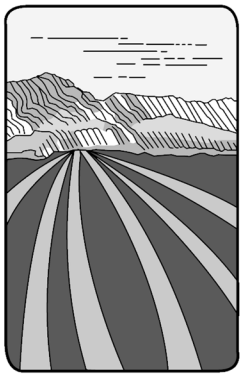

Oregon
Department
of Agriculture

Mid Coast Agricultural Water Quality Management Area Plan

Developed by the:

Mid Coast Local Advisory Committee

Oregon Department of Agriculture

With support from the:

Lincoln and Siuslaw Soil and Water Conservation Districts

Date: September 29, 2015

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Acronyms and Terms Used in this Document

Af – Acre-feet
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
Beneficial Use – An existing or desired use that requires a certain level of water quality. For example, water contact recreation, bull trout, or drinking water supply.
CAFO – Confined Animal Feeding Operation
cfs – Cubic feet per second
CNPCP – Coastal Nonpoint Pollution Control Program
CREP – Conservation Reserve Enhancement Program
CWA – Clean Water Act
CWMA – Cooperative Weed Management Area
CZARA – Coastal Zone Act Reauthorization Amendments of 1990
DEQ – Oregon Department of Environmental Quality
E. coli – Escherichia coli
EPA – Environmental Protection Agency
GIS – Geographic Information System
GWMA – Groundwater Management Area
HUC – Hydrologic Unit Code
IPM – Integrated Pest Management
IR – TMDL – Implementation Ready – Total Maximum Daily Load
LAC – Local Advisory Committee
LMA – Local Management Agency
LSAC – Local Stakeholder Advisory Committee
Management Area – Mid Coast Agricultural Water Quality Management Area
MOA – Memorandum of Agreement
MST – Microbial Source Tracking
NLCD – National Land Cover Data
NOAA – National Oceanic and Atmospheric Administration
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
ODFW – Oregon Department of Fish and Wildlife
OHA – Oregon Health Authority
ORS – Oregon Revised Statute
OSUES – Oregon State University Extension Service
OWEB – Oregon Watershed Enhancement Board
PMP – Pesticides Management Plan
PSP – Pesticides Stewardship Partnership
Regulations – Agricultural Water Quality Management Area Regulations
RUSLE – Revised Universal Soil Loss Equation
SWCD – Soil and Water Conservation District
303(d) List – The Clean Water Act, in Section 303(d), requires states to list waters that are "water quality limited"
T – Soil Loss Tolerance Factor
TAC – Technical Advisory Committee
TMDL – Total Maximum Daily Load
WQPMT – Water Quality Pesticides Management Team

Foreword

This Agricultural Water Quality Management Area Plan (Area Plan) provides guidance for addressing agricultural water quality issues in the Mid Coast Agricultural Water Quality Management Area (Management Area). The purpose of this Area Plan is to identify strategies to prevent and control water pollution from agricultural lands through a combination of educational programs, suggested land treatments, management activities, compliance, and monitoring.

The provisions of this Area Plan do not establish legal requirements or prohibitions, as described in Oregon Revised Statute (ORS) 568.912(1).

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 (Oregon Administrative Rule (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 the Oregon Department of Agriculture (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 Agricultural Water Quality Management Program.

Chapter 2: Local Background. Provides the local geographic, water quality, and agricultural context for the Management Area. Describes the water quality issues, regulations (Area Rules), and available or beneficial practices to address water quality issues.

Chapter 3: Local Goals, Objectives, and Implementation Strategies. Chapter 3 presents goal(s), measurable objectives and timelines, and strategies to achieve the goal(s) and objectives.

Chapter 4: Local Implementation, Monitoring, and Adaptive Management. ODA and the Local Advisory Committee (LAC) will work with partners to summarize land condition and water quality status. Trends are summarized 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 local agricultural water quality issues. The purpose of the Area Plan is to identify strategies to prevent and control water pollution from agricultural activities and soil erosion (ORS 568.909(2)) on agricultural and rural lands for the area 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 Agricultural Water Quality Management Area Local Advisory Committee (LAC), with support and input from the SWCD and the Oregon Department of Environmental Quality (DEQ). The public was invited to participate in the original development and approval of the Area Plans and is invited to participate in the biennial review process. The Area Plan is implemented using a combination of outreach, conservation and management activities, compliance, 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 OAR regulations 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 regulations for this Management Area (OAR 603-095-2200 to OAR 603-095-2260). The Ag Water Quality Program's general OARs guide the Ag Water Quality Program, and the OARs for the Management Area are the regulations that landowners are required to follow.

The Area Plan and its associated regulations apply to all agricultural activities on non-federal and non-Tribal Trust land within this Management Area, including:

- Large commercial farms and ranches.
- Small rural 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).

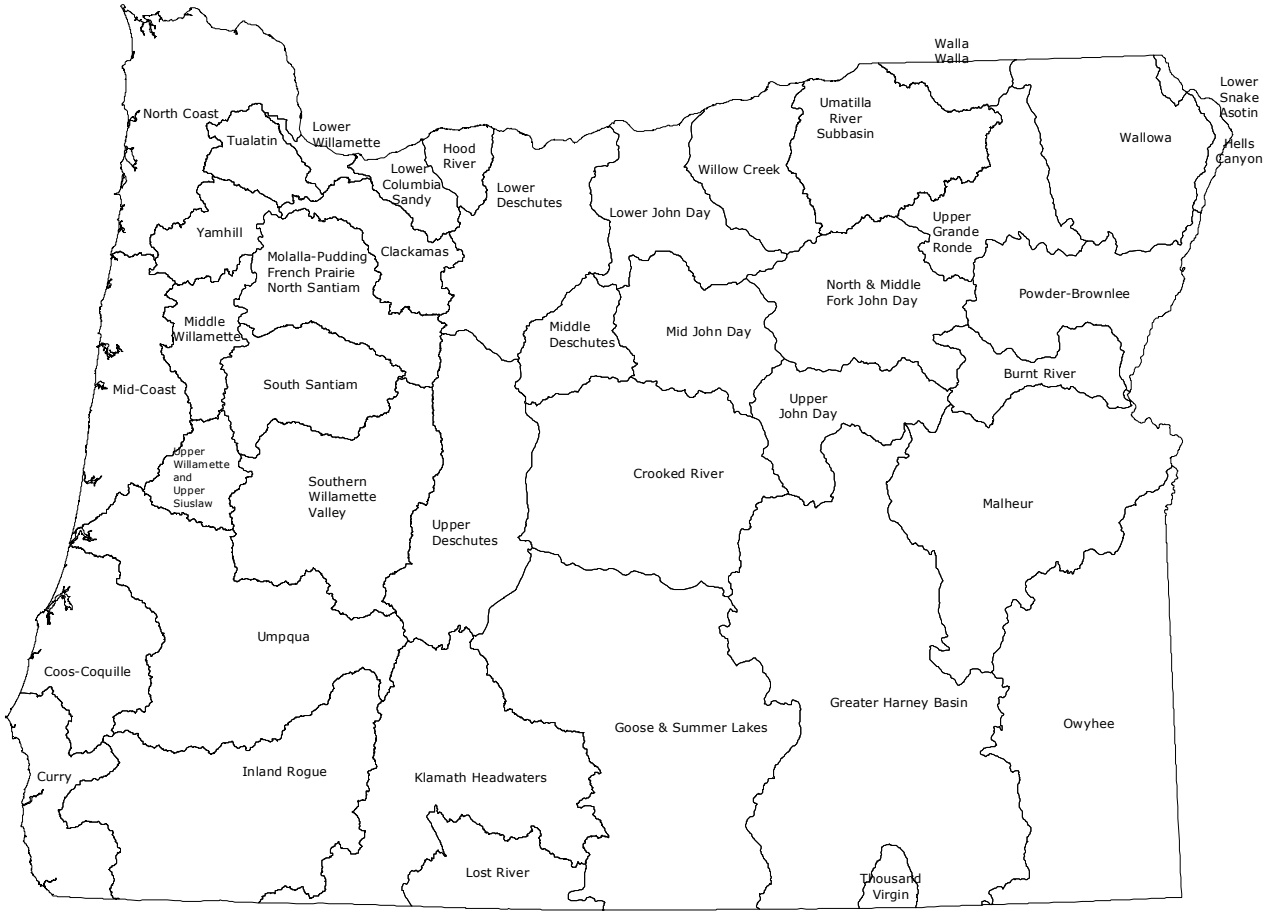
1.2 History of the Ag Water Quality Program

- In 1993, the Oregon Legislature passed the Agricultural Water Quality Management Act (formerly known as "Senate Bill 1010") directing ODA to develop plans to prevent and control water pollution from agricultural activities, soil erosion, and to achieve water quality standards (ORS 568.900 through ORS 568.933). Senate Bill 502 was passed in 1995 to clarify that ODA regulates agriculture with respect to water quality (ORS 561.191). The Area Plan and its associated regulations were developed and subsequently revised pursuant to these statutes.

Between 1997 and 2004, ODA worked with LACs and SWCDs to develop Area Plans and associated regulations 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 regulations.
- Conducting biennial reviews of Area Plans and associated regulations.
- Monitoring, evaluation, and adaptive management.
- Developing partnerships with SWCDs, state and federal agencies, tribes, watershed councils, and others.

Figure 1: Map of the 38 Agricultural 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 is intended to meet the needs and requirements related to agricultural water pollution including:

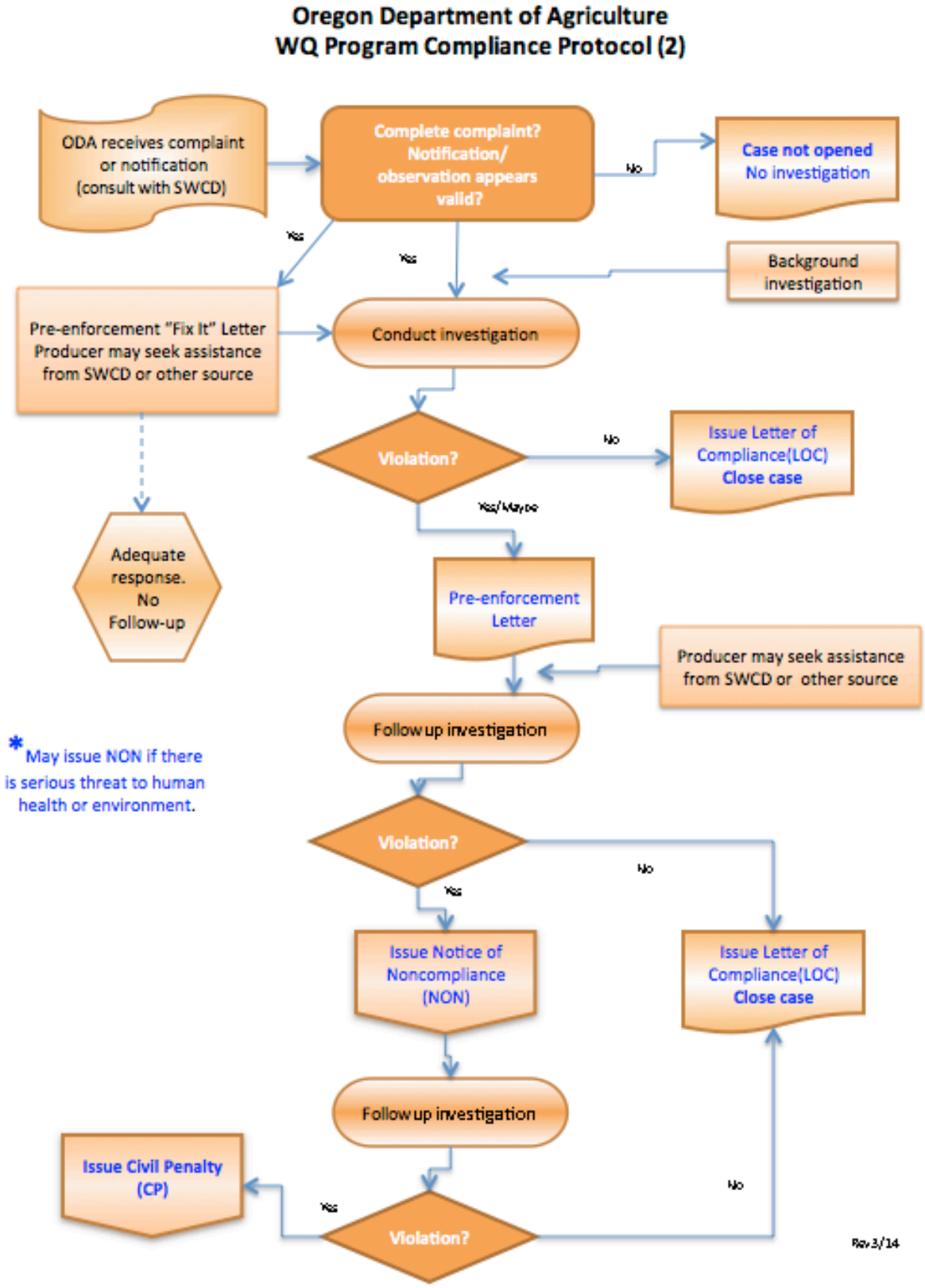
- State water quality standards.
- Load allocations for agricultural nonpoint source pollution assigned under Total Maximum Daily Loads (TMDLs) issued pursuant to the Clean Water Act (CWA), Section 303(d).
- Approved management measures for Coastal Zone Act Reauthorization Amendments (CZARA).
- Agricultural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

The Oregon Department of Agriculture has the legal authority to develop and implement Area Plans and associated regulations 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 regulations 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 associated regulations. ODA has responsibility for any actions related to enforcement or determination of noncompliance with regulations (OAR 603-090-0080 through OAR 603-090-0120). ORS 568.912(1) and ORS 568.912(2) give ODA the authority to adopt regulations that require landowners to perform actions necessary to prevent and control pollution from agricultural activities and soil erosion.

The emphasis of the Area Plan is on voluntary action by landowners or operators to control the factors effecting water quality in the Management Area. The regulations are outlined as a set of minimum standards that landowners and operators must be meet on all agricultural or rural lands.

The Oregon Department of Agriculture will use enforcement where appropriate and necessary to gain compliance with agricultural water quality regulations. Figure 2 outlines ODA's compliance process. Any enforcement action will be pursued 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 Order such as a Notice of Noncompliance. If a Notice of Noncompliance is issued, ODA will direct the landowner or operator 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, civil penalties may be assessed for continued violation of the regulations. See the Compliance Flow Chart for a diagram of the compliance process. If and when other governmental policies, programs, or regulations conflict with the Area Plan or associated regulations, ODA will consult with the appropriate agency to resolve the conflict in a reasonable manner.

Figure 2: Compliance Flow Chart



1.3.2 Local Management Agency

A Local Management Agency (LMA) is an organization that ODA designated to implement an Area Plan (OAR 603-090-0010). The Oregon Legislature's intent is for SWCDs to be LMAs, to the fullest extent practical, and 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 agreement between ODA and each SWCD. 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 associated regulations as needed.

1.3.3 Local Advisory Committee

For each Management Area, the director of ODA appoints an LAC (OAR 603-090-0020) with up to 12 members to assist with the development and subsequent biennial reviews of the local Area Plan and associated regulations. The LAC serves in an advisory role to the director of ODA and to the Board of Agriculture. LACs are composed primarily of agricultural landowners in the Management Area and must reflect a balance of affected persons.

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 ongoing revisions of the Area Plan.
- Participate in the development and revisions of the regulations.
- 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 regulations.
- Submit written biennial reports to the Board of Agriculture and the ODA director.

1.3.4 Agriculture's Role

Each individual landowner or operator in the Management Area is required to comply with the regulations, which set minimum standards. However, the regulations alone are not enough. To achieve water quality standards, individual landowners also need to attain land conditions that achieve the goals and objectives of the voluntary Area Plan. Each landowner or operator is not individually responsible for achieving water quality standards, agricultural pollution limits, or the goals and objectives of the Area Plan. These are the responsibility of the agricultural community collectively. Achieving water quality standards will take the collective efforts of all people and land uses within the watershed, with agriculture playing its role.

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

Under the Area Plan and associated regulations, agricultural landowners and operators are not responsible for mitigating or addressing factors that do not result from agricultural activities, 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.
- Other circumstances not within the reasonable control of the landowner or operator.

However, agricultural landowners or operators 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 Plans and associated regulations. 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 Plans and regulations, as needed, to address comments received. The director of ODA adopted the Area Plans and regulations in consultation with the Board of Agriculture.

The Oregon Department of Agriculture, LACs, and SWCDs conduct biennial reviews of the Area Plans and regulations. Partners, stakeholders, and the general public are invited to participate in the process. Any future revisions to the regulations will include a formal public comment period and a formal public hearing.

1.4 Agricultural Water Quality

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 are also regulated as point sources. Irrigation water discharges may be at a defined discharge point 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 sources include erosion and contaminated runoff from agricultural and forest lands, urban and suburban areas, roads, and natural sources. In addition, groundwater can be impacted from 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 are usually fish and aquatic life, water contact recreation, and public and private domestic water supply. These uses are generally 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 contribute to the impairment of beneficial uses in the Management Area. Beneficial uses that have the potential to be impacted in this Management Area are summarized in Chapter 2.

Many water bodies throughout Oregon do not meet state water quality standards. Many of these water bodies 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, nitrates, pesticides, and mercury. These parameters vary by Management Area and are summarized in Chapter 2.

1.4.3 Impaired Water Bodies and Total Maximum Daily Loads (TMDLs)

Every two years, DEQ is required by the federal CWA to assess water quality in Oregon. Clean Water Act 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 is required to establish TMDLs for pollutants on the 303(d) list.

A TMDL includes an assessment of water quality data and current conditions and describes a plan to restore polluted waterways to conditions that meet water quality standards. TMDLs specify the daily amount of pollution that a water body can receive and still meet water quality standards. In the TMDL, point sources are assigned pollution limits as "waste load allocations" that are implemented via waste discharge permits, while nonpoint sources (agriculture, forestry, and urban) are assigned pollution limits as "load allocations." The agricultural sector is responsible for helping achieve the pollution limit by meeting 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, and not just to an individual water body on the 303(d) list. Once a TMDL is developed for a basin, the basin's impaired water bodies are removed from the 303(d) list, but they remain on the list of impaired water bodies. 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 this Management Area. Biennial reviews and revisions to the Area Plan and associated regulations must address agricultural or nonpoint source load allocations from relevant TMDLs.

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

Following passage of the Agricultural Water Quality Management Act in 1993, the Oregon Legislature passed Senate Bill 502 in 1995 to clarify that ODA is the state agency responsible for regulating farming activities to protect water quality. Codified as ORS 561.191, this statute 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."

To implement Senate Bill 502, ODA incorporated ORS 468B into all of the Area Plans and associated regulations in the state.

ORS 468B.025 states that:

"(1) ...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."

The aspects 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:

"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. Additionally, OAR 603-095-0010(53) includes but is not limited to commercial fertilizers, soil amendments, composts, animal wastes, vegetative materials, or any other wastes.

"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.

"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.

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 agricultural water pollution. Streamside vegetation provides three primary water quality functions: shade for cooler stream temperatures, streambank stability, and filtration of pollutants. Other water quality functions include: water storage for cooler and later season flows,

sediment trapping that builds 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 improves water quality related to multiple pollutants, including: temperature (heat), sediment, bacteria, nutrients, toxics, and pesticides.
- Streamside vegetation provides fish and wildlife habitat.
- Landowners can improve streamside vegetation in ways that are compatible with their operation.
- Streamside vegetation condition can be monitored readily to track the status and trends of agriculture's progress in addressing water quality concerns.

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 (e.g., channelization, roads, modified flows, past 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 local or regional scientific research. ODA does not consider invasive, non-native plants, such as introduced varieties of reed canary grass and blackberry, to be site-capable vegetation.

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 all streams flowing through agricultural lands. The agricultural water quality regulations for each Management Area require that agricultural activities provide the water quality functions equivalent to what site-capable vegetation would provide.

In some cases, for narrow streams, mature site-capable vegetation such as tall trees may not be needed. 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.

1.5 Other Water Quality Programs

1.5.1 Confined Animal Feeding Operation (CAFO) 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. Since the early 1980s, CAFOs in Oregon have been registered to a general Water Pollution Control Facility permit designed to protect water quality, while allowing the operators and producers to remain economically viable. A properly maintained CAFO does not pollute ground or surface water. To assure continued protection of ground and surface water, the 2001 Oregon Legislature directed ODA to convert the CAFO Program from a Water Pollution Control Facility permit program to a federal National Pollutant Discharge Elimination System (NPDES) program. ODA and DEQ jointly issue the NPDES CAFO Permit, which complies with all CWA requirements for CAFOs. This permit does allow discharge in certain circumstances as long as the discharge does not violate water quality standards.

Oregon NPDES CAFO permits require the registrant to operate according to a site-specific, ODA-approved Animal Waste Management Plan that is incorporated into the NPDES CAFO permit by reference.

1.5.2 Groundwater Management Areas

Groundwater Management Areas (GWMAs) are designated by DEQ where groundwater has elevated contaminant concentrations resulting, at least in part, from nonpoint sources. Once 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: the Lower Umatilla Basin GWMA, the Northern Malheur County GWMA, and the Southern Willamette Valley GWMA. Each GWMA has a voluntary action plan to reduce nitrate concentrations in groundwater. After a scheduled evaluation period, if DEQ determines that the voluntary approach is not effective, then 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 associated regulations 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 program.

Through the PSP, state agencies and local partners work together to monitor pesticides in streams and to improve water quality (www.deq.state.or.us/wq/pesticide/pesticide.htm). Department of Environmental Quality, ODA, 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.

Oregon Department of Agriculture led the development and implementation of a Pesticides Management Plan (PMP) for the state of Oregon (www.oregon.gov/ODA/PEST/water_quality.shtml). 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 currently approved for use by the United States Environmental Protection Agency (US EPA) and Oregon in both 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 resources.

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. The Department of Environmental Quality and OHA encourage community-based protection and preventive management strategies to ensure that all public drinking water resources are kept safe from current and future contamination. For more information see: www.deq.state.or.us/wq/dwp/dwp.htm. Agricultural activities are required to meet those water quality standards that contribute to safe drinking water.

1.5.6 Oregon's Coastal Management Program and the Coastal Zone Management Act Reauthorization Amendments 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 (NOAA) 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 associated regulations as the state's strategy to address agricultural measures. The Area Plan and associated regulations 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 located 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 DEQ under the federal CWA for protection of water quality in Oregon. In turn, DEQ is the lead state agency with overall authority to regulate water quality in Oregon. DEQ coordinates with other state agencies, including ODA and ODF, to meet the requirements of the CWA. The Department of Environmental Quality sets water quality standards and develops TMDLs for impaired waterbodies. 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.

The Department of Environmental Quality designated ODA as the Designated Management Agency (DMA) for water pollution control activities on agricultural and rural lands in Oregon to coordinate meeting agricultural TMDL load allocations.

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 associated regulations in collaboration with DEQ.
    - ODA will determine the percentage of lands achieving compliance with Management Area regulations.
    - 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 its associated regulations. The petition must allege, with reasonable specificity, that the Area Plan or associated regulations are not adequate to achieve applicable state and federal water quality standards (ORS 568.930(3)(a)).

1.6.2 Other Partners

The 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.

1.7 Measuring Progress

Agricultural landowners and operators 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. ODA is working with SWCDs, LACs, and other partners to develop and implement strategies that will produce measurable outcomes for agricultural water quality. ODA is working also 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.

After ODA, the LAC, and the LMA establish measurable objectives and associated milestones, they will evaluate progress toward the milestones at each biennial review of the Area Plan. Using adaptive management, the biennial review 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 keep on track for achieving the longer-term measurable objective(s), and will revise strategies to address obstacles and challenges.

Measurable objectives allow the Ag Water Quality Program to better evaluate progress toward meeting water quality standards. Many of these measurable objectives relate to land conditions and are primarily implemented through focused work in a small geographic area (section 1.7.3), with a long-term goal of developing measurable objectives and monitoring methods at the Management Area scale. 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 is generally 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 nutrients, because many pesticides and nutrients 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.
- It can be difficult to separate agriculture's influence on water quality from other land uses.
- Extensive monitoring of water quality is needed to evaluate progress, which is expensive and may fail to demonstrate improvements in the short term.
- Improved land conditions can be documented immediately, but there may be significant lag time or a need for additional implementation before water quality improves.
- Agricultural improvements in water quality are primarily through changes in land conditions and management activities.

Water quality monitoring data may 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 significant water quality or land condition concerns that are associated with agriculture. Through the Focus Area process, the SWCD delivers systematic, concentrated outreach and technical assistance in small geographic areas. 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 a small geographic area, and is supported by a large body of scientific research (e.g., Council for Agricultural Science and Technology, 2012).

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. In some cases, a Focus Area is selected because of efforts already underway or landowner relationships already established. The scale of the Focus Area matches the SWCD's capacity to deliver concentrated outreach and technical assistance, and to complete (or initiate) projects over a biennium. The current Focus Area for this Management Area is described in Chapter 3.

Working within a Focus Area is not intended to prevent implementation within the remainder of the Management Area. 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 agricultural water quality regulations, 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 agricultural water quality regulations. Finally, ODA completes a post-assessment to document progress made in the watershed. Chapter 3 describes any SIAs that are currently underway 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 associated regulations by evaluating the status and trends in agricultural land conditions and water quality data. This assessment will include an evaluation of progress toward measurable objectives across the entire Management Area and within the Focus Area. ODA conducts land condition and water quality monitoring at the statewide level and will analyze this and other agencies' and organizations' local monitoring data. The Area Plan summarizes the results and findings in Chapter 4 for each biennial review. 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 Statewide Aerial Photo Monitoring of Streamside Vegetation

Starting in 2003, ODA began evaluating streamside vegetation conditions using aerial photos acquired specifically for this purpose. ODA focuses on land condition monitoring of streamside areas because these areas have such a broad influence over water quality. Stream segments representing 10 to 15 percent of the agricultural lands in each Management Area were randomly selected for long-term aerial photo monitoring. Stream segments are generally 3-5 miles long. ODA evaluates streamside vegetation at specific points within 30, 60, and 90-foot bands along both sides of stream segments from the aerial photos and assigns each segment a score based on streamside vegetation. The score can range from 70 (all trees) to 0 (all bare ground). The same stream segments are re-photographed and re-scored every five years to evaluate changes in streamside vegetation conditions over time. Because site capable vegetation varies across the state, there is no single "correct" streamside vegetation index score. The purpose of this monitoring is to measure positive or negative change. The results for this Management Area are summarized in Chapter 4.

1.8.2 Agricultural Ambient Water Quality Monitoring

The Oregon Department of Agriculture evaluates water quality data from DEQ's long-term monitoring sites to determine trends in water quality at agricultural sites statewide. Results from monitoring sites in this Management Area, along with local water quality monitoring data, are described in Chapter 4.

1.8.3 Biennial Reviews and Adaptive Management

This and all Area Plans and associated regulations 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 associated regulations. This evaluation includes discussion of enforcement actions, land condition and water quality monitoring, and outreach efforts over the past biennium. ODA and partners evaluate progress toward achieving measurable objectives, 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 associated regulations 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 and Responsibilities

2.1.1 Local Advisory Committee (LAC)

This Area Plan was developed with the assistance of an LAC. The LAC was formed in 2002 to assist with the development of the Area Plan and regulations and with subsequent biennial reviews. Current members are:

Name	Area/Watershed	Representing
Kevin Carroll	Westlake, Siltcoos	Farrier
Wayne Hoffman, Chair	South Beach, Mid Coast	Mid Coast Watersheds Council
Richard Huff, Vice-Chair	Florence, Siuslaw	Timber, Cattle
Elmer Ostling	Waldport, Alsea	Beef Cattle, Hay
Howard Pazdral	Deadwood, Siuslaw	Hay, Logging, Percheron Horses
Joe Steere	Lincoln City	Timber, Cattle
Shiloh Sundstrom	Deadwood, Siuslaw	Cattle

2.1.2 Local Management Agency

The implementation of this Area Plan is accomplished through an Intergovernmental Agreement between ODA and the Lincoln and Siuslaw SWCD(s). This Intergovernmental Agreement defines the SWCD(s) as the Local Management Agency(ies) for implementation of the Area Plan. The SWCD(s) was/were also involved in development of the Area Plan and associated regulations.

2.2 Area Plan and Regulations: Development and History

The Area Plan and regulations were approved by the director of ODA in 2002.

Since approval, the LAC met in 2004, 2008, 2011, and 2013 to review the Area Plan and regulations. The review process included assessment of the progress of Area Plan implementation toward achievement of plan goals and objectives.

The LAC met on March 25 and May 20, 2008, to review the Area Plan and Rules. At these meetings, the LAC approved updates to the Area Plan with the understanding that a full review of the Area Plan and Rules would be initiated starting in July of 2008. From July of 2008 to March of 2009, the LAC met monthly to revise and update the Area Plan.

The LAC met in March of 2011 to receive updates regarding implementation of the Area Plan. Changes to the Area Plan were not made during the 2011 review in anticipation of a completed TMDL and complete review thereafter.

The LAC met on April 3 and May 8, 2013, to review the Area Plan and Rules. At these meetings, the LAC recommended the following:

- For the LAC to meet within three-months of the Mid Coast TMDL approval to review the Area Plan and Rules and make adjustments to meet the TMDL as necessary,
- Include language in the Area Plan recommending that landowners take steps to control invasive species and plant native vegetation in riparian areas,

- Include available management measures and approved CZARA management measures into the Prevention and Control Measures Section, and
- Remove invasive species from the list of historical and current human influences to site capability.

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 1. Acreage and major tributaries of watersheds in the Management Area.

Watershed	Acreage	Major Tributaries
Alsea River	302,720	Canal Creek, Drift Creek, Fall Creek, Five Rivers, Lobster Creek, South Fork
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
Siltcoos River	82,560	Fiddle Creek, Maple Creek, Tahkenitch Lake, Woahink Lake, Siltcoos Lake
Siuslaw River	494,720	Deadwood Creek, Indian Creek, Knowles Creek, Lake Creek, North Fork, Wildcat Creek
Yachats River	39,040	North Fork, School Fork, Stump Creek
Yaquina River	161,920	Buttermilk Creek, Depot Creek, Elk Creek, Little Elk Creek, Mill Creek, Olalla Creek, Spilde Creek, Thornton Creek, Young Creek

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, filberts, 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 grow. Small communities may either upgrade existing or build new wastewater treatment facilities. Rather than upgrading or building new facilities required before wastewaters can be discharged to rivers or streams, many communities secure permits from the Oregon Department of Environmental Quality (DEQ) to export bio-solids to willing landowners' 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 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 widespread. Other popular recreation activities include boating, kayaking, camping, 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 2. 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 3. Water appropriations (in cubic feet per second 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 4. Water appropriations (in cubic feet per second and acre-feet) 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, 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.

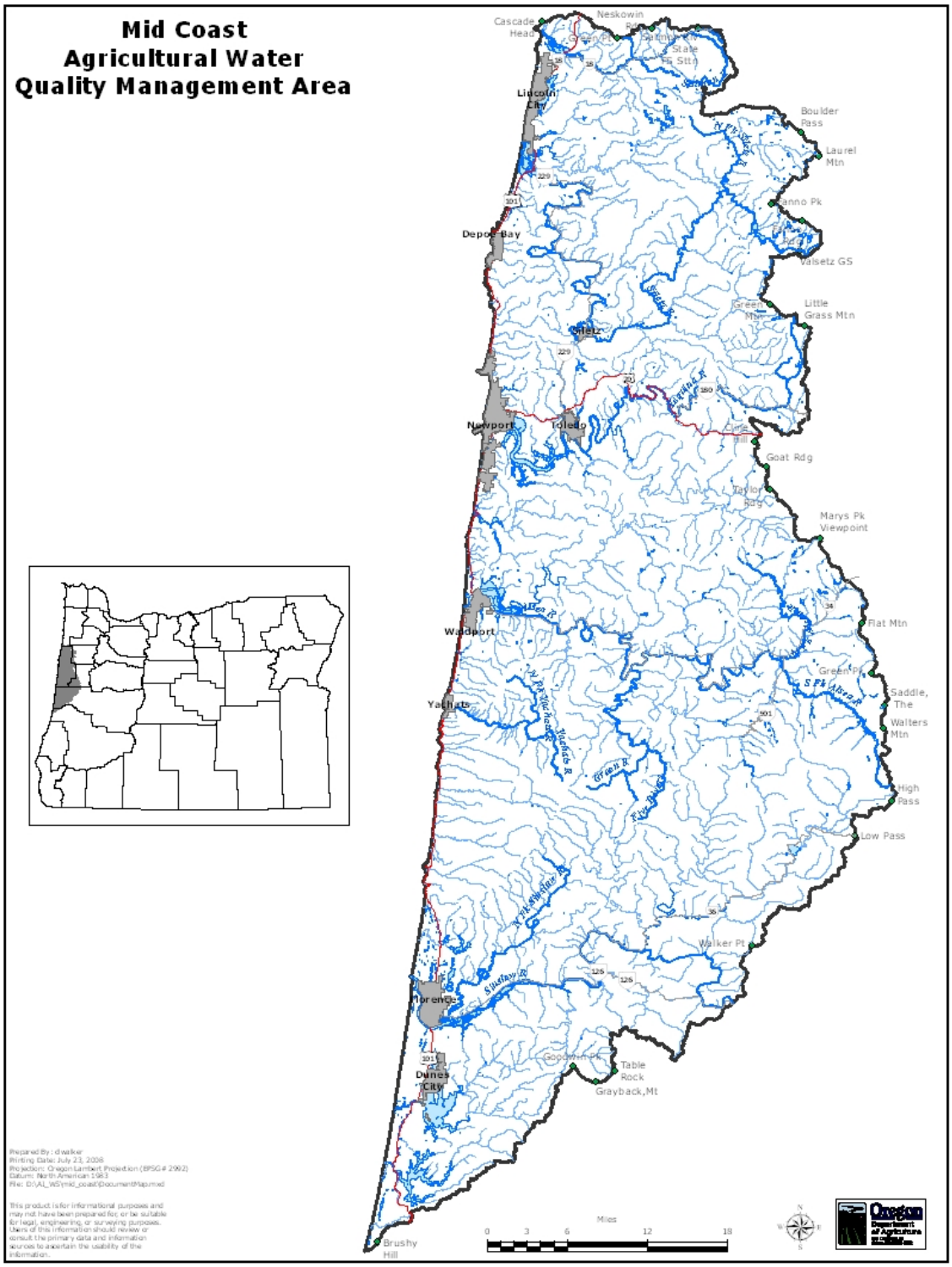
Several of these species are of tremendous importance to the function of terrestrial or aquatic ecosystems, and significantly affect nutrient cycling, type and quality of habitats, populations of other species, and other factors.

2.3.2 Geographic and Programmatic Scope

The Management Area includes the Alsea, Salmon, Siletz, Siltcoos, Siuslaw, Tahkenitch, Yachats, and Yaquina watersheds, as well as several small watersheds that drain directly to the Pacific Ocean. The area includes a very small portion of southern Tillamook County, the southwest portion of Benton County, nearly all of Lincoln County, western Lane County, western Polk County, and a small northwest corner of Douglas County. Communities included in this Area are Alsea, Blodgett, Deadwood, Depoe Bay, Eddyville, Florence, Lincoln City, Mapleton, Newport, Siletz, South Beach, Swiss Home, Toledo, Waldport, Westlake, and Yachats.

Boundaries of the Management Area are the Coast Range Mountains to the east, the Pacific Ocean to the west, the Salmon River-Neskowin Creek watershed boundary to the north, and the Tahkenitch Lake-Smith River watershed boundary to the south. A portion of the Siuslaw River watershed east of the Coast Range is not part of the Management Area. Map 1 shows the boundaries of the Area in more detail.

Map 1. Map of the Management Area



2.4 Agricultural Water Quality in the Management Area

2.4.1 Local Issues of Concern

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.

2.4.2 303(d) List of Impaired Water Bodies

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) and 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.

2.4.3 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. The LSAC and technical working groups have met a number of times and meeting information is maintained on the project website:
http://www.deq.state.or.us/WQ/TMDLs/midcoastLSAC.htm

DEQ informed federal agencies (Environmental Protection Agency [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 bacteria and sediment/bio-criteria/drinking water 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.

2.4.4 Beneficial Uses and Parameters of Concern

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 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 contains a list of all the 303(d) listed waterbodies in the Management Area.

2.4.5 Sources of Impairment

There are many potential causes for the water quality problems identified in the area, including runoff from forest and agricultural lands, runoff from roads, erosion from streambanks and roadsides, waste disposal sites, discharges from waste water treatment plants, leaking septic systems, application of waste water 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, 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 farm buildings are a water quality concern, especially because of the high rainfall in the area and likelihood of runoff to waterbodies.

North and South Fork Beaver Creek in the Alsea subbasin, were included in the 2010 303(d) list for bacteria and dissolved oxygen. This important salmon stream has had dissolved oxygen values down to 1 mg/liter, which is not adequate to support aquatic life. The dissolved oxygen standard, in 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.

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 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 Prevention and Control 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 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 F, 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 E.

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 Confined Animal Feeding Operations (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 criteria. 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 prior 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).

In addition to the upland processes, 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 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 F.

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://publications.usace.army.mil/publications/eng-tech-ltrs/ETL_1110-2-571/ETL_1110-2-571.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). For more information, please see Appendix H.

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).

For an example related to site capability see appendix H.

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 rain events, without regular soil testing, or in excess can run-off and cause 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 biologic 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 amount 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.

When bacteria reach a waterway, they may settle into sediments in a streambed and can live 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 includes information about areas that are on the 303(d) list for violating the bacteria standard for both *E. coli* and fecal coliform. Appendix C 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 groundcover 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 Confined Animal Feeding Operation (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 http://www.oregon.gov/ODA/NRD/cafo_front.shtml.

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."

To implement ORS 561.191, 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, chemical fertilizers, animal manure, compost, seafood waste, sewage sludge, and leguminous and non-leguminous crop residues.

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.
- 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:
http://arcweb.sos.state.or.us/pages/rules/oars_300/oar_340/340_050.html
"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: http://www.deq.state.or.us/wq/bisolids/assistance.htm#bmp.

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.

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 that bind 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, 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.
- Plant or maintain appropriate vegetation along ditches; seed bare ditches following construction or maintenance.
- 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.*

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 label, they can be transported to waters of the state. Oregon law requires that pesticides be applied according to the label. Growers should closely time pesticide applications with 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 http://www.oregon.gov/ODA/PEST/buffers.shtml.

Some pesticide applicators may be required to obtain a DEQ permit. Additional information regarding when a DEQ permit is necessary go to: http://www.deq.state.or.us/wq/wqpermit/pesticides.htm.

Area Rule

There are no new rules associated with this measure. Excerpts from existing Oregon pesticide law are in Appendix D. 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.

303(d) parameters addressed by this measure:

Toxics

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

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

Chapter 3 Goals, Objectives, and Strategies

Introduction

The LAC developed a mission statement, goal, objectives, and strategies based on several resource concerns in the Management Area. These resource concerns relate to listing of waterbodies on the CWA 303(d) list as water quality limited, as well as other concerns identified in the CZARA.

Resource concern: The DEQ has identified many Mid Coast basin waterbodies as "water quality limited" because they exceed state water quality standards for sedimentation, temperature, bacteria, dissolved oxygen, aquatic weeds or algae, chlorophyll A, pH, and nutrients (Appendix B).

Resource concern: Congress, in reauthorizing the Coastal Zone Management Act in 1990, identified non-point source pollution in coastal areas as a concern. Oregon submitted a coastal non-point source pollution control plan that included several measures on agricultural lands (Section 2.5). ODA uses the DEQ's definition of "nonpoint sources" meaning any source of water pollution other than a point source. Generally, a nonpoint source is a diffuse or unconfined source of pollution where wastes can either enter into or be conveyed by the movement of water to waters of the state (OAR 340-041-0002 (42)).

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 Goal

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

3.2 Measurable Objectives

A measurable objective is a numeric long-term outcome with a date by which we want to achieve it. Milestones are the interim steps needed to achieve the measurable objective, and usually consist of numeric short-term targets to reach by specific dates. Together, the milestones define the timeline needed to achieve the measurable objective.

Once ODA, the LAC, and the LMA establish measurable objectives and the associated milestones, we will work to evaluate progress on the milestones at each biennial review of the Area Plan. In a process of adaptive management, the biennial review will consider the success of the more recent milestone(s) and why they were or were not accomplished. We will evaluate if changes are needed to meet the milestone(s) to keep on track for achieving the longer-term measurable objective(s), and revise strategies to address obstacles and challenges.

To tell the story of agriculture and water quality, it is important for SWCDs, ODA and the LAC to document the many accomplishments that agriculture has made toward meeting Oregon's water quality goals. We evaluate our work's effectiveness by tracking progress via measurable objectives within small geographic areas and at the management area scales.

3.2.1 Focus Areas

One way to evaluate and document the effectiveness of agriculture's water quality improvements is to concentrate restoration and tracking efforts in a "Focus Area." A focus area is a relatively small watershed within an Agricultural Water Quality Management Area. During the 2013-2015 Biennium, each district selected their first Focus Areas. Lincoln SWCD selected the Lower Big Elk Creek Focus Area and Siuslaw SWCD selected the Fiddle Creek Focus Area. The Districts based their choices on multiple factors including water quality impairments, Light Detection and Ranging (LiDAR) or other assessments of riparian condition, overlapping local partner priorities and the potential for financial assistance for projects.

As each District completes work within their focus areas, they will choose additional focus areas. Over time and across the management area, the cumulative effect of work within focus areas is anticipated to foster a positive shift towards achieving the water quality goal of the Area Plan.

Methodology

The Districts use ODA's Streamside Vegetation Assessment (SVA) Tool to assess streamside conditions. The SVA is used throughout the state by many districts, which provides a consistent way to assess progress at various scales. Using GIS remote imagery, vegetation types within a 35-foot assessment area are mapped. Outreach and project implementation follow the initial assessment. Post-project assessments can be done periodically to gauge whether streamside vegetation is providing additional benefits.

Measurable Objective

By [date] stream(s) on agricultural properties in the focus areas will have 90% of site capable vegetation or the equivalent functions: streambank stability, filtration of overland flow, and moderation of solar heating.

ODA anticipates that a long-term 90% success rate may be achievable. ODA purposely did not choose a 100% success rate to allow for natural variation and natural disturbance that is expected to occur. ODA will work with the LAC and SWCDs over the next biennium to further discuss this measurable objective and choose a target date.

Milestones and Timelines

The following milestones and timelines are those chosen by each district for their initial focus areas. Preliminary results of these initial investments are provided in Chapter 4.

Lower Big Elk Creek Focus Area

On agricultural lands within the Lower Big Elk Creek sub basin (6th HUC) Lincoln SWCD will provide landowner technical assistance and BMP project implementation to:

- Reduce total acres of "Bare Ag" by 15% by June 30, 2017, through implementation of riparian projects to plant native trees and shrubs ("Shrub").
- Reduce total acres of "Grass Ag" by 5% by June 30, 2017, through implementation of riparian projects to plant native trees and shrubs ("Trees").
- Reduce total acres of "Invasive Shrub" by 5% by June 30, 2017, through implementation of riparian projects to plant native trees and shrubs ("Shrub").

Fiddle Creek Focus Area

On agricultural lands within the Fiddle Creek subbasin (6th HUC) Siuslaw SWCD will provide landowner technical assistance and BMP project implementation to:

- Reduce total acres of "Bare Ag" by 15% by June 30, 2017, through implementation of riparian projects to plant native trees and shrubs ("Shrub").
- Reduce total acres of "Grass Ag" by 15% by June 30, 2017, through implementation of riparian projects to plant native trees and shrubs ("Shrub").

3.2.2 Management Area

By early 2016, an assessment of streamside vegetation conditions along agricultural lands in the entire Management Area will be complete. This assessment can be used to track and report progress in streamside vegetation improvements over time and to identify areas to focus work.

Methodology

As part of the development of the Mid Coast Implementation Ready TMDL, the Oregon DEQ conducted analysis using the National Hydrography Dataset data layer to identify streams, a 30-meter band, along both sides of streams from the edge of the stream, was mapped along all streams in the area for analysis. Each tax lot was attributed to a Designated Management Agency or responsible entity based on tax lot, zoning, and jurisdictional boundaries. Vegetation heights were determined for the areas within the 30-meter band using LiDAR data (Ground/grass 0 feet; Grass/shrubs, 1-5 feet; Small trees, 6-19 feet; Mid size trees, 20-119 feet; Large trees, 120+ feet) or National Land cover Data (NLCD) Canopy Cover (Ground/grass/shrubs, 0% trees; Trees 1-100%) data. LiDAR data have approximately 1-meter resolution and up to eight data points per square meter. Vegetative height classifications were determined based on discussions with DEQ, ODA, and other partners. The NLCD data are limited to a 30-meter resolution, and therefore could only be accurately divided into two categories. The data can be tabulated for 4th, 5th, or 6th field watersheds. These data show the acres within a watershed defined under ODA jurisdiction for each vegetative classification. At the request of the LAC, ODA and DEQ plan to complete analysis on a 10-meter band along both sides of the streams in agricultural areas in 2016.

3.2.3 Additional Objectives

The LAC envisions that the following objectives will be achieved in the management area; however, methodologies to evaluate these objectives have not yet been developed:

- 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.

3.3 Strategies for Area Plan Implementation

The LAC has identified the following strategies for area plan implementation 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 F.

3.3.1 Community and Landowner Engagement

Encourage voluntary conservation through education and outreach. Increase awareness among the agricultural community, rural landowners, and the public of conditions that cause water quality concerns or problems. Continue education and outreach to increase awareness of the Area Plan and Rules:

- 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.

3.3.2 Technical Assistance

Encourage agricultural producers to improve water quality. Provide information and assist agricultural producers to implement water quality improvements to work toward achievement of water quality standards on agricultural and rural lands.

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

3.3.3 Monitoring

Support continued monitoring of water quality in the Management Area to determine water quality conditions and trends in Mid Coast streams and their tributaries. Support ongoing and long-term funding for monitoring with respect to the following parameters: bacteria, sediment, temperature, and nutrients. Conduct monitoring to evaluate the effectiveness of water quality projects and Area Plan and Rules.

Develop a monitoring plan such as source identification, baseline data, data consolidation, ambient water quality and land condition monitoring:

- Conduct mapping, land assessments,
- Obtain monitoring equipment,
- Write monitoring reports,
- Write grants for monitoring funds.

3.3.4 Partnerships

Build partnerships with agencies and agribusinesses to promote water quality and educate the organizations on the Area Plan and Rules.

Coordinate and facilitate natural resource activities:

- 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.

3.4. Targets

The following targets were developed based on scopes of work with the Lincoln and Siuslaw SWCDs. The scopes of work are developed as an agreement between ODA and the SWCD with tasks related to implementation of the Area Plan. The targets are for the time period from July 2013 to July 2015 and are only for the SWCDs. Watershed councils and other groups may make additional efforts that fit within the mission and goal of the Area Plan. The SWCDs are not obligated to these targets; they only serve as direction from the LAC as activities that they would like to see accomplished.

3.4.1 Education and Outreach

- Host two workshops on specific topics such as mud and manure management or small acreage land stewardship. Give five presentations at events hosted by other organizations on water quality issues.
- Identify five top priority watersheds to implement water quality projects. Identify all landowners within two of the priority watersheds and send them information on the Area Plan and best management practices.
- Hold at least one community meeting in two of the priority watersheds on water quality issues.
- Hold at least two tours addressing key issues in priority areas.
- Staff informational booths at a minimum of four events.
- Publish ten news articles highlighting water quality issues in local newspapers and mail out a quarterly newsletter by the Siuslaw SWCD.
- Work with state parks summer education workshops, Salmon and Trout Enhancement Program volunteers, forest field day, Siuslaw Watershed Council summer camp, and water quality lessons to reach at least 250 students.
- Attend at least 50 meetings representing agricultural water quality.
- Develop at least one brochure in cooperation with agencies highlighting agricultural water quality issues in coastal lakes.

3.4.2 Land Stewardship and Water Quality Projects

- Provide one-on-one information about the Area Plan to at least 100 landowners.

- Provide information to 40 landowners regarding best management practices for prevention of control of nutrients, fine sediment, and bacteria entering the waters of the state. This will be through fact sheets or one-on-one technical assistance.
- Assist four landowners to plan and implement practices that improve the function of riparian vegetation.
- Use best management practices to control knotweed at 25 sites in the Management Area.
- Work with four landowners to implement best management practices limiting inputs of nutrients, fine sediment, and bacteria from agricultural activities.
- Develop at least ten agricultural water quality plans.

3.4.3 Funding and Administration

- Write and implement at least eight grants to improve agricultural water quality.
- Provide information to at least 40 landowners on federal and local cost-share programs.
- Assist two to four producers to enroll into the Conservation Reserve Enhancement Program (CREP).
- Assist six landowners to enroll into USDA cost-share programs.
- Include implementation of the Area Plan in the Lincoln and Siuslaw SWCDs annual and long-range works plans.

3.4.4 Monitoring

- Staff from the Lincoln and Siuslaw SWCDs attend six meetings on TMDL development and water quality monitoring results.
- Provide documentation of workshops, tours, demonstration projects, presentations, etc. during the biennial review of the Area Plan to the LAC.
- Provide a summary of violations of Rules to the LAC at the biennial review of the Area Plan.
- Conduct monitoring to determine agricultural sources of pollution and identify trends in water quality in agricultural stream reaches.
- Evaluate LiDAR information to understand vegetative conditions along streams in agricultural areas.

Chapter 4: Implementation, Monitoring, and Adaptive Management

4.1 Implementation and Accomplishments

Many conservation activities and implementation monitoring tracks have been implemented to benefit water quality. The SWCD and NRCS track activities that have been implemented through quarterly reports to ODA and through a NRCS database, respectively. Projects that have received funding from the OWEB are tracked in OWEB's restoration database. In addition, partner agencies can submit reports of projects and activities in the Management Area that improve water quality.

Table 5. Accomplishments in Lincoln SWCD's Service Area during the 2013-2015 Biennium.[1]

Education and Outreach
• Outreach to 22 agricultural landowners regarding pasture and farm related water quality and riparian buffer management, including outreach to priority watersheds to implement water quality projects. • Two community presentations: (1) overview/update presentation to County commissioners and general public regarding District projects and programs, (2) presentation of results of the Siletz river bank erosion assessment to the community of Siletz. • One presentation to local partner: presentation at local watershed council meeting regarding water quality rules and regulations and Lincoln SWCD programs. • Two informational booths at local events: (1) Lincoln County Garden show, (2) Display booth at Lincoln SWCD native plant sale. • Six informational brochures developed and published, including a Lincoln SWCD overview brochure, a native plant guide, landowner outreach brochures, and updating and publishing the 2nd edition of Lincoln County Rural Living Handbook (1500 copies). • Eight quarterly water quality monitoring reports sent via email newsletter (~ 115 recipients per quarter). • Attended 30 meetings representing agricultural water quality (e.g., TMDL Bacteria Working Group meetings, Mid Coast Watershed Council Technical Team meetings/presentations, Siletz Watershed Council meeting/presentations, Salmon Drift Creek Watershed Council Technical Team meeting, Mid Coast Watershed Council Monthly board meetings, Alsea Watershed Council monthly board meeting, Alsea Stewardship Group meetings, Oregon Department of Fish and Wildlife project planning meeting, NRCS Strategic Planning meeting, 10 Rivers Food Web/Oregon State University Extension Planning meeting, presentation given at National Association of Conservation Districts regarding rainwater storage, Oregon Watershed Enhancement Board small grant proposal reviews). • Four newspaper articles, including articles on Lincoln SWCD-assisted agricultural and urban rainwater collection projects, an article on sediment sources and water quality on the Siletz River, and an advertisement for Lincoln SWCD's native plant sale pre-order. • Two native plant sales developed and provided for the community. • Re-developed and launched new Lincoln SWCD website.
Land Stewardship and Water Quality Projects
• Thirty-five landowners received technical assistance regarding best management

practices for prevention of control of nutrients, fine sediment, and bacteria entering waters of the state. • Sixty-seven site visits with landowners associated with agricultural water quality related technical assistance, project development, current project management, or routine follow up visits of previous projects. • Nine agricultural water quality projects developed (e.g., engineered solutions to reduce streambank erosion, riparian buffer plantings and enhancement, livestock exclusion fencing, off-stream livestock water sources, manure storage facility, livestock crossings). • Twenty-five (108.6 acres) agricultural water quality projects implemented (e.g., riparian buffer plantings, plant establishment for agriculture related riparian planting projects, cattle exclusion, manure storage facility, livestock culvert replacement, liquid waste storage facility, off-stream livestock water spring).
Funding and Administration
• Seventeen grant applications submitted to improve agricultural water quality. • Fifteen landowners provided with information on federal and local cost-share programs. • Seven landowners assisted in enrolling in the Conservation Reserve Enhancement Program.[2] • Twelve landowners assisted in enrolling in USDA cost share programs.[2] • Implementation of the Area Plan included in the Lincoln SWCD annual and long-range work plans.
Monitoring
• Conduct monthly water quality sampling events each quarter in the Yaquina/Big Elk, Beaver Creek, Siletz, and Alsea Watersheds; total of 23 separate sites visited each month. • Assisted DEQ with coordination and installation of continuous turbidity and Total Suspended Solids sampling equipment near the Newport, Siletz, and Toledo City water intakes on the Siletz River. Project partners with cities and DEQ to quantify and assess sediment sources (agricultural, roads, forestry) in the Siletz DWSA and to protect water treatment plants from high sediment loads during winter storms by providing real time continuous turbidity data. Project will also help develop a clearer relationship between sediment loads and turbidity and analyze sediment type to better source sediment loads. • Attended seven Working Group meetings on Bacteria TMDL development and water quality monitoring results. • Provided documentation of presentations, brochures, newspaper articles, and handbook during the biennial review of the Area Plan to the LAC. • Provided summary of violations of Rules to the LAC at the biennial review of the Area Plan.

[1]Accomplishments specific to Lincoln SWCD's 2013-2015 Focus Area (Lower Big Elk) are included separately in Section 4.3.
[2]Total for Lincoln and Siuslaw SWCDs combined.

Table 6. Accomplishments in Siuslaw SWCD's Service Area during the 2013-2015 Biennium.[1]

Education and Outreach
• Six District Newsletters published and dispersed, 428 recipients per Newsletter. • Presented at the 2013 Annual OACD Meeting, after receiving the "West Side Spotlight in Conservation Award." • One informational booth at the 2013 Florence Green Fair. • Administered Siuslaw Stream Team VII and VIII, assisted with Forest Field Day, reaching over 250 students.

• Tour of both prior and potential restoration sites with OWEB, ODFW, NOAA, NRCS, and BLM personnel. • Attended 51 meetings representing agricultural water quality.
Land Stewardship and Water Quality Projects
• 228 provided with technical assistance. • Provided one-to-one information regarding the area plan to over 100 landowners. • 49 landowners received technical assistance regarding best management practices for prevention of control of nutrients, fine sediment, and bacteria entering waters of the state. • 141 site visits with landowners associated with agricultural water quality related technical assistance, project development, current project management, or routine follow up visits of previous projects. • Assisted 72 landowners to plan and implement practices that improve the function of riparian vegetation. • Used best management practices to control knotweed at 36 sites in the Management Area. • Seven agricultural water quality projects developed. • 19 (110.39 acres) agricultural water quality practices implemented.
Funding and Administration
• Six grant applications submitted to improve agricultural water quality. • 27 landowners provided with information on federal and local cost-share programs. • Seven landowners assisted in enrolling in the Conservation Reserve Enhancement Program.[2] • 12 landowners assisted in enrolling in USDA cost share programs.[2] • Implementation of the Area Plan included in the Siuslaw SWCD Annual Work Plans and our Long Range Business Plan 2015-2020.
Monitoring
• Monitored effectiveness of 8 implemented restoration projects. • Submitted two-year Monitoring Reports for four implemented restoration projects. Provided documentation of presentations, brochures, newspaper articles, and handbook during the biennial review of the Area Plan to the LAC. • Provided summary of violations of Rules to the LAC at the biennial review of the Area Plan. • Evaluated LiDAR information to understand vegetative conditions along streams in agricultural areas.

[1]Accomplishments specific to Siuslaw SWCD's 2013-2015 Focus Area (Fiddle Creek) are included separately in Section 4.3.
[2]Total for Lincoln and Siuslaw SWCDs combined.

4.2 Water Quality Monitoring—Status and Trends

The Oregon DEQ monitors and evaluates water quality in a given area and statewide through a variety of programs, including: Ambient Monitoring and Oregon Water Quality Index (OWQI), Statewide Toxics Monitoring, Statewide Bio-monitoring, Oregon Beach Monitoring Program (OBMP), Volunteer Water Quality Monitoring, Drinking Water Protection, Groundwater Monitoring as well as a geographic specific water quality assessment projects. Each of these efforts relies on specific funding sources and is designed to provide information to stakeholders and decision makers at certain spatial or temporal scales, including the Oregon Water Quality Assessment and list of impaired waterbodies (i.e., 303(d) list). The WQ Assessment information is accessed via the following:
http://www.deq.state.or.us/wq/assessment/assessment.htm

Many stakeholders are familiar with one or more of these programs and projects and may have participated in one or more of these. This update provides information primarily about monitoring conducted in the Mid Coast Basin since the 2013 Mid Coast LAC meetings.

Ambient Water Quality (and OWQI): DEQ calculates and revises (as necessary) the OWQI for each Basin based on new data at least biennially (http://www.deq.state.or.us/lab/wqm/wqimain.htm). There are six ambient stations in the Mid Coast. For the Mid Coast subbasins, the OWQI represents a single ambient station relatively low in each of the main stem segments (above heads of tide). The 2014 OWQI shows the following status:

- Salmon, North Beaver - Good
- Siuslaw, Alsea, Siletz - Excellent
- Yaquina - Fair

Based on the most recent OWQI, all of these stations showed "No Trend" (condition not improving or declining). The WQ "sub-indices" for specific pollutants are used to evaluate trends in the overall index. Toxic chemicals: DEQ's Statewide Water Quality Toxics Monitoring Program collected and analyzed water samples between 2008 and 2013 in order to establish baseline data on the types and prevalence of toxic chemicals in waters of the state. DEQ tested for more than 500 different chemicals in Oregon rivers and estuaries. Under the program, DEQ collected samples from 177 sites within 15 water basins throughout the state. Of those sites, samples were collected in 2013 at 18 sites in the Mid Coast Basin. Chemicals detected in the Mid Coast Basin included:

- Consumer product constituents (bis(2-ethylhexyl)adipate, Carbamazepine, DEET, Sulfamethoxazole, Venlafaxine),
- Current-use herbicides Atrazine, Diuron, Fluridone, Trifluralin,
- Metals, including arsenic, barium, iron, copper, lead, manganese, nickel, zinc, and chromium
- Legacy pesticides,
- Plant and animal sterols (detected at all sites),
- Combustion byproducts (anthracene, chrysene, fluoranthene, phenanthrene, pyrene),
- Flame-retardants (classified as PBDEs).

DEQ's review thus far shows that the Mid Coast Basin results exceeded the following Oregon water quality criteria:

- Arsenic species (total, dissolved and/or inorganic) exceeded Table 40 criteria established to protect humans from exposure through fish and shellfish consumption at three estuarine sites (Alsea Port docks, Siuslaw R. at Florence Boat Docks, Yaquina R. at Marker #47).
- Iron and thallium exceeded Table 30 criteria established to protect aquatic life at one site.
- Legacy pesticides: Six compounds (Aldrin, Dieldrin, Heptachlor, Heptachlor epoxide, Hexachlorobenzene and Methoxychlor) exceeded Oregon DEQ Table 30 or Table 40 water quality criteria at Siuslaw Falls Park.
- Two combustion by-products (chrysene and benzo(b)fluoranthene) exceeded Oregon DEQ Table 30 or Table 40 water quality criteria at Yaquina River at Trapp Rd (Chitwood) and Alsea Port docks.
- Ammonia: Three sites exceeded the ammonia criterion established to protect aquatic life (Alsea Port docks, Siuslaw River Florence Boat Docks, Yaquina River at Marker #47).

Legacy pesticides (BHC-alpha or BHC-beta individually or in combination) were detected at levels below water quality criteria at the Siletz River at Moonshine Park, Alsea River Alsea Port docks and the Siuslaw River at Florence boat docks. Flame Retardants were detected at several locations, but there are no established water quality criteria.

DEQ has not identified the source(s) of most of these chemicals. General sources include:

- Increased rates of soil erosion and land disturbance exacerbate the delivery of arsenic, mercury and other metals naturally occurring in soils and underlying geologic formations. Human sources of arsenic include the manufacture, use, disposal or abandonment of certain treated wood products.
- Consumer product constituents and animal sterols are indicative of domestic wastewater sources. Animal sterols suggest livestock and wildlife sources.
- Atrazine is labeled for use in forestry and for agricultural crops.
- Fluridone is an aquatic herbicide often used to control invasive plants.
- Trifluralin is a commonly used pre-emergent herbicide.

Bio-monitoring Program: Based on results from Oregon's Statewide Bio-monitoring Program from 1997-2007 and 2012, and subsequent comparison to reference site conditions, a number of sites were identified as "impaired" in the Mid Coast and placed on Oregon's 303(d) list in the 2010 Assessment cycle by U.S.EPA. Additional sites are proposed for placement on the 303(d) list in 2012.

Oregon Beach Monitoring Program (OBMP): DEQ partners with the Oregon Health Authority (OHA) to monitor the waters along Oregon's coastline. The monitoring is funded by annual grants from EPA. Surfrider Blue Water Task Force also conducts beach monitoring and that data is also reviewed by the OBMP. Marine waters are tested for enterococcus, indicator bacteria, for the presence of harmful microbes. Enterococcus is present in human and animal waste and can enter marine waters from a variety of sources such as streams and creeks, storm water runoff, animal and seabird waste, failing septic systems, sewage treatment plant spills, or boating waste.

A number of samples exceeded OHA's health advisory trigger criterion along the Mid Coast beaches segment since the program began which have resulted in 303(d) listings. Most advisories have been associated with developed areas, either urban or higher rural residential density (e.g., Agate Beach, D-River, Nye Beach, Seal Rock). In order to address these water quality problems, DEQ is evaluating monitoring techniques (e.g., fluorescence, microbial source tracking) that are indicators of human sources of bacteria, particularly septic sources, in order to address the highest potential risks. DEQ will be working with SDCWC, LSWCD, Siuslaw WC and other local partners and DMAs to implement these tools in the next few years in both developed and rural landscapes.

Volunteer Water Quality Monitoring (VM program): DEQ supports community based organizations (CBOs) in implementing locally based water quality monitoring programs. DEQ utilizes results from VM programs to augment data collected for standard assessment and TMDLs development efforts. The CBOs have a variety of objectives for their VM programs, including using it as a tool to prioritize further assessment and restoration efforts, and evaluate effectiveness of management actions (e.g., agricultural BMPs) over time. Where the VM data indicates impairments and was used as a basis for 303(d) listing for dissolved oxygen or temperature, DEQ conducts confirmatory sampling and analyses. In the Mid Coast, four CBOs have DEQ-supported VM programs (SDCWC, LSWCD, SWC, DLWID). These programs produce information useful in evaluating and understanding water quality status and trends because (a) the monitoring networks are spatially distributed to assess patterns in relation to land use and major tributaries, and (b) for many locations, monitoring has been conducted long enough to produce data to evaluate both seasonal and annual trends. DEQ and the CBOs are currently reviewing these networks (and the data produced) in evaluating possible revisions to sampling and analysis plans in anticipation of the upcoming OWEB grant cycle.

Lincoln SWCD: The LSWCD collects information on a standard suite of water quality parameters at 23 sites in the Siletz, Yaquina, Alsea and Beaver Creek subbasins through its status and trend monitoring

program. All sites have been monitored since 2011, some earlier, so a longer-term dataset is being developed. The table below summarizes recent results for the fecal indicator bacterium, *E. coli*.

Table 7. Lincoln SWCD VM data status example: Comparison of # *E. coli* samples with exceedances of Oregon single sample maximum (406 MPN/100 ml) for the monitoring period June 2013 - December 2014

Watershed	# Samples - *E. coli* (Duplicates not included)	Total # Exceeded Criterion	% Exceeded Criterion
Beaver Creek	76	13	17.11%
Alsea (Lower)	133	4	3.01%
Upper Yaquina & Big Elk Creek	114	13	11.40%
Siletz	114	0	0%

Data analyses for TMDLs development: Based on DEQ's data review, monitoring locations where Oregon's water quality criteria were exceeded in the past were more likely to continue to exceed criteria in recent monitoring (comparing past (2005-2009) with recent data at same site for Yaquina River at Clem Road, Elk Creek at Feagles Rd bridge, Beaver Creek sites). This is particularly true for fecal indicator bacteria (*E. coli*) and for dissolved oxygen conditions. For *E. coli*, DEQ has been preparing TMDLs based on load duration curves (LDCs). The CBOs are participating in the Mid Coast TMDLs Bacteria Technical Working Group (TWG), and the TWG members reviewed LDC documents to provide local knowledge to assist with data quality assurance and source assessment, as well as identify water quality improvement projects. The VM partners continued to collect data and several sites have failed Oregon's criteria, so DEQ will be updating the LDCs during implementation planning phase with designated management agencies (DMAs) to develop strategies to improve water quality in specific areas.

The LSWCD also participated as a contractor for implementing the Siletz Drinking Water Protection Grant to the cities of Toledo and Newport, funded by Oregon Health Authority (OHA). Three components to the project were conducted and/or supervised by LSWCD within the drinking water source area (DWSA):

1. Rapid Road Assessment (sediment source assessment; public road network)
2. Siletz Bank Erosion study (sediment source assessment)
3. Turbidity Threshold sampling (TTS) monitoring at the Toledo and Newport drinking water intakes

For the first two components, final project deliverables communicate the project background, methods and results to local stakeholders. The information generated from the assessment work forms a solid foundation to complete additional assessment work, identify specific erosion and sediment reduction projects on the road network, or address land conditions and management practices along the Siletz River within the DWSA. The third component (water monitoring) was conducted in winter 2015 and the data are being analyzed by DEQ. Partners are actively seeking funds to conduct additional TTS monitoring in fall/winter 2015-2016.

Following review of current VM programs, future collaborative monitoring efforts may include: continue trend monitoring at existing sites (no change), trend monitoring at existing sites and add sites (expands network), revise trend monitoring (e.g., add and delete sites to maintain about same coverage, focus on specific land use(s) or specific geographic area (e.g., intensive 5th or 6th field HUC); temporal conditions shift/expansion (e.g., storm event & higher flow condition monitoring); expand target pollutant/indicators: continuous temperature/dissolved oxygen monitoring, nutrient sampling, fecal indicator bacteria source

tracking, aquatic macroinvertebrate bio-monitoring, or some combination/variation of the above strategies.

Salmon Drift Creek Watershed Council Monitoring (SDCWC) Water Quality

The small coastal watersheds within the Salmon River and Drift Creek vary in condition but several have significant water quality problems that impact valuable ecosystems and salmon populations. Fecal indicator bacteria levels may also have negative implications for public health during recreational use. Based on land use and development patterns and the SDCWC monitoring data, most of the water quality problems within these watersheds are associated with non-point source pollution. Non-point sources generally come from overland flow that does not follow a defined channel and includes stormwater. Wastewater from a point source comes from a discernible or discrete conveyance such as a pipe, ditch or channel. Based on a review of data from 2009-March 2014, several significant problems have been highlighted by the SDCWC monitoring program. In 2009, all sites dipped below a pH of 6.5 in late summer and fall. The Salmon River system experiences a range of temperature, bacteria, dissolved oxygen and turbidity issues at multiple times of the year. Rowdy Creek at Fraser Road exhibits high exceedences(s) of dissolved oxygen and turbidity criterion in the summer months and recently *E. coli* (9/9/2015) exceedence of 1730 MPN/100 ml. Panther Creek (a watershed with dense rural residential development), routinely exceeds Oregon's criterion for *E. coli* (406 MPN/100ml). Failing septic systems and possibly domestic animals are implicated as primary sources and DEQ is working with the County on a project to assess higher risk septic systems. Devils Lake had high temperatures throughout the summer, even on the bottom of the lake, which is a detriment to its potential as summer refuge for Coho salmon.

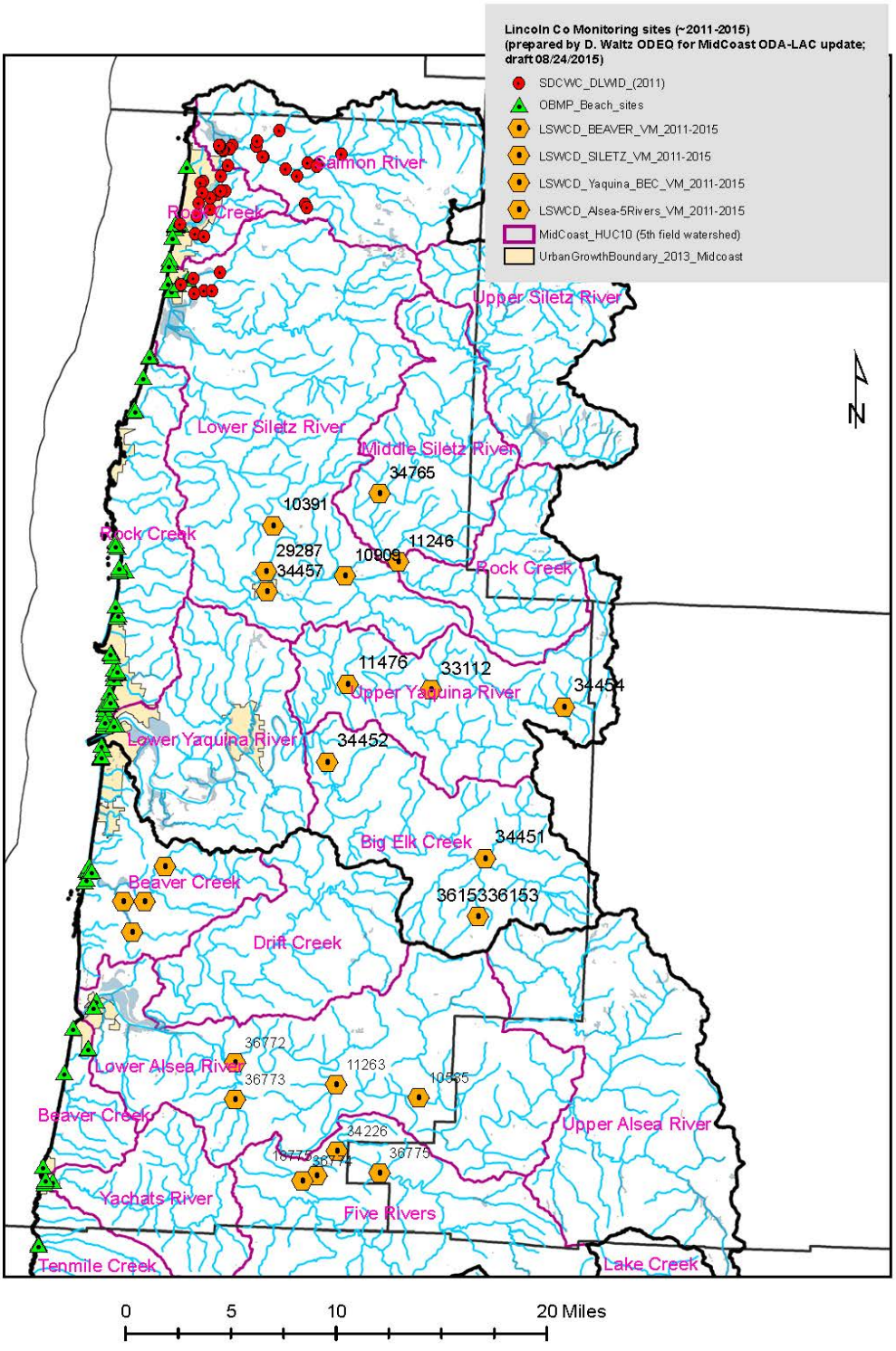
Monitoring at Rock Creek indicates that Rock Creek is a cooler tributary. The culvert at East Devils Lake Road Bridge was replaced with a box culvert and the roadway was raised 300 feet in August 2015 to ameliorate for fish passage and decrease flooding that occurs during theavy rains. Schooner Creek consistently exceeds the applicable salmonid rearing and migration temperature criterion (17.8 C) of 18°C (rearing and migration standard) for around a month. At Schooner Creek at Hwy 101 bridge (below Lincoln City's wastewater treatment plant outfall), *E.coli* exceeded Oregon's *E. coli* criterion (406 MPN/100ml) multiple times.

Drift Creek is on the 303(d) list as temperature impaired during salmon rearing season and continues to exceed applicable standards for salmonid rearing (18°C) in the summer. Drift Creek also exceeded Oregon's *E. coli* criterion (406 MPN/100ml) at multiple sites.

SWCWC has increased Dissolved Oxygen (DO) sampling resolution at target reaches in the Salmon River main stem and tributaries for the second year as part of its Water Quality Monitoring Program. The basis for the dissolved oxygen 303(d) listing on the Salmon River was DO criterion exceedances(s) during the spawning period, also aforementioned, temperature is a high concern for the Salmon River which is 303(d) listed for rearing and migration.

For more information: http://www.salmondrift.org/waterquality_main.html.

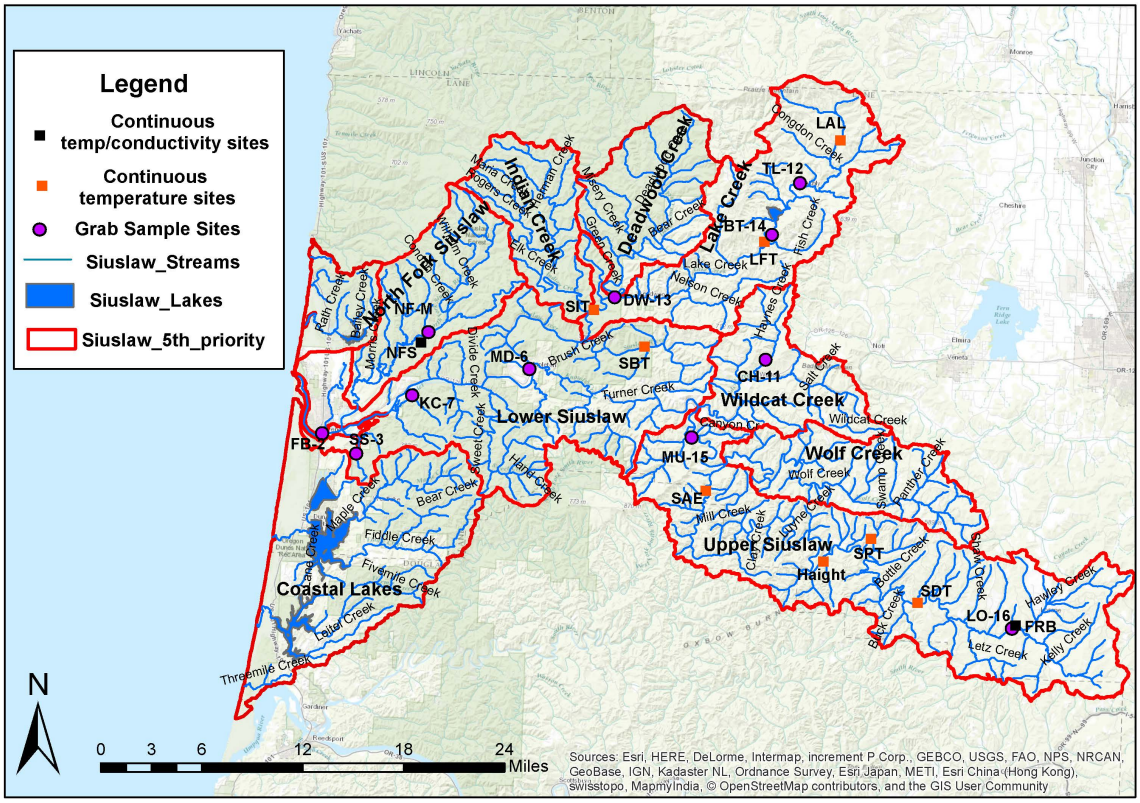
Figure 3. Lincoln County Monitoring Sites



Siuslaw Watershed Council Water Quality Monitoring

The Siuslaw Watershed Council facilitates a wide variety of monitoring projects in the basin and the Siuslaw Volunteer Water Quality Monitoring Program (VWQMP) is one of those projects. Once a month, trained volunteers collect and process surface water samples from 11 sites throughout the watershed. The data obtained in the VWQMP is baseline data. The watershed council currently measures clarity, salinity (in the estuary), dissolved oxygen, turbidity, bacteria, temperature, and weather conditions. Additionally, SWC staff collects continuous data at multiple sites. In 2014, five continuous temperature loggers were deployed, audited and data downloaded. This year, eight continuous temperature loggers and two continuous temperature/conductivity loggers were deployed throughout the watershed from May to October. A map of all current grab and continuous sites is provided below. The council's past and current data as well as their report on water quality data from 2014 can be found at http://www.siuslaw.org/monitoring. The 2015 report will be posted online in early 2016.

SWC Grab Sample & Continuous Temperature Site Map



4.3 Progress Toward Measurable Objectives

During the last biennium, the Lincoln and Siuslaw Districts identified focus areas where voluntary outreach and technical assistance work is underway. Each District completed an assessment to identify the amount of streamside areas meeting water quality goals, streamside areas that are improving and streamside areas that need work. Below is a summary and discussion of results.

Lower Big Elk Creek Focus Area

On agricultural lands within the Lower Big Elk Creek sub basin (6th HUC) the Focus Area measureable objective for the 2013-2015 biennium for Lincoln SWCD was to provide landowner technical assistance and Best Management Practice project implementation to:

- Reduce total acres of "Bare Ag" by 15% by June 30, 2015, through implementation of riparian projects to plant native trees and shrubs ("Shrub").
- Reduce total acres of "Grass Ag" by 5% by June 30, 2015, through implementation of riparian projects to plant native trees and shrubs ("Shrub").
- Reduce total acres of "Invasive Shrub" by 5% by June 30, 2015, through implementation of riparian projects to plant native trees and shrubs ("Shrub").

Lincoln SWCD exceeded the measurable objective for invasive shrub conversion to shrub (young native trees/shrubs) but did not meet its full goals for converting bare-ag and grass-ag to shrub (young native trees/shrubs) (Table 8). This was partially due to not having enough landowners involved in or aware of the program at the start of the Focus Area 2013-2015 Biennium. With the establishment of the Focus Area, landowner outreach was targeted to Big Elk watershed agriculture and foresty landowners and also tailored to specific key landowners. These efforts continued throughout the 2013-2015 Biennium. Where landowners were involved in the Focus Area program, it took the full two years of the 2013-2015 Biennium to get projects funded and installed. Strong partnership with NRCS did facilitate outreach and project development more efficiently and effectively. These efforts will remain in place for the 2015-2017 Biennium to continue and strengthen ongoing relationships with Focus Area landowners and to initiate outreach to additional target landowners to meet the measurable objectives for the 2015-2017 Biennium.

Table 8. Measureable Objectives Reporting for Lincoln SWCD's Lower Big Elk Creek Focus Area in the 2013-2015 Biennium.

SVA Map Category	"SitePre" Final Pre-Assessment	"SitePost" Post-Assessment or End of Biennium Report	Percent Change
Bare Ag (acres)	3.4	3.2	6% decrease
Grass Ag (acres)	12.2	11.8	3% decrease
Invasive Shrub (acres)	30.2	27.9	8% decrease
Total	45.8	42.9	6% total decrease

A summary of the accomplishments in Lincoln SWCD's Lower Big Elk Creek Focus Area during the 2013-2015 Biennium are included in Table 9.

Table 9. Accomplishments in Lincoln SWCD's Lower Big Elk Creek Focus Area during the 2013-2015 Biennium.

Education and Outreach
• Developed outreach postcard and mailed to 78 targeted Big Elk watershed agricultural and forestry landowners. • Thirteen landowners contacted by phone and/or personalized outreach letter. • Attended one community tour in Harlan (an Oregon Forest Resource Institute and Small Woodlot Association sponsored tree farm tour) to discuss District and NRCS programs with local residents. • Attended one workshop "Lincoln County Small Woodlands Association" meeting to discuss District and NRCS interest in Focus Area.
Land Stewardship and Water Quality Projects
• Twelve landowners provided technical assistance regarding best management practices for prevention of control of nutrients, fine sediment, and bacteria entering waters of the state. • Twenty-seven site visits with landowners associated with agricultural water quality related technical assistance, project development, or current project management. • Eight (4.08 acres) agricultural best management water quality projects developed and implemented (e.g., riparian buffer plantings, gutter installation, off-stream livestock water facility, livestock exclusion fencing, heavy use project for livestock near surface water). • Three conservation plans developed that address water quality impairments through best management practices.
Funding and Administration
• Four grant applications submitted to improve agricultural water quality.

Fiddle Creek Focus Area

On agricultural lands within the Fiddle Creek sub basin (6th HUC), the Focus Area measureable objective for the 2013-2015 biennium for Siuslaw SWCD was to provide landowner technical assistance and Best Management Practice project implementation to:

- Reduce total acres of "Bare Ag + Grass Ag" by 15% by June 30, 2015, through implementation of riparian projects to plant trees and shrubs ("Shrub"). Currently 41% of the Fiddle Creek Focus Area is rated as "Bare Ag + Grass Ag." In order to reach our measurable objective, the District needs to plant 30.5 acres to reduce total acres of "Bare Ag + Grass Ag" by 15%.

Siuslaw SWCD did not meet our Focus Area measureable objective for the 2013-2015. This was due to several factors, including but not limited to:

- Establishing landowner trust and willingness. As we continue to develop trust, more lands will open up for potential project development and implementation.
- The District's limited staff capacity. One full time employee can only accomplish so much.
- Limited funding and the associated funding cycle timelines. For the larger, more comprehensive projects that addressed multiple resource concerns, we were able to successfully secure adequate funding. If we had more funding available and if the funding cycles had a quicker turn around, we could accomplish much more.
- Unwilling landowners.

- ODA's SVA only assesses the immediately adjacent 35 feet to the stream. For example, we planted ~10.92 acres of floodplain on agricultural lands, yet only a small percentage of what we planted was accounted for by the SVA.

Once the Fiddle Creek Focus Area was established, landowner outreach was targeted to agriculture, foresty, and rural residential landowners. These efforts continued throughout the 2013-2015 Biennium. Where landowners were open to assistance, it took the full two years of the 2013-2015 Biennium to get projects funded and implemented. Strong partnerships with OWEB, NRCS, USFS, Coast Range Stewardship Fund (CRSF), and the Siuslaw Watershed Council (SWC) did facilitate outreach and project development more efficiently and effectively. These efforts will remain in place for the 2015-2017 Biennium.

Table 10. Measureable Objectives Reporting for Siuslaw SWCD's Fiddle Creek Focus Area in the 2013-2015 Biennium.

SVA Map Category (Alphabetical)	"SitePre" Final Pre-Assessment	"SitePost" Post-Assessment or End of Biennium Report	Percent Change
Bare Ag + Grass Ag	41%	40.03%	0.97 %

A summary of the accomplishments in Siuslaw SWCD's Fiddle Creek Focus Area during the 2013-2015 Biennium are included in Table 11.

Table 11. Accomplishments in Siuslaw SWCD's Fiddle Creek Focus Area during the 2013-2015 Biennium.

Education and Outreach
• Developed personalized outreach letter and mailed to all landowners in the Fiddle Creek Focus Area, 15 total. Of the 15 landowners education and outreach was provided 44 times. • Eight landowners contacted by phone. • Tour of both prior and potential restoration sites with OWEB, ODFW, NOAA, NRCS, and BLM personnel.
Land Stewardship and Water Quality Projects
• Seven landowners provided with technical assistance. Of the seven landowners, technical assistance was provided a total of 27 times. • Provided one-to-one information regarding the area plan to seven landowners. • Seven landowners received technical assistance regarding best management practices for prevention of control of nutrients, fine sediment, and bacteria entering waters of the state. • 40 site visits with landowners associated with agricultural water quality related technical assistance, project development, current project management, or routine follow up visits of previous projects. • Assisted five landowners to plan and implement practices that improve the function of riparian vegetation. • Used best management practices to control knotweed at two sites in Focus Area. • Four agricultural water quality projects developed. • Four (48 acres) agricultural water quality projects implemented on the three project areas. • 10.92 acres of riparian area planted with native species. • 4.6 gross acres of riparian area treated for Japanese Knotweed. • .29 net acres of riparian area treated for Japanese Knotweed. • .37 stream miles treated for Japanese Knotweed. • .81 stream miles with plantings of native species.

• .23 stream miles with exclusion fencing. • 1.5 stream miles of in-stream large wood placement. • Two barrier or derelict culverts removed. • .64 stream miles with improved aquatic organism passage.
Funding and Administration
• Four grant applications submitted to improve agricultural water quality. • Five landowners provided with information on federal and local cost-share programs. • Four landowners assisted in enrolling in the Conservation Reserve Enhancement Program.
Monitoring
• Completed Streamside Vegetation Assessment of the entire Fiddle Creek Focus Area, 209.28 acres total.

4.4 Aerial Photo Monitoring of Streamside Vegetation

Aerial photographs from 2003, 2008, and 2013 were analyzed per the methodology presented in Section 1.8.1. The higher the score, the more trees and shrubs compared to grass and bare ground. The length of each reach assessed varied from about three to four miles.

Six stream reaches were analyzed in 2003. All streams had over 50 percent trees in each of the bands. Significant amounts of water were reported for Indian Creek within 30 feet of the stream, due both to the nature of the channel and because of less accurate digitizing of the stream (we used pre-existing BLM stream layer information). The Yaquina River had significant amounts of bare agricultural ground (7-19 percent) 30 to 90 feet from the creek. Data from the 60 and 90 foot band on the right side of Bummer Creek were inadvertently lost.

Four streams that were monitored in 2003 were also monitored in 2008. Three additional streams were originally monitored in 2003 but were not re-done in 2008 because we determined that we had a large enough sample size of streams in this basin. However, we did add another stream in 2008 – the North Fork Siuslaw – as a replacement for the mainstem Siuslaw done in 2003. This change was made because we decided the North Fork Siuslaw was more representative of agricultural use than the mainstem.

Of the four streams monitored both in 2003 and 2008, two had no significant change in their riparian index scores, while the other two had a significant decrease. However, after extensive review of the 2003 and 2008 air photos it appears that the differences in riparian scores for Deadwood and Elk Creek were due to interpretation errors in 2003. The first year of this project was 2003, and ODA staff was not yet proficient in identifying all landscape features. Also at that time, three staff members were doing interpretations independently. Testing of observer agreement on one stream in 2003 showed that the three staff agreed on interpretations 80% of the time. Examination of the landscape cover data from 2003 to 2008 suggests that all streams had a reduction in tree cover, but detailed examination of the photos side-by-side does not bear this out. It appears instead that many shadowed areas were interpreted as being tree cover in 2003, when the 2008 photos had better lighting conditions showing the presence of other landscape features. Overall, there did not appear to be an appreciable change in landscape cover from 2003 to 2008.

The North Fork Siuslaw had the lowest riparian index score of all the streams monitored in 2008 of 43.01. This is mostly due to the low percentage of trees on the right bank where no more than 16% of any band were trees. Bare agricultural cover ranged from 1 to 9.6%.

Bummer Creek was the only stream with a significant change in landscape condition from 2008 to 2013. Generally we consider a significant change to be a 5% or greater change in riparian index score. Bummer Creek's score declined due to a large loss of tree cover in most bands. Tree cover declined from 66 to 48% in the 90 L band, 74 to 57% in the 60 L, and 81 to 71% in the 30 L band. Tree cover also declined from 99 to 83% in the 60 R band. The NF Siuslaw had the lowest overall riparian index score again due to the same reasons as in 2008.

Table 12: ODA Aerial Photo Monitoring Results

Stream	Measured Scores		
	2003	2008	2013
Bummer Creek	54.7	54.26	50.34
Deadwood Creek	62.6	58.75	58.99
Elk Creek	Faulty interpretation	61.51	59.99
Indian Creek	Faulty interpretation	62.17	62.09
North Fork Siuslaw River	--	44.55	42.97

4.5 Biennial Reviews and Adaptive Management

Upon review of the updated Area Plan, the LAC provides the following reflections and recommendations:

- The LAC commented that uncertainties regarding Mid Coast TMDL allocations and implementation and the court case currently underway (EPA) make it hard to plan for the future when we do not know what the future is.

  For background, on August 8, 2013, EPA disapproved the natural conditions criterion, a key component of Oregon's water temperature standard. A court order issued in April required EPA to revise its prior approval of Oregon's temperature standard in a manner consistent with U.S. District Court Judge Acosta's Feb. 28, 2012, ruling and federal regulations. The court ruling and order resulted from litigation brought by Northwest Environmental Advocates challenging EPA's approval of Oregon's temperature standard in 2004. Additional information can be found at http://www.oregon.gov/deq/EQC/Documents/2013AgendaDocs/August2013/ItemD_ReportAndAttachments.pdf.

  In the meantime, DEQ continues to work with ODA to develop water quality management plans, which identify the load reductions and measures needed to reduce nonpoint source loads to the maximum extent practicable. Management practices and stream restoration to reduce temperatures in impaired waters are needed whether the ultimate regulatory goal is natural conditions or the numeric criteria. This leaves landowners implementing improvements uncertain whether their actions will have been enough.
- Research on grazing management practices is needed to better understand the benefits of flash grazing and the timing, intensity and duration that will achieve results for both production and protection of water quality.
- Information about streamside conditions throughout the management area is needed. DEQ will help assess conditions using LiDAR in early 2016. This information will inform the LAC's discussion about area wide measurable objectives.
- ODA compliance results indicate that the primary types of cases involve either horse boarding facilities or livestock grazing damage to streamside vegetation.

Table 13. ODA Compliance Results

Type of Operation	Compliance Action	Results
Horse Facility	Fix It Letter Water Quality Advisory Letter of Warning	SWCD provided technical and financial assistance and the landowner constructed a state-of-the-art manure storage facility and the case was closed.
Horse Facility	Fix It Letter Water Quality Advisory	Seasonal wetland impacted by horses. Landowner now avoids using the wetland during wet season. Case closed.
Livestock	Water Quality Advisory	Landowner fenced tributary resulting in vegetation establishing. SWCD & NRCS working with landowner to achieve results beyond the compliance action. Case closed.
Livestock	Water Quality Advisory	Investigation revealed there were no water quality violations and the case was closed.
Livestock	NA	Complainant did not provide adequate information and the case was closed.

The types of compliance actions and results indicate that additional outreach to horse boarding facilities may be helpful. Complaints regarding livestock indicate a possible need to provide outreach about the Area Rules for both the general public and for livestock ranchers.

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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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Appendices

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

B. 2010 OregonSection 303(d) List and Decision Matrix, Mid Coast Basin

C. 303(d) List Parameters and Impacted Beneficial Uses

D. Pesticide Use in Oregon

E. Conservation Funding Programs

F. Sources of Information and Technical Assistance

G. Site Capability

H. Mid Coast Area Weeds of Concern

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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: 2010 Oregon Section 303(d) List and Decision Matrix

Mid Coast Basin water quality limited waterbodies

BACTERIA (*E. coli*, Fecal Coliform)

303(d) List	**Season**
Alsea Subbasin:	
Alsea River – Mouth to River Mile (RM) 10	Year-Round
Beaver Creek, North Fork – RM 0 to 9.5 (E. coli)	Summer
Beaver Creek, South Fork – RM 0 to 5.7 (*E. coli*)	Summer
Canal Creek – RM 0 to 7.2 (fecal coliform)	Year-Round
Keller Creek – RM 0 to 2.6 (*E. coli*)	Year-Round
School Fork – RM 0 to 3.2 (*E. coli*)	Year-Round
Stump Creek – RM 0 to 2 (*E. coli)*	Fall-Winter-Spring
Tenmile Creek – RM 0 to 11.5 (fecal coliform)	Year-Round
Williamson Creek – RM 0 to 2.7 (*E. coli*)	Summer
Yachats River, North Fork – RM 0 to 6.3 (*E. coli)*	Fall-Winter-Spring
Yachats River – RM 0 to 16.4 (*E. coli)*	Fall-Winter-Spring
Siletz/Yaquina Subbasin:	
Big Elk Creek – RM 18.9 to 29.5 (*E. coli*)	Summer
Depot Slough – RM 0 to 1.3	Year-Round
Feagles Creek – RM 0 to 5.6 (*E. coli*)	Summer
Nute Slough – RM 0 to1.5 (*E. coli*)	Fall-Winter-Spring
Ollala Creek – RM 0 to 3.2 (fecal coliform)	Year-Round
Poole Slough – RM 0 to 2.6 (fecal coliform)	Year-Round
Salmon River – RM 0 to 23.1 (fecal coliform)	Year-Round
Schooner Creek – RM 0 to 2.7 (*E. coli)*	Summer
Thompson Creek – RM 0 to 2 (*E. coli)*	Year-Round
Yaquina River – RM 0 to 42 (fecal coliform)	Year-Round
Yaquina River – RM 37.6 to 57.5 (*E. coli*)	Summer
Siuslaw Subbasin:	
Siuslaw River – RM 5.7 to 105.9 (fecal coliform)	Year-Round

Potential concern

Alsea Subbasin:	
Stump Creek – RM 0 to 2 (*E. coli)* (Water Contact Recreation)	Summer

TEMPERATURE

303(d) List	**Season**
Alsea Subbasin:	
Alder Creek – RM 0 to 1.3	Year-Round
Alsea River – RM 15.2 to 47.4	Summer
Alsea River – RM 15.8 to 47.2	Sep 15 to Jun 15
Alsea River, North Fork – RM 0 to 15	Year-Round

Alsea River, North Fork – RM 0 to 2.7	Spawning
Alsea River, South Fork – RM 0 to 17.2	Year-Round
Alsea River, South Fork – RM 0 to 2.4	Sept 15 to Jun 15
Big Creek – RM 0 to 9.4	Year-Round
Carson Creek – RM 0 to 9.4	Year-Round
Beaver Creek, North Fork – RM 0 to 9.5	Year-Round
Beaver Creek, South Fork – RM 0 to 6	Year-Round
Buck Creek – RM 0 to 7.7	Year-Round
Bummer Creek – RM 0 to 8.2	Summer
Camp Creek (Mouth to East Fork) – RM 0 to 2.7	Summer
Cascade Creek – RM 0 to 4.4	Summer
Cascade Creek, North Fork – RM 0 to 2.7	Summer
Depew Creek – RM 0 to 1.5	Summer
Drift Creek – RM 5.3 to 29.6	Year-Round
Drift Creek – RM 8.6 to 22.3	Spawning
Fall Creek – RM 0 to 9.8	Year-Round
Fall Creek – RM 0 to 9.8	Spawning
Five Rivers Creek – RM 0 to 22.4	Summer
Fiver River Creek – RM 6.5 to 22.4	Oct 15 to Jun 15
Flynn Creek – RM 0 to 2.5	Year-Round
Gopher Creek – RM 0 to 5.1	Year-Round
Grass Creek – RM 0 to 2.3	Year-Round
Green River – RM 0 to 6.7	Year-Round
Green River, East Fork – RM 0 to 2	Year-Round
Keller Creek – RM 0 to 2.7	Year-Round
Little Lobster Creek – RM 0 to 6.6	Summer
Lobster Creek – RM 0 to 17.7	Year-Round
Lobster Creek – RM 6.8 to 17.7	Spawning
Lobster Creek, South Fork – RM 0 to 4.3	Summer
Meadow Fork – RM 0 to 1.4	Year-Round
Meadow Fork – RM 0 to 2.2	Oct 15 to Jun 15
Peak Creek – RM 0 to 7	Year-Round
Phillips Creek – RM 0 to 2.1	Summer
Preacher Creek – RM 0 to 2	Summer
School Fork Creek – RM 0 to 3.2	Year-Round
Stump Creek – RM 0 to 2	Year-Round
Williamson Creek, RM 0 to 2.7	Year-Round
Yachats River – RM 0 to 13	Summer
Yachats River, North Fork – RM 0 to 6.3	Year-Round

Siletz/Yaquina Subbasin:

Anderson Creek – RM 0 to 2.8	Year-Round
Crowley Creek – RM 0 to 1.8	Year-Round
Cerine Creek – RM 0 to 3.7	Year-Round
Drift Creek – RM 0.8 to 21.6	Summer
Elk Creek – RM 0 to 29.5	Summer
Feagles Creek – RM 0 to 5.6	Year-Round
Mill Creek – RM 0 to 4.2	Year-Round
Mill Creek – RM 0 to 1.7	Oct 1 to Jun 15
North Creek – RM 0 to 3.2	Year-Round
Rock Creek – RM 0 to 6.6	Year-Round

Salmon River – RM 0 to 23.1	Year-Round
Schooner Creek – RM 0 to 9.7	Year-Round
Schooner Creek, South Fork – RM 0 to 4.9	Year-Round
Siletz River – RM 7 to 46.8	Summer
Siletz River, South Fork – RM 0 to 11.4	Year-Round
Slick Rock Creek – RM 0 to 9	Year-Round
Spout Creek – RM 0 to 5.8	Year-Round
West Olalla Creek – RM 0 to 3.7	Year-Round
Yaquina River – RM 15.4 to 27.6	Summer
Yaquina River – RM 0 to 57.5	Year-Round

Siuslaw Subbasin:

Beaver Creek – RM 0 to 4.4	Year-Round
Chickahominy Creek – RM 0 to 2.9	Year-Round
Condon Creek – RM 3.6 to 7.8	Year-Round
Deadwood Creek – Mouth to Headwaters	Year-Round
Deadwood Creek, West Fork – RM 0 to 7.7	Year-Round
Failor Creek – Mouth to Headwaters	Summer
Indian Creek – RM 0 to 22	Year-Round
Knowles Creek – RM 0 to 13.1	Year-Round
Lake Creek – RM 0 to 35.8	Year-Round
McLeod Creek – RM 0 to 7.4	Year-Round
Rogers Creek – RM 0 to 4.4	Year-Round
Siuslaw River – RM 0 to 106	Summer
Siuslaw River, North Fork – RM 0 to 27.3	Year-Round
Siuslaw River, South Fork – RM 0 to 7.3	Year-Round
Sweet Creek – RM 0 to 11.6	Year-Round

Siltcoos Subbasin:

Fiddle Creek – RM 0 to 13.4	Summer
Fivemile Creek – RM 0 to 10	Year-Round

Potential concern	**Season**

Alsea Subbasin:

Alsea River, RM 4.9 to 15.2	Summer
Beaver Creek, RM 0 to 5.3	Summer
Grass Creek – RM 0 to 3.7	Summer

Siletz/Yaquina Subbasin:

Big Rock Creek – RM 0 to 9.7	Summer
Mill Creek – RM 0 to 5.4	Summer
Sampson Creek – RM 0 to 2.5	Summer
Simpson Creek – RM 0 to 3	Summer
Siletz River – RM 0 to 7	Summer

Siuslaw Subbasin:

Indian Creek, North Fork – RM 0 to 5.9	Summer

SEDIMENTATION (all unless indicated) and Turbidity

303(d) List

Siletz/Yaquina Subbasin:
Elk Creek – RM 0 to 29.5
Siletz River, RM 39.5 to RM 65.3 (Turbidity, drinking water supply limited)

Siuslaw Subbasin:
Drew Creek – RM 0 to 3.2
McCloud Creek – RM 0 to 7.4
Morris Creek – RM 0 to 3.9
Porter Creek – RM 0 to 4.9
Siuslaw River – North Fork, RM 0.4 to 273
Taylor Creek – RM 0 to 2.3

BIOLOGICAL CRITERIA

Alsea Subbasin

Beaver Creek, North Fork – RM 0 to 9.5	Year-Round
Cummins Creek – RM 1.5 to 2.2	Year-Round
Flynn Creek – RM 0 to 2.1	Year-Round
Oliver Creek – RM 0 to 2	Year-Round

Siletz/Yaquina Subbasin

Anderson Creek – RM 0 to 2	Year-Round
Deer Creek – RM 0 to 2.7	Year-Round
Drift Creek – RM 0 21.6	Year-Round
Montgomery Creek – RM 0 to 1.9	Year-Round
Rock Creek – RM 0 to 6.8	Year-Round
Siletz River, South Fork – RM 0 to 11.4	Year-Round
South Roy Creek – RM 0 to 2.3	Year-Round
Spout Creek – RM 0 to 5.8	Year-Round
Yaquina River – RM 27.6 to 42	Year-Round

Siltcoos Subbasin

Bell Creek – RM 0 to 3.6	Year-Round
Fivemile Creek – RM 0 to 9.9	Year-Round

Siuslaw Subbasin:

Bear Creek – RM 0 to 2.1	Year-Round
Collins Creek – RM 0 to 1.2	Year-Round
Deadwood Creek – RM 0 to 20.9	Year-Round
Eames Creek – RM 0 to 4.8	Year-Round
Indian Creek – RM 0 to 22	Year-Round
Jeans Creek – RM 0 to 1.2	Year-Round
Potato Patch Creek – RM 0 to 1.7	Year-Round
Simpson Creek – RM 0 to .8	Year-Round
Siuslaw River, South Fork – RM 0 to 3.8	Year-Round
Siuslaw River – RM 0 to 58.4	Year-Round
Siuslaw River – RM 60.2 to 105.9	Year-Round
Sweet Creek – RM 0 to 11.6	Year-Round
Whitaker Creek – RM 0 to 6.4	Year-Round

Potential concern

Alsea Subbasin:

Honey Grove Creek – RM 0 to 4.1	Year-Round
Benner Creek – RM 0 to 1.2	Year-Round
Yachats River – North Fork, RM 0 to 6.3	Year-Round

Siletz-Yaquina Subbasin:

Yaquina River – RM 27.6 to 42

Siuslaw Subbasin:

Cabin Creek – RM 0 to 1.1	Year-Round
Chappell Creek – RM 0 to 1.8	Year-Round
Nelson Creek – RM 0 to 8.5	Year-Round
Panther Creek – RM 0 to 3.4	Year-Round
Porter Creek – RM 0 to 4.9	Year-Round
Raleigh Creek – RM 0 to 1.4	Year-Round

NUTRIENTS

Potential concern

Coastal Lakes:

Mercer Creek/Mercer Lake (Nitrates)

Siletz/Yaquina Subbasin:

Unnamed Stream/Devils Lake (phosphorus)

TMDLs Approved

Siuslaw Subbasin:

Clear Lake (phosphorus)
Collard Lake (phosphorus)

AQUATIC WEEDS OR ALGAE

303(d) List

Coastal Lakes:

Mercer Creek/Mercer Lake

Siletz/Yaquina Subbasin:

Boone Slough
Nute Slough
Unnamed Stream/Devils Lake

Siltcoos Subbasin:

Siltcoos Lake
Tahkenitch Lake

CHLOROPHYLL A

303(d) List	**Season**
Siletz/Yaquina Subbasin:	
Unnamed Stream/Devils Lake	Summer
Coastal Lakes:	
Mercer Creek/Mercer Lake	Summer

DISSOLVED OXYGEN

303(d) List

Alsea Subbasin:	
Alsea River – RM 27 to 47.4	Sept 15 to Jun 15
Alsea River – RM 15.7 to 47.4	Year-Round
Beamer Creek – RM 0 to 2.1	Oct 15 to May 15
Beaver Creek, South Fork – RM 0 to 6	Oct 15 to May 15
Beaver Creek, South Fork—RM 0 to 6	Year-Round
Beaver Creek, North Fork – RM 0 to 9.5	Oct 15 to May 15
Keller Creek – RM 0 to 2.6	Oct 15 to May 15
School Fork – RM 0 to 3.2	Oct 15 to May 15
Stump Creek – RM 0 to 2	Oct 15 to May 15
Williamson Creek – RM 0 to 2.7	Oct 15 to May 15
Yachats River – RM 3.4 to 16.6	Oct 15 to May 15
Siletz/Yaquina Subbasin:	
Beaver Creek – RM 0 to 7.3	Year-Round
Beaver Creek – RM o to 7.3	Oct 15 to May 15
Big Elk Creek – RM 0 to 5.3	Jan 1 to May 15
Big Elk Creek – RM 0 to 29.5	Year-Round
Big Elk Creek – RM 5.3 to 29.5	Oct 15 to May 15
Depot Creek – RM 0 to 4.5	Year-Round
Salmon River – RM 0 to 23.1	Sept 15 to May 31
Siletz River – RM 21.6 to 65.3	Sept 1 to Jun 15
Yaquina River – RM 0 to 56.8	Year-Round
Yaquina River – RM 0 to 26.9	Jan 1 to May 15
Yaquina River – RM 26.8 to 53.9 (Spawning)	Sept 15 to May 31
Siuslaw Subbasin	
Siuslaw River – RM 5.7 to 105.9 (Spawning)	Sept 15 – May 31
Siuslaw River – RM 5.7 to 105.9	June 1 – Sept 14

Potential concern

Siuslaw Subbasin:
Siuslaw River – Mouth to Headwaters

Alkalinity

Potential Concern

Alsea Subbasin

Alsea River – RM 0 to 47.5	Year-Round
Alsea River, South Fork – RM 0 to 17.2	Year-Round
Big Creek – RM 0 to 9.4	Year-Round
Bob Creek – RM 0 to 5.9	Year-Round
Cascade Creek – RM 0 to 4.4	Year-Round
Crab Creek – RM 0 to 6.5	Year-Round
Cullen Creek – RM 0 to 1.2	Year-Round
Cummins Creek – RM 0 to 7	Year-Round
Drift Creek – RM 0 to 29.6	Year-Round
Elkhorn Creek – RM 0 to 1.4	Year-Round
Fiver Rivers – RM 0 to 22.4	Year-Round
Flynn Creek – RM 0 to 2.5	Year-Round
Rock Creek – RM 0 to 5.8	Year-Round
Tenmile Creek – RM 0 to 11.5	Year-Round
Trout Creek – RM 0 to 5.8	Year-Round

Siletz/Yaquina Subbasin

Boulder Creek – RM 0 to 7.3	Year-Round
Cerine Creek – RM 0 to 3.7	Year-Round
Mill Creek – RM 0 to 3.1	Year-Round
Montgomery Creek – RM 0 to 1.9	Year-Round
North Creek – RM 0 to 3.2	Year-Round
Salmon River – RM 0 to 23.1	Year-Round
Siletz River – RM 0 to 65.345	Year-Round
Siletz River, South Fork – RM 0 to 11.4	Year-Round
Steer Creek – RM 0 to 5.9	Year-Round
Yaquina River – RM 0 to 57.5	Year-Round

Siuslaw Subbasin

Beaver Creek – RM 0 to 4.4	Year-Round
Buck Creek – RM 0 to 2.8	Year-Round
Condon Creek – RM 0 to 7.8	Year-Round
Deadwood Creek – RM 0 to 20.9	Year-Round
Eames Creek – RM 0 to 4.8	Year-Round
Indian Creek – RM 0 to 22	Year-Round
Lake Creek – RM 0 to 35.8	Year-Round
Siuslaw River – RM 0 to 106	Year-Round
Sweet Creek – RM 0 to 11.5	Year-Round

PH

Alsea Subbasin

Beaver Creek, South Fork – RM 0 to 2.8	Year-Round

Siletz/Yaquina Subbasin:

Unnamed Stream/Devils Lake	Summer

Metals

Potential Concern

Alsea Subbasin	
Cullen Creek – RM 0 to 1.2 (Iron)	Year-Round
Honey Grove Creek – RM 0 to 4.1 (Iron)	Year-Round
Honey Grove Creek – RM o to 4.1 (Manganese)	Year-Round
Siletz/Yaquina Subbasin	
Yaquina River – RM 0 to 57.5 (Iron)	Year-Round
Siuslaw Subbasin	
Bernhardt Creek Trib – RM 0 to 1.4 (Manganese)	Year-Round
Deadwood Creek – RM 0 to 20.9 (Lead)	Year-Round
Eames Creek – RM 0 to 4.8 (Iron)	Year-Round
Eames Creek – RM 0 to 4.8 (Manganese)	Year-Round
Lake Creek – RM 0 to 35.8 (Iron)	Year-Round
Siuslaw River, South Fork – RM 0 to 7.3 (Iron)	Year-Round
Siuslaw River, South Fork – RM 0 to 7.3 (Manganese)	Year-Round
Wolf Creek Trib – RM 0 to 1.1 (Iron)	Year-Round
Wolf Creek Trib – RM 0 to 1.1 (Manganese)	Year-Round

Appendix C: 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

Template Language

Descriptions of Common Agricultural Parameters of Concern: This language can be used or added to existing language.

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 D: Pesticide Use in Oregon

Oregon has strict laws and regulations related to pesticide use, storage, and reporting. All pesticide users are required to apply and store pesticides according to the label. Users of restricted-use pesticides are required to obtain certification from the ODA. Improper application and storage of pesticides can lead to surface or groundwater quality problems.

The following are prohibited under ORS 634.372:

634.372 Prohibited acts. No person shall:
(1) Make false or misleading claims through any media, relating to the effect of pesticides or application methods to be utilized.
(2) As a pesticide applicator or operator, intentionally or willfully apply or use a worthless pesticide or any pesticide inconsistent with it's labeling, or as a pesticide consultant or dealer, recommend or distribute such pesticides.
(3) Operate a faulty or unsafe pesticide spray apparatus, aircraft or other application device or equipment.
(4) Perform pesticide application activities in a faulty, careless, or negligent manner.
(5) Refuse or neglect to prepare and maintain records required to be kept by the provisions of this chapter.
(6) Make false, misleading, or fraudulent records, reports, or application forms required by the provisions of this chapter.
(7) Operate pesticide applicators' apparatus, machinery, or equipment without a licensed pesticide applicator or certified private applicator performing the actual application, or supervising such application if such is performed by a pesticide trainee. This prohibition does not apply to the operation of tractors, trucks, or other vehicular equipment used only under the supervision of a certified private applicator.
(8) As a pesticide applicator, work or engage in the application of any classes of pesticides without first obtaining and maintaining a pesticide applicator's license, or apply pesticides that are not specifically authorized by such license.
(9) As a pesticide operator, engage in the business of, or represent or advertise as being in the business of, applying pesticides upon the land or property of another, without first obtaining and maintaining a pesticide operator's license, nor shall such person engage in a class of pesticide application business that is not specifically authorized by license issued by the state Department of Agriculture. Further, no such person shall employ or use any person to apply or spray pesticides who is not a licensed pesticide applicator or pesticide trainee.
(10) As a pesticide trainee, work or engage in the application of any class of pesticides without first obtaining and maintaining a pesticide trainee's certificate and is otherwise in compliance with the provisions of this chapter.
(11) Act as, or purport to be, a pesticide dealer or advertise as such without first obtaining and maintaining a pesticide dealer's license.
(12) Act as, or purport to be, a pesticide consultant without first obtaining and maintaining a pesticide consultant's license.
(13) Apply any pesticide classified as a restricted-use or highly toxic pesticide to agricultural, horticultural or forest crops on land owned or leased by the person without first obtaining and maintaining a private applicator certificate.
(14) As a person described in ORS 634.106 (6), use power-driven pesticide application equipment or devices (use hand or backpack types only), or use or apply any pesticide other than those prescribed by the department.
(15) Deliver, distribute, sell or offer for sale any pesticide that is misbranded.
(16) Formulate, deliver, distribute, sell, or offer for sale any pesticide that is adulterated.
(17) Formulate, deliver, distribute, sell, or offer for sale any pesticide that has not been registered as required by ORS 634.016.

(18) Formulate, deliver, distribute, sell or offer for sale any powdered pesticide containing arsenic or any highly toxic fluoride that is not distinctly colored.
(19) Distribute, sell or offer for sale any pesticide except in the manufacturer's original unbroken package.
(20) Make application of pesticides, by aircraft or otherwise, within a protected or restricted area without first obtaining a permit for such application from the committee of the protected or restricted area in which the application is to be made, nor shall such person make such application contrary to the conditions or terms of the permit so issued.
(21) Use isopropyl ester of 2,4-D, or any other ester of equal or higher volatility with regard to plant damage as determined by the department, without first obtaining a permit for such use as provided in ORS 634.322 (10).
(22) Sell, use or remove any pesticide or device subjected to a "stop sale, use or removal" order until the pesticide or device has been released there-from as provided in ORS 634.322 (3).
(23) Fail to comply with any provision or requirement of sections 2 to 9, chapter 1059, Oregon Laws 1999, or rules adopted there-under. [1973 c.341 s.34; 1987 c.158 s.121; 1995 c.360 s.2; 1999 c.1059 s.14]

For complete laws and regulations related to pesticides, please consult the ODA website at: http://oregon.gov/ODA/PEST/lawsregs_index.shtml or an updated copy of the Oregon Revised Statutes and Oregon Administrative Rules.

For more detailed recommendations on pesticide use and control of pests and disease, contact the ODA Pesticides Division, OSU Extension Service, or a qualified consultant.

Appendix E: 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 F 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

Program	General Description	Contact
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

Program	General Description	Contact
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
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.[1]	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
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

[1]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.

Program	General Description	Contact
		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

Appendix F: 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, Ste A
Dallas, OR 97338-1911
(503) 623-2396

Tillamook County
6415 Signal Street
Tillamook, OR 97141
(503) 842-2848

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 Highway 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

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.

381 N Second Street
Coos Bay, OR 97420
(541) 269-2721
http://www.deq.state.or.us

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
810 SW Alder Street, Suite C
Newport, OR 97365
(541) 265-8306

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

Springfield office
3150 E Main Street
Springfield, OR 97478
(541) 726-3515
http://www.dfw.state.or.us

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

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

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

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
Roseburg, OR 97470
(541) 672-4461

Lane County
783 Grant Street
Eugene, OR 97402
(541) 344-5859

Lincoln County
29 SE 2nd Street
Newport, OR 97365
(541) 574-6534

Polk County
182 SW Academy
P.O. Box 640
Dallas, OR 97338
(503) 623-8395

Tillamook County
2204 4th 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, Room 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
23 North Coast Highway
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
http://www.siuslaw.org

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
23 North Coast Highway
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

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Appendix G: Site Capability

How site capability applies in an Agricultural Water Quality Management Area

Site capability can be applied in several ways in an Agricultural Water Quality Management Area. It can help provide a clearer picture of the vegetation and riparian functions a site could be anticipated to provide in a compliance situation. It can be used in voluntary conservation and outreach projects to illustrate the vegetation landowners might expect given a management regime and the capability of a site. For example, it could predict the likelihood of success of "passive restoration, " that involves reducing management pressure on the existing plant community, versus more "active restoration," that involves reducing management pressure, planting desirable vegetation, and/or controlling undesirable vegetation. Site capability can also predict the consequences or benefits of planting desirable species in specific locations in a riparian area.

Example

Historically, Llama Creek meandered through a narrow coastal valley until it reached the Pacific Ocean. Historical vegetation along Llama Creek included a canopy of Douglas fir, western red cedar, big leaf maple, and alder in the headwaters, and a combination of alder, willow, red osier dogwood, grasses, and sedges in the lower reaches (site potential). The vegetation provided many functions, including shade, bank stability, infiltration of runoff water, and filtration of sediment and nutrients.

In the upper reaches of Llama Creek, there are generally younger age classes and less older age classes of vegetation than there were historically, but vegetation is still composed mostly of Douglas fir, western red cedar, big leaf maple, and alder. Streamside sites in upper Llama Creek are still able to produce plant communities that were historically present, and those plant communities provide the water quality-related functions listed above.

Over the past few decades, the lower reaches of Llama Creek were channelized and straightened. As a result, streambanks eroded, lower Llama Creek became much wider and shallower, and the water table dropped. Presently, lower Llama Creek is capable of supporting those plant species that can establish and grow under the constraints of a lower water table. Depending on the site, the plant community will likely include blackberry, native shrubs, herbaceous species, and tree species capable of establishing and growing in these modified conditions. Some sites dominated by blackberry and other invasive vegetation do not provide riparian functions at the same level as the historic plant community, but at other sites the vegetation still promotes infiltration of runoff water, filters sediment and nutrients from runoff, provides shade, and provides for some bank stability.

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Appendix H: 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