Mid Coast Agricultural Water Quality Management Area Plan

September 2019

Developed by the

Oregon Department of Agriculture

Mid Coast Local Advisory Committee

With support from the

Lincoln and Siuslaw Soil and Water Conservation Districts

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Acronyms and Terms Used in this Document

Ag Water Quality Program – Agricultural Water Quality Management Program
Area Plan – Agricultural Water Quality Management Area Plan
Area Rules – Agricultural Water Quality Management Area Rules
CAFO – Confined Animal Feeding Operation
CNPCP – Coastal Nonpoint Pollution Control Program
CWA – Clean Water Act
CZARA – Coastal Zone Act Reauthorization Amendments
DEQ – Oregon Department of Environmental Quality
DMA – Designated Management Agency
GWMA – Groundwater Management Area
HABs – Harmful Algal Blooms
LAC – Local Advisory Committee
LMA – Local Management Agency
Management Area – Agricultural Water Quality Management Area
MOA – Memorandum of Agreement
NPDES – National Pollution Discharge Elimination System
NRCS – Natural Resources Conservation Service
OAR – Oregon Administrative Rules
ODA – Oregon Department of Agriculture
ODF – Oregon Department of Forestry
OHA – Oregon Health Authority
ORS – Oregon Revised Statute
OWEB – Oregon Watershed Enhancement Board
PCSRF – Pacific Coast Salmon Recovery Fund
PMP – Pesticides Management Plan
PSP – Pesticides Stewardship Partnership
RCA – Required Corrective Action
SIA – Strategic Implementation Area
SWCD – Soil and Water Conservation District
TMDL – Total Maximum Daily Load
USDA – United States Department of Agriculture
US EPA – United States Environmental Protection Agency
WPCF – Water Pollution Control Facility
WQPMT – Water Quality Pesticides Management Team

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)). It references associated Agricultural Water Quality Management Area Rules (Area Rules), which are Oregon Administrative Rules (OARs) 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 state and federal law (OAR 603-090-0030(1)). At a minimum, an Area Plan must:

- Describe the geographical area and physical setting of the Management Area.
- List water quality issues of concern.
- List impaired beneficial uses.
- State that the goal of the Area Plan is to prevent and control water pollution from agricultural activities and soil erosion and to achieve applicable water quality standards.
- Include water quality objectives.
- Describe pollution prevention and control measures deemed necessary by ODA to achieve the goal.
- Include an implementation schedule for measures needed to meet applicable dates established by law.
- Include guidelines for public participation.
- Describe a strategy for ensuring that the necessary measures are implemented.

Plan Content

Chapter 1: Agricultural Water Quality Management Program Purpose and Background. The purpose is to have 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 available practices to address water quality issues.

Chapter 3: Implementation Strategies. Presents goal(s), measurable objectives, timelines, and strategies to achieve these goal(s) and objectives.

Chapter 4: Implementation, Monitoring, and Adaptive Management. ODA and the Local Advisory Committee (LAC) will work with knowledgeable sources to summarize land condition and water quality status and trends to assess progress toward the goals and objectives in Chapter 3.

Chapter 1: Agricultural Water Quality Management Program Purpose and Background

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

As part of Oregon's Agricultural Water Quality Management 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 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 developed to implement the Area Plan, 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 603-095-2200 to OAR 603-095-2260). The Ag Water Quality Program's general rules guide the Ag Water Quality Program, and the Area Rules for the Management Area are the regulations that landowners are required to follow. Landowners will be encouraged through outreach and education to implement conservation 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 a few 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 lands in Oregon is regulated by DEQ and on Tribal Trust lands by the respective tribe, with oversight by the United States Environmental Protection Agency (US EPA).

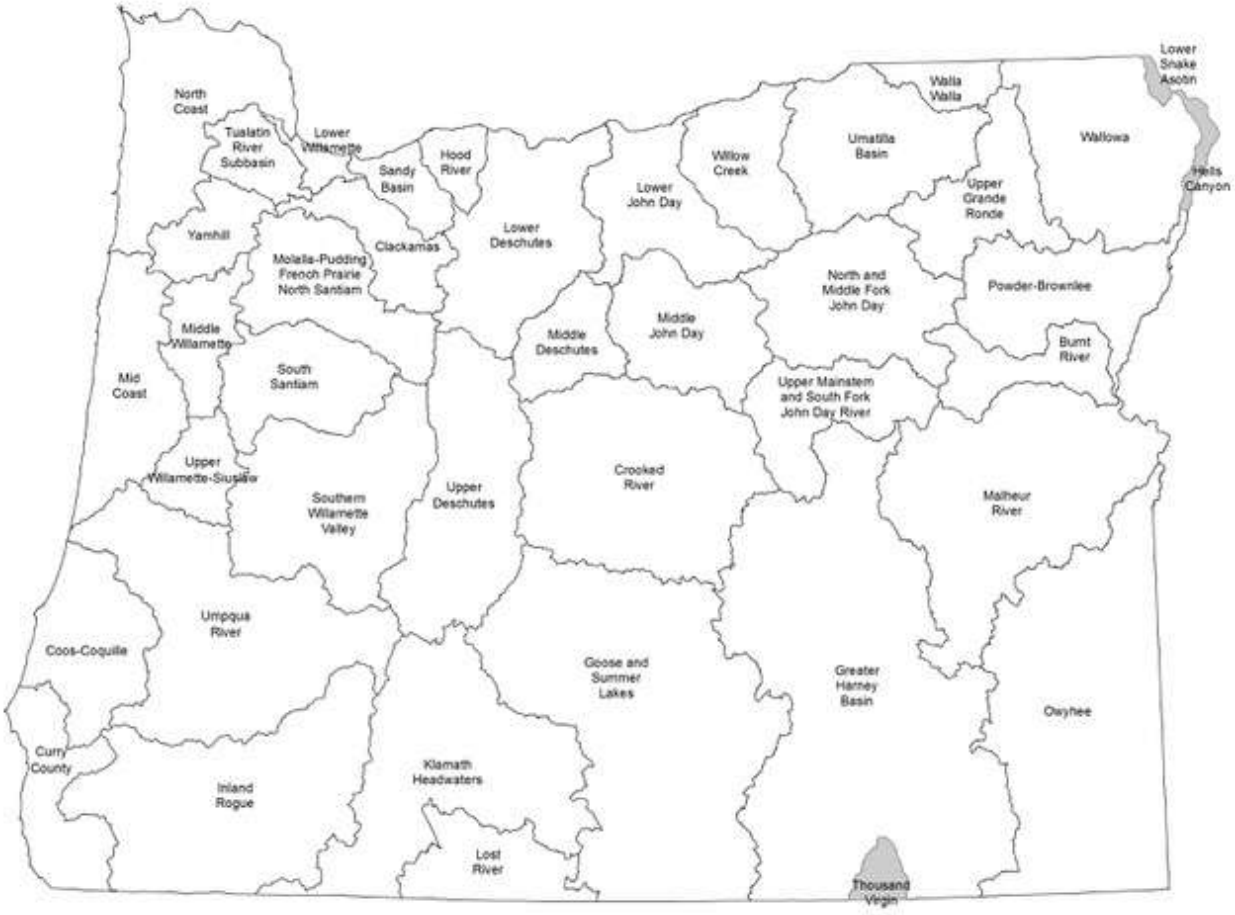
1.2 History of the Ag Water Quality Program

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, to 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). 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: Map of 38 Agricultural Water Quality Management Areas
Grey areas are not incorporated into Ag Water Quality Management Areas



1.3 Roles and Responsibilities

1.3.1 Oregon Department of Agriculture

The Oregon Department of Agriculture 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 carry out a water quality management plan 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:

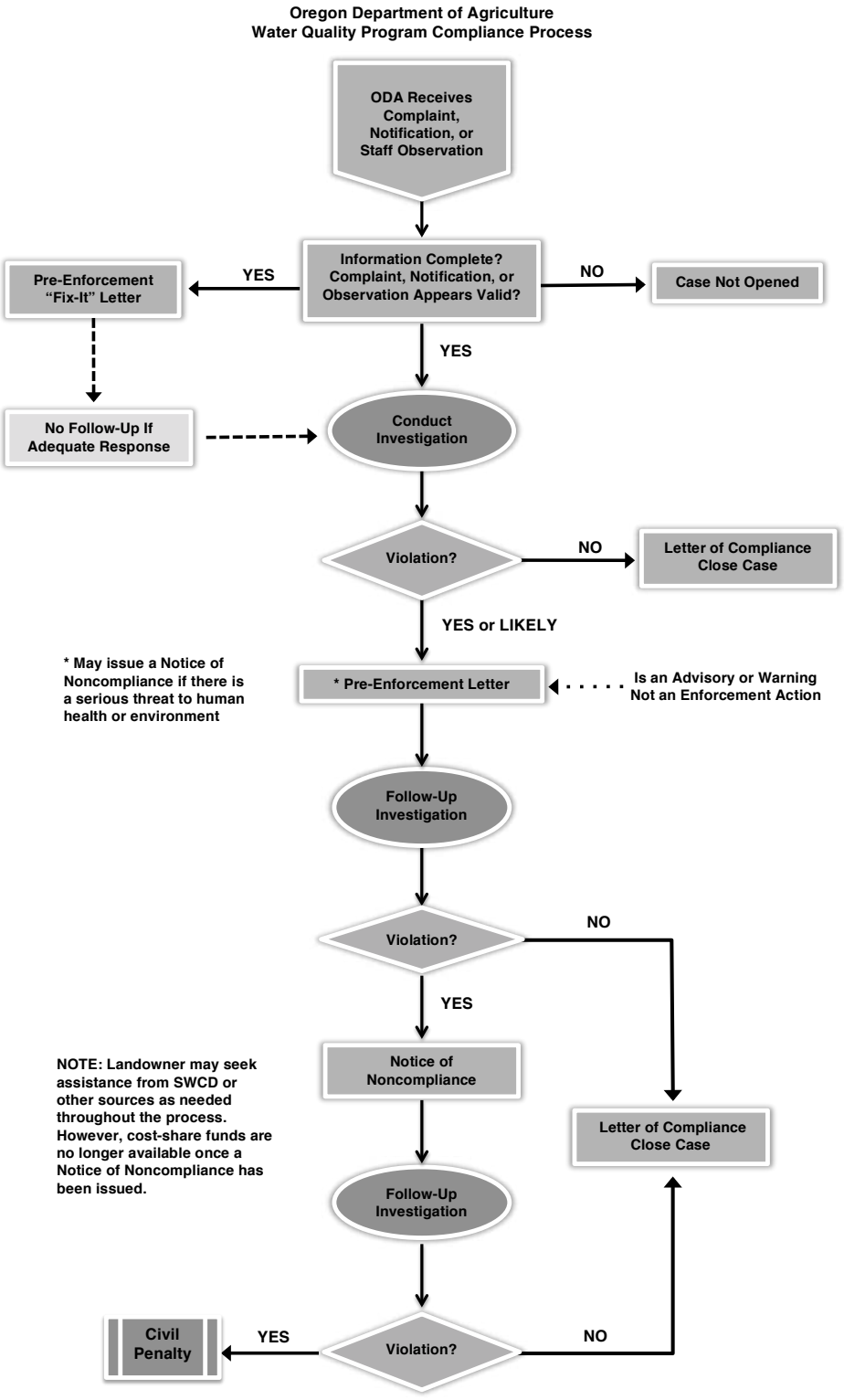
- State water quality standards,
- Load allocations for agricultural or nonpoint source pollution assigned under Total Maximum Daily Loads (TMDLs) issued pursuant to the federal Clean Water Act (CWA), Section 303(d),
- Approved management measures for Coastal Zone Act Reauthorization Amendments (CZARA),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

The Oregon Department of Agriculture has the legal authority to develop and implement Area Plans and Area Rules for the prevention and control of water pollution from agricultural activities and soil erosion, where such plans are required by state or federal law (ORS 568.909 and ORS 568.912). 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. 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 gain compliance with Area Rules. Figure 2 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 the condition through required corrective actions (RCAs) 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 RCAs, ODA may assess civil penalties for continued violation of the 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.

Any member of the public may file a complaint, and any public agency may file a notification of a violation of an Area Rule. As a result, ODA may initiate an investigation (See Figure 2).

Figure 2: Compliance Flow Chart



1.3.2 Local Management Agency

A Local Management Agency (LMA) is an organization that ODA designated to assist with the implementation of an Area Plan (OAR 603-090-0010). The Oregon Legislature's intent is for SWCDs to 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 a LAC (OAR 603-090-0020) with as many as 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 in the development, implementation, and biennial reviews of the Area Plan and Area Rules. The LAC's primary role is to provide advice and direction to 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 their responsibilities, which include but are not limited to:

- Participate in the development and subsequent revisions of the Area Plan,
- Participate in the development and subsequent revisions of the 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. However, 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 a suite of measures to protect water quality. 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 also may 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:

- Conditions resulting from unusual weather events,

- Hot springs, glacial melt water, extreme or unforeseen weather events, and climate change,
- 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.

The Oregon Department of Agriculture, the LACs, and the SWCDs 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 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. Significant 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 many are regulated under ODA's CAFO Program. Pesticide applications in, over, or within three feet of water also are regulated as point sources. Irrigation water flows from agricultural fields may be at a defined outlet but they do not currently require a permit.

Nonpoint 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 in OARs for each basin. They may include: public and private domestic water supply, industrial water supply, irrigation, livestock watering, fish and aquatic life, wildlife and hunting, fishing, boating, water contact recreation, aesthetic quality,

hydropower, and commercial navigation and transportation. 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.

Many waterbodies throughout Oregon do not meet state water quality standards. Many of these waterbodies have established water quality management plans that document needed pollutant reductions. The most common water quality concerns related to agricultural activities are temperature, bacteria, biological criteria, sediment and turbidity, phosphorous, algae, pH, dissolved oxygen, harmful algal blooms (HABs), nitrates, pesticides, and mercury. Water quality impairments vary by Management Area and are summarized in Chapter 2.

1.4.3 Impaired Water Bodies and Total Maximum Daily Loads

Every two years, DEQ is required by the CWA to assess water quality in Oregon. CWA Section 303(d) requires DEQ to identify a list of waters that do not meet water quality standards. The resulting list is commonly referred to as the 303(d) list. In accordance with the CWA, DEQ must establish TMDLs for pollutants that led to the placement of a waterbody on the 303(d) list.

A TMDL includes an assessment of water quality data and current conditions and describes a plan to achieve conditions so that water bodies will meet water quality standards. TMDLs specify the daily amount of pollution a waterbody can receive and still meet water quality standards. In the TMDL, point sources are allocated pollution limits as "waste load allocations" that are then incorporated in National Pollutant Discharge Elimination System (NPDES) waste discharge permits, while a "load allocation" is established for nonpoint sources (agriculture, forestry, and urban). The agricultural sector is responsible for helping achieve the pollution limit by achieving the load allocation assigned to agriculture specifically, or to nonpoint sources in general, depending on how the TMDL was written.

Total Maximum Daily Loads generally apply to an entire basin or subbasin, not just to an individual waterbody on the 303(d) list. Water bodies will be listed as achieving water quality standards when data show the standards have been attained.

As part of the TMDL process, DEQ identifies the Designated Management Agency (DMA) or parties responsible for submitting TMDL implementation plans. TMDLs designate the local Area Plan 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.

For more general and specific information about Oregon's TMDLs, see: www.oregon.gov/deq/wq/tmdls/Pages/default.aspx. The list of impaired water bodies (303(d) list), the TMDLs, and the agricultural load allocations for the TMDLs that apply to this Management Area are summarized in Chapter 2.

1.4.4 Oregon Water Pollution Control Law – ORS 468B.025 and ORS 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 of the 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 to prevent and control water pollution from agriculture activities and to prevent and control soil erosion. Streamside vegetation can provide three primary water quality functions: shade for cool stream temperatures, 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.

Additional reasons for the Ag Water Quality Program's emphasis on streamside vegetation include:

- Streamside vegetation can improve water quality related to multiple pollutants, including: temperature (heat), sediment, bacteria, nutrients, and toxics (e.g., pesticides, heavy metals, etc.),
- Streamside vegetation provides fish and wildlife habitat,
- Landowners can improve streamside vegetation in ways that are compatible with their operation,
- Streamside vegetation condition is measurable and can be used to track progress in achieving desired site conditions.

Site-Capable Vegetation

The Ag Water Quality Program uses the concept of "site-capable vegetation" to describe the vegetation that agricultural streams can provide to protect water quality. Site-capable vegetation is the 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 vegetation consistent with site capability 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 for 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 recognizes removal as a good conservation activity and encourages landowners to remove these plants. Voluntary programs through SWCDs and watershed councils provide technical assistance and financial incentives for weed control and restoration projects. In addition, the Oregon State Weed Board identifies invasive plants that can negatively impact watersheds. Public and private landowners are responsible for eliminating or intensively controlling noxious weeds as may be provided by state and local law enacted for that purpose. For further information, visit www.oregon.gov/ODA/programs/weeds.

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

The Oregon Department of Agriculture is the lead state agency for the CAFO Program. The CAFO Program was developed to ensure that operators do not contaminate ground or surface water with animal manure or process wastewater. Since the early 1980s, CAFOs in Oregon have been registered to a general Water Pollution Control Facility (WPCF) permit designed to protect water quality. A properly maintained CAFO must implement a site-specific suite of structural and management practices to protect ground and surface water. To assure continued protection of ground and surface water, the 2001 Oregon State Legislature directed ODA to convert the CAFO Program from a WPCF permit program to a federal NPDES program. ODA and DEQ jointly issue the NPDES CAFO permit, which complies with all CWA requirements for CAFOs. In 2015, ODA and DEQ jointly issued a WPCF general CAFO permit as an alternative for CAFOs that are not subject to the federal NPDES CAFO permit requirements. Currently, ODA can register CAFOs to either the WPCF or NPDES CAFO permit.

Both of the Oregon CAFO 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 about the CAFO program, go to www.oregon.gov/ODA/programs/NaturalResources/Pages/CAFO.aspx.

1.5.2 Groundwater Management Areas

Groundwater Management Areas are designated by DEQ where groundwater has elevated contaminant concentrations resulting, at least in part, from nonpoint sources. After the GWMA is declared, a local groundwater management committee comprised of affected and interested parties is formed. The committee works with and advises the state agencies that are required to develop an action plan that will reduce groundwater contamination in the area.

Oregon 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.

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

The ODA Pesticides Program holds the primary responsibility for registering pesticides and regulating their use in Oregon under the Federal Insecticide Fungicide 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, the interagency Water Quality Pesticide Management Team (WQPMT) was formed to expand efforts to improve water quality in Oregon related to pesticide use. The WQPMT includes representation from ODA, Oregon Department of Forestry (ODF), DEQ, and Oregon Health Authority (OHA). The

WQPMT facilitates and coordinates activities such as monitoring, analysis and interpretation of data, effective response measures, and management solutions. The WQPMT relies on monitoring data from the Pesticides Stewardship Partnership (PSP) program and other 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.

The Oregon Department of Agriculture 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 OHA. The program provides individuals and communities with information on how to protect the quality of Oregon's drinking water. DEQ and OHA encourage preventive management strategies to ensure that all public drinking water resources are kept safe from current and future contamination. For more information see: www.oregon.gov/deq/wq/programs/Pages/dwp.aspx.

1.5.6 Oregon's Coastal Management Program and Coastal Zone Management Act Reauthorization Amendments (CZARA) of 1990

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 in compliance 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 geographical 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. Additional information about CZARA and Oregon's CNPCP can be found at: www.oregon.gov/LCD/OCMP/pages/watqual_intro.aspx.

1.6 Partner Agencies and Organizations

1.6.1 Oregon Department of Environmental Quality

The US EPA delegated authority to Oregon to implement the federal CWA in our state. DEQ is the lead state agency with overall authority to implement the CWA in Oregon. DEQ coordinates with other state agencies, including ODA and ODF, 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 NPDES permits for point sources, the CWA Section 319 grant program, Source Water Protection, the CWA Section 401 Water Quality Certification, and GWMAs. DEQ also coordinates with ODA to help ensure successful implementation of Area Plans.

A Memorandum of Agreement (MOA) between DEQ and ODA recognizes that ODA is the state agency responsible for implementing the Ag Water Quality Program. ODA and DEQ updated the MOA in 2012.

The MOA includes the following commitments:

- ODA will develop and implement a monitoring strategy, as resources allow, in consultation with DEQ,
- ODA will evaluate the effectiveness of Area Plans and Area Rules in collaboration with DEQ:
    - ODA will determine the percentage of lands achieving compliance with Area Rules,
    - ODA will determine whether the target percentages of lands meeting the desired land conditions, as outlined in the goals and objectives of the Area Plans, are being achieved.
- ODA and DEQ will review and evaluate existing information to determine:
    - Whether additional data are needed to conduct an adequate evaluation,
    - Whether existing strategies have been effective in achieving the goals and objectives of the Area Plans,
    - Whether the rate of progress is adequate to achieve the goals of the Area Plans.

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

Oregon Department of Agriculture and SWCDs work in close partnership with local, state, and federal agencies and organizations, including: DEQ (as indicated above), the United States Department of Agriculture (USDA) NRCS and 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 needed to achieve the measurable objective.

The AgWQ 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 implemented through focused work in small geographic areas (section 1.7.3), with a long-term goal of developing measurable objectives and monitoring methods at the Management Area scale.

The State of Oregon continues to improve its ability to use technology to measure current streamside vegetation conditions and compare it to the vegetation needed to meet stream shade targets to keep surface waters cooler. 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 incentive programs.

At each biennial review, ODA and its partners will evaluate progress toward the most recent 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 achieving the measurable objective(s) and will revise strategies to address obstacles and challenges.

The measurable objectives and associated milestones for the Area Plan are in Chapter 3 and progress toward achieving the measurable objectives and milestones is summarized in Chapter 4.

1.7.2 Land Conditions and Water Quality

Land conditions can serve as useful surrogates (indicators) for water quality parameters. For example, streamside vegetation generally is used as a surrogate for water temperature, because shade blocks solar radiation from warming the stream. In addition, sediment can be used as a surrogate for pesticides and phosphorus because they 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,
- Reductions in water quality 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 cost-prohibitive and could fail to 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 less likely to document the short-term effects of changing land conditions on water quality parameters such as temperature, bacteria, nutrients, sediment, and pesticides.

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 in the Focus Area. A key component of this approach 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 and is supported by a large body of scientific research (e.g. Council for Agricultural Science and Technology, 2012. Assessing the Health of Streams in Agricultural Landscapes: The Impacts of Land Management Change on Water Quality. Special Publication No. 31. Ames, Iowa).

Systematic implementation in Focus Areas provides the following advantages:

- Measuring progress is easier in a small watershed than across an entire Management Area,
- Water quality improvement may be faster since small watersheds generally respond more rapidly,
- A proactive approach can address the most significant water quality concerns,
- Partners can coordinate and align technical and financial resources,
- Partners can coordinate and identify appropriate conservation practices and demonstrate their effectiveness,
- A higher density of projects allows neighbors to learn from neighbors,
- A higher density of projects leads to opportunities for increasing the connectivity of projects,
- Limited resources can be used more effectively and efficiently,
- Work in one Focus Area, followed by other Focus Areas; will eventually cover the entire Management Area.

Soil and Water Conservation Districts select a Focus Area in cooperation with ODA and other partners. The scale of the Focus Area matches the SWCD's capacity to deliver concentrated outreach, technical assistance, and to complete projects. The current Focus Area for this Management Area is described in Chapter 3. The SWCD 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 cooperation 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. 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 made in the watershed. Chapter 3 describes any SIAs in this Management Area.

1.8 Monitoring, Evaluation, and Adaptive Management

The Oregon Department of Agriculture, the LAC, and the LMA will assess the effectiveness of the Area Plan and Area Rules by evaluating the status and trends in agricultural land conditions and water quality (Chapter 4). This assessment will include an evaluation of progress toward measurable objectives. ODA will utilize other agencies' and organizations' local monitoring data when available. ODA, DEQ, SWCDs, and LACs will examine these results during the biennial review and will revise the goal(s), measurable objectives, and strategies in Chapter 3 as needed.

1.8.1 Agricultural Water Quality Monitoring

As part of monitoring water quality status and trends, DEQ regularly collects water samples at over 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). DEQ collects water quality samples every other month throughout the year to represent a snapshot of water quality conditions. Parameters consistently measured include alkalinity, biochemical oxygen demand (BOD), chlorophyll a, specific conductance, dissolved oxygen (DO), DO percent saturation, *E. coli*, ammonia, nitrate and nitrite, pH, total phosphorus, total solids, temperature, and turbidity.

At each biennial review, DEQ assesses the status and trends of water quality in relation to water quality standards. Parameters included in the analysis are temperature, pH, and bacteria. DEQ will add additional parameters as the data become available, depending on the water quality concerns of each Management Area. ODA will continue to work with DEQ to cooperatively summarize the data results and how they apply to agricultural activities.

Water quality monitoring is described in Chapter 3, and the data are presented in Chapter 4.

1.8.2 Biennial Reviews and Adaptive Management

All Area Plans and Area Rules around the state undergo biennial reviews by ODA and the LAC. As part of each biennial review, ODA, DEQ, SWCDs, and the LAC discuss and evaluate the progress on implementation of the Area Plan and Area Rules. This evaluation includes discussion of enforcement actions, land condition, water quality monitoring, strategic initiatives, and outreach efforts over the past biennium. ODA and partners evaluate progress toward achieving measurable objectives and milestones, and revise implementation strategies as needed. The LAC submits a report to the Board of Agriculture and the director of ODA describing progress and impediments to implementation, and recommendations for modifications to the Area Plan or Area Rules necessary to achieve the goal of the Area Plan. ODA and partners will use the results of this evaluation to update the measurable objectives and implementation strategies in Chapter 3.

Chapter 2: Local Background

2.1 Local Roles

2.1.1 Local Advisory Committee

The Area Plan was developed with the assistance of the LAC. The LAC was formed in 2002 to assist with the development of the Area Plan and Area Rules and with subsequent biennial reviews.

Table 1: Current LAC members are:

Name	Location	Description
Richard Huff, Chair	Siltcoos	Cattle & Timber
Howard Pazdral, Vice Chair	Siuslaw	Hay, Logging, Percheron Horses
Kevin Carroll	Siltcoos	Farrier & Siuslaw SWCD Board
Elmer Ostling	Alsea	Beef Cattle & Hay
Joe Steere	Salmon	Cattle, Timber, OSWA and Farm Bureau
Alan Fujishin	Siletz	Blueberries & Cattle, SWCD Board
Mark Saelens	Yaquina	Mid Coast Watersheds Council
Lorissa Fujishin, Alternate	Siletz	Blueberries, Cattle, Fishery & Aquatic Science

2.1.2 Local Management Agency

Implementation of the Area Plan is accomplished through an Intergovernmental Grant Agreement(s) between ODA and the Lincoln and Siuslaw SWCD(s). This Intergovernmental Grant Agreement defines the SWCD(s) as the LMA(s) for implementation of the Ag Water Quality Program in this Management Area. The SWCD(s) was/were also involved in development of the Area Plan and Area Rules.

The LMA implements the Area Plan by conducting the 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 Area Plan and Area Rules in 2002.

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

2.3 Geographical and Physical Setting

2.3.1 Location, Water Resources, Land Use, Land Ownership, Agriculture

Physical features

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

border between Lane and Douglas counties, were created as dunes blocked the outlets of several coastal streams. Dams were also installed at the outlets of Siltcoos and Tahkenitch lakes in the 1960s.

Table 2. Acreage and major tributaries of watersheds in the Management Area.

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

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

Climate

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

Land use/land ownership

Agriculture and forestry

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

About 90 percent of the Management Area is in forestland. Major landowners and managers in the Management Area include the Bureau of Land Management, the U. S. Forest Service, industrial timber

companies, and smaller acreage timberland owners. Much of the timberland is on highly productive soils on the steep slopes of the Coast Range.

Urban/residential

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

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

Roads

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

Recreation

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

Water Resources

Water availability

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

Table 3. Average annual, summer, and winter flows in the Alsea, Siletz, Siuslaw, and Yaquina rivers (United States Geological Survey, 2001). Flows are listed in cubic feet per second (cfs).

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

Table 4. Water appropriations (in cfs and acre-feet (af)) in the Salmon, Siletz, Yaquina, and Alsea watersheds. (Oregon Water Resources Department, 1990)

Water Use	Salmon River		Siletz River		Yaquina River		Alsea River	
	cfs	af	cfs	af	cfs	af	cfs	af
Irrigation	4	2	13	2	14	1	39	8
Fish and Wildlife	34	6	11	1	9	.1	70	6
Agriculture	.03	0	.06	.7	.02	0	5	16
Industrial	.3	4	35	4,350	36	6,060	.4	0
Municipal	.7	0	21	2	1.5	500	7	0

Table 5. Water appropriations (in cfs and af) in the Yachats, Siuslaw, Siltcoos, and Tahkenitch watersheds. (Oregon Water Resources Department, 1990).

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

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

Water use

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

Biological Resources

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

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

2.4 Agricultural Water Quality

2.4.1 Water Quality Issues

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

2.4.1.1 Beneficial Uses

To assess water quality in the Mid Coast for the 2010 303(d) List and Decision Matrix, the Oregon DEQ and EPA evaluated data from several sources, including the U.S. Geological Survey, U.S. Forest Service, Oregon Department of Fish and Wildlife (ODFW), the Devils Lake Water Improvement District, Boise Cascade, local volunteer water quality monitoring groups, and its own monitoring program. The LAC strongly recommends that future monitoring programs include additional sites and parameters, to improve characterization of water quality and watershed health in the agricultural portions of the Management Area.

The 2010 303(d) list identified eighty stream segments in the Management Area that do not meet state standards for temperature. Several lakes and sloughs within the area do not meet state standards for aquatic weeds or algae. Twenty-four segments were identified on the list because of low dissolved oxygen levels. Several segments (six) in the Siuslaw Subbasin and Elk Creek in the Yaquina Subbasin are on the list for sedimentation. Twenty-eight segments within the Management Area are on the list for biological criteria. Twenty-three segments within the Management Area are identified on the list for bacteria. Appendix B provides a list of the beneficial uses.

2.4.1.2 WQ Parameters and 303(d) list

The impaired water body segments in the Mid-Coast Basin were placed on Oregon's Clean Water Act Section 303(d) list in 1998 and more segments were added in subsequent assessment cycles through 2010 (Appendix B). DEQ is currently developing TMDLs for waterbodies identified as impaired for bacteria (freshwater, estuaries, beaches), sedimentation/bio-criteria and drinking water/turbidity. DEQ is delaying development of temperature TMDLs until litigation concerning Oregon's temperature standards is better resolved. Other impaired waterbodies/pollutants will be addressed in subsequent TMDLs or through other Plans or authorities, including: Oregon's coastal nonpoint pollution control program (CNPCP), Clean Water Act Section 319 and Oregon state statutes and regulations. DEQ is preparing to open a public comment on the 2018 Integrated Report and Section 303(d) list in fall 2019.

2.4.2 Basin TMDLs and Agricultural Load Allocations

A stakeholder technical advisory committee (TAC) was established to advise DEQ on the Mid-Coast TMDLs in 2008 – 2009. The TAC process was placed on hold due to resource constraints in mid-2009. In 2010, DEQ committed to development of "implementation-ready" TMDLs (IR-TMDLs) consistent with the CZARA settlement agreement reached in litigation regarding Oregon's CNPCP (*NWEA v. Locke et al*). In March 2012, DEQ formed a Local Stakeholder Advisory Committee (LSAC) to advise DEQ on IR-TMDLs for the Mid-Coast. ODA and agricultural representatives are active members of the LSAC.

The LSAC and technical working groups have met a number of times and meeting information is maintained on the project website: http://www.oregon.gov/deq/wq/tmdls/Pages/TMDLs-Basin-MidCoast.aspx

DEQ informed federal agencies, EPA and National Oceanic and Atmospheric Administration (NOAA) Coastal Program, in February 2012 that DEQ would be unable to meet certain timelines in the CZARA settlement agreement. Technical work is proceeding on dissolved oxygen, temperature and bacteria impairments. Due to the dynamic nature of the TMDLs process and associated litigation, readers are advised to contact ODA or DEQ staff to obtain the most current status information.

2.4.3 Sources of Impairment

There are many natural and human-caused potential sources for the water quality problems identified in the area, including runoff from forest and agricultural lands, runoff from roads, erosion from streambanks and roadsides, wildlife activity, waste disposal sites, discharges from waste water treatment plants, leaking septic systems, application of biosolids, manures and other fertilizers on agricultural lands, and erosion from home building and development. Rerouting of runoff via road building, construction, and land surfacing (such as parking areas) results in hydro-modification and can lead to excessive erosion or pollutant transport. Increased heat input due to vegetation removal along streams, seasonal flow reduction, changes in channel shape, depth of pools and floodplain alteration are also potential sources of water quality impairments.

Other water quality concerns exist in the Management Area in addition to 303(d) listed problems. In several waterbodies, lead from fishing lures has become a water quality concern. Anecdotal estimates indicate that up to one pound of lead per fisher per week can be lost in creeks (Kinney, 2002). Some of the lead can dissolve and become bound in organic materials, eventually forming a fine layer on the creek bottom. Further investigation is underway to determine whether organic-bound lead can again become bio-available if a disturbance stirs up the creek bottom. Oil and fuel spills or improperly disposed petroleum products around roads, residences, industrial sites, and farm buildings are a water quality concern, especially because of the high rainfall in the area and likelihood of runoff to waterbodies. Pesticide application is a concern and current use and legacy pesticides have been detected in some waterbodies[1].

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

Several watershed assessments, which examine existing data and recommend monitoring and management to characterize and improve watershed health, have also been completed in the Management Area. The Siuslaw Watershed Council and the Mid Coast Watersheds Council have published assessments for the Salmon, Siletz, Yaquina, Alsea, Yachats, and Siuslaw watersheds, as well as many smaller ocean tributaries. Water quality-related recommendations in the assessments include: increase monitoring of salmonid populations, focus on water quantity and water quality issues (particularly

[1] DEQ Toxics program webpage: https://www.oregon.gov/deq/wq/Pages/WQ-Monitoring-ToxicsMap.aspx

temperature); continue riparian restoration efforts in areas with identified temperature problems; establish a systematic water quality monitoring program designed to answer specific questions and develop baseline information, expand continuous stream temperature monitoring, and identify and complete restoration projects using a landscape/watershed perspective (Earth Design Consultants & Green Point Consulting, 2001; Ecotrust, 2002).

2.5 Voluntary and Regulatory Measures

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

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

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

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

The approved management measures for CZARA and available management practices that may help landowners achieve compliance are probably not enough for someone who wants to know exactly how to implement an available management practice on their property for a specific purpose. For more information, please consult one of the agencies or organizations listed in Appendix D, sources of information and technical assistance, or one of the publications listed in the references section.

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

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

303(d) List parameters:

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

Coastal Zone Act Reauthorization Amendments Measures:

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

This Area Plan serves as a guidance document and as stated in the foreword, does not establish provisions for enforcement. The Area Rules developed with the LAC, OAR 603-095-2240(2) through 603-095-2240(6), are included in this document only as a reference for landowners. Each Area Rule has a border around it and appears in italics. The following, OAR 603-095-2240(1) gives some provisions that apply to the Area Rules that were developed with the LAC.

OAR 603-095-2240

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

2.5.1 Riparian/Streamside Area Management

Issue

The purpose of this prevention and control measure is to provide the functions supported by riparian buffers. If riparian buffers are functioning properly, agricultural practices should not impact the water quality or beneficial uses. A properly functioning riparian buffer provides the water quality functions of shade to help maintain cool water temperatures, filtration of pollutants in runoff before they reach the stream, and protection against unhealthy levels of streambank erosion. In addition to these water quality functions, riparian buffers can provide sources of food and habitat for fish and wildlife.

A riparian buffer is an area next to a stream, which if functional, limits the negative interactions between the stream and managed uplands. Natural factors that may limit the establishment and protection of

riparian zones include precipitation, soil types, stream channel morphology, upland topography, adjacent land uses, and current vegetative community including invasive plants. Also, the width of the riparian buffer zone sufficient to provide the stated water quality functions will be site specific, and vary by soils, slope, adjacent land use, size of stream, and other site capability factors.

For many years, researchers have investigated factors that influence stream temperatures. Influences on stream temperature can include upland processes. Several authors emphasize the importance of water stored in the landscape and its importance in maintaining stream temperatures (Krueger et al, 1999; Moore and Miner, 1997; Naiman and Decamps, 1997). Clark (1998) explains that upland conditions strongly influence stream temperatures by affecting the infiltration of precipitation and the storage and release of water. Adequate ground cover in upland areas increases the likelihood of precipitation infiltrating into the soil profile and decreases the possibility of overland flow, soil loss, and resulting sediment delivery to streams. Other influences on stream temperature include stream channel width, stream depth, channel substrate, air temperature, and elevation (Bilby, 1984; Chen et al, 1998; Larson and Larson, 1996; Krueger et al, 1999; Ward, 1995).

Practices that keep water in the stream and vegetation on the banks go a long way to protecting cold water where it exists. Floodplain storage capacity and hyporheic flow are key factors that also reduce high summer stream temperatures. A functioning floodplain stores more water, increases summer stream flows in quantity and duration through the slow metered release exchanges between cold ground water and surface waters. It is important to restore in-stream habitats (especially in incised systems) to improve water quality on agricultural lands. Tributaries or springs and seeps with relatively constant, cool flow throughout the summer may create cold-water refuges at confluences where tributaries enter the mainstem. These areas may be particularly important to protect from warming by maintenance of adequate streamside vegetation shading. These features may lose value as refuges if they are diverted or withdrawn as water sources. For additional information see EPA's *Primer for Identifying Cold-Water Refuges to Protect and Restore Thermal Diversity in Riverine Landscapes* https://cfpub.epa.gov/si/si_public_record_Report.cfm?dirEntryId=242850

In addition to temperature, increased instream complexity also provides other water quality benefits. Projects such as large wood placement, reconnecting side channels, and restoring historical meander help to reduce erosion, trap sediment, process nutrients, and increase dissolved oxygen levels.

Beavers as a Partner in Restoration

Increasingly, restoration practitioners are using beaver to accomplish stream, wetland, and floodplain restoration. This is happening because, by constructing dams that impound water and retain sediment, beavers substantially alter the physical, chemical, and biological characteristics of the surrounding river ecosystem, providing benefits to plants, fish, and wildlife. The possible results are many, inclusive of: higher water tables; stream aggradation (a change in the stream grade due to sedimentation); reconnected and expanded floodplains; more hyporheic exchange (between surface and subsurface water); higher summer base flows; expanded wetlands; improved water quality; sediment trapping; greater habitat complexity; more diversity and richness in the populations of plants, birds, fish, amphibians, reptiles, and mammals; and overall increased complexity of the riverine ecosystems.

In many cases these effects are the very same outcomes that have been identified for river restoration projects. Thus, by creating new and more complex habitat in degraded systems, beaver dams (and their human-facilitated analogues) have the potential to help restoration practitioners achieve their objectives. Beavers have become our new/old partner in stream restoration.

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

In addition to the upland processes and projects that increase cold water refugia such as placement of large wood, the main factor that affects stream temperatures is streamside vegetation. Many studies highlight the significance of streamside shade in the maintenance of stream temperatures (Brown, 1969; Beschta, 1997). Research suggests that shade from riparian vegetation can reduce in-stream peak temperatures. The LAC feels that supplementing existing riparian vegetation is a key method to provide water quality functions and recommends that landowners take a proactive approach to restoring riparian functions.

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

- Complex vegetation structure and diverse species composition—The riparian area supports a diverse assortment of vegetation, such as grasses, sedges, shrubs, and deciduous and coniferous trees, appropriate to site capability, in two or more vertical layers. Riparian areas should be dominated by native species with a diverse age class distribution.
- Vegetation should cover approximately 90 percent of the soil surface, with less than ten percent bare soil or impervious surfaces.
- Width—riparian buffer zone width should be sufficient to fulfill site-specific functions. Two potential options to calculate buffer width include an area two times the height from the summer low flow to the bank full height plus ten feet (2h + 10') on each side of the stream, or NRCS recommends a minimum 35 feet for filtration and 35 to 100 feet for shade (Bentrup, 2008).
- Stream shading—riparian vegetation should shade 75 percent of a natural waterway where the water body is not too wide and when achievable in the summer.
- Streambank stability—streambanks should be stable without the use of riprap or other artificial structures when feasible. Streambank vegetation is comprised of those plants and plant communities that have root masses capable of withstanding 20 to 25-year storm events.

Maintenance and protection of healthy riparian buffer zones should always be incorporated into a landowner's water quality planning. Landowner(s) may implement management practices within riparian buffer zones to establish and/or maintain streamside vegetation. If any activity degrades the riparian buffer zone, the landowner should replant or restore the disturbed area to a level, which in a reasonable amount of time, will provide the required water quality functions.

Invasive weeds displace desired vegetation by creating monocultures and they severely disrupt the proper structure and function of riparian and upland ecosystems. Invasive weeds generally provide less shade, filtering capacity, and stabilizing root mass than the native plants they replace. Invasive weed infestations tend to spread rapidly to adjacent lands in uplands, riparian areas, and flood zones. Once invasive weeds have invaded, control can be very problematic and expensive. Invasive weed management issues need to be addressed in the early stages of restoration and enhancement projects. Cooperative efforts among landowners and agencies are critical to the control of invasive weeds. For a list of weeds of concern, see Appendix H.

An agricultural activity must be preventing the establishment of riparian vegetation for OAR 603-095-2240(2) to apply. At times, invasive species such as reed canary grass, blackberry, or knotweed may be preventing the establishment of trees and shrubs to provide shade. When invasive species limit the establishment of trees and shrubs, it is recommended that landowners take proactive steps to control the invasive species and plant native trees and shrubs.

This prevention and control measure does not prohibit grazing in riparian areas as long as riparian vegetation is allowed to establish and is not degraded by grazing practices. Grazing management should allow for recovery of plants and leave adequate vegetation to ensure streambank stability, reduce sediment or other pollutants from entering the stream and provide streamside shading consistent with the vegetative capability of the site. This Area Plan does not prescribe specific practices to landowners for management of riparian buffer zones. Management activities that promote the growth and establishment of riparian vegetation are listed on page 39. Contact information for local resources can be found in Appendix D.

The Conservation Reserve Enhancement Program (CREP) is a state-federal partnership that provides a modest rental payment and substantial cost share to encourage protection of riparian areas on agricultural lands. Participation in this program would ultimately provide a healthy riparian buffer zone. Landowners are encouraged to contact the local SWCD or USDA-NRCS office for more information.

Area Rule

OAR 603-095-2240

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

* The following is a link to the current "Guidelines for Landscape Planting and Vegetation Management at Levees, Floodwalls, Embankment Dams, and Appurtenant Structures:
http://www.publications.usace.army.mil/Portals/76/Publications/EngineerTechnicalLetters/ETL_1110-2-583.pdf

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

303(d) parameters addressed by this prevention and control measure:

Temperature, nutrients, sedimentation, bacteria, dissolved oxygen, aquatic weeds or algae.

Definitions

Riparian vegetation – plant communities consisting of plants dependent upon or tolerant of the presence of water near the ground surface for at least part of the year. (OAR 603-095-0010(36))

Site capability - the vegetation that can be expected to grow at a particular site, given natural site factors (e.g. elevation, soils, climate, wildlife, fire, floods) and historical and current human influences (e.g. channelization, roads, past land management).

Site capability and site potential—Streamside vegetation generally affects water quality. The primary water quality-related functions provided by streamside vegetation are shade, bank stability, filtration of sediment and nutrients, and infiltration of runoff water. Absent of human influence, different riparian sites have varying abilities to support these functions. This ability is referred to as **site potential**, or the highest ecological status an area can attain. The site potential is influenced by physical and biological factors, such as elevation, aspect, geology, climate, and the current plant community. It is also influenced by disturbances found in riparian systems, such as flooding, and the complex variation of these disturbances.

Site conditions that affect the establishment and development of streamside vegetation are further modified by human infrastructure, such as roads, power and telephone lines, and irrigation and drainage systems. When infrastructure limits a site's ability to achieve or maintain its vegetative potential, the resulting condition is called the **site capability**. This capability determines what can be expected in terms of vegetation, such as the types of bank-stabilizing shrub species, and the functions the site can provide.

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

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

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

2.5.2 Nutrients and Manure Management

Issue

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

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

Sources of *E. coli* include discharge or untreated sewage overflows from wastewater treatment plants, leakage from failing septic systems, runoff of domestic animal manure from agricultural lands, yards, and other facilities, and runoff of manure from wild animals such as geese and elk. Numerous factors influence the nature and volume of bacteria that reach waterways. Some of these factors are climate, topography, soil types and infiltration rates, and animal species and animal health, as well as travel time from source to the waterbody. *E. coli* has a finite lifespan outside of its human or animal host. Factors that impact *E. coli* survival and persistence in open environments include moisture, exposure to sunlight, temperature, nutrient availability, and competing microbial communities.

When bacteria reach a waterway, they may settle into sediments in a streambed and can survive there for an extended period of time. If sediments are disturbed by increased stream turbulence following a runoff event, human or animal traffic, or other means, sediment-bound bacteria may be re-suspended into the water column (Sherer et al 1992).

Oregon's water quality standard for *E. coli* bacteria was established to protect the most sensitive beneficial use affected by bacteria levels, which is water contact recreation. In addition, there is a water quality standard for fecal coliform that was established to protect shellfish growing. There is currently no state freshwater standard for enterococcus. EPA has determined that *E. coli* and enterococcus bacteria are the best indicators of gastrointestinal illness when people have full immersion contact with the water. *E. coli* levels better predict illness in freshwater and enterococcus best predicts illness in coastal waters. Fecal coliform criteria best predict illness due to consumption of filter feeding shellfish, such as clams, oysters, and mussels. Appendix B provides more details related to the water quality standards and the affected beneficial uses.

Livestock manure is a potential source of bacteria, nutrients, and vegetative material. If stored properly and applied to the land at agronomic rates, manure can be a beneficial source of nitrogen and phosphorus, as well as organic matter (Mikkelsen and Gilliam, 1995). Nothing in this prevention and control measure is intended to discourage the use of manure or other amendments; rather, it seeks to ensure that they are applied correctly. Also, this prevention and control measure is not intended to hold landowners responsible for water quality problems beyond their control, such as runoff of wildlife or wildfowl manure from agricultural lands into waterways.

This prevention and control measure does not prohibit grazing in riparian areas. As long as grazing is conducted at appropriate times of year, stocking rates, duration, and intensity, and in compliance with the

riparian prevention and control measure, it should not violate this prevention and control measure. However, unlimited or concentrated livestock access to streams resulting in waste accumulations may lead to violations. In addition, winter-feeding areas should be managed to limit access and impacts to streams. Management practices, such as filter strips, should be used to minimize run-off. The LAC recognizes that there may be seasonally high levels of nutrients and bacteria, such as during the first rains in the fall when the nutrients and bacteria flush from the uplands into the streams. These spikes may be caused by fecal material from wildlife or agricultural sources. Visual indicators that may determine if a landowner is responsible for a violation include the following: presence of livestock with unrestricted access to the stream, lack of ground cover vegetation, location of heavy use areas in proximity to waters of the state, and manure deposits or piles in locations that are likely to flow into waters of the state.

A recently developed suite of methods for identifying sources of microbial pollution is called Microbial Source Tracking (MST). MST attempts to identify sources of microbial pollution by distinguishing DNA patterns of *E. coli* that live in specific animals. Though fecal coliform bacteria found in animal species are very similar genetically, there are differences among members of the same species because they are thought to adapt to the different intestinal environments of host species.

The few DNA studies in Oregon have shown a wide range of species with *E. coli* detections identified. Due to the expense of MST and the wide range of results, it is often more cost effective to identify bacterial sources by observing whether livestock impact areas near streams, dye-testing suspected failing septic systems, and using traditional bacteria monitoring to identify "hot spots" of bacterial contamination.

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

Oregon Revised Statute (ORS) 561.191 (Senate Bill 502) was passed in 1995, authorizing ODA as the state agency responsible for direct regulation of farming activities for the purpose of protecting water quality. ORS 561.191, states that ODA "…shall develop and implement any program or rules that directly regulate farming practices, as defined in ORS 30.930, that are for the purpose of protecting water quality …" It further 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."

ODA incorporated ORS 468B.025 and 468B.050 into all of the agricultural water quality management area plans in the state. The following prevention and control measure references ORS 468B.025 and 468B.050. ORS 468B.025 is existing statute developed to address water pollution from all sources. A Department of Justice opinion dated September 12, 2000, clarifies that ORS 468B.025 applies to point and non-point source pollution as that term is commonly applied.

Two Area Rules are referenced below because both relate to nutrient and bacteria levels in streams and rivers. The OAR 603-095-2240(3) relates specifically to nutrient applications, and the OAR 603-095-2240(4) references a statute that applies to wastes, which can include nutrients and bacteria.

Area Rules

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

ORS 468B.025(1) states:

…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.

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

303(d) parameters addressed by this measure

Nutrients, aquatic weeds or algae, chlorophyll a, dissolved oxygen, toxics, sediment, turbidity, and bacteria.

Definitions

Nutrients - elements taken in by a plant that are essential to its growth, and that are used by the plant in the production of its food and tissue. These elements are: carbon, hydrogen, oxygen, nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, zinc, iron, manganese, copper, boron, molybdenum, and chlorine. Sources of nutrients include, but are not limited to, irrigation water, synthetic fertilizers, animal manure, compost, seafood waste, biosolids, and leguminous and non-leguminous crop residues and mulches.

Pollution - has the meaning given in ORS 468B.005(3), which states: 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, that will or tends to, either by itself or in connection with any other substance, create a public nuisance or that 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.

Wastes - has the meaning given in ORS 468B.005(7), which states: sewage, industrial wastes, and all other liquid, gaseous, solid, radioactive or other substances that will or can cause pollution or tend to cause pollution of any waters of the state (waste includes manure).

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

- *Develop, implement, and periodically update a nutrient management plan to: (1) apply nutrients at rates necessary to achieve realistic crop yields, (2) improve the timing of nutrient application, and (3) use agronomic crop production technology to increase nutrient use efficiency. When the source of the nutrients is other than commercial fertilizer, determine the nutrient value and the rate of availability of the nutrients.* ***Determine and credit the nitrogen contribution of any legume crop. Soil and plant tissue testing should be used routinely.***
- *Nutrient management plans contain the following core components:*
    - *Farm and field maps showing acreage, crops, soils, and waterbodies.*
    - *Realistic yield expectations for crop(s) based primarily on the producer's actual yield history, state land grant university-yield expectations for the soil series, or NRCS Soils-5 information for the soil series.*
    - *A summary of the nutrient resources available to the producer, that at a minimum include:*
        - *Soil test results for pH, phosphorus, nitrogen, and potassium;*
        - *Nutrient analysis of manure, sludge, mortality compost (birds, pigs, etc.) or effluent (if applicable);*
        - *Nitrogen contribution to the soil from legumes grown in the rotation (if applicable); and*
        - *Other significant nutrient sources (e.g., irrigation water).*
    - *An evaluation of field limitations based on environmental hazards or concerns, such as:*
        - *Sinkholes, shallow soils over fractured bedrock, and soils with high leaching potential,*
        - *Lands near surface water,*
        - *Highly erodible soils, and*
        - *Shallow aquifers.*
    - *Use of the limiting nutrient concept to establish the mix of nutrient sources and requirements for the crop based on a realistic yield expectation.*
    - *Identification of timing and application methods for nutrients to: provide nutrients at rates necessary to achieve realistic crop yields; reduce losses to the environment; and avoid applications as much as possible to frozen soil and during periods of leaching or runoff.*
    - *Provisions for the proper calibration and operation of nutrient application equipment.*
- Apply nutrients and manure according to soil test results and OSU Extension recommendations,
- Store manure under and tarp or roof and on an impervious surface,
- Establish sacrifice or heavy use areas to reduce seasonal soil compaction and overgrazing,
- Harden animal walkways,
- Do not allow access to pastures when soils are saturated,
- Locate barns and sacrifice areas away from streams,
- Properly store and manage leachate from silage and other vegetative materials,
- Dispose of dead animals properly,
- Install gutters and downspouts in areas with high livestock use,
- Install/maintain diversions or French drains to prevent upslope drainage into barnyards and sacrifice areas.

Bio-solids Applications and Jurisdiction

DEQ regulates bio-solids under OAR 340 Division 50:
https://secure.sos.state.or.us/oard/displayDivisionRules.action?selectedDivision=1467

"Bio-solids" means solids derived from primary, secondary, or advanced treatment of domestic wastewater which have been treated through one or more controlled processes that significantly reduce pathogens and reduce volatile solids or chemically stabilize solids the extent that they do not attract pests. This term refers to domestic wastewater treatment facility solids that have undergone adequate treatment to permit their land application. The term has the same meaning as the term "sludge" in ORS 468B.095, and the term "sewage sludge" found elsewhere in OAR Chapter 340.

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

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

Bio-solids Management Plan

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

Site Authorization Letter

A site authorization letter is issued by DEQ regional water quality staff and is required prior to land application at a particular site. The letter specifies conditions for land application, including crop requirements, bio-solids application rates, seasonal restrictions, setback distances to roads, wells, and water sources, and other pertinent site management information.

Site Authorization Documentation Checklist for the Land Application of Bio-solids

Soil information is needed to determine the suitability of a site for bio-solids land application. Information from a soil survey should be attached to the site authorization request.

2.5.3 Soil Erosion Prevention and Control

Issue

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

Proper erosion control from agricultural activities retains important soil resources on the farm and minimizes the opportunity for excess fine sediment to enter waterways. Normal or natural levels of fine sediment are vital for aquatic systems and proper river functions. However, excess fine sediment levels are harmful to humans, fish, and some aquatic organisms. Agricultural erosion control protects drinking water quality and reduces water treatment costs. In addition, good erosion control protects stream bottoms from excess fine sediment that can fill streambed gravel, prevent fish from spawning, and suffocate eggs. Excessive levels of fine sediment may also clog fish gills.

In addition to the concern of erosion of fine sediments there is concern with contaminants associated with soil particles and run-off with the soil. Contaminants of concern include phosphorus, toxics, metals, and pesticides. Erosion control practices should also limit contaminant runoff. There are many lakes in the Management Area, and high phosphorus levels in the lakes contribute to algal blooms. There are many potential sources of the phosphorus, but the impacts from agricultural activities can be minimized through proper stocking rates, correct application rates of fertilizers, and filter strips.

This prevention and control measure addresses soil erosion from upland areas, while prevention and control measure 4.1, near-stream management areas, addresses soil erosion in riparian areas. Nothing in this prevention and control measure is intended to prevent or discourage water bars on roads and pathways, a stormwater diversion practice that frequently provides water quality benefits by dissipating energy and providing filtration.

Area Rule

This Rule specifies that "agricultural activities" must prevent sheet wash, gullies, or multiple rills. Landowners are not responsible for the impacts of browsing activities of elk, geese, beaver, or other wildlife.

303(d) parameters addressed by this measure

Sedimentation, nutrients, aquatic weeds or algae, and dissolved oxygen.

Definitions

Active channel erosion – means **gullies** or channels that at the largest dimension have a cross-sectional area of at least one square foot and that occur at the same location for two or more consecutive years. (OAR 603-095-0010(1)).

Rill erosion – means an erosion process in which numerous small channels only several inches deep are formed and which occurs mainly on recently disturbed soils. The small channels formed by rill erosion would be obliterated by normal smoothing or tillage operations. (OAR 603-095-0010(14))

Sediment – soil particles, both mineral and organic, that are in suspension, are being transported, or have been moved from the site of origin by flowing water or gravity. (OAR 603-095-0010(39))

Sheet erosion – means the removal of a fairly uniform layer of soil from the land surface by runoff water. (OAR 603-095-0010(15))

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

- *Apply the erosion component of a resource management system as defined in the Field Office Technical Guide of the U.S. Department of Agriculture, NRCS to minimize the delivery of sediment to surface waters.*
- *Design and install a combination of management and physical practices to settle the settleable solids and associated pollutants in runoff delivered from the contributing area for storms of up to and including a 10-year, 24-hour frequency.*
- Graze pasture plants to an appropriate height; leave a minimum of four-inches of pasture vegetation,
- Utilize rotational grazing to maintain pasture health,

- Provide off-stream water to livestock in each pasture,
- Install water bars to divert runoff to roadside ditches,
- Time road maintenance, ditch cleaning, and tillage practices to avoid runoff events. Consider installing organic or synthetic erosion barrier on projects that disturb soils,
- Plant or maintain appropriate vegetation along ditches; seed bare ditches following construction or maintenance,
- Maintain adequate vegetative riparian buffers to intercept erosion from upland activities,
- Plant cover crops in orchards or nurseries,
- In orchards where canopy closure or harvesting methods prevent planting cover crops, install waterbars or small ditches perpendicular to the slope to convey water off the orchard,
- Apply straw mulch in areas with steep slope or prone to erosion,
- Install underground outlets or grassed waterways in areas where gullies repeatedly appear.

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

303(d) parameters addressed by this measure

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

2.5.4 Irrigation

Issue

Irrigation water runoff has not been specifically identified as a contributing factor for the 303(d) listing of Management Area waters for nutrients or sedimentation. Most irrigation in the Management Area occurs with sprinklers. Growers should be aware, however, that over-application of irrigation water could result in transport of nutrients, sediment, and/or manure to waters of the state. Three Area Rules are referenced in this section. OAR 603-095-2240(6) relates directly to irrigation water return flow. OAR 603-095-2240(3) and (5), which relate to runoff of nutrients and sediment, are included in this section to remind readers that irrigation return flow can cause erosion and runoff of sediment and nutrients to rivers and streams.

Area Rules

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

303(d) parameters addressed by this measure

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

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

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

2.5.5 Pesticides (including Herbicides)

Issue

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

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

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

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

Area Rule

There are no new rules associated with this measure. Rules related to erosion and sediment control, and nurtrients and bacteria apply to to the potential for pesticides and toxics that could be transported into waters of the state. If toxics or pesticides are detected at levels of concern, then ODA and the LAC will evaluate the data and address it at that time.

In 2013, DEQ conducted an extensive assessment of toxics in water under its Toxics monitoring program. The results are published on DEQ's website[2] and were summarized for the 2015 LAC meeting.

303(d) parameters addressed by this measure:

Toxics

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

- *Evaluate the pest problems, previous pest management practices, and cropping history.*
- *Evaluate the soil and physical characteristics of the site, including mixing, loading, and storage areas for potential of leaching or runoff of pesticides. If leaching or runoff is found, steps should be taken to prevent further contamination.*
- *Use integrated pest management (IPM) strategies that:*
    - *Apply pesticides only when an economic benefit to the producer will be achieved (i.e. application based on economic thresholds).*
    - *Apply pesticides efficiently and at times when runoff losses are unlikely.*
    - *When pesticide applications are necessary and a choice of registered materials exists, consider the persistence, toxicity, runoff potential, and leaching potential of products being used.*
    - *Periodically calibrate pesticide spray equipment.*

[2] DEQ Toxics program webpage: https://www.oregon.gov/deq/wq/Pages/WQ-Monitoring-ToxicsMap.aspx

    - *Use anti-backflow devices on hoses used for filling tank mixtures.*
- Apply pesticides and herbicides according to the label. Use the correct rate and timing. Comply with label restrictions and precautions.
- Triple rinse pesticide application equipment. Apply rinsates to sites. Dispose of or recycle clean containers according to Oregon law.
- Calibrate, maintain, and correctly operate application equipment.
- Store and mix pesticides on leak proof facilities.

Store surfactants and petroleum products in leak proof containers and facilities; cleanup petroleum products properly.

Chapter 3: Implementation Strategies

Goal

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

LAC Mission

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

3.1 Measurable Objectives

3.1.1 Management Area

The State of Oregon is working on a project to acquire statewide satellite imagery and to refine methods to characterize streamside vegetation. Once available, the results will allow the LAC to know the streamside vegetation conditions throughout the Management Area and to identify spatial and temporal objectives for streamside vegetation improvements.

Additional Objectives

The LAC envisions that the following objectives will be achieved in the management area:

- No visible sediment loss from cropland through precipitation or irrigation induced erosion.
- No significant bare areas due to livestock overgrazing within 50 feet of streams on pasturelands and/or rangelands.
- Active gullies have healed or do not exist on pasturelands.
- Livestock manure is stored under cover and in a location that minimizes risk to surface and groundwater.

ODA compliance results and the District's ongoing efforts to provide education and technical assistance address these objectives on a case-by-case basis; however, a consistent methodology has yet to be developed to gage overall progress. The LAC recommends that ODA develop methodologies to evaluate sediment loss, livestock grazing impacts, active gullies and manure storage and handling.

3.1.2 Focus Area(s)

There are currently two Focus Areas in the Mid Coast Management Area.: 1) Fiddle Creek and Maple Creek Focus Area and 2) Siletz Focus Area. The Focus Areas are described below.

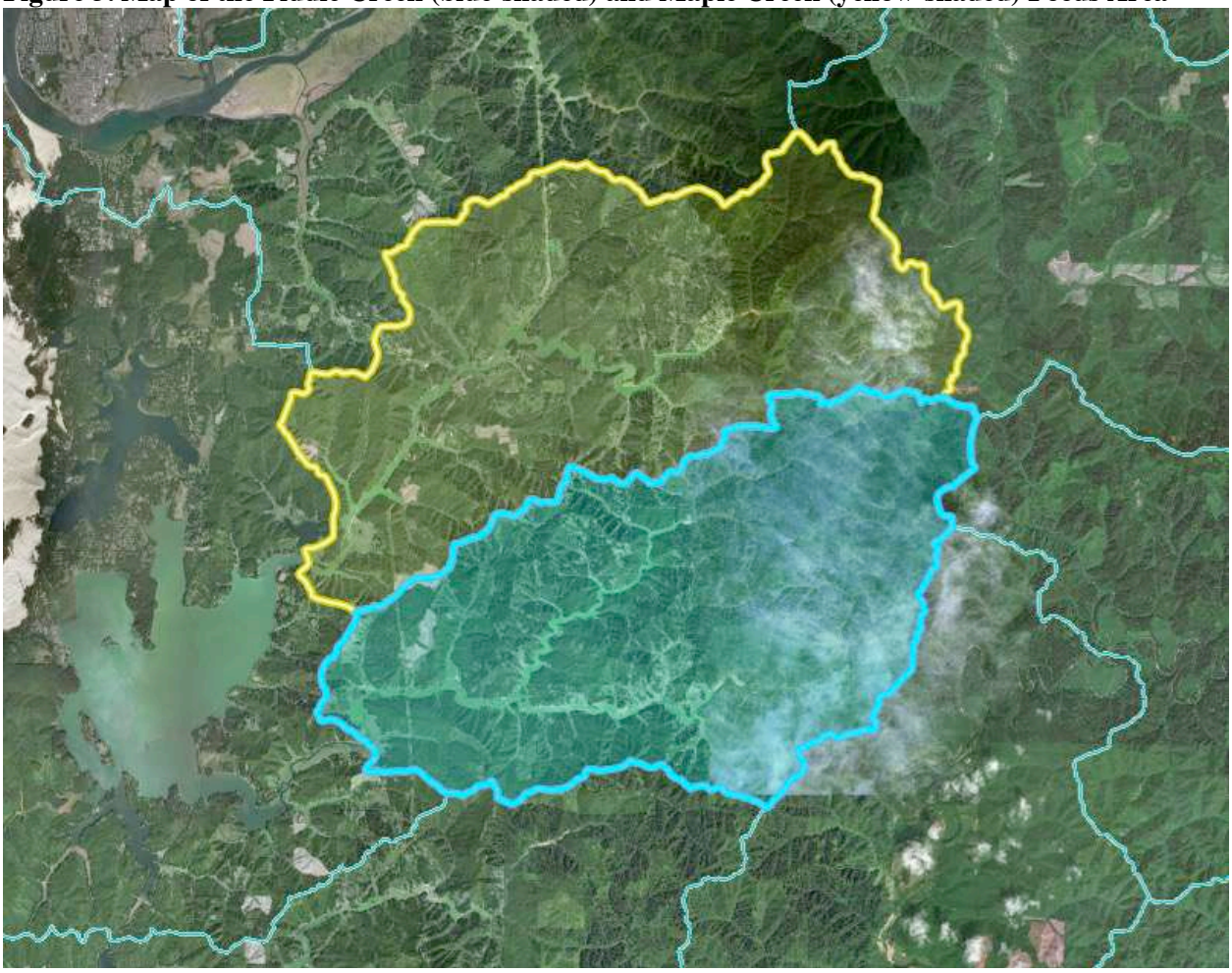
Fiddle Creek and Maple Creek Focus Area

Description

The Siuslaw SWCD is currently working in the Fiddle Creek and Maple Creek Focus Area (Figure 3). Work began in the Fiddle Creek watershed in 2015 and is now being expanded to include the Maple Creek watershed. Agriculture in the watershed includes cattle, hay, timber, and locally grown fruits and

vegetables. These watersheds were chosen because they are some of the most active agricultural areas within the Siuslaw District. In addition, the watersheds are just upstream from the Siltcoos Lake, which is a municipal water source for Dunes City and a recreational asset has experienced recent blue-green algal blooms that have threatened these uses. The watershed supports healthy populations of Coastal Cutthroat Trout and Steelhead and is renowned for having one of the healthiest native Coho Salmon runs in all of Oregon. Stream temperature and sediment are identified parameters affecting water quality. A number of partnerships exist within this Focus Area that have fostered the completion on many projects that are helping improve water quality.

Figure 3. Map of the Fiddle Creek (blue-shaded) and Maple Creek (yellow-shaded) Focus Area



Methodology

In 2015, Siuslaw SWCD conducted a pre-assessment using the ODA Streamside Vegetation Assessment (SVA) methodology to identify vegetation types within a 35-foot band on both sides of the stream on all agricultural lands in the Fiddle Creek watershed. This allowed a targeted approach to improve shade to help improve stream temperature. Preliminary results indicated that 41 percent of the Fiddle Creek watershed was either 'Bare Ag' or 'Grass Ag' (Figure 4). A pre-assessment of the Maple Creek watershed is underway. The SWCD invests in conducting a fluvial ecosystem restoration aproach which looks at all factors that may be needed to achieve water quality goals - such as planting, placing large wood, treating invasive species and replacing failing fish passage structures that contribute to increased sediment inputs.

Table 6. Fiddle Creek Conditions at the Beginning of the 2019-2021 Biennium

	Ag Buildings	Bare	Bare Ag	Grass	Grass Ag	Not Ag	Shrub Native	Shrub Ag	Shrub Invasive	Tree	Tree Ag	Water	Total Ag Acres
2019	3.2	0.0	2.6	0.0	78.6	4.5	9.6	8.7	0.13	97.5	0.5	8.6	213.8

Milestones

Milestones for the the Maple Creek portion of the Focus Area will be chosen after the pre-assessment vegetation types have been determined. Milestones for the Fiddle Creek portion of the Focus Area are to:

Fiddle Creek Watershed Milestones for the 2019-2021 Biennium:

- Increase 'Tree' by 10% = 9.75 acres
- Increase 'Native Shrub' by 10% = 0.96 acres
- Decrease 'Bare Ag' by 10% = 0.26 acres
- Decrease 'Grass Ag' by 10% = 7.86 acres
- Decrease 'Invasive Shrub' by 10% = 0.87 acres

Siletz River Focus Area

Winding through 67 miles of Lincoln County before meeting the Pacific Ocean, the Siletz Basin Focus Area consists of three HUC-10 Watersheds: Rock Creek, the Middle Siletz River, and Lower Siletz River (which includes 21.6 miles of Drift Creek Siletz and 10 miles of Schooner Creek as major tributaries) comprise a total of 191,384 acres (Figure 5). Only 4 percent of that area is Resource Zoned Agricultural Conservation by the Lincoln County tax assessor's office. However, that percentage represents a large area of 7,903 acres.

Figure 4. Map of the Siletz Focus Area

Pastureland is the most common agricultural land use type, generally used to graze cattle and other livestock as well as for haying.

The majority of the Focus Area, or 82 percent, is zoned for timber production. Roughly 70 percent of that number owned/managed by Industrial-scale entities with a mix of Private Individuals, Small companies, and the US Forest Service dividing that remaining ~10 percent of land. The remainder of the Focus Area consists of smaller public parcels owned by Department of Forestry, Bureau of Land Management, Bureau of Indian Affairs, US Fish and Wildlife, State Lands, and local government.

Lincoln SWCD chose the Siletz Basin as a Focus Area because of the need to improve water quality, concentration of agricultural/forestry activity, presence of ecologically important aquatic species, and the high potential for partnerships. Habitat restoration to improve instream conditions not only provide positive environmental outcomes, but also benefit neighboring human communities as the Siletz River and Schooner Creek are the drinking water source to the communities of Lincoln City, Newport, Seal Rock, Siletz, and Toledo. Additionally, the Siletz River watershed provides critical habitat and spawning ground for the ESA listed Coho Salmon, as well as Coastal Cutthroat Trout, Steelhead, Chinook Salmon, Chum Salmon, Rainbow Trout, Pacific Lamprey, and other aquatic species.

DEQ's most recent 303d report of impaired waters, released in 2012, listed several streams in the Siletz Basin Focus Area as impaired. Increased water temperature is the most common impairment in the watershed; however, *E.coli*, dissolved oxygen, turbidity, and biological criteria also threaten water quality and watershed health. General causes of impairments are changes in land use, lack of riparian vegetation, erosion, and non-point source pollution from agricultural practices and stormwater. While water quality

pollutants have been identified, DEQ is still working to establish TMLDs for these impairments. Lincoln SWCD and DEQ are in the process of collecting data which will be used to develop a TMDL for dissolved oxygen for the Siletz River.

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

Methodology

In 2019, Lincoln SWCD conducted a pre-assessment using the ODA Streamside Vegetation Assessment (SVA) methodology to identify vegetation types within a 35-foot band on both sides of the stream on all agricultural lands in the Siletz River watershed (Figure 6). This will allow a targeted approach to improve shade to help improve stream temperature.

Table 7. Siletz Focus Area Conditions at the Beginning of the 2019-2021 Biennium

Acres	Ag Buildings	Bare	Bare Ag	Grass	Grass Ag	Not Ag	Shrub Native	Shrub Ag	Tree	Tree Ag	Water	Total Ag Acres
2019	5.5	4.6	5.0	15.8	253.5	443.4	120.1	1.29	684.8	0	0	1,533.9

Milestones

On agricultural lands within the Siletz River basin Lincoln SWCD will provide landowner technical assistance and Best Management Project implementation to:

Table 8: Increase riparian buffers & plant diverse woody species in the following classes.

3.2 Strategies and Activities

The LAC has identified the following strategies for Area Plan implementation These are also identified in the SWCD's Scopes of Work as high priority objectives and strategies for improving water quality and achieving the mission and goal of the Area Plan. The LAC believes the objectives and strategies will achieve the mission and goal and produce the following outcomes:

- All agricultural landowners in the area become aware of the Area Plan and Rules and opportunities for technical and financial assistance.

- An increase in information and/or assistance requests to SWCDs and watershed councils about water quality issues and water quality improvement practices identified in the optional management practices section.
- Improvement of water quality in impacted waterbodies with agricultural use.

The LAC recommends that the Lincoln and Siuslaw SWCDs, ODA, watershed councils, and any other agencies or organizations wishing to aid in addressing water quality issues implement the objectives and strategies. For a complete list of organizations that provide educational and technical assistance in the Management Area, please consult Appendix D.

Table 9: Strategies and Activities

Strategy	Activities
Community & Landowner Engagement	▪ Develop printed materials including information about the Area Plans and Rules, newsletter articles, tutorials and handbooks. ▪ Conduct workshops, provide displays, give presentations and direct landowner contacts. ▪ Develop and maintain a website and other social media. ▪ Host native plant sales. ▪ Provide demonstration projects, tours for landowners, and other activities such as youth Envirothon, outdoor school, presentations and poster contests. ▪ Write grants for funds to support education and outreach.
Technical Assistance & Project Implementation	▪ Conduct site visits to provide conservation planning and design projects. ▪ Write grants for agricultural water quality projects. ▪ Implement conservation practices such as riparian restoration, weed eradication, irrigation efficiency, pasture management, manure management and/or cover crops. ▪ Assist ODA with compliance visits. ▪ Provide project management, inspection and verification not covered in other grant agreements.
Partnerships	▪ Seek opportunities to diversify funding. ▪ Develop NRCS cooperative agreements. ▪ Participate in local and basin work groups such as Mid Coast TMDL Local Stakeholder Advisory and Technical teams and Siuslaw Coho Partnership.
Monitoring	***Lincoln SWCD*** ▪ Conducts monthly water quality data at ten sites above tidal influence along the Siletz mainstem through June 2020. ▪ The SWCD participates with the OHA Sediment Monitoring on Siletz River during high water events. ▪ Assists with the ODA 20-year temperature monitoring study to provide the adequate data required to show changes in A-biotic aquatic conditions over time. ▪ Completed SVA for the Siletz River 2018-2019. ▪ Assists with biological monitoring of aquatic species populations through the Mid Coast Monitoring Project. ***Siuslaw SWCD***

	▪ The SWCD has partnered with the Siuslaw Watershed Council (SWC) and ODA to continue our 20 year temperature monitoring study to provide the adequate data required to substantiate whether or not riparian revegetation efforts on agricultural lands are effective at decreasing stream temperatures within the Siltcoos Lake Watershed. The data will also be used to track the effectiveness of implementing the Siuslaw and Coastal Lakes Strategic Action Plan (SAP) currently being developed by the Siuslaw Coho Partnership (SCP). The District's role is primarily to deploy, audit, and retrieve the temp loggers. The SWC will do the pre and post accuracy checks; as well as download, analyze and submit the data to the Oregon DEQ. ▪ Grant writing to fund monitoring.

3.3 Monitoring and Evaluation

DEQ and Partner Monitoring

A substantial amount of continuous temperature and dissolved oxygen data has been collected by DEQ and local volunteer monitoring organizations. Nearly all data collected through 2017 is now available in DEQ's publicly accessible AWQMS database whereas some of the 2018 data is not yet in an external database. This data was collected for multiple purposes, including baseline monitoring, re-assessment of segments on the 303d list, and for development of water quality models. Several draft reports have been published containing the results of monitoring and data analysis, including the Siletz DO data analysis (2017), the Upper Yaquina DO (2016) and QUAL-2kw model calibration report (2018).

The data quality for the Alsea River and Beaver Creek DO assessment (2018) is being reviewed and the data has been or will be assessed using a variety of tools and compared to applicable criteria.

To address existing 303d listings, DEQ currently is working with multiple agencies, tribal nations, and local non-governmental stakeholders to develop coordinated monitoring efforts to assess current status for dissolved oxygen in the listed segments and, where necessary, develop TMDLs for factors contributing to

DO impairments. For more information, see Mid-Coast Basin local stakeholder advisory committee at: http://www.oregon.gov/deq/wq/tmdls/Pages/TMDLs-Basin-MidCoast-LSAC.aspx.

Monitoring data collected sporadically from 1999 to 2018 by multiple organizations suggest that 18 river segments in the Mid Coast Subbasin may fail to consistently meet Oregon's applicable dissolved oxygen (DO) criteria for cold water and/or spawning. Many of the Mid Coast river segments were placed on Oregon's Section 303d list based on grab samples collected by DEQ or volunteer monitoring organizations. Subsequent analyses of continuous monitoring data collected in 2008 for several of these segments confirm that standards are not consistently met. For some of these waterbodies, DO status has been reassessed using continuous monitoring data are collected and evaluated from 2016-2018. U.S. EPA added segments in the Mid-Coast Basin when the 2012 Section 303(d) list for Oregon was approved. DEQ commented that many of these additional listings were not supported by the data and the final 303(d) reflected some changes based on those comments. DEQ's status and trends report is discussed below in 4.3.1 below.

ODA Stream Temperature and Streamside Vegetation Monitoring

In 2017, ODA began working with 14 local organizations to collect data on stream temperature, air temperature, stream flows, and riparian vegetation on agricultural lands. This monitoring will be carried out for 20 years. Data will be used by ODA to determine whether improved stream temperatures can be measured as a result of improved riparian vegetation on agriculture lands. In addition, the local organizations will use the data to answer their own questions relating to stream temperature. Oregon's DEQ will use the data to assess whether the monitored stream reaches are meeting water temperature standards.

For a description of monitoring and evaluation results, see Chapter 4.

Chapter 4: Implementation, Monitoring, and Adaptive Management

4.1 Progress Toward Measurable Objectives

4.1.1 Management Area

ODA is working with SWCDs and LACs throughout Oregon towards establishing long-term Measurable Objectives, to achieve desired conditions. At the focus area scale, milestones over space and time serve to show progress. The following sections provide assessment results and progress toward measurable objectives and milestones detailed in Chapter 3.1. See Chapter 3.1 for background and assessment methods.

4.1.2 Focus Area(s)

Fiddle Creek and Maple Creek Focus Area

Over the past biennium, Siuslaw SWCD has implemented the following accomplishments and projects in the Fiddle Creek portion of the Focus Area:

- Awarded 2019 Wild Salmon Center funding and Siuslaw Partnership for Fiddle Creek Tributary & Wetland Enhancement,
- Awarded PCSRF funds through the Confederated Tribes of the Coos, Lower Umpqua & Siuslaw Indians for floodplain and aquatic enhancement projects,
- Ongoing outreach and technical assistance was provided to Focus Area landowners,
- Ongoing water quality monitoring was conducted in Fiddle and Maple Creek watersheds.

Projects Completed:

- Conducted site preparation and riparian planting on 13.22 acres,
- Established plants on 37.08 acres,
- Large wood was placed in 1.7 miles of stream,
- Replaced failing culverts with bridges to provide access on 1.9 miles of stream and reduce sediment.

Assessment Results

- Sisulaw SWCD has demonstrated in the Fiddle Creek Focus Area that it is possible to achieve water quality standards. At least, we know from water quality monitoring data that the Temperature standard was attained during the last biennium. Because baseline information is lacking, we can't say with certainty that this is due to project implementation. We hope to see a steady or improving trend at future biennial review checks. Nonetheless, there has been little change in the vegetation categories from Grass Ag to Grass, Tree or Shrub. The fact that the temperature standard is being attained may be due to also having placed large wood and having conducted other instream restoration. This would be worth looking into further to consider whether this combination might be helpful in other watersheds.
- The milestone selected relative to the ODA SVA is an arbitrary number that may have been overly ambitious with regard to anticipated changes in vegetation using the ODA SVA. However, demonstrating achieving water quality standards is a higher bar and this achievement is exemplary. Figures 7 and 8 provide ODA SVA data. To explore current water quality results, see 4.3 below.

Factors for success include:

- The SWCD District Board's ability to build relationships with the farming and ranching community. This history of relationship building has resulted in the SWCD being able to focus on project implementation and less on outreach at this point in time.
- Taking a whole watershed approch in the Focus Area which includes addressing instream habitat, fish passage and addressing invasive species in addition to improving streamside vegetation.

Challenges and Opportunities:

- After years of extensive planning and collaboration working with partners through the Oregon Coastal Coho Business Plan process to draft a Salmon Action Plan, the partners were not able to secure the Siuslaw Coho Partnership (SCP) OWEB FIP. This significantly affects what could have been accomplished in the next biennium. The SCP is diversifying their pool of funding sources which should provide opportunities to elevate the scale and pace of restoration within the Coastal Lakes Watersheds.
- Changes in land ownership resulted in a need to re-evaluate potential projects.
- Because there is more work to do with willing landowners, the SWCD plans to continue the Fiddle Creek Focus Area with the addition of the Maple Creek watershed.

Figure 5. Fiddle Creek Focus Area Streamside Vegetation Assessment Results Over Time

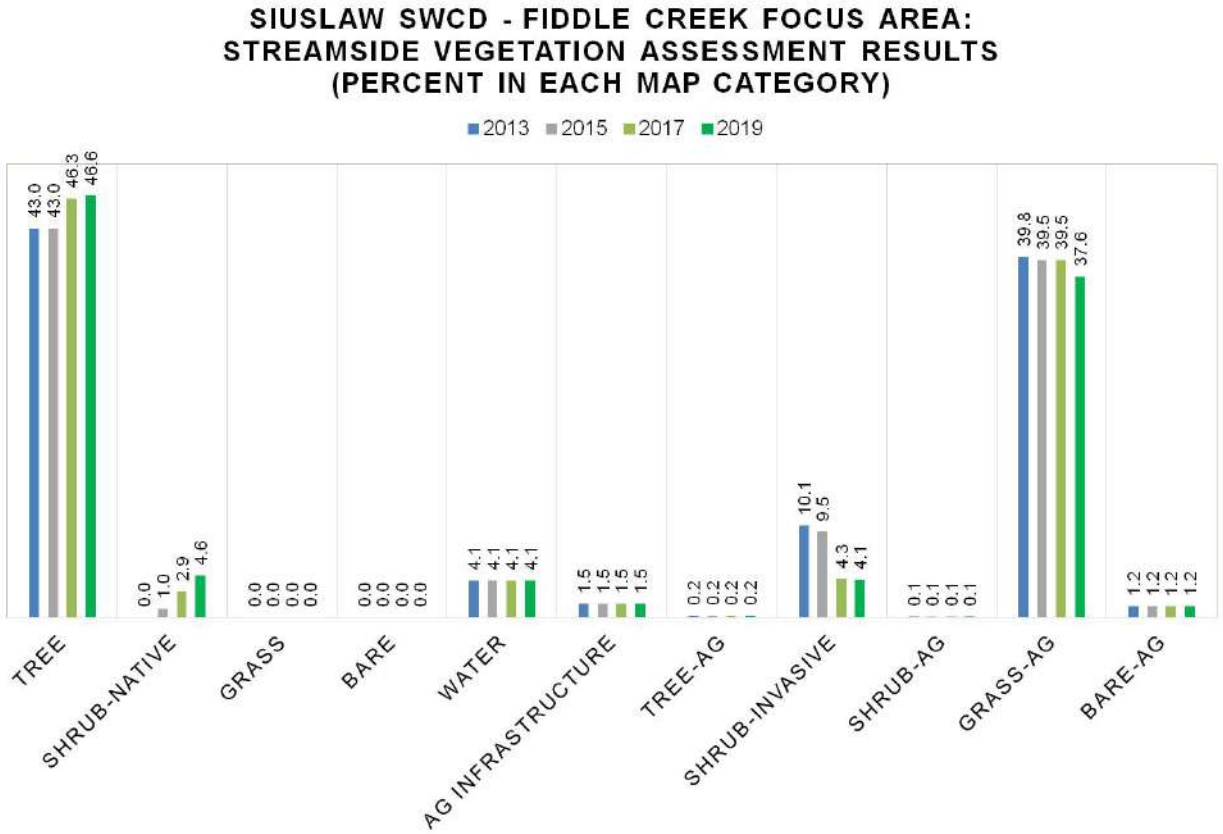


Table 10: Fiddle Creek Conditions

Acres	Ag Buildings	Bare	Bare Ag	Grass	Grass Ag	Not Ag	Shrub Native	Shrub Ag	Shrub Invasive	Tree	Tree Ag	Water	Total Ag Acres
2013	3.2	0.0	2.6	0.0	83.3	4.5	0.0	0.1	21.2	89.9	0.5	8.6	213.8
2015	3.2	0.0	2.6	0.0	82.6	4.5	2.0	0.1	19.8	89.9	0.5	8.6	213.8
2017	3.2	0.0	2.6	0.0	82.6	4.5	6.0	0.1	8.9	96.8	0.5	8.6	213.8
2019	3.2	0.0	2.6	0.0	78.6	4.5	9.6	0.1	8.7	97.5	0.5	8.6	213.8
+/-	0	0	0	0	-4.0	0	+3.6	0	-0.2	+0.7	0	0	0

Siletz River Focus Area

Over the past biennium, Lincoln SWCD has implemented the following accomplishments and projects in the Siletz River Focus Area:

- Conducting outreach and site visits for Focus Area landowners:
  - soil health and erosion abatement projects
  - riparian plant establishment
  - wetland enhancement
  - off-stream livestock watering
  - streambank erosion
- Conducting monitoring,
- Assisting to develop a survey and outreach activities for the Mid Coast Water Planning, Partnership related to biosolids applications in the Focus Area,
- Developed a conservation farm plan for a landowner.

Assessment Results

This Focus Area is in the early stages of implementation. A pre-assessment has been completed and milestones will be identified early in the 2019-2021 biennium (Figure 9). The SWCD experienced staff changes in 2018 and 2019. New staff, hired in late 2019, will increase the SWCD's capacity to develop and conduct stakeholder engagement opportunities.

Figure 11: Siletz River Conditions

	Ag Bldgs	Bare	Bare Ag	Grass	Grass Ag	Not Ag	Shrub Ag	Shrub Invasive	Tree	Tree Ag	Water	Total Ag Acres
2017	5.45	4.58	5.03	15.80	253.54	443.36	1.29	684.75	0	0	1,533.90	1,090.54
2019	5.45	4.58	5.03	15.80	253.54	443.36	1.29	684.75	0	0	1,533.90	1,090.54
+/-	0	0	0	0	0	0	0	0	0	0	0	1,090.54

Note: the number of acres of water is skewed due to how the SVA was completed.

Even though staff are relatively new they have successfully:

- Conducted site visits to discuss a variety of practices,
- Hosted an erosion workshop and native plant sale,
- Conduct monthly water quality monitoring through a DEQ grant,
- Collaborated with Lincoln County Environmental Health Department to secure a grant through the Oregon Health Authority Domestic Well Testing Program. The partners will engage with Siletz landowners to provide information and conduct monitoring of wells.
- Submitted a proposal for stakeholder engagement in the Siletz watershed.

4.2 Activities and Accomplishments

Table 12: 2015 – 2017 Fiscal Biennium Accomplishments		Lincoln	Siuslaw
	# Workshops/Presentations	6	NA
	# Workshop Attendees	284	NA
	# Fact Sheets/Brochures Distributed	619	NA
Technical Assistance	# Landowners Provided with Technical Assistance	61	92
	# On-Site Evaluations/On-Site Visits	31	35
	# Fund Applications Submitted for Landowner Projects	3	5
	# Ag Water Quality Projects Implemented	0	9
Project Implementation	Total Acres in Implemented Ag Water Quality Projects		11.93
	Riparian Release (acres)		11.93
	Riparian Forest Buffer (acres)		1.5
	Stream Habitat Improvement & Management (miles)		.5
	Pest Management		.25
	Aquatic Organism Passage (miles)		.5

4.3 Monitoring—Status and Trends

4.3.1 Water Quality

A formal DEQ Status and Trends Report is not available for this review but will be completed in the near future. Once completed, the report can be found at https://www.oregon.gov/deq/wq/programs/Pages/wqstatustrends.aspx.

However, an interactive map and certain results are available, which can be explored to view the status of certain parameters and see whether sufficient data is available to calculate the trend. At the link below, you will find the tabular results that will be included in the formal Mid-Coast Status and Trend Report.
ftp://deqftp2.deq.state.or.us/rmichie/WQST_2019-Mid-Coast_DRAFT_2019_08_12.zip

Included in this report are status and/or trend results for water quality data collected between Jan 1, 1999 and Dec 31, 2018 for:

- Dissolved Oxygen
- Bacteria (Fecal Coliform, E coli, and enterococcus)
- pH
- Total Phosphorus (Phosphate-phosphorus)
- Temperature
- Total Suspended Solids

Caveats:
As you review the data, keep in mind:

- The factors for attaining, or not attaining, a standard can be complex.
- Site specific data beyond what the DEQ Status and Trends data tell us is needed in order to link specific practices with an outcome.

Key Conclusions:

Temperature
It is worth noting that the Temperature standard is attained, for the most part, in the Fiddle Creek watershed for the past biennium. We cannot say that this is due to the projects implemented by the

Siuslaw SWCD because we do not have baseline data to compare with. However, at future LAC meetings we may be able to know whether the trend is steady, improving or declining. We can also consider whether the projects implemented are, in fact, making a difference.

Dissolved Oxygen
Water quality modeling in the Upper Yaquina watershed indicates that temperature and phosphorus are the primary factors influencing DO conditions. Each of these factors has anthropogenic sources; temperature is primarily a result of solar radiation reaching the water surface on streams resulting from inadequate site potential shade, and phosphorus loads are often related to nutrient management or rural onsite septic disposal systems. For the Siletz watershed (from Moonshine Park to Cedar Creek), the 2017 assessment data indicates that spawning criterion are being met whereas the cold water (rearing and migration) criterion were not consistently met throughout the assessment area.

Bacteria
Water quality assessment, local knowledge and modeling in the Upper Yaquina watershed indicates that land use and practices are the primary factor influencing fecal bacteria levels. Although bacteria levels are a combination of natural (wildlife) and anthropogenic sources, DEQ's assessment through the local technical working group (TWG) process indicates that the controllable portion of bacteria loads is related to livestock practices, manure management and rural onsite septic disposal systems (OSDS). DEQ is preparing the draft TMDLs and water quality management plans for the Upper Yaquina River. As part of the stakeholder process, DEQ and ODA will coordinate evaluation of the agricultural contribution and load reductions. Lincoln County will be engaged to evaluate the OSDS contribution.

Total Suspended Solids
There is insufficient data to determine the status or trend for total suspended solids.

4.4 Biennial Reviews and Adaptive Management

Summary of Progress and Impediments
▪ The Area Plan is a good document describing water quality issues, practices that can be done to address the water quality issues and a summary of work that is being accomplished. ▪ The LAC and guests voiced appreciation for the process and working with the LAC and other partners to achieve mutual goals. ▪ There is still a lot of work to be done in streamside areas to cool water, filter surface runoff and maintain bank stabillity. ▪ There is an ongoing need for maintenance once streamside areas have been planted. ▪ The voluntary approach is best and neighbor to neighbor communications can be effective way to lead by example. ▪ Questions still remain on what is best for fish. While the LAC acknowledges a need for improved streamside vegetation we also need to continuously learn and adapt our strategies as new information becomes available. ▪ There is a need to test for emerging contaminants such a pharmaceuticals and personal care products. At the current time resources only allow for monitoring of basic water quality parameters. ▪ We need to get the principles understood first before we can know the best practices to implement.
Recommended Modifications and Adaptive Management
▪ Focus improvements on improving streamside vegetation. ▪ Instream habitat is not addressed by the Plan but is essential to achieve the agricultural water quality program goals. The Program should explicitly acknowledge this as a backdrop to the voluntary efforts among various partners to achieve uplift beyond the compliance bar.

ODA Compliance:

Over the past biennium there have been two compliance cases. One is closed and the landowner received a Letter of Compliance. The other is active and the SWCD is working with the landowner to assist them to achieve objectives for their farm. This landowner received a Water Quality Advisory from ODA and a follow up inspection is planned for the fall/winter. Both cases involve livestock manure. The closed case was management of horses adjacent to a large river and the other regards overland flow across a pig pasture carrying manure onto a neighbor's land and potentially into a large river.

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Note: For copies of these publications, check with your local SWCD, watershed council, or OSU Extension office. Many of these publications are also available on the Internet.

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Appendix A: Anadromous Fish Habitat Use, Distribution, and Status, *Mid Coast Basin

Species	Habitat use for spawning and rearing	Distribution in Management Area	Status in the Management Area
Coho	Use small, relatively low-gradient tributary streams for spawning and juvenile rearing; can use lakes for rearing when available; prefer complex in-stream structure for rearing	Spawning and rearing in Salmon, Siletz, Yaquina, Alsea, Yachats, and Siuslaw rivers, and Siltcoos/Tahkenitch lakes, as well as several smaller coastal streams	Populations much lower than historic levels and very unstable - federally listed as a threatened species
Chum	Use mainstems and tributaries very close to tidewaters for spawning; inhabit estuaries briefly and then migrate to ocean	Spawning and rearing in Salmon, Siletz, Yaquina, Alsea, and Siuslaw rivers	Populations much lower than historic levels; several coastal populations stable; 1998 federal review determined that Endangered Species Act listing was not warranted
Fall Chinook	Use mainstems and lower tributaries for spawning and rearing; rearing also occurs in estuaries	Spawning and rearing in Siletz, Yaquina, Alsea, Yachats, and Siuslaw rivers	Populations much lower than historic levels, but stable; 1998 federal review determined that Endangered Species Act listing was not warranted
Spring Chinook	Use mainstems and lower tributaries for spawning and rearing; rearing also occurs in estuaries	Spawning and rearing in Siletz and Alsea rivers	Populations lower than historic levels but stable; 1998 federal review determined that Endangered Species Act listing was not warranted

Species	Habitat use for spawning and rearing	Distribution in Management Area	Status in the Management Area
Summer Steelhead	Use small, moderate-gradient tributaries for spawning and rearing; prefer complex in-stream habitat	Spawning and rearing in Siletz River	Several populations declining; candidate for listing under the federal Endangered Species Act
Winter Steelhead	Use small, moderate-gradient tributaries for spawning and rearing; prefer complex in-stream habitat	Spawning and rearing in Salmon, Siletz, Yaquina, Alsea, Yachats, and Siuslaw Rivers, and Siltcoos/Tahkenitch lakes, as well as several smaller coastal streams	Several populations declining; candidate for listing under the federal Endangered Species Act
Coastal Cutthroat	Spawn in very small tributaries; use channel margins and backwaters for early rearing and low-velocity pools and side channels with large, woody in-stream structure for later rearing	Spawning and rearing in Salmon, Siletz, Yaquina, Alsea, Yachats, and Siuslaw Rivers, and Siltcoos/Tahkenitch lakes, as well as several smaller coastal streams	Populations unstable, candidate for listing under the federal Endangered Species Act

* Information is derived from Oregon Department of Fish and Wildlife spawning survey records and aquatic inventory reports.

Appendix B: 303(d) List Parameters and Impacted Beneficial Uses

The following parameters are used by DEQ in establishing the 303(d) List and assessing and documenting waterbodies with TMDLs. Note: This is an abbreviated summary and does not contain all parameters or detailed descriptions of the parameters and associated standards. Specific information about these parameters and standards can be found at: www.deq.state.or.us/wq/assessment/assessment.htm or by calling (503) 229-6099.

Parameters

Bacteria: *Escherichia coli (E. coli)* is measured in streams to determine the risk of infection and disease to people. Bacteria sources include humans (recreation or failing septic systems), wildlife, and agriculture. On agricultural lands, E. coli generally comes from livestock waste, which is deposited directly into waterways or carried to waterways by livestock via runoff and soil erosion. Runoff and soil erosion from agricultural lands can also carry bacteria from other sources.

Biological Criteria: To assess a stream's ecological health, the community of benthic macro invertebrates is sampled and compared to a reference community (community of organisms expected to be present in a healthy stream). If there is a significant difference, the stream is listed as water quality limited. These organisms are important as the basis of the food chain and are very sensitive to changes in water quality. This designation does not always identify the specific limiting factor (e.g., sediment, nutrients, or temperature).

Dissolved Oxygen: Dissolved oxygen criteria depends on a waterbody's designation as fish spawning habitat. Streams designated as salmon rearing and migration are assumed to have resident trout spawning from January 1 – May 15, and those streams designated core cold water are assumed to have resident trout spawning January 1 – June 15. During non-spawning periods, the dissolved oxygen criteria depends on a stream's designation as providing for cold, cool or warm water aquatic life, each defined in OAR 340 Division 41.

Harmful Algal Blooms: Some species of algae, such as cyanobacteria or blue-green algae, can produce toxins or poisons that can cause serious illness or death in pets, livestock, wildlife, and humans. As a result, they are classified as Harmful Algae Blooms. Several beneficial uses are affected by Harmful Algae Blooms: aesthetics, livestock watering, fishing, water contact recreation, and drinking water supply. The Public Health Department of the Oregon Health Authority is the agency responsible for posting warnings and educating the public about Harmful Algae Blooms. Under this program, a variety of partners share information, coordinate efforts and communicate with the public. Once a water body is identified as having a harmful algal bloom, DEQ is responsible for investigating the causes, identifying sources of pollution and writing a pollution reduction plan.

Mercury: Mercury occurs naturally and is used in many products. It enters the environment through human activities and from volcanoes, and can be carried long distances by atmospheric air currents. Mercury passes through the food chain readily, and has significant public health and wildlife impacts from consumption of contaminated fish. Mercury in water comes from erosion of soil that carries naturally occurring mercury (including erosion from agricultural lands and streambanks) and from deposition on land or water from local or global atmospheric sources. Mercury bio-accumulates in fish, and if ingested can cause health problems.

Nitrate: While nitrate occurs naturally, the use of synthetic and natural fertilizers can increase nitrate in drinking water (ground and surface water). Applied nitrate that is not taken up by plants is readily carried

by runoff to streams or infiltrate to ground water. High nitrate levels in drinking water cause a range of human health problems, particularly with infants, the elderly, and pregnant and nursing women.

Pesticides: Agricultural pesticides of concern include substances in current use and substances no longer in use but persist in the environment. Additional agricultural pesticides without established standards have also been detected. On agricultural lands, sediment from soil erosion can carry these pesticides to water. Current use agricultural pesticide applications, mixing-loading, and disposal activities may also contribute to pesticide detections in surface water. For more information, see: www.deq.state.or.us/wq/standards/toxics.htm.

Phosphorous/Algae/pH/Chlorophyll a: Excessive algal growth can contribute to high pH and low dissolved oxygen. Native fish need dissolved oxygen for successful spawning and moderate pH levels to support physiological processes. Excessive algal growth can also lead to reduced water clarity, aesthetic impairment, and restrictions on water contact recreation. Warm water temperatures, sunlight, high levels of phosphorus, and low flows encourage excessive algal growth. Agricultural activities can contribute to all of these conditions.

Sediment and Turbidity: Sediment includes fine silt and organic particles suspended in water, settled particles, and larger gravel and boulders that move at high flows. Turbidity is a measure of the lack of clarity of water. Sediment movement and deposition is a natural process, but high levels of sediment can degrade fish habitat by filling pools, creating a wider and shallower channel, and covering spawning gravels. Suspended sediment or turbidity in the water can physically damage fish and other aquatic life, modify behavior, and increase temperature by absorbing incoming solar radiation. Sediment comes from erosion of streambanks and streambeds, agricultural land, forestland, roads, and developed areas. Sediment particles can transport other pollutants, including bacteria, nutrients, pesticides, and toxic substances.

Temperature: Oregon's native cold-water aquatic communities, including salmonids, are sensitive to water temperature. Several temperature criteria have been established to protect various life stages and fish species. Many conditions contribute to elevated stream temperatures. On agricultural lands, inadequate streamside vegetation, irrigation water withdrawals, warm irrigation water return flows, farm ponds, and land management that leads to widened stream channels contribute to elevated stream temperatures. Elevated stream temperatures also contribute to excessive algal growth, which leads to low dissolved oxygen levels and high pH levels.

Appendix C: Conservation Funding Programs

The following is a list of some conservation funding programs available to landowners and organizations in Oregon. For more information, please refer to the contact agencies for each program. Additional programs can become available after the publication of this document. For more current information, please contact one of the organizations listed below (see Appendix D for contact information).

Program	General Description	Contact
Agricultural Conservation Easement Program	Provides financial and technical assistance to help conserve agricultural lands and wetlands and their related benefits.	Natural Resources Conservation Service, Farm Service Agency, Soil and Water Conservation Districts
Conservation Reserve Enhancement Program (CREP)	Provides annual rent to landowners who enroll agricultural lands along streams. Also cost-shares conservation practices such as riparian tree planting, livestock watering facilities, and riparian fencing.	Natural Resources Conservation Service, Farm Service Agency, Soil and Water Conservation Districts, Oregon Department of Forestry
Conservation Reserve Program (CRP)	Competitive CRP provides annual rent to landowners who enroll highly erodible lands. Continuous CRP provides annual rent to landowners who enroll agricultural lands along seasonal or perennial streams. Also cost-shares conservation practices such as riparian plantings.	Natural Resources Conservation Service, Farm Service Agency, Soil and Water Conservation Districts
Conservation Stewardship Program (CSP)	Provides cost-share and incentive payments to landowners who have attained a certain level of stewardship and are willing to implement additional conservation practices.	Natural Resources Conservation Service, Soil and Water Conservation Districts
Emergency Watershed Protection Program (EWP)	Available through the USDA-Natural Resources Conservation Service. Provides federal funds for emergency protection measures to safeguard lives and property from floods and the products of erosion created by natural disasters that cause a sudden impairment to a watershed.	Natural Resources Conservation Service, Soil and Water Conservation Districts
Environmental Protection Agency Section 319 Grants	Fund projects that improve watershed functions and protect the quality of surface and groundwater, including restoration and education projects.	DEQ, Soil and Water Conservation Districts, Watershed Councils
Environmental Quality Incentives Program (EQIP)	Cost-shares water quality and wildlife habitat improvement activities, including conservation tillage, nutrient and manure management, fish habitat improvements, and riparian plantings.	Natural Resources Conservation Service, Soil and Water Conservation Districts
National Timber Tax Website	Provides federal tax credit as incentive to plant trees.	Internal Revenue Service http://www.timbertax.org/getstarted/reforestation
Forest Legacy Program	State assistance up to 100 percent of the costs to convert non-stocked forestland to timber stands. Available to non-industrial private landowners.	Oregon Department of Forestry
Grassland Reserve Program (GRP)	Provides incentives to landowners to protect and restore pastureland, rangeland, and certain other grasslands.	Natural Resources Conservation Service, Farm Service Agency, Soil and Water Conservation Districts

Program	General Description	Contact
Landowner Incentive Program (LIP)	Provides funds to enhance existing incentive programs for fish and wildlife habitat improvements.	U.S. Fish and Wildlife Service, Oregon Department of Fish and Wildlife
Oregon Watershed Enhancement Board (OWEB)	Provides grants for a variety of restoration, assessment, monitoring, and education projects, as well as watershed council staff support. 25% local match requirement on all grants.	Soil and Water Conservation Districts, Watershed Councils, Oregon Watershed Enhancement Board
Partners for Wildlife Program	Provides financial and technical assistance to private and non-federal landowners to restore and improve wetlands, riparian areas, and upland habitats in partnership with the U.S. Fish and Wildlife Service and other cooperating groups.	U.S. Fish and Wildlife Service (503) 231-6179, Natural Resources Conservation Service, Soil and Water Conservation Districts
Private Stewardship Grants Program	Provides up to 90% cost-share for landowners to improve sensitive, threatened, and endangered species habitat.	U.S. Fish and Wildlife Service
Public Law 566 Watershed Program	Program available to state agencies and other eligible organizations for planning and implementing watershed improvement and management projects. Projects should reduce erosion, siltation, and flooding; provide for agricultural water management; or improve fish and wildlife resources.	Natural Resources Conservation Service, Soil and Water Conservation Districts
Resource Conservation & Development (RC & D) Grants	Provides assistance to organizations within RC & D areas in accessing and managing grants.	Resource Conservation and Development, (541) 757-6709
Regional Conservation Partnership Program	Provides assistance to producers through partnership agreements and through program contracts or easement agreements.[3]	Natural Resources Conservation Service, Soil and Water Conservation Districts
State Tax Credit for Fish Habitat Improvements	Provides tax credit for part of the costs of voluntary fish habitat improvements and required fish screening devices.	Oregon Department of Fish and Wildlife
State Property Tax Exemption	Provides property tax exemption or special assessment programs for Conservation Easements, Riparian Lands, Wildlife Habitat Conservation and Management and Open Space Lands.	Oregon Department of Revenue
Wetlands Reserve Program (WRP)	Provides cost sharing to landowners who restore wetlands on agricultural lands.	Natural Resources Conservation Service, Soil and Water Conservation Districts
Wildlife Habitat Incentives Program (WHIP)	Provides cost-share for wildlife habitat enhancement activities.	Natural Resources Conservation Service, Soil and Water Conservation Districts
Wildlife Habitat Tax Deferral Program	Maintains farm or forestry deferral for landowners who develop a wildlife management plan with the approval of the Oregon Department of Fish and Wildlife.	Oregon Department of Fish and Wildlife, Soil and Water Conservation Districts, Natural Resources Conservation Service

[3]Assistance is delivered in accordance with the rules of EQIP, CSP, ACEP and HFRP; and in certain areas the Watershed Operations and Flood Prevention Program.

Appendix D: Sources of Information and Technical Assistance

USDA Farm Services Agency
Maintains agricultural program records and administers federal cost-share programs. Maintains up-to-date aerial photographs and slides of agricultural and forest lands.

Douglas County
2593 NW Kline Street
Roseburg, OR 97470
(541) 673-6071 ext. 2

Lane County
780 Bailey Hill Road
Eugene, OR 97402-545
(541) 465-6443

Linn/Lincoln/Benton counties
31978 North Lake Creek Drive
Tangent, OR 97389
(541) 967-5925

USDA Natural Resources Conservation Service
Provides information on soil types, soils mapping, and interpretation. Administers and provides assistance in developing conservation plans for federal programs such as the CRP, CREP, the EQIP, and the WRP. Makes technical determinations on wetlands and highly erodible lands.

Benton County
31978 North Lake Creek Drive
Tangent, OR 97389
(541)-967-5925

Lincoln County
157 NW 15th Street, Unit 1
Newport, OR 97365
(541) 265-2631

Lane County
780 Bailey Hill Road
Eugene, OR 97402-5451
(541) 465-6443

Douglas County
2593 NW Kline Street
Roseburg, OR 97470
(541) 673-6071

Polk County
580 Main Street, Suite A
Dallas, OR 97338-1911
(503) 623-2396

Tillamook County
641 Signal Street
Tillamook, OR 97141
(503) 842-2848

Waldport Service Center
1130 SW Forestry Lane
Waldport, OR 97394

Noxious Weed Control Agents
Conduct education programs to spread awareness of noxious weeds and their impacts, and work to eradicate noxious weeds within their designated noxious weed control district.

Benton County Public Works
360 SW Avery
Corvallis, OR 97333
(541) 766-6821

Douglas County
433 Rifle Range Road
Roseburg, OR 97470
(541) 440-4268

Lane County Public Works
3045 Delta Hwy N
Eugene, OR 97408
(541) 682-6900

Lincoln County
880 NE 7th Street
Newport, OR 97365
(541) 265-5747

Polk County SWCD
580 Main Street, Suite A
Dallas, OR 97338
(503) 623-9680

Tillamook County SWCD
6415 Signal Street
Tillamook, OR 97141
(503) 842-2240, ext. 102

Oregon Department of Agriculture
The Natural Resources Program Area is responsible for developing and implementing Agricultural Water Quality Management Area plans and rules across Oregon, the CAFO Program, the Smoke Management Program, providing support to Oregon's SWCDs, and the Pesticides Program. The Pesticides Program regulates the sale and use of pesticides; tests and licenses all users of restricted-use pesticides, is responsible for fertilizer registration, and investigates incidents of alleged pesticide misuse. The Plant Division's weed program works to survey and detect noxious weeds, prevent new invasive species from

becoming established in Oregon, eradicate non-native pests, and educate public and private entities about the impacts of non-native invasive species.

635 Capitol Street NE
Salem, OR 97301
Natural Resources Division: (503) 986-4700
Pesticides Division: (503) 986-4635
Plant Division: (503) 986-4621
http://www.oda.state.or.us

Oregon Department of Environmental Quality
Responsible for protecting Oregon's water and air quality, cleaning up spills and releases of hazardous materials, and managing the proper disposal of solid and hazardous wastes. Maintains a list of water quality limited streams and establishes TMDLs for water quality limited waterbodies.

165 E. 7th Avenue
Eugene, OR 97401
(541) 687-7345

Oregon Department of Fish and Wildlife
Works with landowners to protect and enhance habitat for a variety of fish and wildlife species, manages recreational fishing and hunting programs, monitors fish and wildlife populations, conducts education and information programs, and administers wildlife habitat tax deferral program.

Newport office
2040 SE Marine Science Dr.
Newport, OR 97365
(541) 867-4741
http://www.dfw.state.or.us

Florence office
P.O. Box 1
Florence, OR 97439
(541) 902-1384

Springfield office
3150 E Main Street
Springfield, OR 97478
(541) 726-3515

Oregon Department of Forestry
Implements Oregon forest practices laws, administers Oregon forestry property tax programs, provides forest management technical assistance to landowners, and administers or assists with several federal and local cost sharing programs.

Douglas County
1758 NE Airport Road
Roseburg, OR 97470
(541) 440-3412

Lane County
87950 Territorial Highway
Veneta, OR 97487-015
(541) 935-2283

Tillamook County
801 Gales Creek Road
Forest Grove, OR 97116
(503) 357-2191
http://www.odf.state.or.us

Lincoln County
763 NW Forestry Road
Toledo, OR 97391
(541) 336-2273

Polk and Benton counties
825 Oak Villa Road
Dallas, OR 97338
(503) 623-8146

Oregon Department of Revenue
955 Center St NE
Salem, OR 97301-2555
(503) 378-4988

Additional nformation and forms at: https://www.oregon.gov/DOR/Pages/index.aspx

Oregon Department of State Lands
Administers Oregon fill and removal law and provides technical assistance.

775 Summer Street NE, Suite 100
Salem, OR 97301-1279
(503) 986-5200
http://www.oregon.gov/DSL/

OSU Extension Service
Offers educational programs, seminars, classes, tours, publications, and individual assistance to guide landowners in meeting natural resource management goals.

Benton County
4077 Research Way
Corvallis, OR 97333
(541) 766-6750

Douglas County
1134 SE Douglas
P.O. Box 1165
Eugene, OR 97402
(541) 344-5859

Lane County
783 Grant Street
Roseburg, OR 97470
(541) 672-4461

Lincoln County
1211 SE Bay Blvd.
Newport, OR 97365
(541) 574-6534

Polk County
182 SW Academy
PO Box 640
(503) 623-8395

Tillamook County
2204 Fourth Street
Tillamook, OR 97141
(503) 842-3433

Oregon Water Resources Department
Provides information on stream-flows and water rights, issues water rights, and monitors water use.
http://www.wrd.state.or.us

Benton, Lincoln, and Polk counties
158 12th Street NE
Salem, OR 97301
(503) 378-3739

Douglas County
Douglas County Courthouse, R 306
Roseburg, OR 97470
(541) 440-4255

Lane County
125 East 8th Ave
Eugene, OR 97401
(541) 682-3620

Tillamook County
C/o Port of Tillamook Bay
4000 Blimp Blvd.
Tillamook, OR 97141
(503) 842-2413

Oregon Watershed Enhancement Board
Provides funding for a variety of watershed enhancement, assessment, the monitoring of educational activities. Provides support to watershed councils throughout Oregon.

775 Summer St. NE, Suite 360
Salem, OR 97301-1290
(503) 986-0178
http://www.oweb.state.or.us

Watershed Councils
Bring diverse interests together to cooperatively monitor and address local watershed conditions. Collect watershed condition data, conduct education programs, and train and involve volunteers.

Mid Coast Watersheds Council
411 NE Avery Street, Suite B
Newport, OR 97365
(541) 265-9195
http://www.midcoastwatershedscouncil.org

Salmon-Drift Creek Basin Planning Team
(541) 994-8427

Siletz Watershed Group
PO Box 28
Logsden, OR 97357
(541) 444-7848

Alsea Watershed Council
10518 E. Five Rivers Road
Tidewater, OR 97390
(541) 528-3221

Siuslaw Watershed Council
10961 Oregon 36
Mapleton, OR 97453
(541) 268-3044

Soil and Water Conservation Districts
Provide technical assistance in a wide variety of agricultural and natural resource areas and assist landowners in accessing federal and local funding programs.

Benton SWCD
456 SW Monroe Ave, Ste 110
Corvallis, OR 97333
(541) 753-7208

Lincoln SWCD
411 NE Avery St., Ste. B
Newport, OR 97365
(541) 265-2631

Polk SWCD
580 Main Street, Ste A
Dallas, OR 97338
(503) 623-9680

Siuslaw SWCD
1775 Laurel Place, Suite 4
P.O. Box 2768
Florence, OR 97439
(541) 997-1272

Tillamook SWCD
6415 Signal Street
Tillamook, OR 97141
(503) 842-2240, ext 102

Umpqua SWCD
2285 Longwood Drive
Reedsport, OR 97467
(541) 662-1341

Water Improvement Districts
Can provide domestic or industrial water supply and water-related recreation, enhance water pollution control, water quality, and fish and wildlife resources.

Devils Lake Water Improvement District
820 US Highway 101
Lincoln City, OR 97367
(541) 994-5330

Appendix E: Mid Coast Area Weeds of Concern

Notes for the table, which lists weeds of concern in the Cooperative Weed Management Area (CWMA):

Weed Categories: Weeds are divided into four general categories, which are managed in different ways. These categories are similar to ODA's rating system, but assignment of weeds to specific categories reflects the distribution of those weeds within the CWMA region. This list of weeds may not include all weeds found locally. An official list of noxious weeds for Oregon can be obtained from ODA's Noxious Weed Control Program.

Potential Invaders: These weeds are found outside the CWMA region but could invade the region at any time in the future. Management focuses on developing an "early alert" network of people and organizations to identify sites, followed by reporting to ODA's Noxious Weed Control Program or other partner for eradication.

New invaders: These weeds exist in just a few sites in small numbers in the CWMA. They are managed in the same way as the potential invader category.

Locally established: These weeds can be locally very abundant, or occur in spotty distribution across the landscape. Management focuses on inventory to determine distribution, followed by eradication of small, isolated populations, and control or containment of larger infestations.

Widely established: These weeds occur across the landscape at a level where eradication, containment or control is not possible. Management focuses on removing them from ecologically, socially and economically important sites and slowing their spread through prevention actions. When available, biological controls should be used.

ODA rating: An "A" means the weed is either a potential invader from neighboring states or it is present in small enough infestations to make eradication/containment possible. A "B" means the weed is regionally abundant, but may have limited distribution in some counties. Biological control is the preferred approach. A "T" means ODA is implementing a statewide management plan targeted to that species.

Active Management: This column indicates those species for which members of the CWMA are actively pursuing inventory and/or treatment projects.

Habitat: "U" means upland, "R" means riparian, "D" means dunes, "A" means aquatic

Table 1: Weeds of concern

Common Name	Latin Name	ODA Rating	Active Mgmt	Habitat
Potential Invaders				
Kudzu	*Pueraria lobata*	A, T		U, R
Yellow Floating Heart	*Nymphoides peltata*	A		A
Spartina	*Spartina alterniflora*	B		A
Giant Hogweed	*Heracleum mantegazzianum*	A, T		U, R
Garlic Mustard	*Alliaria petolata*	B. T		U, R
New Invaders				
Bamboo	*Sasa palmata*	Not listed		U, R
Butterfly bush	*Buddleja globosa, davidii*	B	1	U, R
French Broom	*Cytisus monspessulanas*	B	1	U, R, D
False Brome	*Brachypodium sylvaticum*	B	1	U, R
Yellow Flag Iris	*Iris pseudocorus*	B		R, A
Meadow Knapweed	*Centaurea pratensis*	B	1	U, R
Pampas/Jubata Grass	*Cortaderia selloana/jubata*	B	1	U, R
Policeman's Helmet	*Impatiens glandulifera*	B		R
Purple Loosestrife	*Lythrum salicaria*	B, T	1	R, A
Spotted Knapweed	*Centaurea maculosa*	B, T	1	U, R
Yellow Starthistle	*Centaurea solstitialis*	B. T	1	U
Locally Established				
Saltmarsh cordgrass	*Spartina patens*	A, T	1	A
Elodea	*Elodea (=egeria)densa*	B		A
Parrot's feather	*Myriophyllum aquaticum*	B	1	A
Eurasian water milfoil	*Myriophyllum spicatum*	B		A
Fragrant water lily	*Nymphaea odorata*	Not listed		A
Canada Thistle	*Cirsium arvense*	B		U, R
Clematis (Old Man's Beard)	*Clematis vitalba*	B		U, R
Everlasting Peavine	*Lathyrus latifolius*	Not listed		U, R
Japanese, Giant, hybrid knotweeds	*Polygonum cuspidatum, sachalinense, Xbohemicum*	B, T	1	R
Himalayan knotweed	*Polygonum polystachyum*	B, T	1	R
Gorse	*Ulex europaeus*	B, T	1	U, R, D
Portuguese Broom	*Cytisus striatus*	B, T	1	U, R, D
Widely Established				
Himalayan blackberry	*Rubus discolor*	B	1	U, R
Evergreen blackberry	*Rubus laciniatius*	Not listed	1	U, R
Scotch broom	*Cytisus scoparius*	B	1	U, R, D
Oxeye daisy	*Leucanthemum vulgare*	Not listed	1	U, R
English ivy	*Hedera helix*	B	1	U, R
English holly	*Ilex aquafoluim*	Not listed	1	U
European beachgrass	*Ammophila arenaria*	Not listed	1	D
Reed canary grass	*Phalaris arundinacea*	Not listed		R
Tansy ragwort	*Senecio jacobaea*	B, T	1	U, R