemented 2019-2022 throughout the Management Area by Curry SWCD, Curry Watersheds Partnership

Quarter #	12-Digit HUC #	NRCS Pract. Code	NRCS Practice Name	NRCS Unit (acres, feet, #)	How Many Implemented	Notes	Funding Source(s): (e.g., OWEB, CREP, EQIP, etc.)
7	171003 060102	391	Riparian Forest Buffer (Willow Creek)	acres	3.96	Tree/shrub planting	OWEB/BLM
8	171003 060102	612	Tree/shrub estab, moisture conservation (Willow Creek)	acres	3.96		OWEB/BLM
8	171003 060102	612	Tree/shrub estab, moisture conservation (Willow Creek trib)	acres	0.15		OWEB
8	171003 060203	612	Tree/shrub estab, moisture conservation (Crystal Creek)	acres	2.1		OWEB

8	171003 060102	612	Tree/shrub estab, moisture conservation (Floras Creek)	acres	11.5		OWEB/BLM
1	171003 060203	612	Tree/shrub estab, moisture conservation (Crystal Creek)	acres	2.1		OWEB/WRCA
1	171003 060102	612	Tree/shrub estab, moisture conservation (Floras Creek)	acres	2.5		OWEB/BLM
1	171003 060102	612	Tree/shrub estab, moisture conservation (Willow Creek)	acres	3.96		OWEB/BLM
1	171003 060104	612	Tree/shrub estab, moisture conservation (S. Langlois Creek)	acres	2.1		BLM
1	171003 060203	396	Aquatic Organism Passage	miles	1.27	NF Crystal ranch road fish passage culvert	Landowner
1	171003 060102	396	Aquatic Organism Passage	miles	0.75	Johnson Creek ranch road fish passage culvert	OWEB, BLM
3	171003 060302	391	Riparian Forest Buffer (Cedar Creek)	acres	1.28		OWEB, USFWS
3	171003 060102	391	Riparian Forest Buffer (Willow Creek)	acres	0.30		WRCA
3	171003 060102	612	Tree/shrub estab, moisture conservation (Willow Creek)	acres	4.26		OWEB, WRCA

3	171003 060203	612	Tree/shrub estab, moisture conservation (Crystal Creek)	acres	2.1		WRCA
3	171003 060102	612	Tree/shrub estab, moisture conservation (Floras Creek)	acres	2.5		OWEB, BLM
3	171003 060102	391	Riparian Forest Buffer (Floras Creek)	acres	0.35		OWEB, BLM
3	171003 060102	614	Watering Facility	sites	14	Livestock drinking water troughs	OWEB, Landowner
4	171003 060302	612	Tree/shrub estab, moisture conservation (Elk River)	acres	3.6	Elk River mainstem	NOAA, OWEB
4	171003 060102	614	Watering Facility	sites	3	Livestock drinking water troughs	OWEB, BLM
6	171003 120202	614	Watering Facility	sites	6	Livestock drinking water troughs	OWEB, Landowner
7	171003 060302	391	Riparian Forest Buffer (Cedar Creek)	acres	1.69		OWEB, USFWS
7	171003 120202	391	Riparian Forest Buffer (Winchuck River)	acres	0.2		USFS
7	171003 060102	612	Tree/shrub estab, moisture conservation (Willow Creek)	acres	4.26		OWEB, BLM
7	171003 060302	612	Tree/shrub estab, moisture conservation (Cedar Creek)	acres	2.97		OWEB, BLM

7	171003 060302		Riparian Forest Buffer (Kermit Cr)	acres	13.08	2650 seedlings planted	NOAA
8	171003 060102	612	Tree/shrub estab, moisture conservation (Floras Creek)	acres	18.19	Released seedlings at 4 sites in Langlois' SWPA	DWPP (BLM)
2	171003 060203	580	Streambank and shoreline protection	feet	200		Landowner
4	171003 060102	612	Tree/shrub estab, moisture conservation (Willow Creek)	acres	3.96	Riparian restoration	OWEB/BLM
4	171003 060302	612	Tree/shrub estab, moisture conservation (Cedar Creek Elk River)	acres	7	Riparian restoration	Oregon Dept. of Forestry
4	171003 060302	612	Tree/shrub estab, moisture conservation (Kermit Creek & Elk River)	acres	43	Riparian restoration	Oregon Dept. of Forestry
5	171003 060102	580	Streambank and shoreline protection	feet	200		OWEB /Landowner
5	171003 060102	578	Stream Crossing	#	1	Livestock bridge	BLM/Landowner
5	171003 120404	382	Fence	feet	3,800	Riparian fence	OWEB/Landowner
5	171003 060302	580	Streambank and shoreline protection	feet	1,200	Riverbank Restoration	WSC (NOAA)/ NFWF/ USFS RAC

4.3 Additional Agricultural Water Quality and Land Condition Monitoring

4.3.1 Water Quality

4.3.1.1 DEQ Monitoring

DEQ analyzed data for *E. coli*, pH, dissolved oxygen, temperature, total phosphorus, and TSS in the Management Area (DEQ, 2022 Oregon Water Quality Status and Trends Report, (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.

DEQ's ambient monitoring sites in the Curry Management Area include Sixes River at HWY 101, Elk River at HWY 101, Floras Creek upstream of HWY 101, Pistol River at Pistol River Loop Road, Chetco River at USGS gage, and the Winchuck River at HWY 101.

The Oregon Department of Agriculture received funding in the 2011 Legislative Session to conduct water quality monitoring at agriculturally influenced sites around the state. ODA worked with DEQ to select sites that would specifically determine trends in water quality from agricultural lands.

Table 4.3.1.1 shows surface waters with statistically significant trends of improving, degrading, or holding steady for the period of 2016-2020. This table is a small subset of the more than 1,050 sites and parameters examined in the 2022 Status and Trends Report. Sites that are degrading should be examined more closely to determine the potential source of the degradation while those sites that are improving or holding steady should seek to continue or improve current actions.

Table 4.3.1.1 Surface waters showing improving, degrading, or steady statistical trends in the South Coast Basin (2016-2020). Information generated from the DEQ 2022 Status and Trends Report for the South Coast DEQ Ambient Water Quality Monitoring sites.

Station ID	Station Name	Subbasin Name	Parameter	Status 2016-2020	Trend
12590-ORDEQ	Floras Creek at HWY 101	Floras	Dissolved Oxygen	Attaining	No Trend
10533-ORDEQ	Sixes River at HWY 101	Sixes	Dissolved Oxygen	Attaining	Improving
11905	Elk River at HWY 101	Elk	Dissolved Oxygen	Attaining	Improving
11493-ORDEQ	Pistol River at Pistol River Loop Road	Pistol	Dissolved Oxygen	Attaining	Degrading
11483-ORDEQ	Chetco River at USGS Gage	Chetco	Dissolved Oxygen	Attaining	No Trend
10537-ORDEQ	Winchuck River 1.3 miles upstream of HWY 101	Winchuck	Dissolved Oxygen	Attaining	Degrading
12590-ORDEQ	Floras Creek at HWY 101	Floras	E. Coli	Attaining	Degrading
10533-ORDEQ	Sixes River at HWY 101	Sixes	E. Coli	Attaining	Degrading
11905-ORDEQ	Elk River at HWY 101	Elk	E. Coli	Attaining	Degrading
10537-ORDEQ	Winchuck River 1.3 miles upstream of HWY 101	Winchuck	E. Coli	Attaining	Degrading
12590-ORDEQ	Floras Creek at HWY 101	Floras	pH	Attaining	No Trend
10533-ORDEQ	Sixes River at HWY 101	Sixes	pH	Attaining	No Trend
11905-ORDEQ	Elk River at HWY 101	Elk	pH	Attaining	Steady
11493-ORDEQ	Pistol River at Pistol River Loop Road	Pistol	pH	Attaining	Degrading

11483-ORDEQ	Chetco River at USGS Gage	Chetco	pH	Attaining	Steady
10537-ORDEQ	Winchuck River1.3 miles upstream of HWY 101	Winchuck	pH	Attaining	Degrading

Temperature, total phosphorus, and total suspended solids were not assessed for the 2016-2020 period for the DEQ 2022 Status and Trends Report; additionally, insufficient data exists to derive a trend for these parameters at this time. This represents a significant data gap that will need to be addressed by DEQ and partners to continue to track land use management strategies that seek to improve water quality.

4.3.1.2 SIA Monitoring

The monitoring activities completed in the Pistol River SIA indicate that agricultural activities are not regularly contributing to degraded winter water quality in tributaries or the Pistol River mainstem. Summer water temperature is of some concern in the lower reaches of Crook Creek, but it is not clear that agricultural activities are responsible for the elevated stream temperatures. Future monitoring efforts will attempt to understand the hydrology of Crook Creek in order to better focus efforts to address summer water temperature in the lower reaches of the stream.

4.3.1.3 ODA Temperature Monitoring

The Curry County SWCD is 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 SWCD selected Morton Creek because it had been a Focus Area with 2 miles of streamside plantings that should mature over time. They are monitoring six sites; stream temperature data are provided to DEQ annually and are incorporated in DEQ's Status and Trends Reports. ODA will write the final report.

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 March 23, 2023, 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
The private agricultural landowners in Curry County continue to make significant progress to protect and improve water quality in partnership with the Curry SWCD, Curry Watersheds Partnership, CREP, and NRCS.
Impediments
• Illegal marijuana cartel activity is a water quality and quantity concern in Curry County.

• Concerns about conversion of forest land to agricultural land use ahead of the Private Forest Accord. • Concerns that land may turn to invasive weeds, such as gorse, rather than be properly converted to productive ag pasture.
Recommended Modifications and Adaptive Management
• In current and future versions of the Plan reporting, be sure to include all applicable progress for agricultural water quality on private lands. Include implementation efforts such as the Sixes Focused Investment Partnership, Elk River Salmon Action Plan, and Langlois Drinking Water Protection. Also include a full list of implemented projects, not an oversimplified summary. • Include information in the Plan regarding the benefits of beaver on ag water quality and aquatic habitat. • Include updated fisheries information.

Table 4.4b Number of ODA compliance activities (Jan. 1, 2019 through Dec. 31, 2022)

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	0	0	6	0	2	3	0	0
Within SIA	1	1	3	0	0	0	0	0

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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.

Appendix B: Pesticide Management for Water Quality Protection

Pesticides

Always apply chemicals in accordance with the label requirements in order to minimize crop damage, buildup of chemicals in the soil, potential runoff, and leaching into groundwater. Read the label, and as required by ORS 634.372(2) and (4), follow label recommendations for both restricted use and non-restricted use pesticides. DEQ now requires a permit for pesticide applications in, over, or within 3 feet of water. This permit provides coverage for pesticide applications to control mosquitoes and other flying insect pests, weeds, algae, nuisance animals, and area-wide pest control (see: www.deq.state.or.us/wq/wqpermit/pesticides.htm).

Calibrate, maintain, and correctly operate application equipment. Spray rigs need to be calibrated each time there is a change in product and/or application rate. Nozzles need to be replaced often, particularly if an abrasive pesticide formulation (such as wettable powders) is used. Sprayers need to be operated in the correct pressure range (dictated by the material and nozzle combination used), to prevent excess drift to non-target areas (e.g., waters of the state).

Adopt integrated pest management (IPM) strategies. IPM promotes a diverse, multi-faceted approach to pest control. This strategy establishes an economic threshold for control actions, to guide the manager to use a variety of field/orchard sanitation and cultural practices, field scouting, beneficial insects, and other biological controls, and the use of properly selected chemical pesticides. While IPM does not exclude the use of chemical pesticides, it does seek to optimize their use and minimize off-target movement into the environment.

Establish appropriate vegetative buffer strips. Buffer strips will help to retain soil (which may include pesticides) and surface runoff (which may have dissolved pesticides) from making contact with waters of the state.

Store and handle pesticide materials correctly. Storage and handling facilities should be secure and include a leak-proof pad with curbing for mixing and loading. An alternative to a permanent, concrete pad is to always mix pesticides in the field; frequently moving sites prevent chemical buildup. Wash/rinse water should be directly applied to the appropriate crop. Empty liquid pesticide containers should be triple rinsed, then punctured and disposed of in an approved manner. Dry chemical bags should be emptied completely. Bundle and store paper bags until they can be disposed of in an approved manner.

Watch for a pesticide waste collection days held throughout the state. These events allow individuals to safely and anonymously drop off unwanted, unused, or out of date agricultural pesticides, along with some empty containers.