Oregon
Department
of Agriculture

North Coast Basin Agricultural Water Quality Management Area Plan Includes: Sauvie Island, and West Multnomah, Clatsop, Columbia, and Tillamook counties

June 2018

Developed by the

Oregon Department of Agriculture

North Coast Local Advisory Committee

With support from the:
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Tillamook Soil and Water Conservation District
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Acronyms and Terms Used in this Document

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

Foreword

This Agricultural Water Quality Management Area Plan (Area Plan) provides guidance for addressing water quality related to agricultural activities in the Agricultural Water Quality Management Area (Management Area). The Area Plan identifies strategies to prevent and control water pollution from agricultural lands through a combination of outreach programs, suggested land treatments, management activities, compliance, and monitoring.

The Area Plan is neither regulatory nor enforceable (Oregon Revised Statute (ORS) 568.912(1)). It references associated Agricultural Water Quality Management Area Rules (Area Rules), which are Oregon Administrative Rules (OARs) enforced by the Oregon Department of Agriculture (ODA).

Required Elements of Area Plans

Area Plans must describe a program to achieve the water quality goals and standards necessary to protect designated beneficial uses related to water quality as required by state and federal law (OAR 603-090-0030(1)). At a minimum, an Area Plan must:

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

Plan Content

Chapter 1: Agricultural Water Quality Management Program Purpose and Background. The purpose is to have consistent and accurate information about the Ag Water Quality Program.

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

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

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

Chapter 1: Agricultural Water Quality Management Program Purpose and Background

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

As part of Oregon's Agricultural Water Quality Management Program (Ag Water Quality Program), the Area Plan guides landowners and partners such as Soil and Water Conservation Districts (SWCDs) in addressing water quality issues due to agricultural activities. The Area Plan identifies strategies to prevent and control water pollution from agricultural activities and soil erosion (ORS 568.909(2)) on agricultural and rural lands within the boundaries of this Management Area (OAR 603-090-0000(3)) and to achieve and maintain water quality standards (ORS 561.191(2)). The Area Plan has been developed and revised by ODA and the LAC, with support and input from the SWCD and the Oregon Department of Environmental Quality (DEQ). The 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 with Area Rules developed to implement the Area Plan, monitoring, evaluation, and adaptive management.

The provisions of the Area Plan do not establish legal requirements or prohibitions (ORS 568.912(1)). Each Area Plan is accompanied by Area Rules that describe local agricultural water quality regulatory requirements. ODA will exercise its regulatory authority for the prevention and control of water pollution from agricultural activities under the Ag Water Quality Program's general regulations (OAR 603-090-0000 to 603-090-0120) and under the Area Rules for this Management Area (OAR 603-095-0800 thru 0860). The Ag Water Quality Program's general rules guide the Ag Water Quality Program, and the Area Rules for the Management Area are the regulations that landowners are required to follow. Landowners will be encouraged through outreach and education to implement conservation management activities.

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

- Farms and ranches.
- Rural properties grazing a few animals or raising crops.
- Agricultural lands that lay idle or on which management has been deferred.
- Agricultural activities in urban areas.
- Agricultural activities on land subject to the Forest Practices Act (ORS 527.610).

Water quality on federal lands in Oregon is regulated by DEQ and on Tribal Trust lands by the respective tribe, with oversight by the United States Environmental Protection Agency (US EPA).

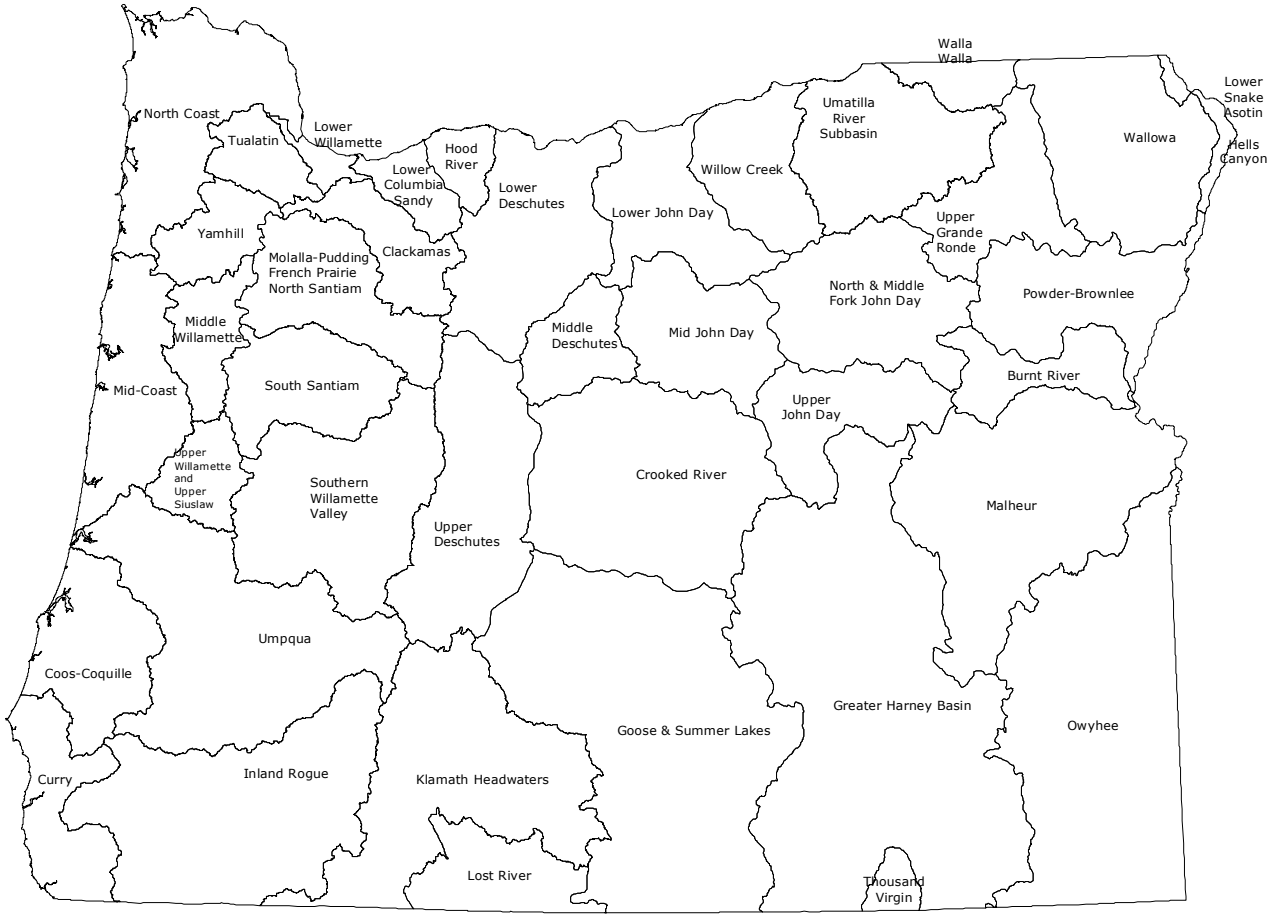
1.2 History of the Ag Water Quality Program

In 1993, the Oregon Legislature passed the Agricultural Water Quality Management Act directing ODA to develop plans to prevent and control water pollution from agricultural activities and soil erosion; to achieve water quality standards; and to adopt rules as necessary (ORS 568.900 through ORS 568.933). Senate Bill 502 was passed in 1995 to clarify that ODA is the lead agency for regulating agriculture with respect to water quality (ORS 561.191). The Area Plan and Area Rules were developed and subsequently revised pursuant to these statutes.

Between 1997 and 2004, ODA worked with LACs and SWCDs to develop Area Plans and Area Rules in 38 watershed-based Management Areas across Oregon (Figure 1). Since 2004, ODA, LACs, SWCDs, and other partners have focused on implementation including:

- Providing education, outreach, and technical assistance to landowners.
- Implementing projects to improve agricultural water quality.
- Investigating complaints of potential violations of Area Rules.
- Conducting biennial reviews of Area Plans and Area Rules.
- Monitoring, evaluation, and adaptive management.
- Developing partnerships with state and federal agencies, tribes, watershed councils, and others.

Figure 1: Map of 38 Agricultural Water Quality Management Areas



1.3 Roles and Responsibilities

1.3.1 Oregon Department of Agriculture

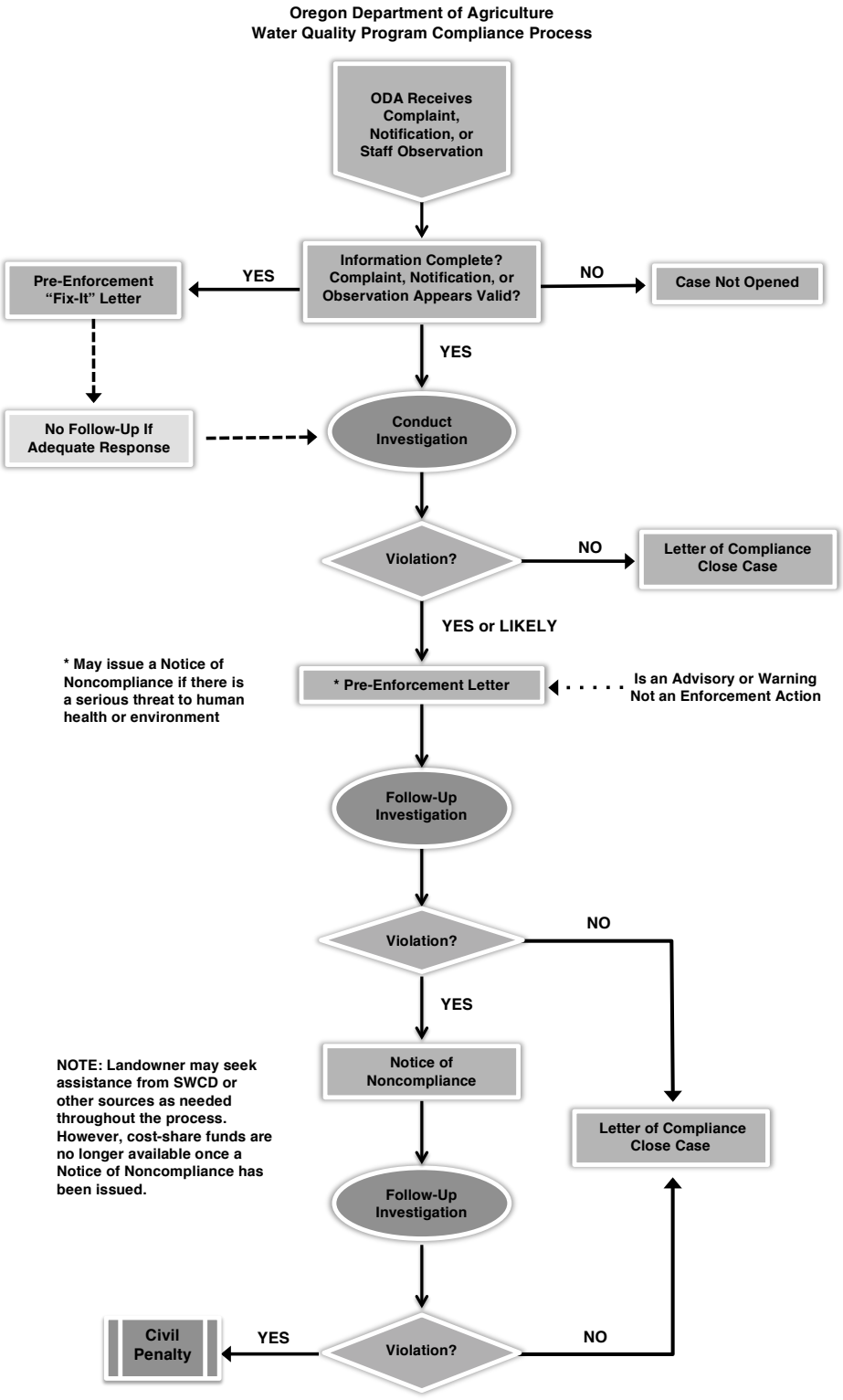
The Oregon Department of Agriculture is the agency responsible for implementing the Ag Water Quality Program (ORS 568.900 to 568.933, ORS 561.191, OAR 603-090, and OAR 603-095). The Ag Water Quality Program was established to develop and carry out a water quality management plan for the prevention and control of water pollution from agricultural activities and soil erosion. State and federal laws drive the establishment of a Ag Water Quality Management Plan, which include:

- 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 DEQ has established a GWMA and an Action Plan has been developed).

The Oregon Department of Agriculture has the legal authority to develop and implement Area Plans and Area Rules for the prevention and control of water pollution from agricultural activities and soil erosion, where such plans are required by state or federal law (ORS 568.909 and ORS 568.912). ODA bases Area Plans and Area Rules on scientific information (ORS 568.909). ODA works in partnership with SWCDs, LACs, DEQ, and other partners to implement, evaluate, and update the Area Plans and Area Rules. ODA is responsible for any actions related to enforcement or determination of noncompliance with Area Rules (OAR 603-090-0080 through OAR 603-090-0120). ORS 568.912(1) and ORS 568.912(2) give ODA the authority to adopt rules that require landowners to perform actions necessary to prevent and control pollution from agricultural activities and soil erosion.

The Area Rules are a set of standards that landowners must meet on all agricultural or rural lands. ("Landowner" includes any landowner, land occupier or operator per OAR 603-95-0010(24)). All landowners must comply with the Area Rules. The ODA will use enforcement where appropriate and necessary to gain compliance with Area Rules. Figure 2 outlines ODA's compliance process. ODA will pursue enforcement action only when reasonable attempts at voluntary solutions have failed (OAR 603-090-0000(5)(e)). If a violation is documented, ODA may issue a pre-enforcement notification or an enforcement Order such as a Notice of Noncompliance. If a Notice of Noncompliance is issued, ODA will direct the landowner to remedy the condition through required corrective actions (RCAs) under the provisions of the enforcement procedures outlined in OAR 603-090-060 through OAR 603-090-120. If a landowner does not implement the RCAs, ODA may assess civil penalties for continued violation of the rules. If and when other governmental policies, programs, or rules conflict with the Area Plan or Area Rules, ODA will consult with the appropriate agencies to resolve the conflict in a reasonable manner.

Figure 2: Compliance Flow Chart



1.3.2 Local Management Agency

A Local Management Agency (LMA) is an organization that ODA designated to assist with the implementation of an Area Plan (OAR 603-090-0010). The Oregon Legislature's intent is for SWCDs to be LMAs to the fullest extent practical, consistent with the timely and effective implementation of Area Plans (ORS 568.906). SWCDs have a long history of effectively assisting landowners to voluntarily address natural resource concerns. Currently, all LMAs in Oregon are SWCDs.

The day-to-day implementation of the Area Plan is accomplished through an intergovernmental 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 Area Rules as needed.

1.3.3 Local Advisory Committee

For each Management Area, the director of ODA appoints an LAC (OAR 603-090-0020) with as many as 12 members to assist with the development and subsequent biennial reviews of the local Area Plan and Area Rules. 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 Area Rules.
- Recommend strategies necessary to achieve the goals and objectives in the Area Plan.
- Participate in biennial reviews of the progress of implementation of the Area Plan and Area Rules.
- Submit written biennial reports to the Board of Agriculture and the ODA director.

1.3.4 Agricultural Landowners

The emphasis of the Area Plan is on voluntary action by landowners to control the factors affecting water quality in the Management Area. Each landowner in the Management Area is required to comply with the Area Rules, In addition, landowners need to select and implement a suite of measures to protect water quality. The actions of each landowner will collectively contribute toward achievement of the water quality standards.

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 also may choose to improve their land conditions without assistance.

Under the Area Plan and Area Rules, agricultural landowners are not responsible for mitigating or addressing factors that 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.

However, agricultural landowners may be responsible for some of these impacts under other legal authorities.

1.3.5 Public Participation

The public was encouraged to participate when ODA, LACs, and SWCDs initially developed the Area Plans and Area Rules. In each Management Area, ODA and the LAC held public information meetings, a formal public comment period, and a formal public hearing. ODA and the LACs modified the Area Plans and Area Rules, as needed, to address comments received. The director of ODA adopted the Area Plans and Area Rules in consultation with the Board of Agriculture.

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

1.4 Agricultural Water Quality

The CWA directs states to designate beneficial uses related to water quality for every waterbody, decide on parameters to measure to determine whether beneficial uses are being met, and set water quality standards based on the beneficial uses and parameters.

1.4.1 Point and Nonpoint Sources of Water Pollution

There are two types of water pollution. Point source water pollution emanates from clearly identifiable discharge points or pipes. Significant point sources are required to obtain permits that specify their pollutant limits. Agricultural operations regulated as point sources include permitted Confined Animal Feeding Operations (CAFOs), and many are regulated under ODA's CAFO Program. Pesticide applications in, over, or within three feet of water also are regulated as point sources. Irrigation water flows from agricultural fields may be at a defined outlet but they do not currently require a permit.

Nonpoint water pollution originates from the general landscape and is difficult to trace to a single source. Nonpoint water pollution sources include runoff from agricultural and forest lands, urban and suburban areas, roads, and natural sources. In addition, groundwater can be polluted by nonpoint sources including agricultural amendments (fertilizers and manure).

1.4.2 Beneficial Uses and Parameters of Concern

Beneficial uses related to water quality are defined by DEQ in OARs for each basin. They may include: public and private domestic water supply, industrial water supply, irrigation, livestock watering, fish and aquatic life, wildlife and hunting, fishing, boating, water contact recreation, aesthetic quality, hydropower, and commercial navigation and transportation. The most sensitive beneficial uses usually are fish and aquatic life, water contact recreation, and public and private domestic water supply. These uses generally are the first to be impaired because they are affected at lower levels of pollution. While there may not be severe impacts on water quality from a single source or sector, the combined effects from all sources can contribute to the impairment of beneficial uses in the Management Area. Beneficial uses that have the potential to be impaired in this Management Area are summarized in Chapter 2.

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

1.4.3 Impaired Waterbodies and Total Maximum Daily Loads (TMDLs)

Every two years, DEQ is required by the 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 must establish TMDLs for pollutants specific to the pollutants that led to the placement of a waterbody on the 303(d) list.

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

Total Maximum Daily Loads generally apply to an entire basin or subbasin, not just to an individual waterbody on the 303(d) list. Waterbodies 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 Area Rules must address agricultural or nonpoint source load allocations from relevant TMDLs.

The list of impaired waterbodies (303(d) list), the TMDLs, and the agricultural load allocations for the TMDLs that apply to this Management Area are summarized in Chapter 2.

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

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

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

ORS 468B.025 states that:
(1) Except as provided in ORS 468B.050 or 468B.053, no person shall:
(a) Cause pollution of any waters of the state or place or cause to be placed any wastes in a location where such wastes are likely to escape or be carried into the waters of the state by any means.

(b) Discharge any wastes into the waters of the state if the discharge reduces the quality of such waters below the water quality standards established by rule for such waters by the Environmental Quality Commission.
(2) No person shall violate the conditions of any waste discharge permit issued under ORS 468B.050."

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

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

"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 water pollution from agriculture activities and to prevent and control soil erosion. Streamside vegetation can provide three primary water quality functions: shade for cool stream temperatures, streambank stability, and filtration of pollutants. Other water quality functions from streamside vegetation include: water storage in the soil for cooler and later season flows, sediment trapping that can build streambanks and floodplains, narrowing and deepening of channels, and biological uptake of sediment, organic material, nutrients, and pesticides.

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

- Streamside vegetation 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 conditions may be improved without the removal of the agricultural activity, such as with managed grazing.
- Streamside vegetation condition is measurable and can be used to track progress in achieving desired site conditions.

Site-Capable Vegetation

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

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

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

In many cases, invasive, non-native plants, such as introduced varieties of blackberry and reed canarygrass, grow in streamside areas. This type of vegetation has established throughout much of Oregon due to historic and human influences and may provide some of the water quality functions of site-capable vegetation. ODA's statutory authority does not require the removal of invasive, non-native plants, however, ODA recognizes removal as a good conservation activity and encourages landowners to remove these plants. Voluntary programs through SWCDs and watershed councils provide technical assistance and financial incentives for weed control and restoration projects. In addition, the Oregon State Weed Board identifies invasive plants that can negatively impact watersheds. Public and private landowners are responsible for eliminating or intensively controlling noxious weeds as may be provided by state and local law enacted for that purpose. For further information, visit www.oregon.gov/ODA/programs/weeds.

1.5 Other Water Quality Programs

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

1.5.1 Confined Animal Feeding Operation Program

The Oregon Department of Agriculture is the lead state agency for the CAFO Program. The CAFO Program was developed to ensure that operators do not contaminate ground or surface water with animal manure or process wastewater. Since the early 1980s, CAFOs in Oregon have been registered to a general Water Pollution Control Facility (WPCF) permit designed to protect water quality. A properly maintained CAFO must implement a site-specific suite of structural and management practices to protect ground or surface water. To assure continued protection of ground and surface water, the 2001 Oregon State Legislature directed ODA to convert the CAFO Program from a WPCF permit program to a federal

National Pollutant Discharge Elimination System (NPDES) program. Oregon Department of Agriculture and DEQ jointly issue the NPDES CAFO Permit, which complies with all CWA requirements for CAFOs. In 2015, ODA and DEQ jointly issued a WPCF general CAFO Permit as an alternative for CAFOs that are not subject to the federal NPDES CAFO permit requirements. Currently, ODA can register CAFOs to either the WPCF or NPDES CAFO permit.

Either of the Oregon CAFO permits require the registrant to operate according to a site-specific, ODA-approved, Animal Waste Management Plan that is incorporated into the CAFO permit by reference. You can view the CAFO program site at
http://www.oregon.gov/ODA/programs/NaturalResources/Pages/CAFO.aspx

1.5.2 Groundwater Management Areas

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

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

1.5.3 The Oregon Plan for Salmon and Watersheds

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

1.5.4 Pesticide Management and Stewardship

The ODA Pesticides Program holds the primary responsibility for registering pesticides and regulating their use in Oregon under the Federal Insecticide Fungicide Rodenticide Act. ODA's Pesticide Program administers regulations relating to pesticide sales, use, and distribution, including pesticide operator and applicator licensing as well as proper application of pesticides, pesticide labeling, and registration.

In 2007, the interagency Water Quality Pesticide Management Team (WQPMT) was formed to expand efforts to improve water quality in Oregon related to pesticide use. The WQPMT includes representation from ODA, 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.oregon.gov/deq/wq/programs/Pages/Pesticide.aspx. ODA, DEQ, and Oregon

State University Extension Service work with landowners, SWCDs, watershed councils, and other local partners to voluntarily reduce pesticide levels while improving water quality and crop management. Since 2000, the PSPs have made noteworthy progress in reducing pesticide concentrations and detections.

Oregon Department of Agriculture led the development and implementation of a Pesticides Management Plan (PMP) for the state of Oregon (www.oregon.gov/ODA/programs/Pesticides/water/pages/AboutWaterPesticides.aspx). The PMP, completed in 2011, strives to protect drinking water supplies and the environment from pesticide contamination, while recognizing the important role that pesticides have in maintaining a strong state economy, managing natural resources, and preventing human disease. By managing the pesticides that are approved for use by the US EPA and Oregon in agricultural and non-agricultural settings, the PMP sets forth a process for preventing and responding to pesticide detections in Oregon's ground and surface water 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 DEQ and OHA encourage preventive management strategies to ensure that all public drinking water resources are kept safe from current and future contamination. For more information see: www.oregon.gov/deq/wq/programs/Pages/dwp.aspx.

1.5.6 Oregon's Coastal Management Program and 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 administer CZARA at the federal level. The federal requirements are designed to restore and protect coastal waters from nonpoint source pollution and require coastal states to implement a set of management measures based on guidance published by the US EPA. The guidance contains measures for agricultural activities, forestry activities, urban areas, marinas, hydro-modification activities, and wetlands. In Oregon, the Department of Land Conservation and Development and DEQ coordinate the program. The geographical boundaries for the CNPCP include the North Coast, Mid-Coast, South Coast, Rogue, and Umpqua basins. Oregon has identified the ODA coastal Area Plans and Area Rules as the state's strategy to address agricultural measures. The Area Plan and Area Rules are designed to meet the requirements of CZARA and to implement agriculture's part of Oregon's CNPCP.

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

1.6 Partner Agencies and Organizations

1.6.1 Oregon Department of Environmental Quality

The US EPA delegated authority to Oregon to implement the federal CWA in our state. DEQ is the lead state agency with overall authority to implement the CWA in Oregon. DEQ coordinates with other state agencies, including ODA and ODF, to meet the requirements of the CWA. The DEQ sets water quality standards and develops TMDLs for impaired waterbodies, which ultimately are approved or disapproved

by the EPA. In addition, DEQ develops and coordinates programs to address water quality including NPDES permits for point sources, the CWA Section 319 grant program, Source Water Protection, the CWA Section 401 Water Quality Certification, and GWMAs. DEQ also coordinates with ODA to help ensure successful implementation of Area Plans.

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

The MOA includes the following commitments:

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

The Environmental Quality Commission, which serves as DEQ's policy and rulemaking board, may petition ODA for a review of part or all of any Area Plan or Area Rules. The petition must allege, with reasonable specificity, that the Area Plan or Area Rules are not adequate to achieve applicable state and federal water quality standards (ORS 568.930(3)(a)).

1.6.2 Other Partners

Oregon Department of Agriculture and SWCDs work in close partnership with local, state, and federal agencies and organizations, including: DEQ (as indicated above), the United States Department of Agriculture (USDA) NRCS and Farm Service Agency, watershed councils, Oregon State University Agricultural Experiment Stations and Extension Service, tribes, livestock and commodity organizations, conservation organizations, and local businesses. As resources allow, SWCDs and local partners provide technical, financial, and educational assistance to individual landowners for the design, installation, and maintenance of effective management strategies to prevent and control agricultural water pollution.

1.7 Measuring Progress

Agricultural landowners have been implementing effective conservation projects and management activities throughout Oregon to improve water quality for many years. However, it has been challenging for ODA, SWCDs, and LACs to measure progress towards improved water quality. ODA is working with SWCDs, LACs, and other partners to develop and implement strategies that will produce measurable outcomes. ODA also is working with partners to develop monitoring methods to document progress.

1.7.1 Measurable Objectives

Measurable objectives allow the Ag Water Quality Program to better evaluate progress towards improved water quality. A measurable objective is a numeric long-term desired outcome to achieve by a specified date. Milestones are the interim steps needed to make progress toward the measurable objective and consist of numeric short-term targets to reach by specific dates. Together, the milestones define the timeline needed to achieve the measurable objective.

The Oregon Department of Agriculture, LAC, and LMA will establish measurable objectives and associated milestones for each Area Plan. Many of these measurable objectives relate to land conditions and primarily are implemented through focused work in small geographic areas (section 1.7.3), with a long-term goal of developing measurable objectives and monitoring methods at the Management Area scale.

At each biennial review, ODA and its partners will evaluate progress toward the most recent milestone(s) and why they were or were not achieved. ODA, the LAC, and LMA will evaluate whether changes are needed to keep on track for achieving the measurable objective(s) and will revise strategies to address obstacles and challenges.

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

1.7.2 Land Conditions and Water Quality

Land conditions can serve as useful surrogates (indicators) for water quality parameters. For example, streamside vegetation generally is used as a surrogate for water temperature because shade blocks solar radiation from warming the stream. In addition, sediment can be used as a surrogate for pesticides and phosphorus because they often adhere to sediment particles.

The Ag Water Quality Program focuses on land conditions, in addition to water quality data, for several reasons:

- Landowners can see land conditions and have direct control over them.
- It can be difficult to separate agriculture's influence on water quality from other land uses.
- There is generally a lag time between changes on the landscape and the resultant improvements in the water. 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 before water quality improves or water quality impacts due to other sources.
- Reductions in water quality from agricultural activities are primarily through changes in land conditions and management activities.

Water quality monitoring data will help ODA and partners to measure progress or identify problem areas in implementing Area Plans. However, as described above, water quality monitoring may be less likely to document the short-term effects of changing land conditions on water quality parameters such as temperature, bacteria, nutrients, sediment, and pesticides.

1.7.3 Focused Implementation in Small Geographic Areas

Focus Areas

A Focus Area is a small watershed with water quality concerns associated with agriculture. Through the Focus Area process, the SWCD delivers systematic, concentrated outreach and technical assistance in a small geographic area. A key component of this approach is measuring conditions before and after implementation to document the progress made with available resources. The Focus Area approach is consistent with other agencies' and organizations' efforts to work proactively in small geographic areas and is supported by a large body of scientific research (e.g. Council for Agricultural Science and Technology, 2012. Assessing the Health of Streams in Agricultural Landscapes: The Impacts of Land Management Change on Water Quality. Special Publication No. 31. Ames, Iowa).

Systematic implementation in Focus Areas provides the following advantages:

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

Soil and Water Conservation Districts select a Focus Area in cooperation with ODA and other partners. The scale of the Focus Area matches the SWCD's capacity to deliver concentrated outreach and technical assistance, and to complete (or initiate) projects. The current Focus Area for this Management Area is described in Chapter 3. The SWCD will also continue to provide outreach and technical assistance to the entire Management Area.

Strategic Implementation Areas

Strategic Implementation Areas (SIAs) are small watersheds selected by ODA in cooperation with partners based on a statewide review of water quality data and other available information. ODA conducts an evaluation of likely compliance with Area Rules, and contacts landowners with the results and next steps. Landowners have the option of working with the SWCD or other partners to voluntarily address water quality concerns. ODA follows up, as needed, to enforce Area Rules. Finally, ODA completes a post-assessment to document progress made in the watershed. Chapter 3 describes any SIAs in this Management Area.

1.8 Monitoring, Evaluation, and Adaptive Management

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

1.8.1 Agricultural Water Quality Monitoring

As part of monitoring water quality status and trends, DEQ regularly collects water samples at over 130 sites on more than 50 rivers and streams across the state. Sites are present across the major land uses (forestry, agriculture, rural residential, and urban/suburban). Sites are visited every other month throughout the year and represent a snapshot of water quality conditions. Parameters consistently measured include alkalinity, biochemical oxygen demand (BOD), chlorophyll a, specific conductance, dissolved oxygen (DO), DO percent saturation, *E. coli*, ammonia, nitrate and nitrite, pH, total phosphorus, total solids, temperature, and turbidity.

Other partners may have water quality data that is described in Chapter 3 and presented in Chapter 4.

1.8.2 Statewide Aerial Photo Monitoring of Streamside Vegetation

Starting in 2003, ODA began evaluating streamside vegetation conditions using aerial photos. 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 for an individual reach.

1.8.3 Biennial Reviews and Adaptive Management

All Area Plans and Area Rules around the state undergo biennial reviews by ODA and the LAC. As part of each biennial review, ODA, DEQ, SWCDs, and the LAC discuss and evaluate the progress on implementation of the Area Plan and Area Rules. This evaluation includes discussion of enforcement actions, land condition 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 Area Plans 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

For each Management Area, the director of ODA appoints a Local Advisory Committee (LAC) (OAR 603-090-0020) with as many as twelve members to assist with the development and subsequent biennial reviews of the local Area Plan and Area Rules. 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. Membership may include, but is not limited to:

- State Board of Agriculture representatives;
- Persons serving on local soil and water conservation districts;
- Private landowners;
- Representatives of local, state and federal boards, commissions and agencies;
- Members of Indian tribes;
- Members of the public;
- Persons associated with industry;
- Members of academic, scientific and professional communities;
- Public and special interest groups.

The Area Plan was developed with the assistance of the LAC. The LAC was formed in 1997 to assist with the development of the Area Plan and Area Rules.

Current LAC members are:

(Chair)	Kay C. VanNatta	
(Vice-Chair)	Mike Seppa	
Member Name	**Location**	**Description**
Bob Wiley	Sauvie Island	Livestock, Small Farms, SWCD
Chad Allen	Tillamook	Dairy
John Seymour	Tillamook	Livestock/ Dairy, Timber
Karl Zweifel	Tillamook	Livestock, Hay, Row Crops
Kay C. VanNatta	Columbia	Timber, Livestock/ Beef, SWCD
Vacant	North Coast	Environmental Representative
Margaret Magruder	Columbia	Rancher/ Sheep, LCWC
Vacant	Tillamook	Industry Representative
Mike Seppa	Clatsop	Dairy/ SWCD
Randy Bergman	Columbia	Farmer, Livestock/ Horse, SWCD
Robert Bradley	North Coast	Fisheries Representative
Ted Warila	Clatsop	Timber, Livestock/ Beef, SWCD
Brad Cowan (Alternate)	Clatsop	Dairy

2.1.2 Local Management Agency

The implementation of the Area Plan is accomplished through an Intergovernmental Grant Agreement between ODA and the Tillamook, Columbia, Clatsop, and West Multnomah SWCDs. This Intergovernmental Grant Agreement defines the SWCDs as the LMAs for implementation of the Area Plan. The SWCDs were also involved in development of the Area Plan and associated Area Rules.

2.2 Area Plan and Rules: Development and History

The director of ODA approved the Area Plan and Area Rules on July 7, 2000. Since the Area Plan was approved and the Area Rules were adopted, the LAC has convened for several biennial reviews since 2004 to evaluate progress and update the Area Plan. See section 3.2.3 for details on the biennial review process. Biennial review years: 2004, 2007, 2009, 2011, 2014, 2016, and 2018.

2.3 Geographical and Physical Setting

2.2.1 North Coast Basin

Location and Land Use

The North Coast Basin Management Area encompasses far northwest Oregon, including Tillamook, Clatsop, and Columbia counties as well as Sauvie Island, which straddles the Columbia and Multnomah county line (Figure 3). The North Coast Basin Management Area is bounded by the Pacific Ocean to the west, the crest of the Coast Range to the east, Neskowin Creek, and Little Nestucca River watersheds to the south, and by the confluence of the Willamette and Columbia rivers to the north, where the Columbia River flows west around the northern tip of the Coast Range.

The North Coast Basin is a diverse area characterized by forested mountains, foothills, productive agricultural lands, several estuaries and bays, marine terraces, and dune areas. The largest urban centers include Tillamook, Astoria, and St. Helens, with populations of 4,900, 9,580, and 13,095, respectively in 2015 (Portland State University Population Research Center, 2015). They also serve as the county seats of Tillamook, Clatsop, and Columbia counties, respectively.

Table 1: Land Use in the North Coast Management Area by State Zoning (Acres)
Data: 2017 - Oregon Department of Land Conservation and Development
See Figure 3: Map of the North Coast Management Area

Zones:	Clatsop	Columbia	Tillamook	*Sauvie Island +	MA Total
Farm Use	14,599	30,320	40,588	15,640	**101,147**
Mixed Farm Forest	0	13,841	9,245	0	**23,086**
Forest Private and Federal	450,611	323,591	602,328	51,449	**1,427,979**
Commercial	2,257	717	1,327	91	**4,392**
Industrial	3,301	5,622	2,195	106	**11,224**
Mineral and Aggregates	57	1,736	37	0	**1,830**
Public Use/ Parks/ Open Space	13,021	11,170	13,145	8	**37,244**
Rural Residential	16,572	25,375	16,009	85	**58,041**
Low-High Density Residential	8,382	5,506	7,704	0	**21,592**
Beaches/ Dunes/ Shoreline/ Estuarine	5,527	143	159	0	**5,829**
Other	5,430	3,778	15	0	**9,223**

*Zone acreage is only of those areas inside the North Coast Management Area found in Multnomah and Washington Counties and includes Sauvie Island.

With a land base of almost 1.5 million acres, forestry is the largest commercial activity in the North Coast Basin (Table 1). Tourism, hunting, fishing, and agriculture represent significant economic producers as well. Gross farm and ranch sales in 2011 and 2012 for Tillamook County were approximately $138,402,000 and $141,560,000 with a majority of that coming from the dairy industry. Columbia County follows at $26,149,000 and $26,512,000 and Clatsop County at $73,266,000 and $66,638,000. (ODA, 2013). Table 2 provides an overview of agricultural production in Clatsop, Columbia, and Tillamook counties.

Sauvie Island Agriculture: For the first 100 years after European-Americans settled the area, dairy farming was the island's largest agricultural producer. Today, Sauvie Island has 11,800 acres in farm use and produces over 30 percent of Multnomah County's agricultural products. The agricultural lands are found on the southern end of the island and includes several Century Farms still bearing the name of early pioneers. Major crops are berries, orchard fruits, grass seed, wheat, field vegetables and fruits, pumpkins, Christmas trees, and fresh flowers and herbs. Truck farms and u-pick operations are common as well as an organic CSA (community supported agriculture) and a farmer's market (Matrazza 2016). The northern half of the island is in the Sauvie Island Wildlife Management Area.

Soil Resources

Soils found in the North Coast are diverse. Forested mountain and foothill soils dominate the North Coast Basin and have developed in colluvium or residuum weathered from parent materials such as siltstone, sandstone, basalt, and tuff. Floodplain soils have developed in recent alluvium deposited by the area streams. Tidal floodplain soils developed in recent estuarine deposits. Terrace soils have developed in older alluvial deposits of stream or marine origin. Dune soils have developed in recent to slightly older wind deposits of sand.

Table 2: Agricultural Production in Clatsop, Columbia, and Tillamook Counties (2012)
* 2012 US Census of Agriculture: www.agcensus.usda.gov (last accessed 4/02/2018)
** Data from Oregon Department of Agriculture, Confined Animal Feeding Operation Program 2016

* Production	Clatsop County	Columbia County	Tillamook County
Total Land in Agricultural Production (acres)	16,382	56,668	36,551
Number of Farms	199	751	280
Average Size of Farms (acres)	82	75	131
Irrigated land (acres)	688	1,885	7,137
Total Cropland (acres)	5,318	18,048	14,482
Land in Pasture-All Types (acres)	6,077	16,902	18,215
** Dairy Cattle and Milk Production	4	1	100
Farms in the USDA National Organic Program	0	7	3
*** Livestock (# farms with:)**			
# farms with Beef Cows	86	557	75
Milk Cows	1	13	89
Equine: Horses, Ponies, Mules, and Donkeys	51	202	65
Layers/ Poultry/ Turkey	41	131	49
Goats: Milk/ Angora/ Meat	22	71	27
Sheep and Lambs	27	39	14
Hogs and Pigs	9	25	8
Llamas	11	15	4
Alpacas	0	17	2
Total Bee Colonies in	3	32	13
*** Crops (acres)**			
Hay, Haylage, Grass Silage and Greenchop	3,782	9,266	10,567
Vegetable Row Crops	40	31	35
*** Orchards and Berries (acres)**			
Land in Orchards	2	81	2
Land in Christmas Trees	29	378	18
Land in Berries	64	19	5
***Greenhouse/ Nurseries**			
Nurseries (in acres of growing square footage)	0.25	4	8

North Coast Basin watersheds are disturbance driven systems. Large pulses of sediment are delivered into North Coast Basin waterways due to a high density of naturally occurring landslides in the basin. These disturbances erode streambanks and alter established channels, resulting in river systems naturally high in sediment movement (Pearson, 2002)

Tillamook soils are very unique, with high phosphate and nitrate retention capability. Much of the upper Tillamook watersheds have Andisol soils, a very rare and young soil type. It is expected that this is what gives some of the terrace and floodplain agricultural soils their unique characteristics.

North Coast Basin agriculture is located primarily on the rich alluvial floodplains of the area's many river systems. The steep slopes of the uplands provide naturally high levels of sediment and organic material to the alluvial plains. Mainly derived from basalt, tuff, sandstone, and siltstone bedrock, level floodplain soils have developed in sediments deposited by the region's waterways. These alluvial floodplains encompass the most fertile soils in the region. However, some areas are influenced by tides and require drainage and diking for maximum agricultural production. In the 1850s, European-American settlers recognized the great agricultural potential of the lowlands and began clearing the forest lands, installing drainage ditches, dikes, levees, and tide gates. These actions made the rich soils available for row crops and pasture. Significant lowland areas and intertidal and freshwater wetlands were cleared by the early 1900s. This made much land available for agricultural production, but changed the water flow, sedimentation patterns, and fish habitat.

For detailed information about soils in the North Coast Basin Management Area, refer to United States Department of Agriculture Natural Resource Conservation Service (USDA NRCS) Web Soil Survey at www.websoilsurvey.sc.egov.usda.gov/App/HomePage.htm.

Water Resources

The climate of the North Coast Basin is influenced by proximity to the Pacific Ocean and elevation. Climatic conditions can vary considerably, a function of orographic influence and ocean effects. Annual average precipitation ranges from 40 to 150 inches, mostly rain, with about 80 percent falling between October and April. The greatest precipitation events occur during November, December, and January. Precipitation as high as 200 inches annually has been reported for northeastern Tillamook County at an elevation of over 3,000 feet at the headwaters to the North Fork Wilson River. This represents the highest precipitation in Oregon (Anderson *et al*., 1998).

Localized flooding is common in the North Coast Basin. Heavy lowland rain combined with heavy mountain rain on snow causes severe flooding throughout the North Coast Basin, especially Tillamook County, resulting in significant economic and environmental damage. Flood losses in Tillamook County exceeded 60 million dollars from 1996-2000.

Dominant westerly winds from the Pacific Ocean moderate coastal temperatures. These winds are almost continuous and can reach gale force in the winter. The mean annual temperature is 50°F, with the average minimum in the low 40s. Snowfall is common on the higher uplands and rare in the lowlands. Lowland areas often experience growing conditions the entire year, interspersed with freezes. Summers are cool and relatively drier, punctuated by easterly winds that can create episodes of extreme dry weather. The average summer maximum temperature is about 60°F, with normal summer highs between 70°F and 80°F.

The North Coast Basin includes five major hydrologic areas as described by the U.S. Geological Service and are named for their major rivers. Moving north to south, they are:

Lower Columbia - Clatskanie	301.9 square miles
Lower Columbia - Youngs	323.6

Nehalem	850.4
Necanicum	129.1
Wilson-Trask-Nestucca	964.1

In the North Coast Basin floodplains, the groundwater is often near the soil surface from late fall through late spring. In the lowlands, floodwaters erode and scour the alluvial topsoil and create channels. Because streambanks in the floodplain are non-cohesive and friable, streambanks naturally erode easily during flooding. Without riparian vegetation, this process can be exacerbated, but it may occur even if riparian vegetation is present.

Clatsop County

Major sub-watersheds in Clatsop County are the Youngs River and the Nehalem River. The Necanicum River is the major waterway in the southwest of the county and drains into the Pacific Ocean. These and other Clatsop County waterways have high volume, fast and flashy winter flows, with low and slow summer flows. The Brownsmead tidal flats along the Columbia River are a primary agricultural pasture area.

The Nehalem River flows easterly from steep gradient headwaters in eastern Tillamook County into Washington County, then north and west into and through Columbia County into Clatsop County; near its junction with Highway 26 it slows. Through much of Clatsop County, the Nehalem River is a flat, wide, slow-moving waterway with large winter flows. In the summer, it flows narrow and with little volume. In wide floodways, the channels are often too wide for existing riparian vegetation to provide significant shade.

In wide floodways, the Nehalem has low flows and warmer stream temperatures (Table 3). These characteristics continue as the Nehalem flows south into Tillamook County and into Nehalem Bay where stream temperatures are moderated by tidal influence.

There are 16 Drainage Improvement Districts in Clatsop County, located primarily along the Columbia River. Drainage districts have been established to maintain agricultural production. Winter storm runoff is controlled via large tide gates. These drainage districts encompass much of Clatsop County's productive agricultural soils.

Columbia County

The major subbasins in Columbia County are the Clatskanie River Watershed and the Nehalem River Watershed. Columbia County waterways typically have high volume, fast and flashy winter flows with low and slow summer flows. Land use along the Clatskanie River and Nehalem River revolve around timber, with beef cattle and hay making up the bulk of agricultural land use.

There are 13 districts in the Columbia County Drainage Improvement Districts and manage drainage mainly along the Columbia River. Drainage districts, formed to protect and drain agricultural lands, cover approximately 15,000 to 20,000 acres. Winter storm runoff is drained mainly via large pumps. These districts encompass much of Columbia County's agricultural production and most of its most productive soils.

Table 3: North Coast Surface Water Records Additional North Coast Streamflow Gauges go online to OWRD: https://apps.wrd.state.or.us/apps/sw/hydro_near_real_time/		
USGS Gage 14301000 at Nehalem River Near Foss Period of Record (POR) from 1939-2018 Drainage Area = 667 square miles		
POR Winter Monthly Mean Discharge	December at 3,880 cfs.	January at 6,140 cfs.
POR Summer Monthly Mean Discharge	August at 148 cfs.	September at 212 cfs.
Maximum Discharge on Record	February 8, 1996 at 70,300 cfs.	
Minimum Discharge on Record	August 29-31, 1967 at 34 cfs.	
Highest Annual Average Flow	1974 at 4,235 cfs.	
Lowest Annual Average Flow	2001 at 1,044 cfs.	
2017 Average Annual Flow: 3,904 cfs.		
USGS Gage 14301500 at Wilson River Near Tillamook Period of Record (POR) from 1932-2018 Drainage Area = 161 square miles		
POR Winter Monthly Mean Discharge	December at 2,690 cfs.	January at 2,530 cfs.
POR Summer Monthly Mean Discharge	August at 103 cfs.	September at 156 cfs.
Maximum Discharge on Record	November 6, 2006 at 38,600 cfs.	
Minimum Discharge on Record	September 5, 1973 at 32 cfs.	
Highest Annual Average Flow	1996 at 1,811 cfs.	
Lowest Annual Average Flow	2001 at 494.9 cfs.	
2017 Average Annual Flow: 1,652 cfs.		
USGS Gage 14302480 at Trask River Above Cedar Creek Near Tillamook Period of Record (POR) from 1997-2018 Drainage Area = 156 square miles		
POR Winter Monthly Mean Discharge	December at 2,170 cfs.	January at 2,090 cfs.
POR Summer Monthly Mean Discharge	August at 105 cfs.	September at 136 cfs.
Maximum Discharge on Record	November 25, 1999 at 22,500 cfs.	
Minimum Discharge on Record	September 15, 16, 22, 23 2014 at 47 cfs.	
Highest Annual Average Flow	1999 at 1,449 cfs.	
Lowest Annual Average Flow	2001 at 461.3 cfs.	
2017 Average Annual Flow: 1,376 cfs.		

Sauvie Island

Sauvie Island straddles the county line shared by Columbia and Multnomah counties. The Willamette River flows toward Sauvie Island from the south. Flowing west, the Columbia River converges with the Willamette River at Sauvie Island, and the Multnomah Channel forks from the Willamette and flows around the west side of the island and then meets the Columbia at the northern end (Figure 2).

Before the application of modern agricultural activities, the Gilbert River was the island's greatest waterway, serving as a seasonal high-water channel with relatively low summer flow. In 1921, landowners agreed to build a 21-mile long dike to protect 4,000 acres of farmland from flooding. In 1940, Congress approved funding for 19 more miles of dike, protecting an additional 12,000 acres (Canniff, 1981).

In 1995, the original Sauvie Island Drainage District was reorganized as an Oregon nonprofit corporation now known as the Sauvie Island Drainage Improvement Company. It is responsible for managing and maintaining the 18 miles of levee and more than 30 miles of canals and ditches used to drain excess water from the district. In addition, the company operates five pumping facilities, with a main pumping plant built in 1941 that uses four high-voltage 250 to 300 horsepower pumps. These pumps have the capability to discharge 125,000 gallons of water per minute from inside the district into the Multnomah Channel (Sauvie Island Community Association 2016).

Tillamook County

Major subbasins in Tillamook County are: the Nehalem as it enters from Clatsop County in the north; the Tillamook Bay Basin and its five major rivers; and the Nestucca subbasin. Of the five rivers in the Tillamook watershed, the Tillamook River flows through the most agricultural acres of the five Tillamook coastal plain rivers. It is also the slowest with the most meanders, making its way through the area's poorest drained soils. The other four major rivers emanate from steeper watersheds and move much faster through the system to the bay. Most dairies are in the Tillamook Basin, with fewer in the lower end of the Nestucca watershed centered-around the town of Cloverdale. There are nine drainage districts in Tillamook County incorporating several hundred acres in tidal lands. It is estimated that at least one-quarter of Tillamook agricultural lands are in these drainage districts. Table 3.

Drinking Water

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

Table 4: North Coast Management Area Drinking Water Systems
For more information: www.deq.state.or.us/wq/dwp/swrpts.asp

Public Water System	Drinking Water Source
Astoria	Bear, Cedar, Big Fat Buck, Little, Little Fat Buck, North Fork of Barney and South Fork of Barney Creeks; Middle Lake
Clatskanie	Columbia River, Roaring and West Creeks, Tributary to Tandy Creek, Graham Creek, Spring #1 and Spring #2
Warrenton	Big South Fork. Little South Fork-Lewis and Clark River, Camp "C" Creek, Lewis and Clark River
Arch Cape	Asbury and Shark Creek
Beaver	Beaver Creek
Birkenfeld	Fishhawk Creek
Cannon Beach	Elk Creek-West Fork
Corbett	North and South Forks of Gordon Creek
Manzanita	North, Middle, and West Forks of Anderson Creek
Nehalem	Bob's Creek and Beneke Creek Well
Neskowin	Hawk Creek
Netarts	East Fall Creek
Pacific City	Horn Creek
Rainer	Columbia River and Fox Creek
Rhododendron	Stream (Henry Creek Intake #1)
Rockaway Beach	Jetty Creek
Scappoose	Gourlay, Lazy, and South Scappoose Creeks
Seaside	Beneke Creek Well, Necanicum River and South Fork of Necanicum River
St. Helens	#1(North), #2, (South) and #3 Ranney Collector (Columbia River)
Tillamook	Short, Fawcett, and Kilam Creeks
Vernonia	Rock Creek
Westport	West Creek
Wheeler	Jarvis and Vosburg Creeks

Aquatic Life

The plight of salmon is well documented. In the late 1800s, over-fishing caused a rapid decline of Chinook salmon in Oregon. Today, Coho, Chinook, steelhead, and coastal cutthroat trout populations in the North Coast Basin show similar signs of trouble (Table 5). Human population growth, dams and other river modifications, agriculture, industry, logging, mining, and grazing have all played a part in the salmon's decline.

The effect of these factors on the health of salmon has accentuated the impact of predator populations and poor ocean conditions. In some cases, human activity has actually aided predator ability to feed on salmon as they migrate to or from the ocean. Aiding and restoring salmon and salmon habitat is a complex issue with many factors. Improving the health of Pacific salmon populations will require a broad-based action plan and the commitment of the entire community. This Area Plan outlines how the agricultural community will address these issues and how it will work toward salmon recovery.

North Coast Basin agriculture has an important role to play in water quality improvements and salmon recovery. North Coast Basin crop and pasturelands are mainly located in the lowland floodplains where stream flow is slow and streambanks are formed by alluvial deposits. These areas contain a diverse collection of water dependent animal and plant species. These agricultural lands often encompass river mainstem reaches that are vital salmon rearing habitats and migration routes, particularly for species like Chinook and chum that spend time in tidal areas.

Table 5 reviews the major salmonid (salmon as well as steelhead and sea run cutthroat trout) species of the North Coast Basin and their habitat requirements. Current science indicates that salmon require cold water free of excessive sediment, streams with deep pools, large woody debris, off-channel habitat (including tidal channels), sufficient waterflow, clean gravel, and streambanks with trees and shrubs that provide food and important hiding places for young salmon.

Grazing and pasture management can affect salmonid habitat and water quality. Unless controlled, livestock will congregate in riparian areas, damage native vegetation, and trample soil. Unrestricted livestock access to streams can result in decreased vegetative cover, reduced organic litter, loss of trees and bushes through browsing, and reduced natural establishment of new plants. This in turn may reduce streambank stability, increase streambank erosion, and increase in stream water temperatures (State of Oregon, 1998).

The effects of cropping in and near riparian areas can be more severe that those of grazing. Soil preparation and cropping can permanently remove riparian vegetation and soil disturbance can occur several times each year. This may result in complete loss of stream shading, significant increases in sedimentation, and decreases in streambank stability. In addition, the likelihood increases that agricultural chemicals will enter waterways during runoff events (State of Oregon, 1998).

Table 5: State Status of Salmon Species in Oregon

Fish Species	Oregon Coast	Lower Columbia River
Coho	Threatened	Threatened
Chum	Not Listed	Threatened
Chinook	Not Listed	Threatened
Steelhead	Species of Concern	*Threatened
* Except in the SW Washington Evolutionary Significant Unit of the Columbia River at Gnat Creek		

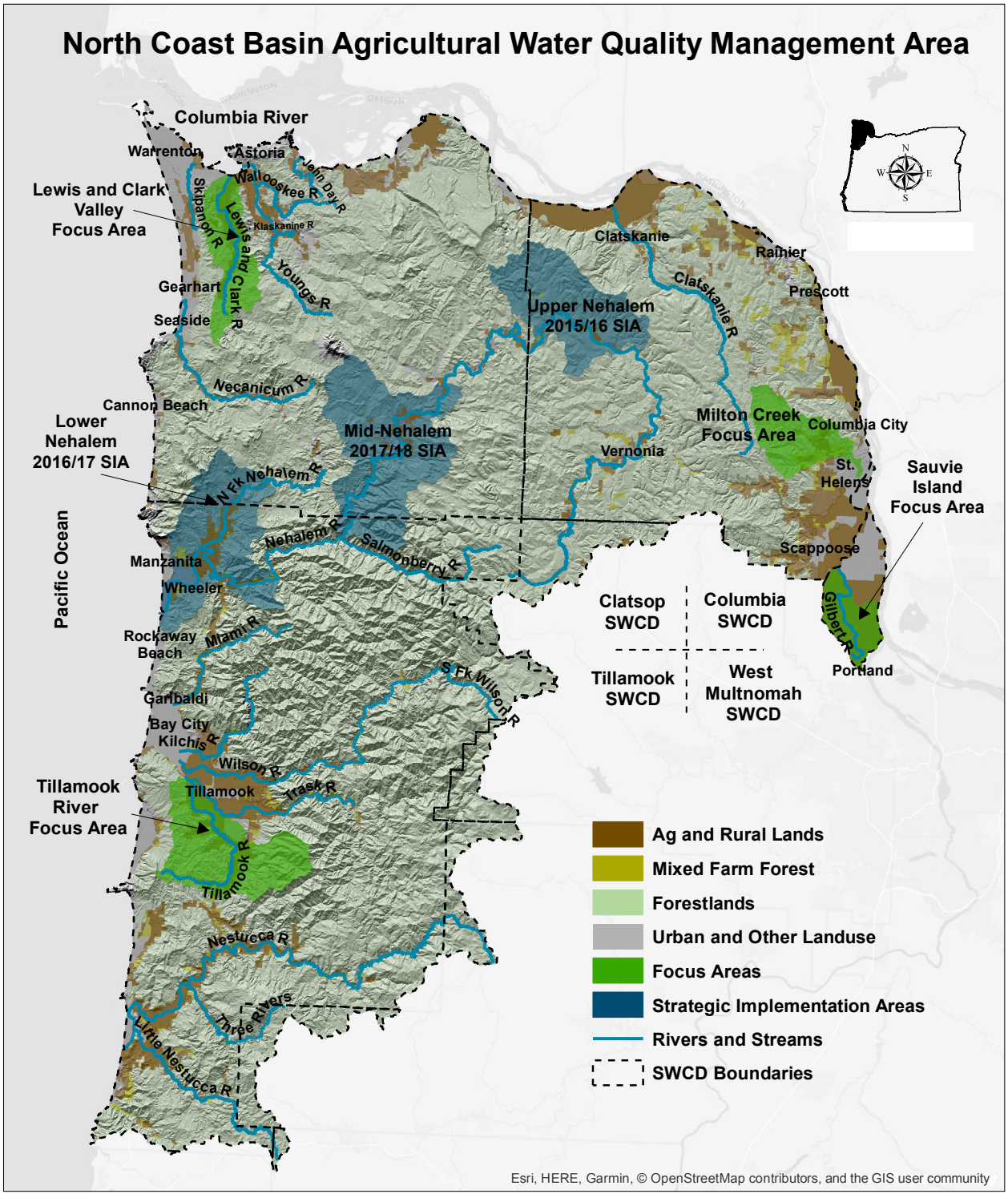
Table 6: Salmonid Habitat Requirements for Northern Oregon Coastal Streams

Adapted from Salmon Habitat Requirements for Northern Oregon Coastal Streams
Tillamook Bay National Estuary Project 1997; Updated 2018 ODFW
This information is general and will vary throughout the North Coast Basin.

Species	Life Cycle	Location	Water Temperature			Fry Habitat	Juvenile Habitat
			Spawning	Incubation	Rearing		
Chinook – Spring	Migration Apr – Jun Spawning Sep – Oct	Upper mainstem streams	42°F – 57°F (5.5°C –13.8°C)	32°F – 68°F (0°C – 20°C)	45°F-58°F; growth stops @ 69°F/ 20°C lethal @ 77°F/ 25°C	Stream; river edges	Deeper water in main river channel
Chinook-Fall	Migration Sep – Dec Spawning Oct – Jan	Mainstem & large tributaries	42°F – 57°F (5.5°C –13.8°C)	32°F – 68°F (0°C – 20°C)	45°F-58°F; growth stops @ 69°F/ 20°C lethal @ 77°F/ 25°C	Stream; river edges	Deeper water in main river channel
Chum	Migration Nov – Dec Spawning Nov –Dec	Lower mainstem and tributaries	45°F – 55°F (7.2°C –12.7°C)	40°F – 56°F (4.4°C – 13.3°C)	44°F-48°F; growth stops @ 69°F/ 20°C lethal @ 77°F/ 25°C	Move directly to estuary	High sediment will kill
Coho	Migration Sep – Jan Spawning Oct – Jan	Small tributaries	40°F – 57°F (4.4°C –13.8°C)	40°F – 56°F (4.4°C – 13.3°C)	53°F-48°F; growth stops @ 69°F/ 20°C lethal @ 78°F/ 25.5°C	Backwater pools & stream edges	Pools, off channel alcoves
Sea Run Cutthroat Trout	Migration Jun – Oct Spawning Dec – Feb	Small headwater tributaries	43°F – 63°F (6.1°C –17.2°C)	43°F – 63°F (6.1°C – 17.2°C)	49°F-55°F; growth stops @ 69°F/ 20°C lethal @ 73°F/ 22.7°C	Stream edges & backwater pools, large wood	Pools and side channels
Steelhead – Summer	Migration May – Jul Spawning Jan – Apr	Small tributaries	39°F – 49°F (3.8°C – 9.4°C)	40°F – 56°F (4.4°C – 13.3°C)	45°F-58°F; growth stops @ 69°F/ 20°C lethal @ 75°F/ 23.8°C	Stream edges	Pools, rifles, & runs of tributaries large woody debris
Steelhead – Winter	Migration Nov – May Spawning Jan – May	Small tributaries	39°F – 49°F (3.8°C – 9.4°C)	40°F – 56°F (4.4°C – 13.3°C)	45°F-58°F; growth stops @ 69°F/ 20°C lethal @ 78°F/25.5°C	Stream edges	Pools, rifles, & runs of tributary streams, large woody debris

Management changes in other land uses will also be needed if this area's water quality is to improve. Some of the nonagricultural sources of water pollution include municipal sewage treatment plants, leaking on-site septic systems in rural areas, forest roads, legacy issues, and residential homes located too close to streams

Figure 3: North Coast Basin Management Area



This product is for informational purposes and may not have been prepared for, or be suitable for legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information.

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Scale: 1:600,000
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2.4 Agricultural Water Quality

2.4.1 Water Quality Issues

2.4.1.1 Beneficial Uses

Water quality standards are established to protect beneficial uses of the state's waters. Beneficial uses are assigned by basin in the OARs for water quality. North Coast Basin (OAR 340-041-0230). Table 7 summarizes the State of Oregon's designated beneficial uses.

Table 7: Beneficial Uses for the North Coast Basin
Adapted from Table 230A (OAR 340-041-0230)
www.oregon.gov/deq/Rulemaking%20Docs/Table230A.pdf

Beneficial Use	Estuaries & Adjacent Marine Waters	All Streams and Tributaries
Public Domestic Water Supply		X
Private Domestic Water Supply		X
Industrial Water Supply	X	X
Irrigation		X
Livestock Watering		X
Fish and Aquatic Life	X	X
Wildlife and Hunting	X	X
Fishing	X	X
Boating	X	X
Water Contact Recreation	X	X
Aesthetic Quality	X	X
Hydro Power		X
Commercial Navigation & Transportation	X	

2.4.1.2 WQ Parameters and 303(d) list

A number of waterbodies within the Management Area are impaired (do not meet state water quality standards - Table 8 and 9) for one or more water quality pollutants. The Oregon DEQ is required to submit a list of impaired waterbodies to the U.S. Environmental Protection Agency (EPA) every two years under section 303(d) of the federal CWA. This list is commonly referred to as the "303(d) list" and is made available online through DEQ's 2012 Integrated Report Assessment Database and 303(d) list. For more information on water quality pollutants, see Appendix H.

DEQ submitted its most recent Integrated Report to EPA in November of 2014. EPA took action on this report on Dec. 21, 2016, and partially approved and disapproved Oregon's 2012 Integrated Report. The approved additions and removals are now effective for CWA purposes. See Table 8 for the current 303(d)listings. For more information and a complete list of 303(d) impaired streams go online to DEQ's 2012 Integrated Report Assessment Database: www.deq.state.or.us/wq/assessment/rpt2012/search.asp.

Table 8: 303(d) List of Pollutants and Impaired Waterbodies North Coast Management Area *Updated from the DEQ 2012 Integrated Report (Last Accessed 04/02/18)* (Cat 5: Water Quality Limited, 303(d) List (TMDLs needed for these water quality pollutants)	
Lower Columbia-Youngs-Clatskanie Subbasins	
Aquatic Weeds or Algae: Cullaby and Smith Lakes	
Arsenic: Columbia River	
Biological Criteria: Big and Beaver Creeks	
Chromium: Unnamed Creek	
Copper: Unnamed Creek	
***E. Coli* (pathogen):** Skipanon River **Fecal Coliform: (pathogen):** Klaskanine, Lewis and Clark, Skipanon, and Columbia Rivers	
Dissolved Oxygen: Skipanon, Klaskanine, Lewis and Clark, and Clatskanie Rivers; Skipanon Waterway, Beaver Slough, and Smith Lake	
Iron: Unnamed Creek	**Polychlorinated Biphenyls (PCBs):** Columbia River
Zinc: Unnamed Creek	**DDE, 4,4** (degradate of DDT)**:** Columbia River
Wilson-Trask-Nestucca-Tillamook Subbasins	
Biological Criteria: Beaver, Ben Smith, Bewley, Cedar, East, Elk, Jewel, Joe, Jordan, Laughlin and Mina Creeks; Little Nestucca, Miami, Little North Fork Wilson, Little South Fork Kilchis, Nestucca, South Fork Kilchis, and Tillamook Rivers; Three Rivers and an unnamed stream	
Dissolved Oxygen: Bewley, Mill, and Vaughn Creeks; Dougherty, Hall, Hathaway, and Hoquarten Sloughs; Kilchis, Miami, Nestucca, Tillamook, Trask, and Wilson Rivers	
Enterococcus (pathogen): Pacific Ocean	**Iron:** Mill Creek
Fecal Coliform (pathogen): Netarts Bay	**pH:** Hall Slough
Habitat Modification: East Beaver Creek and Nestucca River	
Nehalem Subbasin	
Biological Criteria: Belding, Buster, Crooked, Deer, Foley, Gillmore, Lousignont, North Fork Lousignont, Quartz, Sager, South Fork Rock Creek, and Wolf Creeks; East Fork Nehalem and Salmonberry Rivers	
Dissolved Oxygen: Nehalem River	

2.4.2 Basin TMDLs and Agricultural Load Allocations

A TMDL is a calculation of the maximum amount of a pollutant that a waterbody can receive and still meet water quality standards and an allocation of that load among the various sources of that pollutant. Pollutant sources are characterized as either point sources that receive a waste load allocation, or nonpoint sources that receive a load allocation. In general, loading allocations for the above parameters have been developed for each subbasin. Allocations are generally expressed as percentage reductions from existing conditions that would be required to meet water quality standards.

The TMDL allocations (Table 9) have been specifically designed so that when attained, waterbodies of the North Coast Basin will meet water quality standards. Plans to meet TMDL allocations are required for industry, municipalities, forestry, and agriculture to improve water quality so that all beneficial uses are supported. Overall, the goal of developing a TMDL is to end up with an implementation plan or a watershed plan designed to meet water quality standards and restore impaired waterbodies.

This Area Plan serves as an implementation plan for agriculture. Total Maximum Daily Loads (TMDL) for the North Coast have been adopted for several water quality parameters (Table 9). For information on water quality parameters, see Appendix H.

Table 9: Pollutants with * TMDLs and Load Allocations North Coast Management Area ***Updated from the DEQ 2012 Integrated Report (Last Accessed 04/02/18)*** **(Cat 4A: Water quality limited, TMDL approved)**
Bacteria: Applies to all waterbodies in the North Coast Basin ***Load Allocation*:** Target runoff concentrations generally call for a percent reduction relative to current conditions. • Clatskanie River Subbasin: pasturelands 30% reduction • Necanicum River Subbasin: pasturelands 86% • Nehalem Watershed: upland pastures 55%; lowland pastures 95% • Tillamook Subbasin: Miami River – 96%; Kilchis River 85%; Wilson River – 94%; Trask River 97%; Tillamook River 99% • Nestucca River – 57%; Little Nestucca River – 53% • Willamette Basin (Sauvie Island): 66% - 83%
Temperature: Applies to all waterbodies in the North Coast Basin and Sauvie Island ***Load Allocation*:** Small streams (0-20 feet) should be in the range of 90% effective shade or greater. Effective shade targets are as low as 40% on the widest streams owing to the inability of tall trees to shade the entire width.
Sedimentation: Applies to all waterbodies in the Nestucca Subbasin ***Load Allocation*:** 20 percent (reduction) streambed area fines in riffle and glide reaches.
Mercury: Applies to all waterbodies in the Willamette Basin (Sauvie Island) ***Load Allocation*:** 27% is the estimated percent reduction needed to attain the interim water column guidance value.
Dioxin (2,3,7,8-TCDD): Applies to the Columbia River
Total Dissolved Gas: Applies to the Columbia River
*** TMDL Documents for the North Coast Management Area** **North Coast Subbasins:** Lower Columbia-Youngs, Lower Columbia-Clatskanie, Necanicum, and Nehalem Approved 2003 **Willamette Basin (Sauvie Island):** Chapters 2, 3, 4, and 5 - Lower Willamette Subbasin. Approved 2006 **Wilson-Trask-Nestucca Subbasin:** Wilson-Trask-Nestucca: Nestucca Bay Watershed Approved 2002 and Tillamook Bay Watershed Approved 2001 Available online at: http://www.oregon.gov/deq/wq/tmdls/Pages/TMDLs-Basin-N-Coast.aspx

2.5 Voluntary and Regulatory Measures

These Pollution Prevention and Control Measures (PCMs) have been developed to help agricultural operators reduce agricultural water pollution when combined with pollution control efforts from other land uses in the planning area. The PCMs have also been designed to implement the agricultural measures required by Section 6217(g) of CZARA. The PCM identifies Required and Prohibited Conditions from the North Coast Basin AgWQMA Rules and suggests ways they may be achieved through flexible management solutions.

In 1990, as part of the federal Coastal Zone Amendments Reauthorization Act (CZARA), Congress enacted Section 6217(g) to specifically address the impacts of nonpoint source pollution in coastal areas. Each state with an approved coastal zone management program must develop and submit to the USEPA and the National Oceanic and Atmospheric Administration (NOAA) a Coastal Nonpoint Pollution Control Program. The purpose of the program "shall be to develop and implement management measures for nonpoint source pollution to restore and protect coastal waters, working in close conjunction with other state and local authorities." Under "A Pollution Prevention and Control Program for Oregon's

Coastal Waters," the state of Oregon presented agricultural management measures (Appendix C) to meet the requirements of the CZARA Section 6217(g).

Agricultural landowners should review the area rules -- cited in the box within each PCM -- to evaluate their operations and determine if they are in compliance with the rules and review the PCMs for ideas on how to improve water quality through their management activities.

Based upon this assessment, landowners should develop their own site-specific adaptive management strategy to meet these conditions. The PCMs are intended to be flexible enough for landowners to develop feasible and affordable approaches to meet water quality standards.

In addition to the PCMs outlined in the next sections, Appendices B and C provide further management measures for agriculture that have been found to be effective in controlling and preventing agricultural water pollution. Section 2.4.9 is a list of definitions related to sections 2.4.1-2.4.8.

2.5.1 Healthy Riparian Streambank Condition

Benefits of a Healthy Riparian Streambank Condition
In the landscape, riparian areas comprise a small percentage of total land area but are essential for maintaining water quality and quantity, for ground water recharge, and for dissipating stream energy. It is anticipated that the Healthy Riparian Streambank Condition (HRSC) will assist with drainage and flood control.

HRSCs benefit both the landowner and the environment. Riparian areas are often indicators of watershed health as they are among the first landscape features to reflect damage from improper management or natural events within the watershed (National Riparian Service Team, 1997).

Landowners benefit from riparian streambank stabilization through soil deposition on streambanks and vegetative bank stabilization, prevention or rate reduction of crop and pasture land damaged or lost to floods, and prevention or reduction of flood debris deposited on fields. The environmental benefits of a HRSC include more shade to improve water temperature moderation and reduce heating, enhanced habitat for wildlife, and a reduction in the quantity of sediment, chemicals, bacteria, and nutrients contained in surface water runoff reaching a stream.

General Description of Healthy Riparian Streambank Condition
A stream in Healthy Riparian Streambank Condition (HRSC) provides the following benefits:

- Shade to help maintain cool water temperatures;
- Streambank stabilization and protection;
- Filtering of sediment, animal waste, and chemicals in surface runoff; and
- Sources of food, hiding, and resting places for fish including large wood for fish habitat.

To provide these benefits, North Coast Basin riparian areas need the following:

- Complex vegetation structure and diverse species composition
    - The riparian area supports a diverse assortment of plants, trees, shrubs/ground cover, in two or more vertical layers. Riparian areas should be dominated by native species with a diverse age class distribution. Where suitable, conifers are the preferred dominant tree species.

Required and Prohibited Conditions

OAR 603-095-0840

(2) Healthy Riparian Streambank Condition. Effective upon rule adoption.

(a) Allow the natural and managed regeneration and growth of riparian vegetation -- trees, shrubs, grasses, and sedges -- along natural waterways (as defined in OAR 141-085-0010(27)) to provide shade to moderate water temperatures and bank stability to maintain erosion near background levels.

(b) The technical criteria to determine compliance with OAR 603-095-0840(2)(a) are:

(A) Ongoing renewal of riparian vegetation that depends on natural processes (including processes such as seed fall, seed bank in soil, or sprouting from roots, rhizomes, or dormant crowns) is evident.

(B) Ongoing growth of riparian vegetation that has a high probability of remaining or becoming vigorous and healthy is evident.

(C) Management activities minimize the degradation of established native vegetation while allowing for the presence of nonnative vegetation.

(D) Management activities maintain at least 50% of each year's new growth of woody vegetation both trees and shrubs.

(E) Management activities are conducted in a manner so as to maintain streambank integrity through 25-year storm events.

(c) Exemptions:

(A) Levees and dikes are exempt from the Healthy Riparian Streambank Condition OAR 603-095-0840(2)(a) and (b), except for areas on the river-side of these structures that are not part of the structures and which can be vegetated without violating U.S. Army Corps of Engineers vegetation standards.

(B) Drainage areas where the only connection to other waterbodies are through pumps shall be exempt from the Healthy Riparian Streambank Condition OAR 603-095-0840(2)(a) and (b).

(C) Access to natural waterways for livestock watering and stream crossings are allowed such that livestock use is limited to only the amount of time necessary for watering and crossing the waterway.

(D) Drainage and irrigation ditches managed in compliance with OAR 603-095-0840(3) are exempt from the Healthy Riparian Streambank Condition OAR 603-095-0840(2)(a) and (b).

- Vegetative cover
    - Vegetation should cover approximately 90 percent of the soil surface, with less than 10 percent bare soil or impervious surfaces.
- Width
    - Riparian area width should be sufficient to fulfill site-specific functions and meet HRSCs.
- Stream shading
    - Riparian vegetation should shade 75 percent of a natural waterway where the waterbody is not too wide and when achievable in the summer.
- Streambank stability
    - Streambanks should be stable without the use of rip-rap 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.

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 meet or exceed the HRCS. Landowners are encouraged to contact the local SWCD or USDA NRCS office for more information. See Appendix A for contact information and Appendix I for other cost-share programs that benefit healthy riparian streams.

See Section 1.5.4 for more information related to Streamside Vegetation.

Potentially Impacted 303(d) List Parameters
Water temperature, bacteria, sedimentation, and habitat modification.

2.5.2 Drainage and Irrigation Ditches

Benefits of drainage and irrigation ditches
Ditches provide important drainage functions for agricultural lands. Appropriate construction, use, and maintenance of ditches will protect waters of the state from erosion, sediment delivery, and sloughing from ditches. The environmental benefits of proper drainage and irrigation ditch operation include a reduction in sediment and bacteria conveyance to the state's waters.

General description of satisfactory drainage and irrigation ditch conditions

The following characteristics are found in a well-maintained and operated drainage or irrigation ditch:

- Ditches are protected from erosion, sediment delivery, and sloughing with appropriate vegetation;
- Ditch side vegetation does not restrict water flow or prohibit ditch maintenance.

Ditches that provide important drainage functions for agricultural land require periodic maintenance. Although ditch bank vegetation may be damaged during maintenance, care should be taken to minimize this damage and provide for re-vegetation.

A joint permit from the U.S. Army Corps of Engineers and the Department of State Lands (DSL), or a General Authorization permit from DSL, must be obtained to clean or dig new ditches. Suggested management strategies can be found in Appendix B, and a list of resources can be found in Appendix A of this Area Plan.

Required and Prohibited Conditions

OAR 603-095-0840

(3) Drainage and irrigation ditches (channels legally constructed). Effective upon rule adoption.

(a) Construction, maintenance, and use of surface drainage ditches shall not result in sediment delivery to waters of the state from soil erosion caused by excessive channel slope, unstable channel cross section, or placement of disposed soils.

(b) Ditch bank vegetation shall be present to stabilize earthen ditch banks.

(c) Technical criteria to determine compliance with OAR 603-095-0840(3)(a) and (b) are:

(A) Construction and maintenance of drainage and irrigation ditches utilize ditch slope and ditch cross section that are appropriate to the site.

(B) Disposed soils from construction and maintenance of drainage and irrigation ditches are placed such that sediment delivery to waters of the state from the placement of these soils is consistent with natural background sediment delivery from these sites.

(d) Exemptions:

(A) Bank vegetation damaged and soils exposed during maintenance (as defined in OAR 141-085-0010(22)) and construction, in accordance with Department of State Lands rules. Bank vegetation must be reestablished as soon as practicable after construction and maintenance are completed. However, sediment delivery to waters of the state shall not result from inappropriate ditch slope and cross section or from placement of disposed soils.

Potentially Impacted 303(d) List Parameters
Sedimentation, bacteria, and dissolved oxygen.

2.5.3 Tide Gates

Required and Prohibited Conditions

OAR 603-095-0840

(4) Tide Gates. Effective upon rule adoption.

(a) Tide gates shall open and close as designed.

Benefits of tide gates in satisfactory condition
It is anticipated that this measure will improve water quality upland of tide gates where it is degraded and also improve fish passage. This measure will also improve the drainage and flood management functions of malfunctioning tide gates.

Tide gates in satisfactory condition serve several key functions. Tide gates that open and close as designed improve drainage, protect water quality, support agricultural flood management, and provide the means for fish to access habitat and refuge areas that may be present behind the gate. Poorly operating tide gates can reduce water column exchange that results in stream and slough water that does not meet water quality standards, most notably those for temperature and dissolved oxygen.

This measure does not require the replacement of existing tide gates. However, it does encourage landowners to replace malfunctioning and "fish unfriendly" tide gates in a time and manner determined by the landowner. Landowners are encouraged to replace poorly operating tide gates with "fish friendly" tide gates that provide improved fish access to vital rearing and winter habitat that may be present upland of the tide gate. Landowners are encouraged to participate with local watershed councils and SWCDs to obtain cost-share funding to utilize the best "fish-friendly" tide gates available. Contact the local SWCD for more information (Appendix A).

General description of tide gates in satisfactory condition

Tide gates in satisfactory condition are those that open and close as designed and are maintained regularly. They provide a healthy water column exchange where appropriate, such as in sloughs, though this may not be desired in drainage canals. Lightweight aluminum tide gates function at lower tides and mimic natural drainage patterns better than older, heavy, iron, and steel gates.

Potentially Impacted 303(d) List Parameters
Temperature, Dissolved Oxygen, Habitat Modification.

2.5.4 Erosion and Sediment Control from Sources Beyond Streambanks

Benefits of satisfactory erosion and sediment control
It is anticipated that this measure will reduce sedimentation of streams while economically protecting the most valuable agricultural resource - the soil.

Proper erosion and sediment control from agricultural activities retains important soil resources on the farm and minimizes the opportunity for excess sediment to enter waterways. Normal or natural levels of sediment are vital for aquatic systems and proper river functions. However, excess sediment levels are harmful to humans and fish. Agricultural erosion and sediment control protect drinking water quality

Required and Prohibited Conditions

OAR 603-095-0840

(5) Erosion and Sediment Control. Effective upon rule adoption.

(a) No cropland erosion in excess of the soil loss tolerance factor (T) for the subject field, as determined by the Revised Universal Soil Loss Equation (RUSLE) for soil loss will occur.

(A) Exceptions: The department shall establish an alternate erosion control standard for croplands which the department determines cannot practically or economically achieve the soil loss tolerance factor. Any alternate erosion control standard for croplands established by the department shall assure that delivery of sediment to adjacent water sources is reduced to the maximum extent practicable.

(b) Private roads that traverse rural lands or private roads used for agricultural activities shall be constructed and maintained such that road surfaces, fill and associated structures are designed and maintained to limit contributing sediment to waters of the state. All private roads on agricultural lands not subject to the Oregon Forest Practices Act are subject to this regulation.

(A) Exceptions: Roads subject to the Oregon Forest Practices Act.

(c) Agricultural lands shall be managed to prevent and control runoff of sediment to public road drainage systems.

(d) Except for operations governed by the Oregon Forest Practices Act, no activities related to the conversion of woodland to non-woodland agricultural uses that require removal of the majority of woody material from a parcel of land, such that the land no longer meets the definition of woodland, shall be conducted in a manner which results in the placement of soil, the delivery of sediment or the sloughing of soil into waters of the state, the initiation or aggravation of streambank erosion, or the loss of a healthy riparian streambank condition as defined in OAR 603-095-0840(2)

and reduces water treatment costs. Stream bottoms are protected from fine sediment that can fill stream bed gravel, prevent fish from spawning, and suffocate eggs. Excessive levels of sediment may also clog fish gills.

General description of satisfactory erosion and sediment control

Agricultural managers are encouraged to:

- Utilize erosion control management alternatives such as maintenance of healthy and vigorous pasture, cover, and green manure cropping, no till, conservation tillage, and other activities that reduce the detachment and movement of soil; and
- Utilize sediment control management alternatives such as strip cropping, vegetative filter strips, straw bales, grass-lined waterways, and catch basins.
- Plant or till perpendicular to slope following elevation contour lines.
- Utilize soil health principles and avoid leaving your soil bare or uncovered. Plant a cover crop. USDA Soil Health Website: www.nrcs.usda.gov/wps/portal/nrcs/main/national/soils/health/
- Under certain farming conditions, sub-soiling or deep ripping a field can improve water infiltration.

Potentially Impacted 303(d) List Parameters

Sedimentation, Dissolved Oxygen, Habitat Modification.

2.5.5 Manure, Nutrients, and Other Waste

Required and Prohibited Conditions

OAR 603-095-0840

(6) Manure, Nutrients, and Other Waste. Effective upon rule adoption.

(a) No person conducting agricultural land management shall 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) No person conducting agricultural land management shall 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.

(c) No person shall violate the conditions of any waste discharge permit issued under ORS 468B.050.

(d) Exceptions:

(A) Access to natural waterways for livestock watering and stream crossings are allowed such that livestock use is limited to only the amount of time necessary for watering and/or crossing the waterway.

Benefits of manure and nutrients

Manure and fertilizers are important nutrient sources for crop and pasture production. This measure is designed to decrease nutrient and bacteria contamination of water resulting from agricultural activities. It is a goal of this measure to minimize nutrient and bacteria contributions while allowing managed riparian grazing and providing limited livestock crossing and water access.

Appropriate manure and nutrient use can help save operators money through considering more efficient utilization of nutrients that minimize leaching from the plant root zone and losses from surface runoff and tile drainage. Reducing leaching and surface runoff will also reduce ground water and surface water pollution from agricultural activities.

General description of appropriate manure and nutrient control

Manure and nutrients are most efficiently tracked and utilized through the development and implementation of a nutrient management plan. Landowners are encouraged to develop a nutrient management strategy that provides guidance to:

Apply nutrients at rates necessary to achieve realistic crop yields;

a. Improve the timing of nutrient applications. Avoid nutrient applications during periods with a high potential for leaching or runoff, identify timing and application methods to provide nutrients at rates necessary to achieve realistic crop yields, and reduce losses to the environment;
b. Use agronomic crop production technology to increase nutrient use efficiency;
c. Identify the limiting nutrient and manage to not exceed application of that nutrient (e.g. nitrogen, phosphorus, potassium) greater than the recommended rate;
d. Properly calibrate and operate nutrient application equipment;
e. Land application of manure and fertilizer should ensure all nutrients are applied in the proper amounts and in a way that controls movement of soil;
f. Tillage, crop residue management, grazing management and other agricultural activities are performed in a manner that minimizes movement of soil, organic materials, nutrients, and bacteria to surface and ground water;
g. Livestock barnyards, feedlots, dry-lots and other non-pasture areas should not be located adjacent to natural waterways unless a runoff control system is installed and maintained so that suspended solids are kept from waters of the state;

h. A functional and effective vegetative buffer or equally effective pollution control application should be established adjacent to waters of the state to minimize soil and manure transport to waters of the state.

Useful nutrient management information that a land manager may consider is located in Appendix B and Appendix C, subsection 3, Nutrient Management Measure. Landowners are encouraged to contact the local SWCD or USDA NRCS office listed in Appendix A for more information.

Potentially Impacted 303(d) List Parameters
Bacteria, Dissolved Oxygen.

2.5.6 Livestock and Grazing

This Pollution Prevention and Control Measure (PCM) incorporates Area Rules developed to address other soil and vegetative conditions. Many of the required and prohibited conditions that address water quality as impacted by livestock and grazing management are described in the OARs quoted in PCMs "A" and "G."

Benefits of appropriate livestock and grazing strategies
It is anticipated that this measure will minimize the impact of livestock and protect riparian vegetation, maintain stable streambanks, encourage alternative and off-stream water sources, and protect and improve water quality. It is also a goal of this measure to provide for livestock crossing and water access such that large numbers of livestock do not loiter in natural waterways, while allowing managed riparian grazing.

Appropriate livestock and grazing management can benefit landowners through developing healthy and vigorous pasture grass. Utilizing grazing management alternatives can protect and improve riparian habitat, stabilize streambanks and reduce sedimentation, and minimize nutrient and bacteria access to waterways.

General description of appropriate livestock and grazing strategies

Landowners are encouraged to develop livestock control and grazing strategies that protect water quality, streambanks, stream channels, wetlands, estuaries, ponds, lakeshores, riparian soils and vegetation, and upland areas. Some examples of suitable strategies may include:

a. Manage in-stream crossings to minimize erosion beyond background or normal conditions;
b. Manage in-stream crossings so that fish passage is not impeded as provided by ORS 498.351 – Fish Passage required for artificial obstruction across body of water;
c. Where riparian grazing occurs, use improved grazing management techniques such as riparian pasture delineation and management to control the timing of grazing to keep livestock off stream banks and out of waterways when they are most vulnerable to damage;
d. Maintain any pasture in the riparian area in a healthy and vigorous condition, with adequate growth going into the wet season to filter surface water; and
e. Maintain a strip of pasture on upland of the riparian area with adequate growth going into the wet season to filter surface water.

Potentially Impacted 303(d) List Parameters
Temperature, Bacteria, Dissolved Oxygen, Habitat Modification, Flow Modification.

Required and Prohibited Conditions

OAR 603-095-0840

(2) Healthy Riparian Streambank Condition. Effective upon rule adoption.

(a) Allow the natural and managed regeneration and growth of riparian vegetation -- trees, shrubs, grasses, and sedges -- along natural waterways (as defined in OAR 141-085-0010(27)) to provide shade to moderate water temperatures and bank stability to maintain erosion near background levels.

(b)Technical criteria to determine compliance:

(A) Ongoing renewal of riparian vegetation that depends on natural processes (seed fall, seed bank in soil, or sprouting from roots, rhizomes, or dormant crowns) is evident.

(B) Ongoing growth of riparian vegetation that has a high probability of remaining or becoming vigorous and healthy is evident.

(C) Management activities minimize the degradation of established native vegetation while allowing for the presence of nonnative vegetation.

(D) Management activities maintain at least 50% of each year's new growth of woody vegetation -- both trees and shrubs.

(E) Management activities are conducted in a manner so as to maintain streambank integrity through 25-year storm events.

(c)Exemptions -- any of the following are exempted:

(A) Levees and dikes are exempt from the Healthy Riparian Streambank Condition rules, except for areas on the river-side of these structures that are not part of the structures and can be vegetated without violating U.S. Army Corps of Engineers vegetation standards.

(B) Drainage areas where the only outlet to other waterbodies is through pumps shall be exempt from the Healthy Riparian Streambank Condition OAR 603-095-0840(2)(a)(b).

(C) Access to natural waterways for livestock watering and stream crossings are allowed such that livestock use is limited to only the amount of time necessary for watering and crossing the waterway.

(D) Drainage and irrigation ditches managed in compliance with OAR 603-095-0840(3) are exempt from the Healthy Riparian Streambank Condition rules.

(6) Manure, Nutrients, and Other Waste. Effective upon rule adoption.

(a) No person conducting agricultural land management shall 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) No person conducting agricultural land management shall 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.

(c) No person shall violate the conditions of any waste discharge permit issued under ORS 468B.050.

(d) Exceptions:

(A) Access to natural waterways for livestock watering and stream crossings are allowed such that livestock use is limited to only the amount of time necessary for watering and/or crossing the waterway.

2.5.7 Pesticide Management

Required and Prohibited Conditions
603-095-0840
(7) Pesticide Management
(a) Pesticides shall be used in accordance with label requirements as required in ORS 634 (Oregon Pesticide Control Law).
Statutory Authority: ORS 568.909
Stats. Implemented: ORS 568.900-568.933

Pesticide control is presently regulated by ODA under ORS 634 and OARs 603-057. Waterbodies in the North Coast Basin have not been identified on the 303(d) list for pesticide contamination.

Benefits of appropriate pesticide use
It is anticipated that this measure will encourage the appropriate management of pesticides and support the application of pesticides when economically beneficial to the producer while reducing the risk of pesticide contamination of surface water and ground water.

Carefully following label instructions and implementing Integrated Pest Management (IPM) strategies can generally reduce pesticide use, increase yields, increase net returns, minimize surface, and ground water exposure to pesticides and decrease economic risk.

General description of appropriate pesticide use

Proper pesticide use begins with reading the label on the container and following the instructions. As required by ORS 634, users of pesticides must follow label recommendations for both restricted and non-restricted use pesticides.

Agricultural users of pesticides are encouraged to:

a. Evaluate pest problems, previous pest control measures, and cropping history of the site;
b. Evaluate the soil and physical characteristics of the site including mixing, loading, and storage areas for potential leaching or runoff of pesticides. If leaching or runoff is found to occur, steps should be taken to prevent further contamination;
c. Use IPM strategies that:
    1. Apply pesticides when there is an economic benefit to the producer;
    2. Apply pesticides according to label requirements efficiently and at times when runoff losses are unlikely; and
    3. Periodically calibrate pesticide spray equipment and use anti-backflow devices on pesticide tank-filling equipment.

2.5.8 Irrigation and Water Use

Irrigation tail water has not specifically been identified as a contributing factor for the 303(d) listing of North Coast Basin waters. Nutrients and pesticides that could be transported in irrigation tail water have not been identified on the 303(d) list for the North Coast Basin waters. Furrow irrigation is rare in the North Coast and most irrigation occurs via sprinklers on pasturelands. There are no required and prohibited conditions for this measure.

Benefits of appropriate irrigation and water use
It is anticipated that this measure will reduce nonpoint pollution of waterways from sediment, particulate-bound nutrients, chemicals and metals, soluble nutrients, and bacteria while maintaining the economic feasibility of irrigation where irrigation water is applied.

Appropriate irrigation and water use benefit the environment by reducing irrigation water run-off, leaching, and total pollutant discharge from an irrigation system. Landowners benefit from appropriate irrigation and water use by maximizing water use efficiency and minimizing waste.

General description of appropriate irrigation and water use

Agricultural irrigators are encouraged to:

a. Operate irrigation systems so that the timing and amount of irrigation water applied match crop water needs;
b. Operate chemigation systems to meet crop water needs and have any necessary tailwater management system;
c. Screen all irrigation intake openings in natural waterways to prevent the uptake or death of fish; and
d. Incorporate irrigation monitoring to determine uniform application rates.

2.5.9 Pollution Prevention and Control Measure Definitions

- **Dike:** A structure that encloses or encircles a patch of ground, such as a former tidal wetland, preventing tidal flooding (Tillamook Bay National Estuary Project, 1998b).
- **Erosion, Rill:** OAR 603-095-0010(14). 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.
- **Erosion, Sheet:** OAR 603-095-0010(15). The removal of a fairly uniform layer of soil from the land surface by runoff water.
- **Integrated Pest Management:** A pest population management system that anticipates and prevents pests from reaching damaging levels by using all suitable tactics including natural enemies, pest-resistant plants, cultural management, and the judicious use of pesticides. (U.S. Environmental Protection Agency (EPA), 1993).
- **Levee:** A linear structure, generally placed along a riverbank, which prevents flooding of a former floodplain during periods of high water (Tillamook Bay National Estuary Project, 1998b).
- **Maintenance:** OAR 141-085-0010(124*) The periodic repair or upkeep of a structure in order to maintain its original function. Maintenance does not include any modification that changes the use of the structure. Maintenance includes expansion of a structure by not more than (20) twenty percent of its original footprint **within the waters of the state**.
- **Manure:** The fecal and urinary defecations of livestock and poultry; may include spilled feed, bedding litter, or soil (Soil Conservation Society of America, 1982).
- **Native:** OAR (Oregon Administrative Rule) 603-073-0001(9). Any indigenous or resident species currently or historically found in this state.
- **Natural Waterways:** OAR 141-085-0010(140*). As used in ORS 196.800(14), natural waterways mean waterways created naturally by geological and hydrological processes, waterways that would be natural but for human-caused disturbances (e.g. channelized or culverted streams, impounded waters, partially drained wetlands or ponds created in wetlands) and that otherwise meet the definition of waters of the state, and certain artificially created waterways included under the definition of "Other Bodies of Water."

- **Nutrients:** Elements, or compounds, essential as raw materials for organism growth and development, such as carbon, nitrogen, phosphorus, etc. (Soil Conservation Society of America, 1982). For the purposes of this plan, manure shall be considered a source of nutrients.
- **"Other Waters":** OAR 141-085-0010(154*), means waters of the state other than wetlands.
- **Pesticides:** ORS 634.006(8)(h). Any substance or mixture of substances intended to be used for defoliating plants or for preventing, destroying, repelling or mitigating all insects, plant fungi, weeds, rodents, predatory animals, or any other form of plant or animal life which is, or which ODA may declare to be a pest, which may infest or be detrimental to vegetation, humans, or be present in any environment thereof.
- **Pollution or Water Pollution:** ORS 468B.005(3). "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.
- **Revised Universal Soil Loss Equation (RUSLE**): OAR 603-095-0010(38). A method used to estimate soil loss by sheet, rill, and wind erosion.
- **Riparian Vegetation:** OAR 603-095-0010(38). 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.
- **Soil Loss Tolerance Factor, or "T":** As used in OAR 603-095-0010(45), the tons of soil (related to the specific soil series) which can be lost through erosion annually without causing significant degradation of the soil or potential for crop production. It is estimated by the Universal Soil Loss Equation (USLE) or the Revised Universal Soil Loss Equation (RUSLE), and expressed in tons per acre per year.
- **Tide Gate:** A flap gate mounted on a culvert, which runs through a levee or dike. When the water level outside the structure is higher than inside, tide gates close, preventing flooding of protected land. When the water level inside the levee or dike is higher, tide gates open, allowing water to flow off the protected land. (Tillamook Bay National Estuary Project, 1998b)
    - **Fish Friendly Tide Gate:** Tide gates identified by the Performance Partnership of Tillamook County, USDA NRCS, NOAA, and/or the Oregon Department of Fish and Wildlife (ODFW) that have adequate designs to allow fish passage through the gate.
- **Water or Waters of the State:** ORS 468B.005(8). "Water" or "the waters of the state" includes 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 effect a junction with natural surface or underground waters), which are wholly or partially within or bordering the state or within its jurisdiction.
- **Wetlands:** OAR 141-085-0010(230*). Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.
- **Wastes:** ORS 468B.005(7). "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.

Chapter 3: Strategic Initiatives

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

3.1 Measurable Objectives

3.1.1 Management Area

Measurable objectives allow the Ag Water Quality Program to better evaluate progress towards improved water quality. A measurable objective is a numeric long-term desired outcome to achieve by a specified date. Milestones are the interim steps needed to make progress toward the measurable objective and consist of numeric short-term targets to reach by specific dates. Together, the milestones define the timeline needed to achieve the measurable objective.

The Oregon Department of Agriculture, LAC, and LMA will establish measurable objectives and associated milestones for each Area Plan. Many of these measurable objectives relate to land conditions and primarily are implemented through focused work in small geographic areas (section 1.7.3), with a long-term goal of developing measurable objectives and monitoring methods at the Management Area scale. See sections 3.1.2, 3.1.3, 4.1.2.1, and 4.1.2.4 for information related to the strategic initiative's measurable objectives and milestones in the North Coast.

3.1.2 Focus Area(s)

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. The Districts based their choices on multiple factors including water quality impairments and other assessments. 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 through voluntary actions.

Oregon Department of Agriculture approved a Focus Area action plan (action plan) developed by each SWCD for the current biennium that outlines the key components of the Focus Area process. Currently there are four Focus Areas in the North Coast MA. Sections 3.1.2.1 – 3.1.2.4 provide descriptions of each the Focus Areas in the North Coast MA. The SWCDs report the results to the ODA at the end of each fiscal biennium via the action plan. See sections 4.1.1.1 – 4.1.1.4 and Tables 11-15 for assessment results and progress.

Key components and activities of the Focus Area are:

a) Identifying priority water quality parameters of concern.
b) Prioritizing a sub-watershed within the Management Area.
c) Determining an assessment methodology to conduct a pre-and post- assessment of land conditions.
d) Developing milestones and timelines for implementation.
e) Engaging the Focus Area's agricultural community in preventing and controlling water pollution from agricultural activities.
f) Offering technical assistance and site evaluations.
g) Providing information and assistance for cost-share and funding programs.
h) Conducting post assessment of land conditions at two-year intervals.

i) Tracking outputs and reporting accomplishments to the ODA and the North Coast LAC

3.1.2.1 Lewis and Clark Valley Focus Area 2015-2019

The Lower Lewis and Clark Watershed is approximately 39,360 acres at the 6th Field HUC (17080060207) level. Land use in the watershed is approximately 4 percent agriculture, 1 percent developed, 77 percent industrial forest, and 14 percent non-industrial forest. The main agricultural uses include dairy cow production, beef cattle, small livestock, horses, and small acreage crop production. There are 131 stream miles throughout the watershed.

The North Coast Subbasin TMDL was developed in 2003 and addresses temperature and bacteria for the Lewis and Clark rivers. Water quality monitoring data from the Youngs Bay Watershed Assessment of 2000 illustrates that temperature and pH are moderately impaired. Other areas of concern include levels of nitrogen and phosphorus year-round, temperature during summer months, and turbidity from sedimentation. Clatsop SWCD will improve water quality for these parameters by working with landowners to remove streamside agriculture impacts to allow desired riparian vegetation to establish, improve upland forage, and reduce nutrient inputs into streams and ground water.

Assessment Methodology: The Streamside Vegetation Assessment (SVA) is a tool utilized by ODA and partners to analyze streamside vegetation from aerial photographs using a Geographic Information System (GIS) software program. The year of the aerial photos analyzed are typically prior to implementation to create the baseline condition. When projects are completed, the categories of streamside vegetation are changed to represent current conditions. For example, when the Clatsop SWCD completes a planting project in an area that was previously categorized as "Bare-Ag", the Clatsop SWCD can now change that category to a "Shrub" or "Tree" and thus eliminate that acreage of bare ground. The SVA is a tool created to show positive change in the watershed as projects are completed. Assessment results and progress can be found in section 4.1.1.1 and Tables 11 and 15.

2015-2017 Lewis and Clark Valley Focus Area Milestone and Timeline

2015 Condition:	As of June 30, 2015, there were 75.73 total acres in the Grass Ag and Bare Ag SVA mapping categories; 15.9% of the assessed area.
Milestone:	By June 30, 2017: Decrease Grass Ag and Bare Ag acreage along agricultural streams in the Lewis and Clark Valley sub-watershed by 10.73 acres (0.4%) and reduce to 65 Grass Ag and Bare Ag acres; 14% of the assessed acreage.

2017-2019 Lewis and Clark Valley Focus Area Current Milestone and Timeline

2017 Condition:	As of June 30, 2017, there are 36.4 total acres in the Shrub SVA mapping category; 9% of the assessed area.
Milestone:	By June 30, 2019: Increase Shrub acreage along agricultural streams in the Lewis and Clark Valley sub-watershed by 2 acres (0.4%) to achieve 38.4 Shrub acres; 42.4% of the assessed area.
Note:	The Clatsop SWCD adapted their strategy and decided to increase the Shrub category instead of decreasing Grass Ag and Bare Ag acreage.

3.1.2.2 Milton Creek Focus Area 2014-2019

Milton Creek Watershed is 16,282 acres at the 6th Field HUC (17090012043) level and has approximately 45 total stream miles starting at the headwaters in the interior of Columbia County and draining into the Columbia River within the city of St. Helens. Land use throughout the HUC is roughly 35 percent forest, 30 percent rural residential, 25 percent agriculture, and 5 percent urban. The main

agriculture uses are livestock and small acreage agriculture. There are about 2,400 landowners in the HUC, with about 600 landowners in some form of agriculture.

Milton Creek is covered by the Willamette TMDL completed in 2006. There is limited water quality data available, however, we can surmise that there are typical, anecdotal water quality issues. The main concern for this area is land condition and livestock impact to water quality. Roadside visual assessments were conducted along Milton Creek to determine land conditions. Assessment results and progress can be found in section 4.1.1.2 and Tables 12 and 15.

Assessment Methodology
The SWCD completed a pre-assessment, classifying land conditions within the Focus Area using the Livestock Impact Classification. The assessment will be completed through visual assessments, aerial photography, and voluntary surveys sent to landowners. Classifications will be given dependent on livestock amounts, mud and drainage property condition, and data available at the time and will continue to develop and change as more conservation techniques are completed on the ground after the pre-assessment. The classes are described as follows:

- ***Class I:*** Conservation techniques are being used addressing livestock impacts on water quality, no mud/manure drainage problems are present due to conservation techniques. (i.e. Heavy Use Area, Manure Compost Facility, etc.)
- ***Class II:*** Some Conservation Techniques are being used to address livestock impacts on water quality, but mud/manure and drainage problems are still present.
- ***Class III:*** No conservation techniques are being used to address livestock impacts on water quality, mud/manure and drainage issues are major concerns and/or grassed sacrificed areas are being used near or around perennial streams.
- ***Class IV:*** Non-agricultural land or forest land with no known livestock.

2015-2017 Milton Creek Focus Area Milestone and Timeline

2015 Condition:	As of June 30, 2015, there are 4,381 total acres in Class II and III; 21% of the assessed area.
Milestone:	By June 30, 2019: Decrease Class II and III acreage by 1,095 acres; 25% of the assessed area to increase Class I acreage to 3,213. From 10% to 15% of the total assessed area.

2017-2019 Milton Creek Focus Area Current Milestone and Timeline

2017 Condition:	As of June 30, 2017, there are 2,214 total acres in Class I; 52% of the assessed area.
Milestone:	By June 30, 2019: Increase Class I acreage by 222 acres (10% of assessed area) to achieve 2,436 Class I acres; 61% of the assessed area.
Note:	The Columbia SWCD adapted their strategy and decided to increase the Class I category instead of decreasing Class II and Class III acreage. They also re-assessed in 2017 the total acreage and had to change Class I, II and III acreage counts due to new information.

3.1.2.3 Sauvie Island Focus Area 2014-2019

The Sauvie Island Focus Area coincides with the Sauvie Island Drainage Improvement Company (SIDIC) boundary which is the 18-mile federal levee that encircles that jurisdiction. Sauvie Island, located 12 miles from downtown Portland and at the junction of the Willamette and Columbia rivers, contains the majority of agricultural land within the West Multnomah SWCD. Most of the agricultural lands on the 25,000-acre island are located on the southern half which is contained within levees and drained by the SIDIC. Farms on Sauvie Island can produce every type of cash crop grown in Oregon.

The Sauvie Island Focus Area was chosen because of the threat of excess nutrients and other pollutants entering groundwater and open waters. Groundwater within the SIDIC is always near the surface. Most of the cropped lands see groundwater fluctuations from zero (at the surface) in the winter time to a low of around 5-10 feet below the surface. In addition, soil drainage varies from poorly drained to well and even excessively well drained. The poorly drained soils coincided with old lake bottoms and are subject to groundwater near the surface. While the higher elevations of the island are much further from groundwater, the soils there are typically excessively well drained owing their origins as ancient sand dunes. As a result, most areas with the Sauvie Island Focus Area pose a potential risk to groundwater quality.

Additionally, all of the drainage/irrigation canals are hydraulically connected to groundwater. Most of the canals show significant biological activity during the summer months likely due to excess nutrients. While the island is relatively flat, it is still important for farmers to properly buffer canals and waterways. These buffers can filter water before it enters the canals and separate pesticide applications from open waters. Assessment results and progress can be found in section 4.1.2.3 and Tables 13 and 15.

Assessment Methodology

The SWCD completed a pre-assessment - classifying land conditions within the Focus Area by visually assessing, using GIS, and on-the-ground observations - the potential for farming activities to negatively impact water quality within the Focus Area. Parcels will be evaluated remotely using GIS and aerial photography to determine the "potential to impact water quality." Two primary data sets will be used.

1. Soils – this will be used for drainage class as well as a surrogate for depth to ground water based on the known soil forming factors on Sauvie Island.
2. Aerial photography – this will be used to determine proximity of practices that have a likelihood to impact water quality to open waters.

All parcels will be evaluated based on, drainage class, depth to ground water (closer to the water tables = higher likelihood) and proximity to waters of the state (closer = higher likelihood). Once pre-assessment is complete, evaluations will be based on site visits by SWCD, NRCS, or OSU staff and participation in programs aimed at reducing negative impacts from farming activities on water quality. The classes are described as follows:

Class I:	Low potential for impact to water quality (appropriate buffers, low fertilizer/pesticide inputs) OR has comprehensive nutrient management plan and practices to minimize movement of nutrients and pollution to ground water or waterways.
Class II:	Medium likelihood of negative impacts to water quality. Minimal buffers and practices to reduce impacts OR high impact operations far away from open water and well above ground water tables.
Class III:	High likelihood to impact water quality. No buffers, high impact operation with shallow groundwater. No practices to reduce negative impacts to water quality.
Class IV:	Not ag land.

2015-2017 Sauvie Island Focus Area Milestone and Timeline:

2015 Condition:	As of June 30, 2015 there were 945.5 total acres in Class I; 7.4% of the assessed area.
Milestone:	By June 30, 2017: Increase Class I acreage by 120 acres (10% of the assessed area) to achieve 1,065.5 Class I acres; 17.4% of the assessed area.

2017-2019 Sauvie Island Focus Area Current Milestone and Timeline

2017 Condition:	As of June 30, 2017, there are 1,039.5 total acres in Class I; 8.8% of the assessed area.

Milestone: By June 30, 2019: Increase Class I acreage by 100 acres (10% of the assessed area) to achieve 1,140 Class I acres; 18.8% of the assessed area.

3.1.2.4 Tillamook River Focus Area 2013-2019

The Tillamook River is approximately 17 miles long and 38,000 acres. Land use in the watershed is approximately 73 percent Forest, 19 percent Agriculture, 3 percent Urban, 3 percent Rural Residential and 2 percent Agriculture/Forest. The main agricultural uses include dairy, beef cows, horses, and chickens. There are approximately 160 agricultural tax lots in this area.

A TMDL for temperature and bacteria applies to the Tillamook River Watershed. The Tillamook River mainstem from the mouth to the headwaters and Fawcett Creek from the mouth of the headwaters were both identified as water quality limited under section 303(d) of the clean water act. In addition, the 2012 Oregon Water Quality Index shows a ten-year average status of 64 (poor), with bacteria and nitrogen being specific concerns. The Tillamook SWCD will improve water quality by working with landowners to reduce streamside agricultural impacts to allow streamside vegetation to establish and grow. Assessment results and progress can be found in section 4.1.2.1 and Tables 14 and 15.

Assessment Methodology
Stream temperature will be evaluated using riparian vegetation condition as a surrogate. For the pre-assessment, aerial photos and field verification were used to evaluate riparian vegetation condition using Classes I, II, and III and to determine if the vegetation is adequate to provide the functions as identified in the Area Plan and Rules. The post assessment will involve reclassifying properties where improvements have been made. The classes are described as follows:

Class I: Vegetation likely sufficient to moderate solar heating, stabilize streambanks, and filter out pollutants consistent with site capability.

Class II: Agricultural activities not impairing riparian growth, but vegetation likely insufficient to moderate solar heating, stabilize streambanks, or filter out pollutants consistent with site capability.

Class III: Agricultural activities likely not allowing vegetation to moderate solar heating, stabilize streambanks, or filter out pollutants consistent with site capability.

Class IV: Non-agricultural activities, e.g. state highway, likely not allowing vegetation to moderate solar heating, stabilize streambanks, or filter out pollutants consistent with site capability.

2013-2017 Tillamook River Focus Area Milestone and Timeline

2013 Condition: As of June 30, 2013 there are 14.0 stream miles in Class I; 30% of assessed area.
Milestone: By June 30, 2017: Increase Class I agricultural stream miles in the Tillamook River sub-watershed by 7.3 (17.8%) stream miles to achieve 21.3 Class I stream miles; 47.8% of the assessed area.

2017-2019 Tillamook River Focus Area Current Milestone and Timeline

2017 Condition: As of June 30, 2017, there are 15.2 stream miles in Class I; 37% of the assessed area.
Milestone: By June 30, 2019: Increase Class I (Vegetation likely sufficient to moderate solar heating, stabilize streambanks, and filter out pollutants consistent with site capability) agricultural stream miles in the Tillamook River sub-watershed by 7.3 (17.8%) stream miles to achieve 22.5 Class I stream miles; 55% of the assessed area.

3.1.3 Strategic Implementation Area

ODA is implementing a Strategic Implementation Area (SIA) approach in Oregon to help prevent and control water pollution from agricultural activities by working with agricultural landowners and natural resources partners in small watersheds. SIAs are priority areas where ODA identifies and aids those who may need assistance complying with water quality regulations. Through SIAs, ODA systematically conducts agricultural water quality outreach, measures land condition changes over time and conducts compliance efforts that may lead to enforcement.

ODA completed a characterization for watersheds at the 6th field hydrologic unit code (HUC) level statewide on agricultural lands. This characterization calculates scores for temperature, bacteria, nutrients, sediment, and aquatic species of concern (salmonid species and other native aquatic species endemic to Oregon) for each 6th field HUC with surface water and agricultural land. The scores are combined for comparison and allow ODA to identify high priority 6th field watersheds to be considered for SIAs. Currently there are three SIAs in the North Coast MA; see sections 4.1.3- 4.2.3 for evaluations and progress in the SIAs.

Measurable Objective
See sections 4.1.3- 4.2.3 and Tables 15-17 for evaluations and progress toward the measurable objective in the current Strategic Implementation Areas.

- Achieve 100% Compliance with Area Rules within SIAs.

3.1.3.1 Upper Nehalem River (Lundgren, Calvin, and Fishhawk Creeks) Strategic Implementation Area 2015-2016

The Upper Nehalem River Strategic Implementation Area includes three 6th field HUCs (Hydrologic Unit Codes) Lundgren Creek, Calvin Creek, and Fishhawk Creek. The agricultural portion is approximately 675 acres and consists mainly of pasture. Water quality concerns in the watershed are limited to temperature and nutrients but is limited to the data available.

3.1.3.2 Lower Nehalem River (Anderson Creek, Nehalem Bay, and Lower North Fork) Strategic Implementation Area 2016-2017

The Anderson Creek and Nehalem Bay watersheds in Tillamook County (approximately 23,655 total acres; approximately 2,520 agricultural acres) originate from the Nehalem River and flow west to the Pacific Ocean. Agricultural areas of the watershed consist mostly of dairy farms, ranches, small family farms, nurseries, and row crops. Water quality concerns in the watershed are for bacteria, stream temperature, and sedimentation.

3.1.3.3 Mid-Nehalem River (Cow-Creek Nehalem River, Humbug and Cronin Creeks) Strategic Implementation Area 2017-2018

The Humbug Creek, Cow Creek-Nehalem River, Cronin Creek-Nehalem River Watersheds with in Clatsop County consists of approximately 2,488 agricultural acres. Agricultural areas of the watershed consist mostly of hay, livestock (beef cows), small family farms, and ranches with horses. Water quality concerns in the watershed have been identified mainly for temperature.

3.2 Strategies and Activities

3.2.1 Strategies

1. Achieve a high level of awareness regarding the Area Plan and Area Rules among agricultural landowners, operators and the rural public in the North Coast Basin.
2. Establish, maintain, and protect healthy riparian streambank conditions on agricultural lands.
3. Manage drainage and irrigation ditches to protect waters of the state from soil erosion, sediment delivery, and sloughing.
4. Manage land conditions to prevent manure, nutrients, and other wastes from contaminating water resources.
5. Manage land conditions to reduce and control soil erosion and sediment transport.
6. Manage pesticide use to reduce the risk of contamination.

3.2.2 Activities

The activities provided in the following sections were determined by the ODA, the LAC, and the LMA as a means to achieving the objectives of the Area Plan. The activities outlined are to be carried out typically by the ODA and the LMAs (SWCDs). In the North Coast Watershed Management Area, the Clatsop. Columbia, Tillamook, and West Multnomah Soil and Water Conservation Districts are the primary LMAs and local experts and they work in collaboration with ODA in achieving the goals and objectives of the North Coast Area Plan. Agricultural landowners and operators are highly encouraged to participate in the listed activities on their own farms and or in cooperation with the SWCDs, watershed councils, and Management Area partners or through their different grower groups or agribusiness associations. See Appendix A for contact information.

Every two years, with recommendations from the LAC (provided during biennial reviews) and in consultation with ODA, the LMA will select from the activities outlined in sections 3.2.1-3.2.4 that best suit the capability, priorities, and resources of the LMA (SWCD). The LMA details the specific tasks they will implement in their Scope of Work and Focus Area Action Plan, which is submitted to the ODA every two years to receive funding for Area Plan implementation. It is also important that the ODA, the LMA, and Management Area partners consider working together to implement the activities in the Area Plan as opportunities, funding, and resources allow. See sections 4.1- 4.4 for accomplishments and progress towards implementing these activities.

3.2.2.1 Community and Landowner Engagement

A key component to achieving the goals of the Area Plan is working to engage the agricultural community in accomplishing the objectives outlined in this section. It is recommended that the ODA, the LMA, and Management Area partners develop, promote, and conduct events and activities that directly connect with the agricultural community. Activities should include a range of opportunities for agricultural landowners and operators to strengthen their knowledge and capacity to prevent and control water pollution from agricultural activities as well as provide information about specific agricultural water quality issues that are of concern in the North Coast. Moreover, events and activities conducted to engage the agricultural community can be used as a venue for notifying the agricultural community about news and opportunities related to water quality management as well as informing them of their responsibilities in preventing and controlling water pollution from agricultural activities.

The list of recommended activities outlined below are provided for the ODA, the LMA (SWCD), and Management Area partners to consider when putting together a strategy for community and landowner engagement or are planning an event or activity aimed at achieving the objectives of the Area Plan. Engaging the agricultural community should be considered at all levels from small to large-scale

commercial growers to family farms, dairies, equine facilities, and livestock operations. Events and activities should be structured to address the diverse agricultural systems and related water quality concerns found in the North Coast Management Area (Table 2 - Chapter 2).

The North Coast agricultural community has the best potential to engage agricultural landowners and operators in working toward achieving the goals and objectives of the Area Plan. The agricultural community is encouraged to participate in community engagement events and activities by supporting and participating in the activities outlined as well as share news and information related to agricultural water quality issues and solutions with others as opportunities become available through local grower groups and associations, agribusiness, the SWCDs, and Management Area partners. The following tasks and strategies are recommended at the local level and should be conducted in a manner that encourages cooperative efforts and promotes voluntary participation.

Focus

a) The North Coast Area Plan has identified bacteria, dissolved oxygen, sediment, and stream temperature as priority water quality parameters of concern (Tables 8 and 9 - Chapter 2). Events and activities related to water quality should have a focus on these water quality concerns whenever possible.

b) The North Coast Area Rules (PCMs in section 2.5) specify fundamental conditions for healthy riparian streambanks, soil erosion and sediment, drainage and irrigation ditches, tide-gates, irrigation water discharge and water use, and manure, nutrients, and agricultural waste management. Emphasis, when conducting events and activities related to agricultural water quality management, should include information regarding these management objectives whenever possible.

Tasks

a) Develop, promote, and conduct events or activities that function to:
- Increase awareness of agricultural water quality concerns related to the North Coast.
- Inform agricultural landowners and operators of the availability of technical assistance and farm planning public services available in the Management Area. Appendix A.
- Inform agricultural landowners and operators of the availability of cost-share and conservation programs available in the Management Area. Appendix I.
- Inform agricultural landowners and operators of their responsibilities toward preventing and controlling water pollution and soil erosion from agricultural activities. Section 2.4.
- Inform the agricultural community of the goals and objectives of the Area Plan. Section 3.2.

b) Develop, promote, and conduct events or activities that function to strengthen the knowledge and capacity of agricultural landowners and operators:
- To prevent and control water pollution from agricultural activities.
- To prevent and control soil erosion from agricultural activities.
- To self-evaluate their agricultural operation and their impacts to water quality from agricultural activities.

c) Develop an outreach strategy to inform the agricultural community of issues and events related to agricultural water quality prevention and control. This includes but is not limited to the distribution of informational material, interactions on social media, hosting a web page, creating a quarterly newsletter, and submitting public service announcements to local sources of news and communications.

d) Produce and or distribute informational material such as brochures, videos, and fact sheets related to the prevention and control of water pollution from agricultural activities.

e) Increase awareness of the agricultural community's efforts at water quality management and demonstrate successful and innovative efforts toward preventing and controlling water pollution from agricultural activities.

3.2.2.2 Technical Assistance

Providing agricultural landowners and operators with one-on-one technical assistance and consultation should be a core activity developed by the LMA. Dedicated staff-time, training, technical resources, and equipment should be made available at the LMA level in order to build an agricultural water quality program that works to achieve the goals and objectives of the Area Plan.

The ODA can provide technical assistance, however the LMA (SWCD) is a non-regulatory partner and a local source of expert knowledge and are more capable to serve the Management Area's agricultural community in this capacity. The ODA, the LMA, and Management Area partners should work together whenever possible to provide a strong foundation of technical support and site-specific evaluations that work to strengthen the ability and capacity of agricultural landowners and operators to solve water quality management challenges.

Effective water quality management depends on activities and structural measures that are the most effective, practical means of controlling and preventing pollution from agricultural activities. Appropriate management activities for individual farms may vary with the specific cropping, topographical, environmental, and economic conditions at a given site and should fit within a framework of economic profitability and agricultural viability. Technical assistance should also be carried out in a manner that encourages the agricultural landowner or operator to work cooperatively and participate in the voluntary efforts necessary to accomplish the Area Plan's goals and objectives.

Agricultural landowners and operators are encouraged to participate in technical assistance activities by supporting and participating in the activities outlined in section 3.2.2 as well as providing guidance and direction on local agricultural water quality concerns and solutions to ODA, the LMA, agribusiness associations, and Management Area partners. Serving as an LAC member or on an SWCD or watershed council board and participating in local grower groups and agribusiness associations are ways to contribute. The North Coast agricultural community is the best resource for local and specialized technical information related to agricultural management practices. Agricultural landowners and operators are encouraged to share their practical working knowledge of farming practices that work toward the prevention and control of water pollution with others who would benefit. Sections 2.5.1-2.5.8 and Appendix B and C provide basic guidelines for preventing and controlling water pollution from agricultural activities. Appendix A provides contact information for educational and technical guidance related to natural resources and farm management.

Focus
The scope of technical assistance, specifically provided by the LMA, should include a range of information applicable to the local agricultural systems found in the Management Area (Table 2 - Chapter 2) and should be:

- Focused on agricultural water quality management,
- Flexible to provide options for the landowner or operator to choose from or adapt to,
- Tailored and scaled to the agricultural operation or activity,
- Technically sound,
- Planned for operational efficiency,
- Emphasizes long-term solutions,
- Economically feasible to implement successfully, and

- Strengthens the ability for agricultural landowners and operators to self-evaluate their agricultural operation and their impacts to water quality from agricultural activities.

Tasks
Listed below are some recommendations for technical assistance activities:

a. Provide one-on-one technical assistance and consultation to agricultural landowners and operators regarding the prevention and control of water pollution and soil erosion from agricultural activities. Appendices B and C.
b. Provide on-site evaluations for agricultural landowners and operators to identify potential water quality concerns and recommend solutions that prevent and control water pollution and soil erosion from agricultural activities. Appendices B and C.
c. Provide assistance to agricultural landowners and operators who would like to develop and implement a conservation farm or ranch plan including but not limited to nutrient management plans, pasture management plans, soil health management, and irrigation water management.
d. Provide technical assistance for the development, implementation, and maintenance of on-the-ground projects that prevent and control water pollution and soil erosion from agricultural activities. Appendices B and C.
e. Assist agricultural landowners and operators by providing information on funding opportunities as well as assistance in applying and enrolling in cost-share programs as needed. Appendix I.
f) Develop, promote, and conduct events or activities that function to strengthen the knowledge and capacity of agricultural landowners and operators. See section 3.2.1.
    - To prevent and control water pollution from agricultural activities.
    - To prevent and control soil erosion from agricultural activities.
    - To self-evaluate their agricultural operation and their impacts to water quality from agricultural activities.

3.2.2.3 Biennial Review of the North Coast Area Plan

Every two years the ODA will conduct a review of the progress made toward achieving the Area Plan's mission, goals, and objectives. The ODA will administer the Area Plan, coordinate the LAC, and work with the LMA to conduct the biennial review meeting/s.

Tasks
Activities to be carried out for the biennial review:

a) Adapt and modify the Area Plan to accommodate recently identified challenges, new data, new information, and shifting priorities.
b) Convene the LAC members and recruit new members as needed.
c) Compile and report the most recent results of ODA's compliance actions in the North Coast.
d) Review progress and achievements toward the Area Plan's goals and objectives by ODA, the LMA, and Management Area partners by tracking outputs and reporting accomplishments.
e) Analyze available water quality monitoring data and report the status and trends indicated.
f) Evaluate and measure progress toward achieving the Area Plan's goals and objectives by setting and evaluating milestones, describing outcomes, and developing measurable objectives.
g) Deliberate and troubleshoot impediments to achieving the goals and objectives of the Area Plan.

3.2.2.4 Partnerships

An essential activity to achieving the mission of the Area Plan is for ODA and the LMA to work in association with Management Area partners, local agencies, stakeholders, grower groups, and agribusiness associations as well as encourage individual agricultural landowners and operators to engage in local partnerships and efforts that work toward similar goals and objectives described in the Area Plan.

There are several benefits to bringing together individuals and groups to participate in common efforts and mutual activities such as collective resources, diverse expertise, and shared funding. It is recommended as time, opportunities, and funding allow, that ODA and the LMA collaborate and participate in partner efforts to improve water quality in agricultural and rural lands of the North Coast.

Tasks
Facilitate and collaborate with Management Area partners to conduct activities such as landowner and community engagement events, provide technical assistance, attend the biennial review of the Area Plan, assist with strategic initiatives, and collaborate in water quality monitoring.

3.3 Monitoring and Evaluation

Monitoring is an essential activity to tracking the status and trend of water quality in the North Coast as well as understanding the influences landscape conditions have on water quality. Data collected from monitoring efforts can be useful in developing measurable objectives that measure changes in environmental conditions. Data can also be utilized in software applications that model landscape conditions. Additionally, data analysis and results can be informative in determining if goals and objectives of the Area Plan are being achieved.

Water quality monitoring must be performed using quality assurance procedures and specialized equipment that takes funding, time, and resources to accomplish. Monitoring water quality and landscape conditions, for the purposes of the Area Plan, is recommended as an activity to be carried out and collaborated on by the ODA, the LMA and Management Area partners. Currently, water quality monitoring is occurring throughout the North Coast Basin. Refer to section 4.3.1 for a description of monitoring and evaluation results.

Tasks
Listed below are recommendations for monitoring activities that may be completed as opportunities, funding, and resources allow:

a) Develop a water quality-monitoring plan that works to achieve long-term baseline data collection and allows for ease in sharing data with partners and collaborating with other monitoring efforts.
b) Develop quality control plans to guarantee that data collected can be used for the intended purposes and analysis with confidence.
c) Perform water quality monitoring for a set of selected water quality parameters to establish a baseline of water quality data.
d) Characterize bacteria concentrations, sediment, and stream temperature during periods of base flow and storm events.
e) Evaluate Light Detection and Ranging (LiDAR) information to understand vegetative conditions along streams in agricultural areas
f) Identify data gaps that are needed to fully understand influences and changes in water quality.
g) Consider applying for grants or partnering with others to fund and implement monitoring efforts.
h) Consider a monitoring project that seeks to innovate or sample new approaches to measuring water quality conditions or generates new technology or software to monitor environmental changes related to water quality.

Chapter 4: Implementation, Monitoring, and Adaptive Management

4.1 Progress Toward Measurable Objectives and Strategic Initatives

Measurable objectives allow the Ag Water Quality Program to better evaluate progress towards improved water quality. 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.

4.1.1 Management Area

The Oregon Department of Agriculture, LAC, and LMA are working to establish measurable objectives and associated milestones. Many of these measurable objectives relate to land conditions and primarily are implemented through focused work in small geographic areas (section 4.1.2), with a long-term goal of developing measurable objectives and monitoring methods at the Management Area scale. At this time, there have been no measurable objectives at the Management Area scale developed.

4.1.2 Focus Area(s)

Oregon Department of Agriculture approved Focus Area Action Plans (FAAP) for each of the four SWCDs in the North Coast MA. The FAAPs all outline key components of the Focus Area approach. The SWCDs reported the results to ODA at the end of the fiscal biennium. Sections 4.1.2.1 – 4.1.2.4 provide results and progress of the North Coast Focus Areas. Tables 11-14 present a summary of the SWCD's assessment results. Table 15 provides a cumulative summary of the SWCD's tracked outputs and accomplishments. These numbers reflect all the work completed and reported by the SWCDs from July 1, 2013 – June 30, 2017. Figure 3 (located in Chapter 2) displays where Focus Areas are located. For Focus Area project descriptions, refer to sections 3.1.2. – 3.1.2.4.

4.1.2.1 Lewis and Clark Valley Focus Area 2015-2019

2015-2017 Lewis and Clark Valley Focus Area Milestone and Timeline

2015 Condition:	As of June 30, 2015, there were 75.73 total acres in the Grass Ag and Bare Ag SVA mapping categories; 15.9% of the assessed area.
Milestone:	By June 30, 2017: Decrease Grass Ag and Bare Ag acreage along agricultural streams in the Lewis and Clark Valley sub-watershed by 10.73 acres (0.4%) and reduce to 65 Grass Ag and Bare Ag acres; 14% of the assessed acreage.

2017-2019 Lewis and Clark Valley Focus Area Current Milestone and Timeline

2017 Condition:	As of June 30, 2017, there are 36.4 total acres in the Shrub SVA mapping category; 9% of the assessed area.
Milestone:	By June 30, 2019: Increase Shrub acreage along agricultural streams in the Lewis and Clark Valley sub-watershed by 2 acres (0.4%) to achieve 38.4 Shrub acres; 42.4% of the assessed area.
Note:	The Clatsop SWCD adapted their strategy and decided to increase the Shrub category instead of decreasing Grass Ag and Bare Ag acreage.

Progress: During the 2015-2017 biennium, the milestone was not achieved due to staff changes. However, progress was made on their milestone and Bare Ag and Grass Ag were reduced to 72.4 acres. They also

Table 10: Lewis and Clark Valley Focus Areas (Ongoing to 2019-Clatsop SWCD) Summary of Milestones and Progress July 1, 2015 – June 30, 2017 Streamside Vegetation Assessment Total Agricultural Stream Acres Assessed: 240.3				
Acres assessed:	**Pre-Assessment-2015**	**Post Assessment-2017**	**Post Assessment-2019**	**Progress to 2017**
Ag Infrastructure	23.3 acres	23.3	TBD	No Change
Bare	6.5	7.9	TBD	Increased by 1.4 acres
Bare Ag	2.7	2.7	TBD	No Change
Grass	21.9	20.6	TBD	Decreased by 1.3 acres
Grass Ag	72.1	69.7	TBD	Decreased by 2.4 acres
Shrub	33.4	36.4	TBD	Increased by 3.0 acres
Shrub Ag	0.0	0.0	TBD	No Change
Tree	79.5	79.7	TBD	Increased by 0.2 acres
Tree Ag	0.0	0.0	TBD	No Change

increased the Shrub category by 3 acres. The Clatsop SWCD has completed an updated Lewis and Clark Valley Focus Area Action Plan and submitted to ODA for the 2017-2019 biennium. The District intends to keep building on their previous year's work, however, after reviewing their assessment methodology and results, they have adapted their milestone to reflect changes in Shrub acreage instead of Bare Ag and Grass Ag. Previous 2015-2017 milestone is no longer applicable.

4.1.2.2 Milton Creek Focus Area 2014-2019

2015-2017 Milton Creek Focus Area Milestone and Timeline

2015 Condition: As of June 30, 2015, there are 4,381 total acres in Class II and III; 21% of the assessed area.

Milestone: By June 30, 2019: Decrease Class II and III acreage by 1,095 acres; 25% of the assessed area to increase Class I acreage to 3,213. From 10% to 15% of the total assessed area.

2017-2019 Milton Creek Focus Area Current Milestone and Timeline

2017 Condition: As of June 30, 2017, there are 2,214 total acres in Class I; 52% of the assessed area.

Milestone: By June 30, 2019: Increase Class I acreage by 222 acres (10% of assessed area) to achieve 2,436 Class I acres; 61% of the assessed area.

Note: The Columbia SWCD adapted their strategy and decided to increase the Class I category instead of decreasing Class II and Class III acreage. They also re-assessed in 2017 the total acreage and had to change Class I, II and III acreage counts due to new information.

Progress: During the last biennium, the milestone was not achieved due to lack of willing landowner engagement. Due to a re-evaluation of the FA, the classes were updated to reflect new information and Class I was increased by 96 acres (4.5%). Class II decreased by 373 acres (16.5% reduction) and Class III decreased by 30 acres (14.2% reduction). *See Table 11. The Columbia SWCD has completed an updated Milton Creek Focus Area Action Plan and submitted to ODA for the 2017-2019 biennium. The District intends to keep building on their previous year's work because there are still issues in Focus Area and their efforts in the Focus Area are beginning to become known and more successful. They also adapted and drafted a new milestone to reflect the updated acres. Previous 2015-2017 milestone is no longer applicable.

Table 11: Milton Creek Focus Areas (Ongoing to 2019-Columbia SWCD) Summary of Results, Milestones and Progress July 1, 2013 – June 30, 2017 Livestock Impacts Classification Total Agricultural Acres Assessed: 4,286					
Class:	**Pre-Assessment - 2014**	**Post Assessment-2015**	*** Post Assessment-2017**	**Post Assessment-2019**	**Progress to 2019**
Class I	2,118 acres	2,118	2,214	TBD	TBD
Class II	2,263	2,263	1,890	TBD	TBD
Class III	212	212	182	TBD	TBD

Class I	**Class II**	**Class III-**
Conservation techniques are used to address livestock impacts on water quality, no mud/manure drainage problems are present due to conservation techniques.	Some Conservation Techniques are being used to address livestock impacts on water quality, but mud/manure and drainage problems are still present.	No conservation techniques are being used to address livestock impacts on water quality, mud/manure and drainage issues are major concerns and/or grassed sacrificed areas are being used near or around perennial streams.

4.1.2.3 Sauvie Island Focus Area 2014-2019

2015-2017 Sauvie Island Focus Area Milestone and Timeline:

2015 Condition: As of June 30, 2015 there were 945.5 total acres in Class I; 7.4% of the assessed area.

Milestone: By June 30, 2017: Increase Class I acreage by 120 acres (10% of the assessed area) to achieve 1,065.5 Class I acres; 17.4% of the assessed area.

2017-2019 Sauvie Island Focus Area Current Milestone and Timeline

2017 Condition: As of June 30, 2017, there are 1,039.5 total acres in Class I; 8.8% of the assessed area.

Milestone: By June 30, 2019: Increase Class I acreage by 100 acres (10% of the assessed area) to achieve 1,140 Class I acres; 18.8% of the assessed area.

Progress: The WMSWCD fell just short of their milestone and Class I was increased by 94.1 acres. The West Multnomah SWCD completed an updated Sauvie Island Focus Area Action Plan and submitted to

Table 12: Sauvie Island Focus Area (Ongoing to 2019-West Multnomah SWCD) Summary of Milestones and Progress July 1, 2013 – June 30, 2017 Land Use Classification Acres Assessed: **11,701**				
Class:	**Post Assessment-2015**	**Post Assessment-2017**	**Post Assessment-2019**	**Progress to 2017**
Class I	945.5 acres	1,039.5	TBD	Increased by 94.1
Class II	10,724	10,639.6	TBD	Decrease by 94.1
Class III	31.4	31.4	TBD	No Change

Class I	**Class II**	**Class III**
Low potential for impact to water quality (appropriate buffers, low fertilizer/pesticide inputs) OR has comprehensive nutrient management plan and practices to minimize movement of nutrients and pollution to ground water or waterways.	Medium likelihood of negative impacts to water quality. Minimal buffers and practices to reduce impacts OR high impact operations far away from open water and well above ground groundwaters.	High likelihood to impact water quality. No buffers, high impact operation with shallow groundwater. No practices to reduce negative impacts to water quality.

ODA for the 2017-2019 biennium. The District decided to continue on this path because of their efforts are starting to result in more interest. The District intends to keep building on their previous year's work and continue working to increase Class I acreage.

4.1.2.4 Tillamook River Focus Area 2013-2019

2013-2017 Tillamook River Focus Area Milestone and Timeline

2013 Condition: As of June 30, 2013, there are 14.0 stream miles in Class I; 30% of assessed area.
Milestone: By June 30, 2017: Increase Class I agricultural stream miles in the Tillamook River sub-watershed by 7.3 (17.8%) stream miles to achieve 21.3 Class I stream miles; 47.8% of the assessed area.

2017-2019 Tillamook River Focus Area Current Milestone and Timeline

2017 Condition: As of June 30, 2017, there are 15.2 stream miles in Class I; 37% of the assessed area.
Milestone: By June 30, 2019: Increase Class I (Vegetation likely sufficient to moderate solar heating, stabilize streambanks, and filter out pollutants consistent with site capability) agricultural stream miles in the Tillamook River sub-watershed by 7.3 (17.8%) stream miles to achieve 22.5 Class I stream miles; 55% of the assessed area.

Table 13: Tillamook River Focus Area (Ongoing to 2019-Tillamook SWCD)
Summary of Milestones and Progress July 1, 2013 – June 30, 2017
Riparian Condition Classification Stream Miles Assessed: **41**

Class:	Pre-Assessment-2013	Post Assessment-2015	Post Assessment-2017	Post Assessment-2019	Progress to 2017
Class I	14 stream miles	15.2	15.2	TBD	Increase by 1.2
Class II	5	4.4	4.4	TBD	Decrease by 0.6
Class III	22	21.4	21.4	TBD	Decrease by 0.6

Class I	Class II	Class III
Vegetation likely sufficient to moderate solar heating, stabilize streambanks, and filter out pollutants consistent with site capability.	Agricultural activities not impairing riparian growth, but vegetation likely insufficient to moderate solar heating, stabilize streambanks, or filter out pollutants consistent with site capability.	Agricultural activities likely not allowing vegetation to moderate solar heating, stabilize streambanks, or filter out pollutants consistent with site capability.

Progress: The Tillamook SWCD did not achieve the milestone, however, progress was made on their milestone and Class I was increased by 1.2 stream miles. The Tillamook SWCD completed an updated Tillamook River Focus Area Action Plan and submitted to ODA for the 2017-2019 biennium. The District has decided to continue on with the milestone because they still have areas they would like to see improved. The District intends to keep building on their previous year's work to increase the number of Class I stream miles.

Table 14 provides a cumulative summary of the SWCD's tracked outputs and accomplishments in the Focus Areas.

4.1.3 Strategic Implementation Areas

Sections 4.1.3- 4.2.3 and Tables 15-17 reflect the evaluation results and current status of SIAs in the North Coast completed by ODA. Figure 3 (located in Chapter 2) displays where SIAs are located.

Table 14: North Coast Focus Areas Summary of Activities and Accomplishments July 1, 2015 – June 30, 2017					
Activity	**Lewis and Clark Valley**	**Milton Creek**	**Tillamook River**	**Sauvie Island**	**Cumulative Total 2013-2017**
Landowners Contacted (*mailings*)	18	0	69	38	**1,594**
Workshops/ Presentations	0	2	1	1	**6**
Total Attendees to Workshop and Presentations	0	6	8	3	**82**
Fact sheets and Brochures Distributed	0	0	10	0	**10**
Landowners Provided with Technical Assistance	14	29	15	27	**163**
On-Site Evaluations	16	19	16	29	**135**
Fund Applications for Landowner Projects	2	1	0	0	**4**
Water Quality Projects Implemented	2	0	9	7	**27**
Conservation Plans	0	0	1	7	**21**
Total Acres in Conservation Plans	0	0	277.3	177.8	**2,527**
North Coast Focus Areas Applied Conservation Practices 2015-2017					
Applied Practices			**Approximate Units**		
Access Control – Lewis and Clark FA			1,050 feet (Clatsop SWCD-OWEB)		
Riparian Planting - Lewis and Clark FA			670 feet (Clatsop SWCD-OWEB)		
Cover Crops – Sauvie Island FA			38.5 acres (WMSWCD-NRCS (CIS)-OSU)		
Nutrient Management Planned/ Applied – Tillamook River FA			928.3 acres (Tillamook SWCD-NRCS (EQIP))		

Description of Concern Levels (discussed in Tables 15-17):

Potential Violation: Likely potential for agricultural activities to impair surface or ground water or agricultural activities may be preventing adequate vegetation along streams (field verified) or field verified likely violation such as discharge of agricultural waste into waters of the state or active removal of riparian vegetation.

Opportunities for Improvement: Possible potential for agricultural activities to impact surface or ground water or agricultural activities may be preventing adequate vegetation along streams.

Limited Opportunities for Improvement: No water quality concerns related to agricultural activities were observed or minimal potential for agricultural activities to impact surface or ground water or vegetation along streams may be inadequate but unable to determine if agricultural activities are limiting vegetation.

4.1.3.1 Upper Nehalem River Strategic Implementation Area 2015-2016

Open house was held January 27, 2017 and twenty landowners attended. In 2016, two landowners were assisted with ODA SIA funding through the Columbia SWCD and Upper Nehalem Watershed Council. Projects included fence relocation and riparian plantings along the Nehalem River and Fishhawk Creek. In 2017, ODA's technical assistance funding was awarded to Columbia SWCD to restore functions to Fishhawk Creek with bioengineering and additional riparian plantings. Project will address legacy impacts from grazing.

Table 15: Summary 2015-2016 Upper Nehalem River Lundgren, Calvin, and Fishhawk Creeks SIA		
Concern Level	**Evaluation Results**	
Potential Violation	0	
Opportunities for Improvement	1	
Limited Opportunities for Improvement	133	
Total Assessed Tax Lots	134	
Summary of Investigated Cases		
Cases Opened	**Closed**	**Open to Date *(4/18)***
13	12	1

Table 16: Summary 2016-2017 Lower Nehalem River Anderson Creek, Nehalem Bay, and North Fork Nehalem River SIA		
Concern Level	**Evaluation Results**	
Potential Violation	0	
Opportunities for Improvement	9	
Limited Opportunities for Improvement	999	
Total Assessed Tax Lots	1,008	
Summary of Investigated Cases		
Cases Opened	**Closed**	**Open to Date** *(5/29/18)*
9	9	0

4.1.3.2 Lower Nehalem River Strategic Implementation Area 2016-2017

Open house was held January 27, 2017, and twenty landowners attended. One hundred percent compliance was achieved at the end of project date.

4.1.3.3 Mid-Nehalem River Strategic Implementation Area 2017-2018

Open house was held April 4, 2018, and ten landowners attended. Clatsop SWCD was awarded ODA SIA funding for technical assistance and landowner engagement and is currently drafting a landowner engagement strategy.

Table 17: Summary 2017-2018 Mid-Nehalem River Cow-Creek Nehalem River, Humbug and Cronin Creeks SIA		
Concern Level	**Evaluation Results**	
Potential Violation	1	
Opportunities for Improvement	11	
Limited Opportunities for Improvement	582	
Total Assessed Tax Lots	594	
Summary of Investigated Cases		
Cases Opened	**Closed**	**Open to Date** *(4/18)*
To Be Determined	To Be Determined	To Be Determined

4.2 Activities and Accomplishments

4.2.1 Management Area Accomplishments

Section 4.2.2 provides a brief summary by the LMAs and Management Area Partners in the North Coast Management Area presenting their accomplishments towards implementing the activities outlined in section 3.2. Table 14 is an approximate summary of the LMAs' accomplishments and reflect all the work completed and reported by the LMAs from July 1, 2015 – June 30, 2017.

4.2.1.1 Clatsop SWCD

The Clatsop SWCD provided the most technical assistance and site evaluations for riparian and native plantings, flooding, and streambank stability. The District found that the most challenging concerns they encountered in the last biennium was related to landowners that have too many animals on too few acres and engaging small hobby farmers and horse owners.

The District worked cooperatively with Management Area partners to accomplish projects that improve water quality specifically the OWEB, NRCS and ODA. Project Highlights:

- Construction of a manure storage building for a horse and sheep farm,

- Installation of a heavy use area for horses.

The Clatsop SWCD works to engage landowners by writing and distributing a quarterly newsletter that provides information and news related to mostly water quality issues in Clatsop County.

2015-2017 Events:

- Clatsop County Fair 2015, 2016, 2017
- Clatsop County Horsefest 2016, 2017
- Brownsmead Cornfeed 2017

4.2.1.2 Columbia SWCD

The Columbia SWCD provided the most technical assistance and site evaluations for mud and manure management on agricultural lands. This is a large concern in their area and landowners are looking for and willing to listen to how changes can occur by improving this management techniques. The District found that the most challenging concerns they encountered in the last biennium was related to financing mud and manure solutions for landowners. These issues can be resolved with less animals and a place to move the animals off the pasture during the wet season. While sacrifice areas do help, it still creates muddy areas in the field. Heavy use pads can prevent a muddy situation, however, rocking is a better but more expensive solution. Small grants help but they usually do not cost-share enough money for landowners to have a feasible opportunity to make a change, especially if they are lowering their livestock numbers, which lowers their income.

Due to the nature of their challenges, implementing projects becomes difficult when the finances are not there to complete. However, one heavy use pad has been implemented with no funds from the District other than technical assistance on one property. What is exciting about this project is the landowner came in for a concern in forestland, and when the site visit happened, they realized their issues on their forestland were minimal compared to the mud and manure they had by the creek. This motivated them to build a heavy use pad for their animals immediately, which provided instant benefit to the stream.

The Columbia SWCD works to engage landowners with several different outreach techniques that directly relate to agricultural water quality. Their social media accounts are active and they typically post information on weeds, conservation techniques, and seminars promoting conservation relating to ag water quality.

2015-2017 Events:

- Pasture Management Class
- Small Market Operator Workshop

4.2.1.3 Tillamook SWCD

The Tillamook SWCD provided the most technical assistance and site evaluations for soil erosion and nutrient management. The District focused on rural lands with tree and shrub establishment in the riparian area and sharing information and resources through programs and incentives to agriculture producers. The District found that the most challenging water quality concern they faced in the last biennium was related to nutrient management and manure storage. For this, they focused on assisting landowners in tracking applications and ensuring nutrients are applied at an agronomic rate.

The District worked cooperatively with Management Area partners to accomplish projects that improve water quality; specifically, the Tillamook County Creamery Association, Tillamook Estuaries Partnership, OWEB, DEQ and ODA. Project Highlights:

- Miami River: Tillamook SWCD, along with their partners, fenced 6, 600 feet of riparian area. Followed by invasive species removal and revegetation, which resulted in five acres of tree and shrub establishment.
- Nestucca River: Tillamook SWCD installed 13,000 feet of animal exclusion fencing that will prevent future bank erosion from livestock.

The Tillamook SWCD works to engage landowners and put a place holder on their website for the water quality Area Plan as well as brochures about nutrient and water management. They also write and distribute a newsletter twice a year that updates the District's accomplishment and projects.

2015-2017 Events:

- Tillamook County Fair 2015, 2016, 2017
- Advanced Manure Management Workshop
- "ODARK" Online decision making and record keeping workshop
- Pasture Management Workshop
- Sandlake Tour of Ag Conservation Practices
- Farm, Fish, and Forestry – (Key Speaker)
- Tillamook Farm Bureau presentation 2017
- Tillamook SWCD Port of Nehalem presentation

4.2.1.4 West Multnomah SWCD

The West Multnomah SWCD provided the most technical assistance and site evaluations for livestock management and soil health. The soil health program has been a big success on Sauvie Island. To date they have worked with 15 farms and planted over 130 acres of cover crops. During the timeframe of this review they added five new farms and planted 25 new acres. The result is fewer nutrient inputs and more retention of those inputs in the fields.

West Multnomah SWCD maintains a vibrant and changing web presence on a wide variety of water-related topics relevant to agricultural operations. These include web pages on organic and conventional farming (detailing how to reduce the use of fertilizers and chemicals that can enter nearby streams), horses and livestock (detailing issues such as fencing livestock from streams and fertilizer/manure management and runoff), pasture management (also covering over-fertilizing issues that can affect nearby water bodies) and our Healthy Streams Program.

The objective of the Healthy Streams Program on Sauvie Island's agricultural lands is to improve water quality and reduce invasive plant species, tillage, and livestock use that occur directly adjacent to waterways, which contributes to erosion and sedimentation. A wide variety of brochures, water quality reports, fact sheets and blog posts are also available on our website, covering additional topics that can affect water quality, such as maintaining and repairing well water systems, erosion and storm water management.

The District's partnership with NRCS and OSU extension to implement the WMSWCD Soil Health Program and the Clackamas & Multnomah County Soil Health CIS has been very effective over the last several years. While our outreach efforts have been largely disappointing, the implementation side of these programs has been above expectations.

2015-2017 Events:

- Farmer's Lunch 2016
- Soil School 2016, 2017

Table 18: LMA's Cumulative Reporting of Activities and Accomplishments Progress Toward Work Plan Activities and Measurable Objectives *This table is a combined total of accomplishments completed by Clatsop, Columbia, Tillamook and West Multnomah SWCDs* **July 1, 2015 – June 30, 2017**. Does not include Focus Area accomplishments (see Table 14).			
Community and Landowner Engagement Events and Activities.	**2013-2015**	**2015-2017**	**Cumulative Total 2013-2017**
Community and Landowner Events and Activities	64	**26**	70
Total Attendees to all Events and Activities	3,041	**3,974**	7,015
Fact Sheets/ Brochures Developed	3	**1**	4
Fact Sheets and Brochures Distributed	1,778	**2,303**	4,081
Newsletters	4,659	**1,218**	5,877
Technical Assistance	**2013-2015**	**2015-2017**	**Cumulative Total 2013-2017**
Landowners Provided with Technical Assistance	1,819	**553**	2,372
On-Site Evaluations	364	**281**	645
Fund Applications Submitted for Projects	26	**19**	45
Voluntary Conservation Plans Prepared	49	**12**	61
Total Acres in Conservation Plans	7,098	**2,831**	9,020

2015-2017 Applied Practices	**Units**	**Watershed**
Access Road	486 feet	Sand Creek sub-watershed
Conservation Nutrient Management Plan	2,743 acres	Trask, Lower Tillamook, Kilchis, Nehalem, Wilson, Miami, and Nestucca Rivers
Fencing – Livestock Exclusion	31,448 feet	Headwaters Nestucca, Middle Fork of NF Trask and Miami Rivers; Sand Creek; Netarts Bay
Forage and Biomass Planting	38.5 acres	Headwaters Nestucca River
Irrigation Water Management	1 project	Elk Creek-Nestucca River
Nutrient Management Application	33 landowners covering 6,239 acres in Tillamook County	
Open Channel	132 feet	Netarts Bay sub-watershed
Riparian Plantings	14.81 miles	Gnat Creek sub-watershed
Streambank and Shoreline Protection	0.13 acre and 975 feet	Coon and Bear Creek sub-watersheds; Columbia and Clatskanie River watersheds
Tree Shrub Establishment	17.34 acres	Miami and Nehalem River watersheds
Waste Storage	600 feet	Gnat Creek sub-watershed

4.2.2 Management Area Partnerships

Oregon Department of Agriculture

Confined Animal Feeding Operation Program (CAFO)

The Oregon Department of Agriculture issues a Confined Animal Feeding Operation (CAFO) permit to livestock owners so manure does not pollute ground and surface water.

There are three main factors that determine if your farm needs a CAFO permit:

1. How many animals you have.
2. How long the animals are confined in a prepared area (e.g. in a barn, lot, pen).
3. How the manure and wastewater generated by the farm is stored (e.g. do you collect your manure in a tank or do you stack it in a pile).

Go online for more information:

https://www.oregon.gov/ODA/programs/NaturalResources/Pages/CAFO.aspx

Oregon Department of Agriculture

Pesticide Management Plan

The ODA Pesticides and Fertilizer Program holds the primary responsibility for pesticide registration and use regulation within the state of Oregon under the Federal Insecticide Fungicide Rodenticide Act. As the EPA designated the state as the lead agency for pesticides, ODA is responsible for overseeing the development and implementation of a Pesticide Management Plan (PMP) for the state of Oregon as stipulated in the annual EPA/ODA Consolidated Pesticide Cooperative Agreement. The PMP sets forth a process for preventing and responding to pesticide detections in Oregon's ground and surface water resources by managing the pesticides that are currently approved for use by EPA in both the agricultural and non-agricultural settings. Pesticides that are no longer marketed, also called "legacy" pesticides, are regulated through a separate process under the Clean Water Act. The PMP 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.

Oregon Department of Environmental Quality

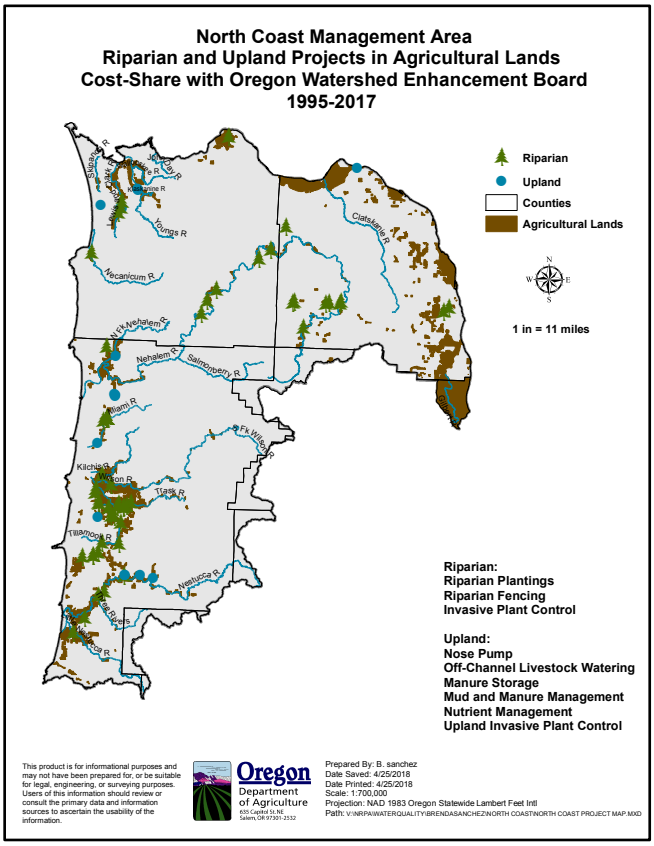
North Coast Water Quality Status and Action Plan

DEQ has undertaken a watershed approach to assist in managing water quality in the state of Oregon. This approach provides a broad assessment of the status of water quality and other environmental indicators within a basin, greater opportunities for stakeholder involvement and interagency coordination. The North Coast Water Quality Status and Action Plan consist of a status report and an action plan that summarizes the important water quality problems and the strategies needing to be implemented. Together these two "halves" of the plan will allow for the adaptive management of water quality in this geographic area.

Figure 4: North Coast Riparian and Upland Projects Funded by OWEB

Oregon Watershed Enhancement Board

The Oregon Watershed Enhancement Board (OWEB) is a state agency that provides grants to help Oregonians take care of local streams, rivers, wetlands and natural areas. Community members and landowners use scientific criteria to decide jointly what needs to be done to conserve and improve rivers and natural habitat in the places where they live. OWEB grants are funded from the Oregon Lottery, federal dollars, and salmon license plate revenue. The agency is led by a 17-member citizen board from the public at large, tribes, and federal and state natural resource agency boards and commissions. Since 1995, OWEB has funded approximately 76 riparian and upland water quality improvement projects on agricultural lands in the North Coast MA (Figure 4).



4.3 Monitoring—Status and Trends

4.3.1 Water Quality

At each biennial review, DEQ assesses the status and trends of water quality in relation to water quality standards. DEQ has provided a status and trend report to ODA for the North Coast Basin.

Analysts retrieved data from DEQ, EPA, and USGS databases. Many other organizations provided data that were queried and evaluated for use in this report (see Appendix A). Data collected between January 2000 and January 2018 were included in this report. Parameters included in the query were temperature, pH, dissolved oxygen, total suspended solids, total phosphorus, and bacteria. Monitoring stations that had at least two years of recent data and/or at least eight years of data fit the criteria to assess status and trends. The North Coast Basin has 40 monitoring stations with sufficient data to assess status and/or trends out of 698 total monitoring stations within the North Coast AgWQ Management Area. Sauvie Island did not have any water quality monitoring stations. Seven stations are summarized and presented below in Table 19. See full report online at:
https://www.oregon.gov/deq/wq/programs/Pages/wqstatustrends.aspx

Table 19: Water Quality Status and Trends at 7 Monitoring Locations in the North Coast Basin

Summary is from the 2018 North Coast Basin Water Quality Status and Trends Analysis for ODA's Biennial Review (DEQ)
Data collected 2000 – 2018

Monitoring Locations	Clatskanie River @ Hwy 30	Skipanon River @ Hwy 101	Nehalem River @ Foley Rd.	Dougherty Slough @ Hwy 101	Tillamook River @ Bewley Creek Rd.	Nestucca River @ Cloverdale	Trask River @ Hwy 101
Pollutants	***Trend Through January 2018**						
Temperature (Summer)	-	-	-	-	-	-	-
***E. coli* (Bacteria)**	NT	NT	NT	-	↑	↓	↓
pH	↓	ST	↓	NT	↓	NT	↓
Dissolved Oxygen	↑	↑	↑	NT	↑	↓	NT
Total Phosphorus	NT	↑	NT	↑	NT	NT	NT
Total Suspended Solids	NT	↓	NT	↑	NT	NT	↓
Pollutants	** **Status: Number of Exceedances per Number of Samples**						
Temperature (Summer)	-	-	-	-	-	-	-
***E. coli* (Bacteria)**	2/110	5/108	0/151	-	188/197	20/234	9/226
pH	8/127	0/114	3/152	0/85	0/116	0/126	0/108
Dissolved Oxygen	7/114	107/115	9/148	44/87	7/116	24/127	16/108
^ Total Phosphorus	110	112	131	59	111	125	107
^ Total Suspended Solids	106	107	141	48	107	119	103

***Trend:** ↑ - Improving ↓ - Declining **ST** – Steady **NT** – No Trend (**-**) – Data Not Available
****Number of Exceedances:** Number of times the sample exceeded the water quality standard expressed over total number of available observations for the period of 2000-2018
^ Number of observations recorded. Number of exceedances was not provided.
Please Note:

- Where total suspended solids were classified as degrading, observed concentrations at these stations were very low. Degrading trends at these stations were marginal. Although statistically significant, these trends are likely the result of having a high number of observations at these stations, rather than a meaningful lessening of water quality at these stations.
- This report is best used as a summary and statistical analysis of the status and trends in water quality data collected throughout the North Coast AgWQ Management Area. Interpretation of results will require knowledge of local conditions known to affect the observed water quality conditions at individual sites.

4.3.2 Volunteer Water Quality Monitoring Program

Tillamook Estuary Partnership published a State of the Bays 2015 Health Report. The report was an evaluation of the TEP's Volunteer Water Quality Monitoring Program (VWQMP), which began in 1997. Water quality monitoring began as an effort to understand bacteria levels in the rivers and streams entering Tillamook Bay. Today they monitor most of the major rivers and streams and all five estuaries. The results are evaluated and compared to the State of Oregon's water quality standards for bacteria and other parameters such as stream temperature and dissolved oxygen. The data is used to determine if beneficial uses are sustained such as recreation, which includes fishing, swimming, and boating. For the full report go online to the Tillamook Estuaries Partnership website in the resources/reports and publications tab at: www.tbnep.org/

4.3.3 DEQ Groundwater Monitoring Program: North Coast 2015-2016

The stated objective of Oregon statute ORS 468B.155 is "to prevent contamination of Oregon's groundwater resource while striving to conserve and restore this resource and to maintain the high quality of Oregon's groundwater resource for present and future uses." The Statewide Groundwater Monitoring Program began collecting water quality data in 2015. All studies include analysis of nitrate, arsenic, bacteria, pesticides, and common ions in 60 to 100 wells. Additional analyses are added based on local risk factors and program capacity. (2017 DEQ). For the full report go online: www.oregon.gov/deq/FilterDocs/grw-northcoast2015-16.pdf

4.3.4 Oregon Water Quality Toxics Monitoring of the North Coast

In 2013, DEQ laboratory staff collected seasonal (May, August and December) water samples at 19 locations across the basin. The sampling locations represented a range of watershed sizes and land uses as well as both freshwater and estuarine environments. The laboratory analyzed samples collected in the North Coast Basin for greater than 500 unique chemicals. Of these, 33 chemicals were detected at least once. For the full report go online at: http://www.oregon.gov/deq/FilterDocs/WQToxicsAssessmentReport.pdf

4.3.5 Strategic Enterprise Approach to Monitoring (STREAM Team)

Monitoring provides the data Oregon needs to identify and prioritize water quality concerns, target actions where they will have the most benefit for the least cost and determine what is working and what is not. To be successful, we must have an integrated monitoring system that will support the right decisions around natural resources and their beneficial uses. Toward this end the Governor seeks to build upon a cross-agency STREAM Team-approach to monitor water quality (ODA, OWEB, DEQ, DSL, WRD, ODF, and ODFW).

In February 2018, the STREAM Team came to the Mid and North Coast to hold the 2018 North Coast Water Monitoring Summit. The summit was two days of sessions related to water quality monitoring efforts in the Mid and North Coast regions. Over 100 water quality professionals attended sessions on water quality and quantity, habitat for fish and aquatic life, land use and streamside habitat conditions, value of coordinated efforts, and data tools to connect local and statewide information needs. The summit was a rare chance to get water quality practitioners of different roles and responsibilities together and discuss water quality monitoring along the Mid and North Coast regions. The summit was a success and has led to several more next steps to engage in over the next years.

4.4 Biennial Reviews and Adaptive Management

Two years after the adoption of the North Coast Basin Area Rules/OARs and approximately every two years following, ODA, in cooperation with the North Coast Basin LMAs, the LAC, and DEQ will assess the progress of the Area Plan implementation toward achievement of Plan goals and objectives through the biennial review process. These assessments will include:

- A review of projects, demonstrations, and tours used to showcase successful management practices and systems;
- An evaluation of outreach and education programs designed to provide public awareness and understanding of water quality issues;
- An evaluation of the effectiveness of technical and financial assistance sources available to the agricultural community;
- Documentation of violations of the prevention and control measures and subsequent corrections;
- An evaluation of available current water quality monitoring data and sources of pollution in the North Coast; and
- A review of load allocations as found in any completed North Coast Basin TMDL and the anticipated effectiveness of this Plan in meeting the load allocations as described in the TMDLs for the North Coast.

Based on these assessments, ODA, the North Coast Basin LMAs, the LAC, and the State Board of Agriculture will consider making appropriate modifications to the North Coast Basin Area Plan and the associated administrative Rules.

2018 Biennial Review Summary of Impediments:
Overall, the LAC was satisfied with the work that is being done in the North Coast. There were no impediments suggested. The LAC discussed that they would like to see more use of microbial DNA tracking of bacteria to help better understand where sources of bacteria are coming from, which in turn would direct resources to the appropriate source. The LAC also discussed tide gates and the recent public outreach meetings along the coast and the complexity related to tide gate installation and maintenance.

2018 Biennial Review Recommendations for Modifications:
The LAC suggested few modifications to the Plan. Overall, they liked the revisions presented and they felt good about them. They look forward to seeing the measurable objectives at the next biennial review (Chapter 3).

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APPENDIX A: Educational and Technical Contacts

Soil and Water Conservation Districts (SWCDs)
Prepare and help implement management plans by coordinating with other technical experts in natural resources.

Clatsop SWCD:	503/325-4571	Astoria
Columbia SWCD:	503/397-4555	St. Helens
Tillamook SWCD:	503/842-2240	Tillamook
West Multnomah SWCD:	503/238-4775	Portland

USDA – Natural Resources Conservation Service (NRCS)
Provides information on soil types, soils mapping, and interpretation. Administer and provide assistance in developing plans for Conservation Reserve Program (CRP), Conservation Reserve Enhancement Program (CREP), Environmental Quality Incentives Program (EQIP), Wetland Reserve Easement Program and other cost share programs. Prepares management plans. Makes technical determinations on wetlands and highly erodible land.

Clatsop NRCS Field Office	503/325-4571	Astoria
St. Helens NRCS Service Center:	503/397-4555	St. Helens
Tillamook NRCS Service Center:	503/842-2240	Tillamook

Oregon State University Extension Service (OSUES)
Offers educational programs, seminars, classes, tours, and publications to guide landowners in managing their resources.

Clatsop County:	503/ 325-8573	Astoria
Columbia County:	503/ 397-3462	St. Helens
Tillamook County:	503/ 842-3433	Tillamook

Oregon Department of Agriculture (ODA)
Oversees the Agricultural Water Quality Management Program. ODA issue permits, helps producers comply with confined animal feeding water management programs, and provides support to SWCDs.

Natural Resources Division:	503/ 986-4700	Salem
North Coast Water Quality Specialist:	503/ 986-5141	Salem
North Coast Livestock Water Quality Specialist:	503/ 842-6278	Tillamook
Livestock Water Quality Specialist:	503/ 986-4780	Salem

Department of Environmental Quality (DEQ)
Responsible for protecting and enhancing 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, sets Total Maximum Daily Load (TMDL) allocations.

State Office:	800/ 452-4011	Portland

Department of State Lands (DSL)
Administers state removal/fill law and provides technical assistance.

State Office:	503/ 986-5200	Salem
Northwest Program:	503/ 986-5233	Salem

USDA – Farm Service Agency (FSA)
Maintains agricultural program records and administers various Federal cost share programs. Also provide up-to-date aerial photography of farm and forestland.

US Consolidated Farm Service Agency:	503/ 648-3174	Hillsboro

Oregon Water Resources Department (OWRD)
Provides technical and educational assistance, water right permits and information.

State Office:	503/ 986-0900	Salem
Northwest Region:	503/ 986-0893	Salem
District 1 Watermaster:	503/ 815-1967	Tillamook

North Coast Basin Agricultural Water Quality Management Area Plan
Local Advisory Committee (LAC)
Voluntary committee composed of 12 agricultural producers in the North Coast Basin. Charged with developing the North Coast Basin Area Plan in accordance with the 1993 state Agricultural Water Quality Management Act.

ODA North Coast Water Quality Specialist:	503/ 986-5141	Salem

Oregon Department of Fish and Wildlife (ODFW)
Works with landowners to balance protection of fish and wildlife with economic, social, and recreational needs. Advises on habitat protection. Offers technical and educational assistance for habitat and restoration projects. Provides plan review for special property tax assessment for wildlife habitat projects.

Salem Headquarters:	503/ 947-6000	Salem
Fish Division:	503/ 947-6200	Salem
Wildlife Division:	503/ 947-6301	Salem
Ocean Salmon and Columbia River Program:	503/ 673-6000	Clackamas
Marine Resources Program:	541/ 867-4741	Newport

Oregon Department of Forestry (ODF)
Technical assistance with State and Federal cost sharing, Oregon Forest Practices Act, Forest Resource Trust, forestry practices, forest management plans, and Oregon property tax programs.

Clatsop County:	503/ 325-5451	Astoria - District Office
Columbia County:	503/ 397-2636	Columbia City - Unit Office
Tillamook County:	503/ 842-2545	Tillamook - District Office
Multnomah County:	503/ 357-2191	Forest Grove - District Office

North Coast Watershed Councils (WC)
Lower Columbia Watershed Council: 503/ 728-9015
Lower Nehalem Watershed Council: 503/ 386-7424
Necanicum Watershed Council: 503/ 717-1458
Nestucca/Neskowin Watershed Council: 503/ 965-2000
North Coast Watershed Association: 503/ 468-0408

- Ecola Creek WC
- Nicolai-Wickiup WC
- Skipanon WC
- Youngs Bay WC

Scappoose Bay Watershed Council: 503/397-7904
Tillamook Bay Watershed Council: 503/ 322-0002
Upper Nehalem Watershed Council: 503/ 429-0869

APPENDIX B: Agricultural Conservation Practices

Conservation Practices for Potential Water Quality Protection "H" = Potentially High Water Quality Protection "M" = Potentially Medium Water Quality Protection "L" = Potentially Low to No Water Quality Protection						
Conservation Practices	**Temperature**		**Bacteria**	**Sediment**		**Dissolved Oxygen**
	Shade	**Hydraulics**		**Bank Erosion**	**Runoff**	
Waterbody Buffers						
Grass Filter Strip	**L**	**L**	**M**	**M**	**H**	**M**
Healthy Riparian Condition	**M**	**H**	**M**	**H**	**M**	**M**
Manure Management						
Wetlands	**L**	**H**	**M**		**M**	**H**
Manure Storage	**L**	**L**	**M**	**L**	**L**	**L**
Manure Application at Agronomic Rates/Timing	**L**	**L**	**M**	**L**	**L**	**L**
Source Separation						
Limited Livestock Access To Riparian Areas	**M**	**M**	**M**	**M**	**M**	**L**
Waste Not Directly Linked To Waterbody	**L**	**L**	**M**	**L**	**L**	**L**
Healthy Riparian Condition	**H**	**H**	**H**	**H**	**H**	**M**
In-stream Structures						
Biotechnical Barbs	**M**	**H**	**L**	**M**	**M**	**M**
Streambank Erosion Protection						
Off-stream Watering	**M**	**M**	**H**	**H**	**H**	**M**
Healthy Riparian Condition	**H**	**M**	**M**	**H**	**H**	**M**
Limited Livestock Access to Riparian Areas	**M**	**M**	**H**	**H**	**L**	**L**

Adapted from the US EPA Tillamook Bay National Estuary Project "Restoring The Balance" Comprehensive Conservation and Management Plan, June, 1999. Cooperative Agreement CE-980127-01. Table 5-1, pp. 5-6.

FOR HELP TO DEVELOP CONSERVATION PRACTICES CONTACT YOUR LOCAL SWCD OR NRCS OFFICE IDENTIFIED IN APPENDIX A.

Agricultural Conservation Practices

<u>Erosion and Sediment Control</u>

Management

- Conservation tillage
- Contour farming
- Contour strip cropping
- Delayed seed-bed preparation

Vegetative

- Cover crops
- Critical area planting (including wetland and riparian zone protection)
- Filter strip/field border
- Grassed waterway

Structural

- Streambank stabilization
- Clean water diversion

- Grade stabilization structure
- Sediment basin/retention pond
- Terrace

Confined Animal Facility Management (Wastewater Runoff Management)

Management

- Agronomic application of manure, composted manure or wastewater to agricultural land

Vegetative

- Heavy use area protection (e.g., cover crops)
- Grassed Waterway

Structural

- Heavy use area protection (e.g., concrete),
- Roof runoff management (e.g., gutters & downspouts),
- Dikes
- Clean water diversion
- Terrace
- Waste storage pond/structure
- Waste treatment lagoon
- Constructed wetland

Nutrient Control

Management

- Overall nutrient management planning (e.g., nutrient budgeting)
- Soil testing
- Manure, sludge, and compost testing
- Proper timing, formulation, and application methods of nutrients for maximum crop utilization
- Plant tissue testing

Vegetative

- Cover crops
- Filter Strip/field border

Pesticides

Management

- Use of Integrated Pest Management (IPM) strategies and systems:
- Biological controls, pheromones, crop rotations, cover crops, economic thresholds, etc.,
- Maintain inventory of current and historical pest problems, cropping patterns, and use of pesticides for each field,
- Consider the persistence, toxicity, and runoff and leaching potential of products, and current label requirements in making a selection when a choice of pesticide materials exists,
- Recalibrate spray equipment each spray season,
- Use of anti-backflow devices on hoses used for filling tank mixtures.

Structural

- Protect against leaching and runoff potential in loading, mixing, and storage areas.

Grazing

Management

- Planned grazing systems
- Deferred grazing & pasture rotation
- Pasture management
- Pasture renovation, cross-fencing, brush/weed management, prescribed burning

Structural

- Alternate water supply practices (off-stream water sources)
- Placement of water and salt supplement facilities away from streams
- Limit livestock access to waterways with fencing, livestock exclusion, stream crossing

Irrigation

Management

- Sprinkler calibration,
- Irrigation scheduling practices,
- Irrigation water management;
- utilization of water measuring devices and soil and crop water use data,
- evaporation monitoring.

Vegetative

- Cover crops and straw mulch
- Filter strip/field border

Structural

- Irrigation water application methods, such as drip or trickle irrigation, sprinkler irrigation, micro-jet irrigation,
- Drainage water management

    - ditch and canal lining, subsurface drainage,
- Surface and subsurface irrigation systems
    - furrows, borders, contour levees/ditches,
- Irrigation land leveling
- Tailwater recovery/recycling systems
- Sediment basin/retention pond
- Rip hardpans and compacted soil layers to improve infiltration rates.

Irrigation and Drainage Ditches

Management

- During maintenance, remove only sand silt; avoid removing gravel important for native fish
- Conduct excavation operations with land-based equipment from one side of the channel
- Properly dispose of dredged sediments away from the channel, either on uplands or spread in a thin layer (three inches or less) on farmed wetland or wet pasture in a manner that does not convert the wetland to upland
- Conduct maintenance and excavation only during the time period specified in the "Oregon Guidelines for Timing of In-Water Work to Protect Fish and Wildlife Resources" prepared by the Oregon Department of Fish and Wildlife

Vegetative

- Promote and maintain woody vegetation along ditches and channelized streams in a manner that provides shade and shelter for fish, yet allows regular maintenance and cleaning
- Plant channel banks and work areas with grass and/or trees and shrubs after maintenance in order to minimize erosion as much as possible

Structural

- Construct and maintain ditches utilizing ditch slope and ditch cross section that are appropriate to the site and prevent ditch bank sloughing.

Riparian Areas and Vegetation

Management

- Exclude livestock from riparian areas
- Create riparian pasture and manage to protect riparian vegetation and streambank stability
- Avoid manure, fertilizer, and chemical applications in the riparian area or where the riparian area could be affected
- Control noxious weeds
- Limit in-stream livestock access and crossings to the absolute minimum

Vegetative

- Riparian forest buffer
- Riparian herbaceous cover
- Vegetative buffers

Structural

- Fencing riparian areas to limit or exclude livestock access
- Electric "New Zealand" style high tensile wire fences are low cost and flood resistant
- Install off-stream water sources for livestock
- Development of appropriately sized bridges and culverts for livestock crossings,
- Biotechnical barbs for streambank stability

APPENDIX C: Pollution Prevention and Control Program for Oregon's Coastal Waters-Coastal Zone Act Reauthorization Amendments of 1990 Management Practices

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

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

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

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

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

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

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

MANAGEMENT MEASURES FOR AGRICULTURE

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

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

2. Facility Wastewater and Runoff from Confined Animal Facility Management
(g) Guidance Management Measure (Large Units)
Limit the discharge from the confined animal facility to surface waters by:

1. Storing both the facility wastewater and the runoff from confined animal facilities that is caused by storms up to and including a 25-year, 24-hour frequency storm. Storage structures should:

a. Have an earthen lining or plastic membrane lining, or
b. Be constructed with concrete, or
c. Be a storage tank; and,

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

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

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

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

4. Pesticide Management
To reduce contamination of surface water and ground water from pesticides:

A. Evaluate the pest problems, previous pest control measures, and cropping history;
B. Evaluate the soil and physical characteristics of the site including mixing, loading, and storage areas for potential leaching or runoff of pesticides. If leaching or runoff is found to occur, steps should be taken to prevent further contamination;
C. Use integrated pest management strategies that:

1. Apply pesticides only when an economic benefit to the producer will be achieved (i.e., applications based on economic thresholds); and
2. Apply pesticides efficiently and at times when runoff losses are unlikely;
3. When pesticide applications are necessary and a choice of registered materials exists, consider the persistence, toxicity, runoff potential, and leaching potential of products when making a selection;
4. Periodically calibrate pesticide spray equipment; and
5. Use anti-backflow devices on hoses used for filling tank mixtures.

5. Grazing Management

I. Riparian Areas: Implement one or more of the following as necessary to protect water quality, streambanks, stream channels, wetlands, estuaries, ponds, lakeshores, and riparian soils and vegetation:

(A) For privately owned lands, implement (1) or (2) below:

(1) Implement one or more of the following:

a) Provide stream crossings or hardened watering access for drinking;

b) Provide alternative drinking water locations away from the stream channel and sensitive areas;

c) Locate salt and additional shade, if needed, away from sensitive areas;

d) Use improved grazing management techniques including the application of scientifically sound grazing systems. The following are some examples of such techniques:

1. Include riparian areas in separate pastures and manage them under separate objectives and strategies, including periodic rest.
2. Fence or, where appropriate, herd livestock out of riparian areas for as long as necessary to avoid negative impacts to streambanks.
3. Control the timing of grazing in riparian areas to (1) protect streambanks when they are most vulnerable to damage; and (2) coincide with the physiological needs of key plant species.
4. Add rest, as needed, to the grazing cycle to increase plant vigor and encourage more desirable plant species composition.
5. Limit grazing intensity, frequency, and duration to a level that will maintain desired plant species composition and vigor.
6. Manage livestock away from riparian areas that are at high risk or with poor recovery potential.

e) Exclude livestock from sensitive areas.

(2) Implement a Conservation Management System (CMS) as defined in the Field Office Technical Guide of the USDA Natural Resource Conservation Service (NRCS) by applying the progressive planning approach of the USDA NRCS.

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

II. Uplands: To protect water quality from grazing impacts on upland areas that are not protected under (I),

(A) For privately owned lands, implement (1) or (2) below:

(1) Implement one or more of the following:

a) Locate livestock watering facilities away from sensitive areas such as springs and seeps;

b) Locate salt and additional shade, if needed, away from sensitive areas;

c) Use improved grazing management techniques including the application of scientifically sound grazing systems. The following are some examples of such techniques:
   1. Control the timing of grazing to (1) protect soils and vegetation when they are most vulnerable to damage; and (2) coincide with the physiological needs of key plant species.
   2. Add rest to the grazing cycle to increase plant vigor or encourage more desirable plant species composition.
   3. Limit grazing intensity, frequency, and duration to a level that will maintain desired plant species composition and vigor.

(2) Implement a CMS as defined in the Field Office Technical Guide of the USDA NRCS by applying the progressive planning approach of the USDA NRCS.

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

6. Irrigation Water Management

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

A. Operate the irrigation system so that the timing and amount of irrigation water applied matches crop water needs. This will require, as a minimum: (a) the accurate measurement of soil-water depletion volume and the volume of irrigation water applied, and (b) uniform application of water.

B. When chemigation is used, include backflow preventers for wells, minimize the harmful amounts of chemigated waters that discharge from the edge of the field, and control deep percolation. In cases where chemigation is performed with furrow irrigation systems, a tailwater management system may be needed.

The following limitations and special conditions apply:

A. In some locations, irrigation return flows are subject to other water rights or are required to maintain stream flow. In these special cases, on-site reuse could be precluded and would not be considered part of the management measure for such locations.

B. By increasing the water use efficiency, the discharge volume from the system will usually be reduced. While the total pollutant load may be reduced somewhat, there is the potential for an increase in the concentration of pollutants in the discharge. In these special cases, where living resources or human health may be adversely affected and where other management measures (nutrients and pesticides) do not reduce concentrations in the discharge, increasing water use efficiency would not be considered part of the management measure.

C. In some irrigation districts, the time interval between the order for and the delivery of irrigation water to the farm may limit the irrigator's ability to achieve the maximum on-farm application efficiencies that are otherwise possible.

D. In some locations, leaching is necessary to control salt in the soil profile. Leaching for salt control should be limited to the leaching requirement for the root zone.

E. Where leakage from delivery systems or return flows supports wetlands or wildlife refuges, it may be preferable to modify the system to achieve a high level of efficiency and then divert the "saved water" to the wetland or wildlife refuge. This will improve the quality of water delivered to wetlands or wildlife refuges by preventing the introduction of pollutants from irrigated lands to such diverted water.

F. In some locations, sprinkler irrigation is used for frost or freeze protection, or for crop cooling. In these special cases, applications should be limited to the amount necessary for crop protection, and applied water should remain on-site.

APPENDIX D: Coordinated Resource Management Planning

Coordinated Resource Management Planning (CRMP) is a process by which natural resource owners, managers, and users work together as a team to formulate plans for the management of major resources within a specific area, and/or seek to identify and resolve specific conflicts concerning management activities. Coordinated resource management planning.

CRMP has been in existence in Oregon for over 40 years and has helped many landowners to more effectively manage their resources. The concept of CRMP follows the principle that adjoining landowners who work together to solve resource issues can be more effective than they can be by working individually.

In many cases, the initial impetus for CRMP comes out of a conflict or crisis over some aspect of natural resource use or management. Often, in the process of trying to resolve a particular issue, a more general plan is developed and the original issue becomes only one of many that are constructively dealt with in both planning and the implementation that follows.

Seldom are natural resource problems confined to single ownerships, single resources, or single resource uses. Moreover, almost never does a single agency, owner/manager, or group have all the answers and expertise needed to deal with resource management issues or conflicts.

Especially helpful in these situations is an approach that involves various resource disciplines, agencies, and users, working together from beginning to end, to develop a rationale upon which management decisions can be based. In such a process, resource owners and managers do not relinquish authority and responsibility over their own final decisions, but they make those decisions only after listening to the viewpoints, experiences, and options of others. Consensus, not voting, is a fundamental element of the CRMP.

Most often, CRMP is initiated at the local level by a request from a person, group, organization, or agency that perceives the need for a group-action approach to averting or resolving a local resource problem. The local SWCD (see Appendix B) can respond to this request because these SWCDs are legal subdivisions of state government with responsibilities for land and water conservation. Following such a request, an informational meeting is usually held, which is open to all affected stakeholders and interested parties. At this time, the CRMP process is presented and discussed, and a decision is reached as to whether or not to proceed in this way.

The planning group which emerges from this initial stage should be kept as small as practical, yet it must include representatives of significant user groups as well as representative owners and managers of the resources within the area of concern. Agency participants in the local planning group should be qualified to address the issues and generally to have the authority to make decisions for their agencies.

The next steps are for the planning group to begin setting meeting goals or objectives for the process. Once this is accomplished, it is ready to tackle the potentially more controversial problems that have brought it together. The CRMP process uses the concept of resource management systems to aid in the making of decisions on a wide range of practices, measures, or items that should be considered.

The decisions of the planning group can be:

- To take an action,
- To do nothing,
- To state a need, or

- To postpone a decision pending further study or consultation.

Once a decision has been reached, the group moves on until all of the resource issues have been addressed. Again, consensus is the method of decision-making, and can be defined as offering the following options:

- Agree,
- Do not fully agree, but can live with it,
- Disagree, but will not object if others wish to have this included, and
- Disagree strongly and cannot accept a plan with this item in it.

Once the plan is completed, it is ready to be implemented. The plan itself is not the end product, but a guide that will be measured by effectiveness in achieving resolution of conflict, accomplishments on the ground, and contribution to social change.

To find out more about CRMP, contact the local SWCD.

APPENDIX E: Native Vegetation List

Tree and Understory Species Lists - Listed in order of importance starting with the most common species first. All species on these lists are native to Tillamook County, and local seed sources should be used to propagate these trees. The tree species lists are taken, for the most part, from *An Environmental History of Tillamook Bay Estuary and Watershed*.

Forested Uplands - Sitka spruce, western hemlock, Douglas fir, western red cedar, black cottonwood, red alder, big leaf maple, Oregon ash, crabapple, hawthorn, vine maple, bitter cherry. Understory ferns, red elderberry, berries (salmon, thimble, native black, rasp) ninebark, ocean spray, cascara, red-osier dogwood, red huckleberry, hazelnut, blue elderberry, Oregon grape, salal, and willows (Sitka, Erect/Upright).

Floodplain - Black cottonwood, Sitka spruce, western hemlock, big leaf maple, western red cedar, Douglas-fir, Oregon ash, willows (Hooker, Scouler, Pacific, Sitka, Erect/Upright), red alder, crabapple, hawthorn, vine maple. Understory ferns, red elderberry, berries (salmon, thimble, native black, rasp) ninebark, ocean spray, cascara, salal, Oregon grape, red-osier dogwood, wild rye grass, wild rose, Indian plum, and honeysuckle.

Tidally Influenced Lands (brackish water) - Sitka spruce, western hemlock, western red cedar, willows (Hooker, Scouler, Pacific, Sitka), crabapple, big leaf maple, red alder, Oregon ash. Understory ferns, red elderberry, berries (salmon, thimble, native black, rasp) ninebark, ocean spray, cascara, red-osier dogwood, wild rye grass, salal, sweet gale, honeysuckle.

Alternative Plant Species for Pest Prone Riparian Areas

***Giant sequoia* - Sequoiadendron giganteum**

Giant Sequoia is not native to Oregon. It occurs naturally in a narrow belt along the west slope of the central Sierra Nevada Mountains. As the name implies, Giant Sequoia grows to become a large tree. The tree grows rapidly, approximately two feet per year, until it reaches a height of approximately 200 feet. At this point, more lateral that vertical growth occurs. The tallest specimen is supposedly 310 feet tall with a trunk that is 347 inches in diameter. Culturally, this species thrives in ample sunlight and well-drained, moist soils. The Giant Sequoia is extremely resistant to decay; however, the wood is very brittle and is frequently destroyed in the falling process. This makes the species undesirable for timber harvest.

It has been noted that beaver and elk do not find the Giant Sequoia palatable. This characteristic would make the tree a good possibility for inclusion in a riparian planting where animal damage is likely going to be a problem. The North Coast LAC is offering this information as a suggestion to project managers with the caution that some funding organizations may not allow non-native species to be planted in projects they are supporting. Check with your funding source before including this plant in your planting plan.

Information References:
Bidwell, R. and S. Jensen. 1998. Tree-of-the-Month 2/98 (Giant sequoia).
http://www.cof.orst.edu/cof/fr/outreach/treeomth/sequoia/index.htm (22-Jun-2002)

Washington Association of Conservation Districts Plant Materials Center Plant Guide, *Right Plant – Right Place, Ensuring Project Success*. WACD Plant Material Center, Bow, WA.

APPENDIX F: Selected Program/Rules – Oregon Department of State Lands

The Removal-Fill Program

In general, Oregon's Removal-Fill Law (ORS 196.800-990) requires people who will remove or fill 50 cubic yards or more in waters of the state to obtain a permit from the DSL. "waters of the state" are defined as "natural waterways including all tidal and non-tidal bays, intermittent streams, constantly flowing streams, lakes, wetlands and other bodies of water in this state, navigable and non-navigable, including that portion of the Pacific Ocean which is in the boundaries of this state."

In areas designated by the DSL as essential indigenous anadromous salmonid habitat and in state scenic waterways, most removal-fill activities require a permit, regardless of the number of cubic yards affected.

The following activities are statutorily exempt from the permit requirements:

- Fills for building, operating and maintaining dams that have a valid water right and a hydroelectric permit or license.
- Fills and removals in non-navigable waterways that are part of a forest management practice conducted in accordance with Oregon's Forest Practices Act.
- Fills and removals associated with normal farming and ranching activities on converted wetlands.
- On lands zoned for exclusive farm use, fills and removals for:
  - Drainage or maintenance of farm or stock ponds.
  - Maintenance of farm roads that does not affect wetlands.
  - Fills and removals for the maintenance or reconstruction of structures such as dikes, dams, levees, rip rap, tide gates, and drainage and irrigation ditches that were serviceable within the past five years, provided the activity does not affect wetlands.
- Fills and removals for maintenance and emergency reconstruction of currently serviceable roads.

Even though these activities are exempt from the permit requirements, they still must be conducted in a manner that does not adversely affect other resources and uses (e.g., water quality, fish and their habitats, recreation, cultural resources). If you are not sure whether your proposed project meets the requirements for an exemption, or if you are not sure of the "Best Management Practices" for an exempt activity, please contact the DSL. DSL contact phone numbers are provided in Appendix B.

All permits include design and operating conditions "Best Management Practices" that are intended to ensure the protection, conservation and best use of state water resources and prevent harm to fishery and recreational uses of the waters. In the case of projects involving wetlands, you also may be required to provide mitigation to compensate for any loss of wetland resources.

In most cases, it takes up to 90 days for the DSL to issue a permit. This is because of the number of other agencies and interested parties (e.g., adjacent landowners) who must have an opportunity to review the permit application. If you need a permit, you should apply at least three months before you plan to do the work, taking into consideration the in-water work periods. However, in an emergency, the DSL can authorize work orally as soon as all necessary information about the project has been received. Also, for certain types of activities the DSL issues a streamlined type of permit called a General Authorization. Currently General Authorizations are available for road construction, erosion control, fish habitat enhancement, wetland restoration and enhancement, and recreational and small-scale placer mining. General Authorizations have uniform permit conditions that apply to all projects.

Most projects that need a state removal-fill permit will also require a federal permit from the Army Corps of Engineers (Corps). The DSL and the Corps use a joint permit application form, so you will only need to fill out one application to obtain both permits. When you send in your completed permit application, the Corps will notify you whether you need a federal permit.

Essential Indigenous Anadromous Salmonid Habitat

Oregon's Removal-Fill Law requires a permit for most removal and fill activities in areas designated as "essential indigenous anadromous salmonid habitat." Essential salmonid habitat is defined as the habitat necessary to prevent the depletion of native salmon species (chum, sockeye, Chinook and Coho salmon, and steelhead and cutthroat trout) during their life history stages of spawning and rearing. The designation applies only to those species that have been listed as "sensitive," "threatened," or "endangered" by a state or federal authority.

In addition to those activities that are exempt from all permit requirements, the following exemptions apply to activities affecting less than 50 cubic yards within areas designated essential salmonid habitat:

- Activities customarily associated with agriculture (e.g., maintenance of an existing irrigation or drainage structure).
- Non-motorized mineral prospecting affecting less than one cubic yard at any one site and not more than five cubic yards annually within a designated stream.

The DSL, in consultation with the ODFW, designates essential salmonid habitat areas based on field surveys and/or the professional judgment of ODFW's district biologists.

Current Department of State Lands Rules for Removing and Disposing of Sediment behind Tide Gates for Channel Maintenance

DIVISION 89
141-089-0060
Purpose
These rules set forth the conditions where a person may, with a letter of authorization from the DSL, remove and dispose of sediment for the purpose of maintaining natural or artificially created drainage channels upstream from tide gates.

141-089-0065
Applicability
This General Authorization applies to sand and silt sediment depositional areas in legally constructed or altered channels upstream of tide gates that are regularly maintained. Such channels have a free and open connection (as defined in OAR 141-85-0010(14)) to other natural waterways (as defined in OAR 141-85-0010(27)) and are presumed to have food and game fish.

141-89-0070
Conditions
(1) **To be eligible for this General Authorization, a project must conform to the following**:
  (a) Removal of existing woody vegetation, other than that growing within the maintained channel bed is prohibited;
  (b) Only sand and silt sediments may be removed. This authorization is not for the removal of gravel;
  (c) Erosion of disturbed areas (i.e., channel banks and work areas) shall be minimized through re-vegetation with grass and/or Planting of trees and shrubs;

(d) Excavation operations shall be conducted with land-based equipment from one side of the channel unless specifically authorized by the DSL;
(e) Dredged sediments may be temporarily side-cast on top of the levee (if one exists) or away from the top of bank (to allow drying of the sediments for spreading) provided the dredged material does not erode back into the channel. If upland dredged material disposal is not feasible, then the dredged material may be spread in a thin layer (three inches or less) on farmed wetland or wet pasture provided there is no permanent conversion from wetland to upland. Freshwater wetland (other than farmed wetland or wet pasture mentioned above), salt marsh, tidal flats, or permanent or semi-permanent open water areas shall not be used for dredged material disposal;
(f) Dredged material removal and disposal shall be conducted during the time period specified in the "Oregon Guidelines for Timing of In-Water Work to Protect Fish and Wildlife Resources" prepared by ODFW;
(g) Sediment removal and disposal shall not violate applicable state water quality standards; and
(h) Removal of sediments shall be kept to the minimum amount necessary to remove recently deposited materials. Additional channel widening or deepening beyond that amount is prohibited.

(2) An application for a General Authorization under this rule shall be submitted on the Joint Permit Application Form provided by the DSL in accordance with the requirements of ORS 196.815(1) and OAR 141-85-025. The DSL shall send copies of the application to adjacent property owners, ODFW, DEQ, DLCD, ODA, the local SWCD, and the local planning department.

(3) Within 45 working days of receipt of a completed application, the DSL shall notify the applicant whether or not the proposed project qualifies for this General Authorization. If the project qualifies, the written authorization may contain additional operating conditions deemed appropriate by the DSL. If the DSL determines that the proposed project does not qualify for the General Authorization, the project may be reviewed as an individual permit under OAR 141-85-035 if requested by the applicant.

(4) The DSL may require an individual permit for projects, which would otherwise be authorized by this General Authorization, upon a showing by the DSL or the reviewing agencies listed above that the project would have more than minimal individual or cumulative environmental effects.

(5) The DSL may, at any time, by notice to affected operators revoke or modify any project approval granted under this General Authorization if it determines the conditions of the General Authorization are insufficient to minimize individual or cumulative environmental impacts.

(6) This General Authorization shall be reviewed by the DSL on or before July 1, 2003, at which time it shall be modified, reissued, or rescinded. The review will include public notice and opportunity for public informational hearing.

141-089-0075

Expedited Review Process for Fill or Removal Less than 50 Cubic Yards in Essential Indigenous Anadromous Salmonid Habitat Any person proposing to conduct a fill or removal of less than 50 cubic yards under this General Authorization in Essential Indigenous Anadromous Salmonid Habitat and seeking expedited approval must still comply with the standards set forth in OAR 141-089-070(1)(a) to (h). The project proponent seeking expedited approval under this section shall so notify the DSL by submitting a complete notification form provided by the DSL. The DSL shall send copies of the notification form to the ODFW, the DLCD, the DEQ, and the local planning department. Within 15 working days of receipt by the DSL of the complete notification form, the DSL shall either mail written confirmation along with authorization to proceed; or, if the project does not qualify for a General Authorization, the DSL shall so inform the applicant in writing and may review the project for an individual removal-fill permit (ORS 196.800 to 196.990).

APPENDIX G: 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: www.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 H: 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 DEQ.

Parameters

Bacteria: *Escherichia coli (E. coli)* is measured in streams to determine the risk of infection and disease to people. Coliform bacteria live in soil or vegetation and in the gastrointestinal tract of animals. Coliforms enter water supplies from the direct disposal of waste into streams or lakes, or from runoff from wooded areas, pastures, feedlots, septic tanks, dog runs, and sewage plants into streams or groundwater. Bacteria sources include humans, wildlife, and livestock. Runoff and soil erosion can also carry bacteria into waterways.

Dissolved Oxygen: Dissolved oxygen criteria depend 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.

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.

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.

Oregon's temperature standard is developed to ensure protection of the most sensitive beneficial uses. These uses in the Nestucca Bay Watershed are cold-water fishes, namely salmonids that are quite sensitive to elevated water temperature. The criteria for salmonid protection require that the temperature will not exceed 64°F during periods of migration and rearing, or 55°F during periods when spawning occurs. In areas where the numeric criteria are being exceeded, the DEQ considers attainment of system potential conditions to serve as compliance with the temperature standard. This is achieved through restoration/protection of riparian vegetation, channel morphology, and hydrologic processes.

APPENDIX I: 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 may become available after the publication of this document. For more current information, please contact one of the organizations listed below. Last updated April 2018.

Program	General Description	Contact
Agricultural Conservation Easement Program (ACEP)	NRCS provides financial assistance to eligible partners for purchasing agricultural land easements that protect the agricultural use and conservation values of eligible land.	NRCS, SWCDs
Conservation Reserve Enhancement Program (CREP)	Provides annual rent to landowners who enroll agricultural lands along fish-bearing streams. Also cost-shares conservation practices such as riparian tree planting, livestock watering facilities, and riparian fencing.	FSA/ NRCS, SWCDs, Oregon Department of Forestry
Conservation Reserve Program (CRP)	USDA CRP is a voluntary program available to agricultural producers to help them use environmentally sensitive land for conservation benefits.	NRCS, SWCDs
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.	NRCS, SWCDs
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, SWCDs, 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.	NRCS, SWCDs
Federal Reforestation Tax Credit	Provides federal tax credit as incentive to plant trees.	Internal Revenue Service
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.	SWCDs, Watershed Councils, OWEB
Oregon Watershed Enhancement Board Small Grant Program.	Provides grants up to $15,000 for priority watershed enhancement projects identified by local focus group.	SWCDs, Watershed Councils, OWEB
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, NRCS, SWCDs
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.	NRCS, SWCDs
State Forestation Tax Credit	Provides for reforestation of under-productive forestland not covered under the Oregon Forest Practices Act.	Oregon Department of Forestry
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