Curry County
Agricultural Water Quality
Management Area Plan

Developed by the
Oregon Department of Agriculture

with assistance from
Curry County Local Advisory Committee

With support from the:
Curry Soil and Water Conservation District

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An Open Letter from the LAC to the Curry Agricultural Community

The Curry Local Advisory Committee (LAC), after discussing the riparian rule at every meeting since February 2002, developed the following riparian statement at the March 12, 2003, meeting.

Riparian Management

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

A proper functioning riparian condition is one important component of clean water and healthy watersheds.

Agricultural management complements the proper functioning condition of a riparian area by allowing vegetation and biomass accumulation that benefits water quality.

| Upon rule adoption, management activities in the riparian area of anadromous fish bearing streams, that are 303d listed for temperature, will be conducted in a manner that avoids increases in stream temperature. Exemptions shall include stream crossings, access for irrigation equipment and other accepted water dependent agricultural uses when conducted in a manner that minimizes impacts on streambank stability. |

The Oregon Department of Agriculture (ODA) rejected this suggestion as inadequate and vulnerable and has inserted its own wording for a riparian rule. A majority of the Curry LAC believes this rule to be adequate to protect watersheds and water quality, while at the same time protecting private property rights.

Sincerely,

Walt Schroeder, Chair, Curry LAC
Acronyms and Terms Used in this Document

Ag Water Quality Program – Agricultural Water Quality Management Program
AgWQM – Agricultural Water Quality Management
Area Plan – Agricultural Water Quality Management Area Plan
Area Rules – Agricultural Water Quality Management Area Rules
BLM – Bureau of Land Management
CAFO – Confined Animal Feeding Operation
Cfs – Cubic Feet Per Second
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
EPA – Environmental Protection Agency
GWMA – Groundwater Management Area
HABs – Harmful Algal Blooms
IPM – Integrated Pest Management
IR – Implementation Ready
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
NTU – Nephelometric Turbidity Units
OAR – Oregon Administrative Rules
ODA – Oregon Department of Agriculture
ODF – Oregon Department of Forestry
ODFW – Oregon Department of Fish and Wildlife
OHA – Oregon Health Authority
ORS – Oregon Revised Statute
OSU – Oregon State University
OWEB – Oregon Watershed Enhancement Board
PMP – Pesticides Management Plan
PSP – Pesticides Stewardship Partnership
RM – River Mile
SB 1010 - Senate Bill 1010 (the Agricultural Water Quality Management Act)
SIA – Strategic Implementation Area
SWCD – Soil and Water Conservation District
TA – Technical Assistance
TFT - The Freshwater Trust
TMDL – Total Maximum Daily Load
USDA – United States Department of Agriculture
USFS – United States Forest Service
US EPA – United States Environmental Protection Agency
VOC – Volatile Organic Chemical
WQPMT – Water Quality Pesticides Management Team
Foreword

This Agricultural Water Quality Management Area Plan (Area Plan) provides guidance for addressing water quality due to agricultural activities in the Agricultural Water Quality Management Area (Management Area). The purpose of the Area Plan is to identify 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) that are enforced by the Oregon Department of Agriculture (ODA).

Required Elements of Area Plans

Area Plans must describe a program to achieve the water quality goals and standards necessary to protect designated beneficial uses related to water quality as required by 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 and was developed by the Department of Agriculture. The Local Advisory Committee and Local Management Agency did not develop or participate in the development of Chapter 1.

Chapter 2: Local Background. Provides the local geographic, water quality, and agricultural context for the Management Area. Describes the water quality issues, Agricultural Water Quality Management Area Rules (Area Rules), and available beneficial or effective 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 purpose of the Area Plan is to identify strategies to prevent and control water pollution from agricultural activities and soil erosion (ORS 568.909(2)) on agricultural and rural lands for the area within the boundaries of this Management Area (OAR 603-090-0000(3)) and to achieve and maintain water quality standards (ORS 561.191(2)). The Area Plan has been developed and revised by ODA and the Agricultural Water Quality Management Area Local Advisory Committee (LAC), with support and input from the SWCD and the Oregon Department of Environmental Quality (DEQ). The public was invited to participate in the original development and approval of the Area Plans and is invited to participate in the biennial review process. The Area Plan is implemented using a combination of outreach, conservation and management activities, compliance 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 603-095-3540). 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 its associated regulations 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).

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, soil erosion, and to achieve water quality standards (ORS 568.900 through ORS 568.933). Senate Bill 502 was passed in 1995 to clarify that ODA regulates agriculture with respect to water quality (ORS 561.191). The Area Plan and its associated 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 associated 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 associated Area Rules.
- Monitoring, evaluation, and adaptive management.
- Developing partnerships with SWCDs, 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 that are drivers for establishing an Ag Water Quality Management Plan 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 a GWMA has been established and an Action Plan developed).

The Oregon Department of Agriculture has the legal authority to develop and implement Area Plans and associated 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 has responsibility 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 emphasis of the Area Plan is on voluntary action by landowners or operators to control the factors affecting water quality in the Management Area. The Area Rules are outlined as a set of minimum standards that landowners and operators must be met on all agricultural or rural lands.

ODA will use enforcement where appropriate and necessary to gain compliance with agricultural water quality rules. Figure 2 outlines ODA’s compliance process. Any enforcement action will be pursued only when reasonable attempts at voluntary solutions have failed (OAR 603-090-0000(5)(c)). If a violation is documented, ODA may issue a pre-enforcement notification or an Order such as a Notice of Noncompliance. If a Notice of Noncompliance is issued, ODA will direct the landowner or operator to remediate the condition through required corrective actions (RCAs) under the provisions of the enforcement procedures outlined in OAR 603-090-060 through OAR 603-090-120. If a landowner does not implement the RCAs, civil penalties may be assessed for continued violation of the rules. See the Compliance Flow Chart for a diagram of the compliance process. If and when other governmental policies, programs, or rules conflict with the Area Plan or associated 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 associated regulations as needed.

1.3.3 **Local Advisory Committee**

For each Management Area, the director of ODA appoints an LAC (OAR 603-090-0020) with as many as 12 members to assist with the development and subsequent biennial reviews of the local Area Plan and associated 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 **Agriculture’s Role**

Each individual landowner or operator in the Management Area is required to comply with the Area Rules, which set minimum standards. However, the Area Rules alone may not be enough in every Management Area. Each landowner and operator in the Management Area is required to comply with the Area Rules. Landowners also are encouraged to engage in restoration activities to achieve the goals and objectives of the Area Plan. Each landowner and operator’s actions will 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 associated Area Rules, agricultural landowners and operators are not responsible for mitigating or addressing factors that do not result from agricultural activities, such as:

- Conditions resulting from unusual weather events.
- Hot springs, glacial melt water, extreme or unforeseen weather events, and climate change.
- Septic systems and other sources of human waste.
- Public roadways, culverts, roadside ditches and shoulders.
• Dams, dam removal, hydroelectric plants, and non-agricultural impoundments.
• Housing and other development in agricultural areas.
• Other circumstances not within the reasonable control of the landowner or operator.

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

1.3.5 Public Participation

The public was encouraged to participate when ODA, LACs, and SWCDs initially developed the Area Plans and 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

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 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 impacted from nonpoint sources including agricultural amendments (fertilizers and manure).

1.4.2 Beneficial Uses and Parameters of Concern

Beneficial uses related to water quality are defined by DEQ in OARs for each basin. They may include: public and private domestic water supply, industrial water supply, irrigation, livestock watering, fish and aquatic life, wildlife and hunting, fishing, boating, water contact recreation, aesthetic quality, hydropower, and commercial navigation and transportation. The most sensitive beneficial uses 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 impacted in this Management Area are summarized in Chapter 2.

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

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

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

A TMDL includes an assessment of water quality data and current conditions and describes a plan to achieve conditions so that water bodies will meet water quality standards. TMDLs specify the daily amount of pollution a water body 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 meeting the load allocation assigned to agriculture specifically, or to nonpoint sources in general, depending on how the TMDL was written.

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

As part of the TMDL process, DEQ identifies the Designated Management Agency (DMA) or parties responsible for submitting TMDL implementation plans. TMDLs designate the local Area Plan as the implementation plan for the agricultural component of this Management Area. Biennial reviews and revisions to the Area Plan and associated regulations must address agricultural or nonpoint source load allocations from relevant TMDLs.

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

1.4.4 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 into all of the Area Rules.

ORS 468B.025 states that:
“(1) ...no person shall:
(a) Cause pollution of any waters of the state or place or cause to be placed any wastes in a location where such wastes are likely to escape or be carried into the waters of the state by any means.
(b) Discharge any wastes into the waters of the state if the discharge reduces the quality of such waters below the water quality standards established by rule for such waters by the Environmental Quality Commission.
(2) No person shall violate the conditions of any waste discharge permit issued under ORS 468B.050.”
The aspects of ORS 468B.050 that apply to the Ag Water Quality Program, state that:
“(1) Except as provided in ORS 468B.053 or 468B.215, without holding a permit from the Director of the Department of Environmental Quality or the State Department of Agriculture, which permit shall specify applicable effluent limitations, a person may not:
(a) Discharge any wastes into the waters of the state from any industrial or commercial establishment or activity or any disposal system.”

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

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

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

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

1.4.5 Streamside Vegetation and Agricultural Water Quality

Across Oregon, the Ag Water Quality Program emphasizes streamside vegetation protection and enhancement to prevent and control water pollution from agriculture activities and to prevent and control soil erosion. Streamside vegetation can provide three primary water quality functions: shade for cooler stream temperatures, streambank stability, and filtration of pollutants. Other water quality functions from streamside vegetation include: water storage 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 measureable 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 outside the program’s regulatory purview (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 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 all 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.

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

ODA does not consider invasive, non-native plants such as introduced varieties of reed canary grass and blackberry to be site-capable vegetation. In many cases, this type of vegetation is removed through voluntary activities and incentives with control and restoration projects. However, noxious weeds, as designated by the Oregon State Weed Board, are invasive plants that pose a public menace, and can negatively impact water quality and watershed health. Public and private landowners in Oregon are responsible for eliminating and intensively controlling noxious weeds. For further information, visit the following link: 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

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

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

Groundwater Management Areas 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: the Lower Umatilla Basin GWMA, the Northern Malheur County GWMA, and the Southern Willamette Valley GWMA. Each GWMA has a voluntary action plan to reduce nitrate concentrations in groundwater. After a scheduled evaluation period, if DEQ determines that the voluntary approach is not effective, then mandatory requirements may become necessary.

1.5.3 The Oregon Plan for Salmon and Watersheds

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

1.5.4 Pesticide Management and Stewardship

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

In 2007, the interagency Water Quality Pesticide Management Team (WQPMT) was formed to expand efforts to improve water quality in Oregon related to pesticide use. The WQPMT includes representation from ODA, Oregon Department of Forestry (ODF), DEQ, and Oregon Health Authority (OHA). The WQPMT facilitates and coordinates activities such as monitoring, analysis and interpretation of data, effective response measures, and management solutions. The WQPMT relies on monitoring data from the Pesticides Stewardship Partnership (PSP) program and other monitoring programs to assess the possible impact of pesticides on Oregon’s water quality. Pesticide detections in Oregon’s streams can be addressed through multiple programs and partners, including the PSP program.

Through the PSP, state agencies and local partners work together to monitor pesticides in streams and to improve water quality (https://www.oregon.gov/deq/wq/programs/Pages/Pesticide.aspx). ODA, Department of Environmental Quality, 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 United States Environmental Protection Agency (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. 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 more information, see: [https://www.oregon.gov/deq/wq/programs/Pages/dwp.aspx](https://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 (NOAA) administer CZARA at the federal level. The federal requirements are designed to restore and protect coastal waters from nonpoint source pollution and require coastal states to implement a set of management measures based on guidance published by the US EPA. The guidance contains measures for agricultural activities, forestry activities, urban areas, marinas, hydro-modification activities, and wetlands. In Oregon, the Department of Land Conservation and Development and DEQ coordinate the program. The geographical boundaries for the CNPCP include the North Coast, Mid-Coast, South Coast, Rogue, and Umpqua basins. Oregon has identified the ODA coastal Area Plans and associated regulations as the state’s strategy to address agricultural measures. The Area Plan and associated regulations are designed to meet the requirements of CZARA and to implement agriculture’s part of Oregon’s CNPCP.

Additional information about CZARA and Oregon's CNPCP can be found at: [www.oregon.gov/LCD/OCMP/pages/watqual_intro.aspx](http://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 Department of Environmental Quality 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 associated Area Rules in collaboration with DEQ.
  
  - ODA will determine the percentage of lands achieving compliance with Management 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 its associated 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 and operators have been implementing effective conservation projects and management activities throughout Oregon to improve water quality for many years. However, it has been challenging for ODA, SWCDs, and LACs to measure progress. ODA is working with SWCDs, LACs, and other partners to develop and implement strategies that will produce measurable outcomes. ODA also is working with partners to develop monitoring methods to document progress.

1.7.1 Measurable Objectives

A measurable objective is a numeric long-term desired outcome to achieve by a specified date. Milestones are the interim steps needed to make progress toward the measurable objective and consist of numeric short-term targets to reach by specific dates. Together, the milestones define the timeline needed to achieve the measurable objective.

After ODA, the LAC, and the LMA establish measurable objectives and associated milestones, they will evaluate progress toward the milestones at each biennial review of the Area Plan. Using adaptive management, the biennial review will evaluate progress toward the most recent milestone(s) and why they were or were not achieved. ODA, the LAC, and LMA will evaluate whether changes are needed to keep on track for achieving the longer-term measurable objective(s), and will revise strategies to address obstacles and challenges.
Measurable objectives allow the Ag Water Quality Program to better evaluate progress toward meeting water quality standards. Many of these measurable objectives relate to land conditions and primarily are implemented through focused work in small geographic areas (section 1.7.3), with a long-term goal of developing measurable objectives and monitoring methods at the Management Area scale. The 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 nutrients, because many pesticides and nutrients adhere to sediment particles.

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

- Landowners can see land conditions and have direct control over them.
- It can be difficult to separate agriculture’s influence on water quality from other land uses.
- Extensive monitoring of water quality is needed to evaluate progress, which is expensive and may fail to demonstrate improvements in the short term.
- Improved land conditions can be documented immediately, but there may be significant lag time before water quality improves or water quality impacts may be 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 may help ODA and partners to measure progress or identify problem areas in implementing Area Plans. However, as described above, water quality monitoring may be less likely to document the short-term effects of changing land conditions on water quality parameters such as temperature, bacteria, nutrients, sediment, and pesticides.

1.7.3 Focused Implementation in Small Geographic Areas

Focus Areas
A Focus Area is a small watershed with water quality or concerns associated with agriculture. Through the Focus Area process, the SWCD delivers systematic, concentrated outreach and technical assistance in small geographic area. A key component of this approach is measuring land 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).

Systematic implementation in Focus Areas provides the following advantages:

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

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

Working within a Focus Area is not intended to prevent implementation within the remainder of the Management Area. The SWCD will also continue to provide outreach and technical assistance to the entire Management Area.

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

1.8 Monitoring, Evaluation, and Adaptive Management

ODA, the LAC and the LMA will assess the effectiveness of the Area Plan and associated Area Rules by evaluating the status and trends in agricultural land conditions and water quality data. This assessment will include an evaluation of progress toward measurable objectives on agricultural lands across the entire Management Area and within the Focus Area. ODA will utilize other agencies’ and organizations’ local monitoring data when available. The Area Plan summarizes the results and findings in Chapter 4 for each biennial review. ODA, DEQ, SWCDs, and LACs will examine these results during the biennial review and will revise the goal(s), measurable objectives, and strategies in Chapter 3, as needed.

1.8.1 Statewide Aerial Photo Monitoring of Streamside Vegetation

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

1.8.2 Agricultural Ambient Water Quality Monitoring

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

This and all Area Plans and associated 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 associated 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

The Area Plan was developed with the assistance of the LAC. The LAC was formed in 2000 to assist with the development of the Area Plan and associated regulations, and with subsequent biennial reviews. Current LAC members are:

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<thead>
<tr>
<th>Name</th>
<th>Location</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linda Smith (Chair)</td>
<td>Langlois</td>
<td>Cattle</td>
</tr>
<tr>
<td>Lee Riddle</td>
<td>Brookings</td>
<td>Lily Bulbs</td>
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<tr>
<td>Ted Fitzgerald</td>
<td>Brookings</td>
<td>Cattle</td>
</tr>
<tr>
<td>Harry Harms</td>
<td>Brookings</td>
<td>Lily Bulbs</td>
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<tr>
<td>Robert McKenzie</td>
<td>Sixes</td>
<td>Cranberries</td>
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<tr>
<td>Mary Wahl</td>
<td>Elk River</td>
<td>Sheep</td>
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<tr>
<td>Jim Kamph</td>
<td>Langlois</td>
<td>Cattle</td>
</tr>
<tr>
<td>Joe Pestana</td>
<td>Sixes</td>
<td>Cattle</td>
</tr>
<tr>
<td>Shirley (Tooz) Wahl</td>
<td>Elk River</td>
<td>Sheep</td>
</tr>
</tbody>
</table>

Previous LAC Members:
- Walt Schroeder, Former Chair
- Knute Andersson
- Becky Crockett
- Jim Donaldson
- Bruce Follansbee
- Norm Yock
- Earl Lang
- George Fleming
- Frank Burris
- Mike Knapp
- Rick McKenzie
- Angie Dillingham
- Joe Brown

2.1.2 Local Management Agency

The implementation of the Area Plan is accomplished through an Intergovernmental Agreement between ODA and the Curry SWCD. This Intergovernmental Agreement defines the SWCD(s) as the LMA(s) for implementation of the Area Plan. The SWCD(s) was/were also involved in development of the Area Plan and associated regulations.

2.2 Area Plan and Regulations: Development and History

The Area Plan and associated regulations were approved by the director of ODA in 2004.

Since approval, the LAC met in 2006, 2010, 2012, and 2014 to review the Area Plan and associated regulations. The biennial review process includes an assessment of progress toward achieving the goals and objectives in the Area Plan.

2.3 Geographical and Physical Setting

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

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

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

The river bottom lands and associated hill-grazing lands made dairy farming the number one farm enterprise in the county. Cheese factories in almost every community manufactured cheese and butter to ship to San Francisco and other markets. A nationally famous Blue Cheese factory was located in Langlois until destroyed by fire in 1957. Close to 400 dairy herds were existing in the county in 1938, though at that time, many were small herds that could be hand milked by the farmer and his children. Now there are only two dairy herds in the entire county. Both have waste management plans and are regulated under the ODA Confined Animal Feeding Operation program (CAFO).

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

During World War II, the Easter lily enterprise greatly expanded when bulbs were no longer available from Japan. Hundreds of farmers and gardeners got into the lily business. The industry started in the Bandon area but over the years it centered on the rich deep soils and climate of the Harbor Bench and nearby Smith River delta in northern California. Growers have developed ponds or wells from which they irrigate their lilies. Easter lilies are a crop unique to the soils and climate of this area and are a stable industry providing many jobs.

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

The cranberry industry continues to weather a boom and bust economic cycle. The growers experience years when the price paid per barrel is high, and must endure other years when the price per barrel is devastatingly low. These economic concerns are in addition to the fluctuating yields resulting from weather and other factors.
Several other crops are grown on the rich soils of the county including hydrangeas, rhododendrons and blueberries. The largest hydrangea farm in the world is located on the Harbor Bench in Southern Curry County.

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

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

Fisheries

Except for the streams with impassable barriers (such as the Harbor Bench area), all Curry County streams (from Floras Creek in the north to the Winchuck River in the south) are excellent producers of salmonids: Chinook salmon, steelhead, cutthroat trout, and Coho salmon. Local watershed councils, the Curry Soil and Water Conservation District (SWCD), and the Salmon Trout Enhancement Program are working to enhance most of these streams and address impacts created by past land use practices. Local agricultural producers have worked with these groups to enhance riparian and upland areas and proactively improve watershed health.

Changes in some native salmonid populations have occurred in Curry County rivers but not to the extent experienced in counties to the north and south. Factors influencing the changes vary between species and river systems, but include spawning and rearing habitat degradation, passage obstacles, overfishing, water demands for other uses, urban development, seasonally limited streamflow and probably most important, changing ocean habitat conditions (El Niños, upwelling, ocean oscillations). However, we should not judge yesterday's activities by today's standards but only recognize that everyone has contributed to the declines and move forward to correct past mistakes.

The nine watershed councils in Curry County have contributed greatly to the enhancement of salmonid habitat through riparian fencing, planting, improving fish passage, instream structure development, habitat improvement, etc. Ranchers have fenced many stream miles voluntarily under the Hire the Fisher program and the Oregon Plan for Salmon and Watersheds.

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

El Nino - events of relatively dry winters for four to five years and the past 20 years of altering ocean conditions have had an adverse effect on anadromous fish populations. In recent years, favorable ocean conditions and wet winter cycles have occurred and we are seeing quantum increases in salmonid returns to many Curry County streams. This suggests that ocean productivity is a long-term natural cycle that falls outside the realm of controllable fisheries management. Some declines in numbers of native fish
have conflicted with increases in hatchery-raised stocks. Targeting hatchery fish while allowing native stocks to spawn naturally in the improved habitat may help to alleviate some of these concerns.

During periods when ocean productivity is low, it is critically important to protect and improve freshwater habitats so they do not become the “weak link” in the chain of salmonid production. Agricultural operators actions can have an important impact on salmonid production and its freshwater habitat and these actions will be discussed in detail in this Plan.

The Watershed as an Ecosystem

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

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

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

Different landscape types within the watershed have different roles in the capture, storage, and slow release of water. Wetlands and flood plains slow down the movement of water allowing time for groundwater recharge. Wetlands also serve the purpose of filtering out possible contaminants. Vegetation helps hold topsoil in place and is an important source of humus in the form of decaying plant material. Healthy topsoil is not only our source of food; it also helps provide clean and abundant water.

Major fires historically occurred in the Klamath mountains eco-region on about 50-year intervals. Native Americans and ranchers both used fires to maintain grasslands and prairies. From the 1920s to 1987, the USFS adopted a policy to aggressively fight forest fires. Although no official policy change had taken place prior to 2002, current forest service practice is to allow fires to burn until they threaten private homes and structures. This first came to light with the Silver Fire in 1987, which burned thousands of acres in Curry County. In 2002, the Biscuit Fire confirmed this new practice as nearly 500,000 acres were consumed. Both national forest and private forest holdings were destroyed in that fire. Sufficient resources to stop this fire were not employed until substantial private residences and structures were put at risk. This watershed management practice is mentioned in the document only because the LAC feels that it has direct impact on stream temperature and sedimentation. We also feel that it has potential for substantially more long-range impact on fish populations in our watersheds.
Climate

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

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

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

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

Physical Settings of Curry County Watersheds (north to south)

Floras Creek

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

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

Extreme flooding is a defining feature of the watershed with floods occurring on a regular basis. High intensity rainfall events caused major floods in 1955, 1964, and 1983 and again in late 1996. The mouth of Floras Creek fluctuates in location almost annually. Floras Creek hits a foredune and flows north from zero to nine miles before breaching the foredune and exiting to the ocean. The fluctuating outlet location and the high flow events have contributed to severe separation of the stream (down-cutting) from its riparian area in the lower portion of the watershed. This separation and high flow events have contributed to streambank erosion, the cutting of wide stream cross-sections, and excessive deposition of gravel bars. The stream fluctuates between a meandering gravel-sand bed stream (Rosgen C4-5) to a straight entrenched stream (Rosgen F4-5) (Rosgen, 1996). During the dry summer months, these same highly eroded stream channels result in a relatively small stream flowing in a large channel. Thus, wide, shallow conditions contribute to low velocities and severe stream warming.
A large portion of the Floras Creek watershed is managed for timber and regulated under the Oregon Forest Practices Act. Most of this land was logged within the past forty years and consists of younger timber stands. Douglas fir is the most common tree used in reforestation and plantations. Some of these areas were left to naturally regenerate resulting in alder dominated stands. Some of the upland areas are managed for livestock grazing and these practices encourage vegetated cover throughout the year. There are also a few rural home sites.

Soils in the uplands are naturally steep, highly erodible, and prone to landslides. These natural geologic conditions in combination with historic logging practices and road construction (prior to Forest Practices Act), and various historic state, county, and private land and road management have contributed to an overall sediment load in the system. Present forest practices and other land and road management minimize upland erosion.

The lower portion of the watershed tends to be coarse to medium textured soils that are level and used for agricultural production. Extensive areas of these soils are allocated to improved pastures for ranching. Cranberries and some row crops are also grown. There is one dairy on Floras Creek. When the dairy is in use, the cows graze the pastures and are brought to the barn for milking. The highly erodible alluvial material presents streambank erosion problems for local landowners. Conservation minded landowners attempt to control loss of pasture and agricultural land by placing riprap, rock groins, bank bars, or spruce trees along the banks. Unfortunately, these steps sometimes prove inadequate and the control structure is removed by floodwaters at times of severe flooding and down cutting. The landowners, in cooperation with the Bureau of Land Management, have submitted permits to mechanically breach the foredune in three locations to create a more consistent outlet for Floras Creek. A more consistent outlet and good vegetative conditions will help stabilize lower Floras Creek and prevent excessive erosion.

Some cranberry production exists in the Floras Lake sub-watershed and lower mainstem of Floras Creek. Cranberry production requires irrigation in the summer and flooding at harvest time in October. Both groundwater and surface water are used. The producers build storage ponds and recycle as much water as possible. The Oregon Water Resources Department and cranberry organizations in the area are cooperating on a water use study analyzing the relationship between ground water and surface water in the area. This study will help determine the potential impacts of groundwater use in cranberry production on low flow stream conditions.

Floras Creek and its tributaries are home to four species of anadromous fish and several species of freshwater stream, estuarine and marine fish species. Most of the species are native to the region, but some; large mouth bass and rainbow trout were introduced to enhance recreational fishing in Floras Lake. Coho salmon, Fall Chinook salmon, Winter Steelhead, and Cutthroat trout have historically spawned in the Floras Creek watershed (Maguire, 2001a).

**Sixes River**

The Sixes River is one of the larger watersheds in the Southern Oregon coastal area, draining approximately 85,650 acres or 134 miles. Elevations in the watershed range from sea level to 3,315 ft. Major tributaries include the North, Middle and South forks, and Dry, Edson, and Crystal creeks. The upper portion of the basin is characterized by steeply sloped forested land with narrow valleys and tributary streams that have moderately steep to very steep gradients. The predominant land use in the middle and upper portions of the watershed is commercial timber production. The lower few miles of the river are relatively low gradient coastal floodplain. Rural residential development, grazing, and other agricultural uses are the dominant land uses in the lower basin.
Approximately 92 percent of the Sixes River watershed is located in the Southern Oregon Coastal Mountains ecoregion, which is characterized by complex geology; steep, high gradient streams; and seasonally abundant precipitation. Watersheds in this ecoregion have high stream densities due to heavy precipitation during winter months. Extensive erosion can result from fractured geology, extremely variable stream flows, and a naturally high incidence of landslides in this ecoregion. The remaining eight percent of the Sixes River drainage is located in the Coastal Lowlands ecoregion and is characterized by low gradient streams that are predominantly underlain by marine terrace deposits and flow through deep soils that range from silty clay loams to sandy loams. Streams in the Coastal Lowlands ecoregion are also susceptible to high erosion rates due to extreme fluctuations between summer and winter stream flows, easily eroded soils, incised channels and historic loss of riparian vegetation.

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

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

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

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

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

Riparian habitats in Sixes River are characterized by a scarcity of large conifers near the surveyed channels and a relatively low incidence of bank erosion. Aquatic habitat complexity is low, primarily because of the lack of secondary channels and large wood throughout the drainage. Sixes River and/or it’s
tributaries are 303d listed for the parameters spawning dissolved oxygen and temperature. EPA proposes to add additional 303d listings for biological criteria and juvenile rearing dissolved oxygen.

Out-of-stream water rights for the Sixes River watershed consist of both storage rights (approximately 426 acre-feet) and in-stream rights (120 cubic feet per second [cfs]), and the majority of those rights are senior to the 1964 in-stream water right of 30 cfs in July and 25 cfs in August and September. Out-of-stream water rights currently exceed the flow in Sixes River from May to October, with the water rights allocated for mining (75 cfs), agriculture (23 cfs), and irrigation (21 cfs) use. Water Storage Rights within the Sixes River watershed total 426 acre-feet and are entirely allocated for agricultural and irrigation use. Many of these rights are not exercised resulting in year-round flow.

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

Chinook and Coho salmon, steelhead, and cutthroat trout are all native to the Sixes River drainage. The historic abundance and distribution of these salmonids within the watershed are not known. Chinook salmon and steelhead are thought to occupy most of their historic habitat in the Sixes River watershed. Coho salmon are listed coast-wide as threatened under the Endangered Species Act. Little is known about the historic distribution and abundance of cutthroat trout, but currently they are thought to fully utilize the available habitat. There are no hatcheries on the Sixes River yet continues to provide a thriving recreational fishery (Maguire, 2001b).

**Elk River**

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

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

The Elk River watershed is comprised of Rocky Point sandstones and siltstones, Humbug Mountain conglomerate, shales of the Galice Formation, diorite intrusions, and ultramafic rocks. Vegetation in the watershed includes forested land with a hardwood/conifer mixture of Douglas fir, western hemlock, Port Orford cedar, Jeffrey pine, Sitka spruce, tanoak, red alder, madrone, myrtle, and bigleaf maple. The understory is huckleberry, salal, rhododendron, vine maple, willow swordfern, poison oak, and others. The major plant communities vary in age from early seral stages to old growth.
Natural climatic events have played a dominant role in shaping the stream channels in the watershed. Evidence from the 1955 and 1964 floods are contained on aerial photographs. Gravel bars were measured along the mainstem of Elk River on 1940-1986 aerial photos. The number of gravel bars on the whole watershed increased by 77 percent overall. In the upper segment which is wider and lower gradient, gravel bars increased more in size than in number. In the lower segment, which is narrower and steeper, a greater increase in the number of bars was observed.

Below the National Forest boundary, comparisons of the Elk River channel from 1940-1986 aerial photos show increased numbers and sizes of gravel bars. The unconfined channel flows through the valley floor show a change in pool geometry and frequency where new flood plains have been established over 46 years of flooding.

Elk River is recognized for its role in maintaining the viability of native salmonid stocks. The Elk River watershed produces anadromous steelhead trout, Coho salmon, Chinook salmon, and cutthroat trout. Resident rainbow and cutthroat trout populations are also present. Oregon Department of Fish and Wildlife operate a fish hatchery that was established in 1968 on the river just below Anvil Creek.

Adult Elk River Chinook salmon are characteristically three and four-year-old fish that return primarily from November through January. This is a departure from many other coastal stocks, most of which return earlier in the fall. It is thought that the delay in adult spawning migration is an environmental adaptation to low-water conditions that persist on the Southern Oregon Coast during the fall months. The Elk River also appears to be the southern boundary between north-migrating and south-migrating coastal Chinook stocks (Maguire, 2001c).

**Hubbard Creek**

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

**Basin Description:**
- Boundaries: Elk River Watershed on the north and east
- Garrison Lake Watershed on the north & west
- Rocky Point on the south
- Pacific Ocean on the southwest
- Elevation: Sea Level to 1,200 feet

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

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

**Fish:**
- North Fork – Cutthroat
- Middle Fork – Cutthroat
- South Fork – Cutthroat, Steelhead, Coho Salmon
**Euchre Creek**

Euchre Creek is only 14 miles long and drains from one of the smallest watersheds of any river in south coastal Oregon (23,831 acres/37 mi.). Elevations in the watershed range from sea level to approximately 3,080 ft. Major tributaries include Cedar and Boulder creeks. The upper portion of the basin is characterized by steeply sloped forested land with narrow valleys and tributary streams that have moderate to very steep gradients. The predominant land use in the middle and upper portions of the watershed is commercial timber production. The lower few miles of the river are relatively low gradient coastal floodplain. Rural residential development, grazing, and other agricultural uses are the dominant land uses in the lower basin.

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

Over three-fourths of the land in the Euchre Creek basin is in private ownership, with almost 49 percent of the land owned and managed by private industrial timber companies, and 29 percent owned by small-parcel, private landowners. Public lands comprise almost 22 percent of the lands in the basin, with management responsibility for these lands split almost evenly between the Bureau of Land Management and the U.S. Forest Service. There are only 25 acres of state land in the Euchre Creek watershed.

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

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

There are relatively few out-of-stream water rights for the Euchre Creek watershed. However, the majority of those rights are senior to the 1964 in-stream water right of 10 cfs in the summer months. Out-of-stream water rights currently exceed the flow in Euchre Creek from May to October of most years, with the majority of these water rights allocated for irrigation use. Water storage rights within the Euchre Creek watershed total 179 acre-feet, and are almost entirely allocated for industrial use. Most of these rights are not used but still active.

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

Chinook and Coho salmon, steelhead, and cutthroat trout are all native to the Euchre Creek drainage,
although the historic abundance and distribution of these salmonids within the watershed are poorly
understood (Maguire, 2001e).

**Rogue River**

The Rogue River basin extends from the west slope of Crater Lake on the east to the northernmost portion
of California on the south to the Pacific Ocean on the west. The Basin covers 5,160 square miles and lies
in the Klamath Mountain Province. The Rogue River is the third largest river in Oregon and is
approximately 200 miles long. This Plan covers that portion of the basin that lies within Curry County.
The lower Rogue River is 303d listed for the parameter temperature.

Precipitation ranges from 80 inches per year at the coast to 130 inches at Signal Buttes. Before 1977, the
annual discharge of the Rogue was 5.66 million acre-feet. After the completion of the Lost Creek Dam in
1977 and the Applegate Dam in 1980, the annual discharge fell to 3.97 million acre-feet. At the Agness
gauge, the highest recorded flow was 290,000 cfs in 1964 and the lowest was 608 cfs in 1968. The
principal tributaries within Curry County are Shasta Costa Creek (river mile [RM] 29), Illinois River (RM
27), and Lobster Creek (RM 11).

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

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

A variety of anadromous and resident salmonids use the watershed including Chinook, winter and
summer steelhead, Coho, cutthroat, and rainbow trout. The Rogue and Illinois mainstems are used as
migration habitat while Lobster and Quosatana creeks provide the majority of the spawning and rearing
habitat. The smaller, steeper tributary streams provide cool water to help lower summer water
temperatures in the mainstem. Other species utilizing the estuary and river include sturgeon (green and
white), shad, and lamprey.

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

The Hunter Creek watershed can be divided into five subwatersheds: Upper Hunter mainstem (North Fork confluence to headwaters), Middle Hunter mainstem (North Fork confluence down to Section 21), Lower Hunter mainstem (Section 21 to the mouth), North Fork Hunter, and Big South Fork Hunter. The whole watershed encompasses 44.4 square miles or 28,405 acres. Hunter Creek and/or its tributaries are 303d listed for the parameters pH and temperature. The Environmental Protection Agency (EPA) proposes to add an additional 303d listing for the parameter juvenile rearing dissolved oxygen.

The watershed is divided between public (38 percent) and private lands (62 percent). The public lands are administered by the USFS, the BLM, and the state. Ownership of the private lands is dominated by approximately 81 percent by forest industry. Forestry uses account for 97 percent of the land in the watershed on both private and public lands. The remaining three percent of the watershed is divided between urban, agriculture/range and rural residential uses.

Precipitation ranges from 80 inches per year at the coast to 130 inches per year in the interior mountains. The majority of the watershed receives approximately 110 inches per year. Elevations range from sea level in the Lower Hunter mainstem sub-watershed to 3,558 feet on Sugarloaf Mountain in the Upper Hunter mainstem sub-watershed and 3,512 feet near Signal Buttes in the North Fork Hunter sub-watershed. The rain-on-snow zone encompasses 15 percent of the watershed - primarily in the Upper Hunter mainstem and North Fork Hunter sub-watersheds.

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

A variety of anadromous and resident salmonids use the watershed including Chinook, winter steelhead, Coho, and cutthroat trout. The lower mainstem is used as migration habitat while the forks and tributaries provide the majority of the spawning and rearing habitat. The smaller, steeper tributary streams provide cool water to help lower summer water temperatures in the mainstem. Coho populations in Hunter Creek were smaller than Chinook due to the steep, confined high-energy streams. Cutthroat are thought to use most of the streams in the watershed, while steelhead use the lower section of each fork and the mainstem (Maguire, 2001f).

Pistol River

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

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

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

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

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

Chinook distribution covers all of the mainstem Pistol River, up to two-thirds of Sunrise Creek, approximately half of the South Fork, and the lower portions of several mainstem Pistol River tributaries. No Chinook have been reported on the Upper Pistol and East Fork. Coho distribution is similar to Chinook with less use of the South Fork and no use of the Sunrise Creek. Steelhead utilize nearly all of the mainstem, all of South Fork, one-third of the North Fork, one-third of the East Fork, and all three major mainstem tributaries (Maguire, 2001g).

**Chetco River**

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

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

Major fires historically occurred in the Klamath Mountains ecoregion on about 50 year intervals. Native Americans and ranchers both used fires to maintain grasslands and prairies. Prior to 2002, modern fire
suppression policy had severely reduced the incidence of wildfire in this region leading to the 2002 Biscuit fire. Severe windstorms occur regularly in the Chetco basin, and can topple large patches of mature trees. High intensity rainfall events on steep slopes can result in many landslides and earth flows into the Chetco River.

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

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

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

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

Chinook and Coho salmon, steelhead, and cutthroat trout are all native to the Chetco River watershed. The historic abundance and distribution of these salmonids within the watershed is poorly understood. Historic numbers of Coho are thought to have been low in most south coast basins, including the Chetco River, due to relatively steep topography which results in high gradient, confined drainages which are not conducive to Coho spawning or rearing. Chinook salmon and steelhead are thought to occupy most of their historic habitat in the Chetco River watershed. Little is known about the historic distribution and abundance of cutthroat trout, but currently they are thought to fully utilize the available habitat. The Chetco River continues to support a healthy recreational and commercial fishery (Maguire, 2001h).

**Winchuck River**

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

The Winchuck River drains approximately 45,600 acres (71.4 square miles of land). Steep forested areas and narrow valleys characterize the upper portion of the basin. Approximately 70 percent of the Winchuck watershed is in public ownership (USFS and some state parks).

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

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

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

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

The Winchuck River system hosts an anadromous fish population that includes Chinook salmon, winter steelhead, coastal cutthroat trout, and Coho salmon. The winter steelhead runs and cutthroat trout stocks are considered healthy by American Fisheries Society standards. The Chinook salmon population had been slowly decreasing since the 1970's, but in recent years has shown an increase (ODFW). Coho salmon populations have historically been limited and a small sustaining run exists in the South Fork watershed.

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

This watershed has a characteristic that allows it to clear faster than any river in Curry or Del Norte counties (including the Chetco and Smith rivers) after major storm events.

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

2.3.2 Geographic and Programmatic Scope

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

The 1993 Oregon Agricultural Water Quality Management Act (AgWQM), was enacted by the Oregon Legislature in response to the Clean Water Act and the Coastal Zone Management Act. States were given the opportunity to develop for themselves a system for implementation that met federal guidelines. This bill was Oregon's response. Without it, the DEQ and/or the courts could have stepped in and imposed some kind of program upon the state.

SB 502 was adopted in 1995 to clarify the scope of the AgWQM Act. It authorized the ODA as the lead agency responsible to administer the water quality related regulations for agriculture in Oregon.
However, ODA is subject to the standard setting and review authorities of other agencies, such as the DEQ and Oregon Health Division.

ORS 468B.010 to 468B.050 lays out a broad framework under which pollution is defined as both point and non-point sources which degrade water quality so as to be detrimental to beneficial uses. State water quality standards are based on those beneficial uses (i.e. 64°F temperature standard, 406 colonies of E. coli bacterial standard). The broad nature of the statute places a heavy burden of responsibility and confusion on the private agricultural landowner. How was the landowner going to determine if his/her operations were harmful to the beneficial uses of a particular water body? Area plan and rule-making seeks to eliminate the confusion of landowners and identify the responsibility of the agriculture community by working with LACs to develop land conditions that describe to both ODA and the landowner what the land looks like that has a potential to cause a 468B violation. In this scenario, ODA retains its full authority to interact with agricultural landowners for resource protection but landowners are the ones who identify the unique conditions that can exist in a particular watershed thereby protecting their operations from unnecessary scrutiny even if local waters were in violation of water quality standards.
2.3.3 Map of the Management Area

Curry Agricultural Water Quality Management Area
2.4 Agricultural Water Quality in the Management Area

2.4.1 Local Issues of Concern

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

We wish to make it clear that there are numerous natural, uncontrollable influences on the listed parameters within Curry County. Headwater streams coming out of the wilderness areas have periods when they are above the temperature criteria for Oregon. Tidal influences, wildly variable stream flows, climatic variables, and geologic factors all influence surface water heating rates. It has been recognized by DEQ that there are many streams in the state that will never meet the seven day maximum moving average $64^\circ F$ criteria. There is nothing agricultural operations (all in the lower part of the watersheds) can do to meet that biological temperature numeric criteria. Instead, we are asked by the state of Oregon to reduce or eliminate our contribution to the rate of heating.

2.4.2 Sources of Impairment

As stated earlier, there are background water quality problems that are not due to human activities. Bacteria reside in streamside soils. Water temperature can be warmed by air temperatures and stream channel substrate. Sediment and bank erosion are part of the natural hydrologic and geologic system. Nutrients, such as phosphorus, can be dissolved from parent rock material. Background sources of pollutants can be very hard and costly to identify and distinguish from management related sources.

Population increases, and their resulting environmental impacts, have changed the face of several stream systems within Curry County. Changes in fire frequency, the severity of peak and low stream flows, waste inputs, flood plain encroachment, degraded riparian areas, and airborne pollutants are all consequences of human population expansion into aquatic and terrestrial habitat. These are consequences that can be buffered but never eliminated. We are now an integral part of the landscape and environment.

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

2.4.3 303(d) List of Impaired Water Bodies

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

While this Area Plan applies to all agricultural nonpoint water pollution, it focuses specifically on parameters on the 303d list in the Management Area.
Appendix D provide tables summarizing the 2012 303d listed waterbodies water quality criteria and standards for identified parameters. More information is available in the 2012 integrated report and 303d list database on the DEQ website (www.deq.state.or.us/wq/assessment/2010Report.htm).

As of 2012, the most prevalent water quality issue in Curry County is the exceedence of the 64°F biologically-based numeric water temperature criterion. Table 1 below illustrates the percentage of the Curry County Basins stream segments listed on the 303(d) list that exceed the federal Clean Water Act standards for temperature and other parameters for which valid data sets are available. These are NOT listed because of agricultural activity in the basin. In many, stream segments are listed as temperature limited without any human induced factors present at all.

<table>
<thead>
<tr>
<th>Parameter (from 2002 303(d) list)</th>
<th>Stream Segments Exceeding Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature [64° F average daily maximum]</td>
<td>26/27 = 96%</td>
</tr>
<tr>
<td>Dissolved Oxygen [less than 90% saturation or 11 mg/l or 8.0 mg/l intergravel]</td>
<td>3/27 = 11%</td>
</tr>
<tr>
<td>pH [6.5-8.5 range]</td>
<td>1/27 = 4%</td>
</tr>
<tr>
<td>Aquatic Weeds or Algae […]having a deleterious effect on stream bottoms, fish or other aquatic life or …injurious to health recreation or industry…]</td>
<td>1/27 = 4%</td>
</tr>
</tbody>
</table>

2.4.4 Basin TMDLs and Agricultural Load Allocations

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

<table>
<thead>
<tr>
<th>Basin</th>
<th>Parameter</th>
<th>EPA Approval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lower Rogue</td>
<td>Temperature</td>
<td>2008</td>
</tr>
<tr>
<td>Lower Rogue Tributaries</td>
<td>Temperature</td>
<td>2008</td>
</tr>
<tr>
<td>Lobster Creek Watershed</td>
<td>Temperature</td>
<td>2002</td>
</tr>
</tbody>
</table>

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

2.4.5 Beneficial Uses and Parameters of Concern

The beneficial uses designated for the South Coast Basin:

- Public Domestic Water Supply
- Private Domestic Water Supply
- Industrial Water Supply
- Irrigation
- Livestock Watering
- Resident and Anadromous Fish and Aquatic Life
- Salmonid Fish Rearing
- Salmonid Fish Spawning
• Wildlife and Hunting
• Fishing
• Boating
• Water Contact Recreation
• Aesthetic Quality
• Hydro Power
• Commercial Navigation & Transportation

2.5 Prevention and Control Measures

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

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

OAR 603-095-3540

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

Definitions

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

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

In 1995, the Oregon legislature recognized potential confusing authorities that belonged to both ODA and DEQ regarding the enforcement of water quality statutes. To clarify authorities granted to ODA in SB 1010, the state legislature passed SB 502, which was codified into ORS 561.191. This statute states that ODA shall develop and implement any program or rules that directly regulate farming practices that are for the purpose of protecting water quality. A 1996 opinion from the Oregon Attorney General’s office states that ODA has the statutory responsibility to regulate agriculturally related water pollution. That same opinion also recognized the need to define that authority by developing water quality plans and rules that specifically address agricultural practices and land conditions and achieve the standards adopted by the Environmental Quality Commission.

2.5.1 ORS 468B – Waste Rule

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

**OAR 603-95-3540**

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

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

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

1. (a) Cause pollution of any waters of the state or place or cause to be placed any wastes in a location where such wastes are likely to escape or be carried into the waters of the state by any means.
2. (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.
3. (2) Violate the conditions of any waste discharge permit issued under ORS 468B or ORS 568.

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

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

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

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

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

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

**Water pollution** means such alteration of the physical, chemical or biological properties of any waters of the state, including change in temperature, taste, color, turbidity, silt or odor of the waters, or such discharge of any liquid, gaseous, solid, radioactive or other substance into any waters of the state, which will or tends to, either by itself or in connection with any other substance, create a public nuisance or which will or tends to render such waters harmful, detrimental or injurious to public health, safety or welfare, or to domestic, commercial, industrial, agricultural, recreational or other legitimate beneficial uses or to livestock, wildlife, fish or other aquatic life or the habitat thereof (State Statute for Water Quality: ORS 468B.005(7)).

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

### 2.5.2 Riparian Areas

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

This Rule was developed to clearly show that landowners are not required to have mature riparian vegetation immediately but only that they must allow for the establishment, growth and maintenance. For guidance on management activities that promote the growth and establishment of riparian vegetation, please contact the Curry SWCD. Streamside area condition can improve several water quality parameters by providing shade (temperature, aquatic weeds / algae, and dissolved oxygen) and streambank stability (mercury, pesticides, and dissolved oxygen). For more information on the effects of riparian vegetation on water quality, please consult the References section.

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

**Definitions:**

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

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

2.5.3 Role of Upland Vegetation to Prevent and Control Pollution

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

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

- Capture, storage, and slow release of precipitation reflective of natural conditions.
- Plant health and diversity that support cover and forage for wildlife and livestock.
- Filtration of sediment and polluted runoff.
- Plant growth that increases root mass, utilizes nutrients, and stabilizes soil to prevent erosion.
Chapter 3: Measurable Objectives and Strategic Initiatives

3.1 Goals and Objectives

3.1.1 Goals

Goal of the Committee

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

Goals of the Area Plan

- Prevent and control water pollution from agricultural activities and soil erosion, and to achieve applicable water quality standards;
- Achieve the following land conditions on agricultural lands throughout the management area that contribute to good water quality:
  - Streamside vegetation provides stream bank stability, filtration of overland flow, and moderation of solar heating, consistent with site capability;
  - Minimize sediment loss from cropland through precipitation or irrigation induced erosion to waters of the state;
  - No significant bare soils within 50 feet of streams on pasturelands and/or rangelands;
  - Livestock manure is stored under cover during the winter and in a location that minimizes risk to surface and groundwater;
  - Implement restoration projects.

3.1.2 Objectives of the Committee

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

3.1.3 Measurable Objectives

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

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

To achieve the Area Plan goal, the following measurable objectives were developed in cooperation with ODA, and the LMA.

**Focus Areas**

**Langlois Creek**
This watershed was a Focus Area from 2011 through June 2017. In 2011, the Curry SWCD did a pre-assessment of streamside vegetation using aerial photography to classify stream reaches into categories.

Assessment categories include:
- **Red**: Agricultural activities likely not allowing vegetation to moderate solar heating, stabilize streambanks, or filter out pollutants consistent with site capability.
- **Yellow**: Agricultural activities not impairing riparian growth, but vegetation likely insufficient to moderate solar heating, stabilize streambanks, or filter out pollutants consistent with site capability.
- **Green**: Vegetation likely sufficient to moderate solar heating, stabilize streambanks, and filter out pollutants consistent with site capability.

**Condition of 16.45 miles of stream**
- In 2011: 11.36 miles of stream were categorized as Red
- In 2015: 10.14 miles of stream were categorized as Red

**Focus Area Milestone for 2015-2017**
By June 30, 2017: Reduce Red category streams by 1.5 miles to 8.64 miles

**Morton Creek**
In 2014, the Curry SWCD completed the Streamside Vegetation Assessment (SVA) for the Morton Creek sub-watershed. The SVA assessed streamside vegetation within 35 feet of both banks of perennial and intermittent streams. Streamside areas were analyzed using GIS aerial photos and results were then ground-truthed from public vantage points, such as public roads. Streamside vegetation conditions were classified using 11 SVA Map Categories: Ag Infrastructure, Bare, Bare Ag, Grass, Grass Ag, Not Ag, Shrub, Shrub Ag, Tree, Tree Ag, Water.

**Condition of 192.41 agricultural acres within 35 feet of a stream**
- 2015: [Grass-Ag + Bare-Ag] = 44.80 acres
- 2017: [Grass-Ag + Bare-Ag] = 44.66 acres

**Focus Area Milestones**
By June 30, 2017: Reduce [Grass-Ag + Bare-Ag] by 2.5 acres to 42.30 acres
By June 30, 2019: Reduce [Grass-Ag + Bare-Ag] by 2.5 acres to 42.16 acres

**Management Area**
Measurable Objectives and Milestones for the Management Area will be added as assessment methods are developed and completed by ODA. The current Management Area wide Measurable Objective language below is in draft form:
- Measurable Objective: By June 30 20XX, 90% of the agricultural areas (measured in acres or streambank miles) in the Management / Focus Area will have streamside vegetation that
likely provides the water quality functions (shade, bank stability, and filtration of overland flow) of the area’s site-capable vegetation.

- Current Conditions: In 2015 - XX% (from pre-assessment).
- Milestone 1: By June 30, 2017 - XX%.
- Milestone 2: By June 30, 2019 - XX%.
- Etc.
- Milestone XX: By June 30, 20XX - 90% (final milestone, which achieves the MO).

Oregon Department of Agriculture uses science and best professional judgment to determine: (1) the Management / Focus Area’s likely site-capable streamside vegetation, (2) the likely level of water quality functions (shade, bank stability, filtration of pollutants) from the site-capable vegetation, and (3) whether the vegetation measured via pre- and post-assessments is likely providing these functions.

3.2 Strategic Initiatives

3.2.1 Focus Area(s)

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

The group decided that a further refinement of the prioritization needed to occur to determine an appropriate sized area within these two watersheds. The first parameter was subdivided into an ‘absolute water quality’ parameter not based on land use and a second ‘possible influence of agriculture on water quality’ parameter. The beneficial use parameter was dropped. The North Langlois Creek and Langlois Creek Sub-watersheds were chosen as the top priority areas. E.Coli and elevated levels of nitrogen and phosphorus were identified as the highest water quality concern for the priority area. Livestock exclusion, management of lateral ditch systems, and upland pasture management were determined by the group to have the most impact on the water quality parameters and would be the focus of the District’s and watershed councils’ efforts.

The current Focus Areas is Morton Creek. Langlois Creek was discontinued July 1, 2017.

Copies of the Focus Area Action Plans can be obtained from the Curry SWCD. The Curry SWCD will report the results to ODA at the end of each fiscal biennium via the Action Plan. As part of the next Biennial Review, ODA will summarize the results in Chapter 4, discuss and evaluate progress with the LAC, and use adaptive management to adjust implementation strategies if needed.

**Langlois Creek Focus Area**

The Langlois Creek Focus Area is 3,367 acres. Land use in the watershed is approximately 90% agriculture and 10% rural residential, and 3.9% urban. The main agricultural uses include cattle and sheep grazing, with a small amount of acreage devoted to cranberries. There are 9.17 miles of perennial streams and 17.4 miles of intermittent streams. The SWCD assessed 16.45 miles of stream to track improvements.
Morton Creek Focus Area
Morton Creek is a 1,850 acre subwatershed of New River that is comprised of coastal plain, stream valley, and hillslope topography. Land use consists of agriculture (~93%), non-industrial forestry (~5%), rural residential (2%), and rock quarrying (less than 0.01%). Approximately 10 landowners are engaged in dispersed livestock production (cattle and sheep ranching), which accounts for nearly 99 percent of the agricultural activity in the watershed, and one landowner operates a ~20 acre cranberry farm. Within the watershed there are approximately 17.5 miles of perennial and intermittent stream channel, of which 15.8 miles are on agricultural lands. The SWCD assessed 192.41 acres along streams on agricultural lands to track improvements.

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

3.2.2 Strategic Implementation Area (SIA)

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

ODA evaluated agricultural tax lots in the watershed for conditions that could potentially impair water quality.

<table>
<thead>
<tr>
<th>Percent of Tax Lots with Agricultural Activities</th>
<th>36%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent of Agricultural Tax Lots with Opportunities for Improvement</td>
<td>4%</td>
</tr>
<tr>
<td>Potential Violations</td>
<td>0</td>
</tr>
<tr>
<td>Opportunities for Improvement</td>
<td>6</td>
</tr>
<tr>
<td>Limited Opportunities for Improvement</td>
<td>127</td>
</tr>
<tr>
<td>NA (forestry)</td>
<td>132</td>
</tr>
<tr>
<td>Total Tax Lots</td>
<td>265</td>
</tr>
</tbody>
</table>

ODA reviewed these results with local partners and agency staff. An Open House was held in April 2018 in the watershed. All agricultural landowners in the watershed were mailed an invitation to the Open House. Landowners were given the opportunity to see the results of the evaluation related to their property. SWCD and Watershed Council staff talked with landowners and offered assistance. OWEB provides funding to SWCDs to assist landowners and monitor progress in SIAs. SWCDs are the local, non-regulatory, helpful organizations. ODA is the only entity with regulatory authority for agricultural water quality issues. Following the Open House, SWCD staff wrote an Outreach Strategy for working with landowners of properties that were evaluated as “Opportunities for Improvement” and “Limited Opportunities for Improvement”.
One year following the Open House, ODA will follow up with compliance cases, as needed, with properties evaluated as “Opportunities for Improvement”. Ideally, the SWCD staff will have worked with the landowners already to solve water quality concerns, or landowners will have taken action to correct any water quality issues on their land. At the conclusion of the SIA, ODA will complete a post-assessment to document progress made in the watershed.

3.3 Strategies and Activities

To protect or improve water quality, an effective strategy must increase awareness of the problems and the range of potential solutions, motivate appropriate voluntary action, and provide for technical and financial assistance to plan and implement effective water pollution prevention and control measures. The SWCD(s) and other partners will cooperate to implement the following strategies at the local level with landowners:

- Prevent runoff of agricultural wastes: to ensure that agricultural activities do not contribute any wastes to, or place waste where it is likely to run off into, waters of the state.
- Prevent and control upland and cropland soil erosion using practical and available methods.
- Control active channel erosion to protect against sediment delivery to streams.
- Prevent bare areas due to livestock overgrazing or cropping near streams.
- Establish streamside vegetation along streams on agricultural properties to provide streambank stability, filtration of overland flow, and moderation of solar heating.

3.3.1 The Curry SWCD

The Curry SWCD can provide direct assistance to landowners in developing Area Plans for individual landowners. The Curry SWCD, as the designated local management agency, will provide specific landowner education and support for this Area Plan. Currently, the following activities are proposed by the SWCD:

- A regular SWCD newsletter containing articles on positive management practices, outstanding District cooperators and their management practices, and articles about the status of the Curry County Area Plan and Rules;
- Workshops, presentations, and seminars that will relate to the unacceptable conditions and positive management practices that are found in the Curry County Area Plan;
- Press releases, and meeting announcements concerning Curry area activities;
- Coordination between other agencies and associations such as DEQ, OSU Extension, Watershed Councils, etc.;
- Serve as a general clearinghouse of information for the public about the Agricultural Water Quality Management Act and also an archive for the Curry LAC;
- Provide technical assistance and assistance obtaining financial cost-share opportunities to assist agricultural landowners in their efforts to comply with the AgWQM Plan and Rules in the Curry Area;
- Employ staff to facilitate the implementation of the AgWQM program in the Curry area;
- Identify, and focus outreach and technical assistance work in small geographic areas to help demonstrate the effectiveness of the area plan. The following process will be followed for each consecutive Focus Area:
  - Determine list of future focus areas, after seeking input from LAC, LMA, and other partners.
  - Identify water quality parameter(s) of concern within the area, and compile available baseline data.
  - Assess baseline land conditions within the area(s).
Conduct educational programs and one-on-one landowner contacts in the area(s) to promote public awareness of water quality issues and their solutions.

- Provide one-on-one voluntary technical assistance to landowners in the area(s) to achieve land conditions that contribute to good water quality.

- Secure necessary resources to help landowners in the area(s) achieve land conditions that contribute to good water quality.

- Assess land conditions within the area(s) again prior to the next biennial review of the Area Plan, and quantify changes from the baseline.

### 3.3.2 Community and Landowner Outreach

ODA coordinated the development of the AgWQM program education projects within the Curry County with the Curry SWCD. They worked hand in hand with US Department of Agriculture’s Natural Resources Conservation Services (NRCS), the OSU Extension Service, and the South Coast and Lower Rogue Watershed councils to carry out an effective water quality education program.

To define, implement, and measure the success of the Curry County education effort, the following quantifiable tasks can be pursued:

1. **Conduct education programs to promote public awareness of water quality issues.**
   - Hold workshops on water quality issues and the conservation practices that will help improve water quality.
   - Develop demonstration projects to highlight successful conservation practices and systems.
   - Organize tours of demonstration projects for agricultural managers and producers.
   - Produce and distribute brochures about water quality issues.
   - Prepare standard presentations for agricultural producer groups.
   - Develop detailed, one-page Curry County fact sheets for erosion control, nutrient and waste management, livestock and grazing management, and riparian and streambank management.
   - Conduct one-on-one and small group visits with landowners to discuss the Curry County Area Plan and adaptive management solutions.

2. **Conduct a media program to inform Curry County agricultural operators, rural landowners, and the public of conservation issues and events.**
   - Submit news articles and public service announcements to area newspapers, radio stations, and newsletters.
   - Invite media to conservation tours and workshops.
   - Include updates on the status of the Curry County Area Plan and water quality data in Curry County SWCD, OSU Extension, and watershed council newsletters.

3. **Involve the agricultural community in conservation education.**
   - Create and maintain a list of experienced agricultural operators willing to share management solutions with other interested people by speaking, leading tours, and providing tour sites.

4. **Build partnerships with commodity groups to promote conservation.**
   - Co-sponsor workshops and tours among the commodity groups, watershed councils, and the Curry County SWCD.
   - Share education materials with commodity groups and their representatives.
   - Develop educational materials in conjunction with commodity groups and watershed councils.
• Partner with other agricultural and natural resource agencies, watershed councils, and commodity groups to access and acquire the material and financial resources to implement the Curry County Area Plan and its educational component.
• Meet with other agencies and organizations, and develop a strategy to obtain funding from traditional and nontraditional sources.

We believe that the vast majority of landowners want to do the things that will benefit the land and their production. A great deal of effort and resources should be used to inform landowners of the management strategies that will improve both their land and the quality of their water.

3.3.3 Public involvement in the Area Plan and Rules development process

This Area Plan in draft form was presented and made available to the public for public comment. Testimony presented at public hearings and collected during public comment periods were reviewed by the ODA and the LAC, and recommended modifications to the Area Plan were presented to the Board of Agriculture and the director of the ODA for their review and comment. The final OARs resulting from this process were adopted through the Administrative Rules process by the director of the ODA.

This Area Plan and the associated Area Rules are subject to a two-year review process. Two years after adoption, ODA, in cooperation with the Curry SWCD and the Curry LAC will assess the progress of Area Plan implementation toward achievement of Area Plan goals and objectives. Any new water quality information and programs, including TMDLs, affecting agriculture will be reviewed and considered during this review process. As needed, recommendations to the State Board of Agriculture and director will be made regarding modifications to the Area Plan that may be necessary to achieve water quality goals and objectives. Any future amendments to the administrative rules will be subject to public participation process as defined in Oregon law.

3.3.4 Conservation Planning and Conservation Activities

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. Due to these variables, it is difficult to recommend any specific, uniform set of management activities in the Area Plan to improve agricultural water quality.

Management activities and land management changes are most effective when selected and installed as parts of a comprehensive resource management or conservation plan based on natural resource inventories and assessment of management activities.

A detailed list of specific measures that can be used to address agricultural pollution are contained in other documents such as the NRCS Field Office Technical Guide, available for reference at the local NRCS office. Landowners and operators have flexibility in choosing management approaches to address water quality issues on their lands.

The federal Coastal Zone Act Reauthorization Amendments (CZARA) section 6217(g) agricultural measures described in Appendix B. provide a menu of options that also prevent and control water pollution.

Voluntary conservation plans describe the management systems and schedule of conservation activities that the landowner will use to conserve soil, water, and related plant and animal resources on all or part of
a farm unit. Landowners, operators, consultants, or technicians available through the SWCDs or the NRCS may develop voluntary conservation plans. A conservation plan can be used to outline specific measures necessary to address the “Prevention and Control Measures” outlined in Chapter 2 of the Area Plan.

Conservation plans and activities should:

- Identify priorities for management activities, including reasonable timelines.
- Control pollution as close to the source as possible.
- Improve irrigation water use and conveyance efficiency to reduce the potential of polluted return flows.
- Document reduction in potential sources of pollution through scientifically valid monitoring and periodic surveys of stream reaches and associated lands.
- Be flexible to adjust management based on feedback, monitoring, and/or changing environmental and economic conditions.

For a list of agencies and organizations to contact for more information about resource management, please refer to Appendix A: Available Technical and Financial Assistance.

3.3.5 Funding

Sometimes the cost of conservation measures do not fit well with a producer’s operating budget. Local, state, and federal technical and financial resources are available to improve the cost-effectiveness of protecting and improving water quality. It is not the intent of the Area Plan to impose a financial hardship on any individual. If there are potential water quality threats on their land, it is the responsibility of the landowner or operator to request technical and/or financial assistance and to develop a reasonable time frame for addressing potential water quality problems.

As resources allow, the SWCD, NRCS, and other natural resource agency staff is available to help landowners evaluate approaches for reducing runoff and soil erosion on their farms and incorporate these into voluntary conservation or water quality plans. Personnel in these offices can also design and assist with project implementation, and help identify sources of cost sharing or grant funding.

Technical and financial assistance may be available through current USDA conservation programs. Other programs that stand ready to partner for conservation include the US EPA’s nonpoint source implementation grants (“319 funds”), or state programs such as the Oregon Watershed Enhancement Board (OWEB) grant programs, and the Riparian Tax Incentive Program and the Wildlife Habitat Conservation and Management Program through the Oregon Department of Fish and Wildlife.

The SWCD(s) will seek funding to implement the Area Plan. Funding is necessary in four main areas:

- Community and landowner outreach: to fund workshops, tours, and development of published materials.
- Technical assistance: to hire staff to work with landowners to develop and implement solutions to agricultural water quality concerns.
- Financial assistance: to provide cost-share dollars to assist landowners in implementing agricultural water quality improvement activities.
- Monitoring: to monitor land conditions and water quality and evaluate how agricultural activities are impacting streams in the Management Area.

For sources of financial assistance, see Appendix A: Available Technical and Financial Assistance.
3.4 Monitoring and Evaluation

Monitoring is an important activity as part of the implementation phase of AgWQM Area Plans. When effectively used, monitoring and data analysis can provide valuable information to:

- Establish baseline information;
- Evaluate trends in water quality improvement;
- Help understand whether water quality improvement activities are achieving their intended goals;
- Assist with adjustments in implementation activities and priorities to gain maximum effects on improving water quality and watershed conditions.

Landowners interested in monitoring can find help locally through OSU, the Curry SWCD, the South Coast and Lower Rogue Watershed councils, DEQ, and other public and private sources.

Monitoring and assessment are also important information gathering activities during site-specific determinations of compliance as part of an investigation. For the purposes of Area Plans, there are four important types of monitoring or assessment that may be conducted.

**Baseline Condition Monitoring**

Baseline condition monitoring provides a starting point for assessing water quality trends and for future evaluation of the effectiveness of water quality improvement efforts. Baseline condition monitoring typically includes identification and analysis of data previously and currently collected in the area according to accepted protocols. The Oregon Plan Water Quality Monitoring Technical Guide Book is the recommended guide for baseline condition monitoring.

**Water Quality Trend Monitoring**

Water quality trend monitoring can help to track how water quality (typically on a watershed or subwatershed scale) is changing over time, including after implementation of an Area Plan. It is recommended that trend monitoring follow recommendations in the Oregon Plan Water Quality Monitoring Technical Guide. This Water Quality Monitoring Technical Guide Book describes accepted procedures and protocols for most activities that would be used to conduct baseline condition and trend monitoring on a watershed scale, including development of quality assurance/quality control plans to assure quality of data. Protocols described in the Water Quality Monitoring Technical Guide Book meet DEQ standards for data collection.

**Effectiveness Monitoring**

Effectiveness monitoring can be used to:

b) Evaluate the effectiveness of specific management practices in reducing losses or loadings of components such as sediment or nutrients. The Natural Resources Conservation Service has a good amount of information about the effectiveness of various practices in protecting surface and groundwater quality.

c) Evaluate the net effect of the implementation of an Area Plan and watershed improvement activities on water quality trends.

**Site-Specific Rule Compliance Monitoring and Assessment**

Conducted as a part of a compliance investigation, this type of monitoring is specific to individual sites. It is performed to assess compliance with conditions in a rule, and to assess the contribution of land...
management activities or land conditions to rule or standards violations attributable to the landowner’s activities. Site-specific information and data is collected to characterize and quantify the physical setting and land management conditions that relate to a potential rule or standards violation. Photographic documentation of the suspected problem is typically also included in the assessment. Water samples may be taken for analyses.

DEQ monitors six sites in the Management Area as part of their ambient monitoring network (Winchuck River above Hwy 101, Chetco R @ USGS Gage, Pistol River @ Pistol River Loop Road, Elk River @ Hwy 101, Sixes River @ Hwy 101, and Floras Creek @ Hwy 101).

DEQ retrieved data from DEQ, EPA, and USGS databases for January 1, 2000 to May 1, 2018 for the Management Area. DEQ determined status for the last two consecutive years of recent data at a station and trends for stations with at least eight years of data. Their report is summarized in Chapter 4 and can be found at https://www.oregon.gov/deq/wq/programs/Pages/wqstatustrends.aspx. The report will be updated for future biennial reviews.

For a description of monitoring and evaluation results, see Chapter 4.
Chapter 4: Implementation, Monitoring, and Adaptive Management

4.1 Progress Toward Measurable Objectives

The Curry SWCD has been working in two Focus Areas. See below, in section 4.2 for a record of their progress over the past two years. Measurable Objectives with 2019 milestones are listed in 3.1.3.

4.2 Progress on Strategic Initiatives

4.2.1 Langlois Creek and Morgan Creek Focus Areas

Langlois Creek (July 2016 – July 2017)
Landowners provided with technical assistance: 4, Funding applications: 0, Agricultural water quality projects implemented: 4, Total acres in agricultural water quality projects: 5

Riparian Forest Buffer: 1 acre, Tree/Shrub Establishment: 5 acres, Fencing: 3000 feet

Funding sources: BLM, Wild Rivers Coast Alliance

<table>
<thead>
<tr>
<th>Class</th>
<th>2011 Pre-Assessment Results</th>
<th>2015 Interim Assessment Results</th>
<th>2017 Post-Assessment (or Interim-Assessment) Results</th>
<th>Percent Change During 2015-2017 Biennium</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red</td>
<td>11.36</td>
<td>10.14</td>
<td>9.64</td>
<td>-4.93</td>
</tr>
<tr>
<td>Yellow</td>
<td>3.04</td>
<td>3.71</td>
<td>3.89</td>
<td>4.85</td>
</tr>
<tr>
<td>Green</td>
<td>2.05</td>
<td>2.60</td>
<td>2.92</td>
<td>12.3</td>
</tr>
<tr>
<td>TOTAL</td>
<td>16.45</td>
<td>16.45</td>
<td>16.45</td>
<td></td>
</tr>
</tbody>
</table>

Conditions
• In 2011: 11.36 miles of stream were categorized as Red
• In 2015: 10.14 miles of stream were categorized as Red
• In 2017: 9.64 miles of stream were categorized as Red

Focus Area Milestone for 2015-2017
• By June 30, 2017: Reduce Red category streams by 1.5 miles to 8.64 miles

The 2017 milestone was not achieved due to the difficulty of finding funding to temporarily fence seasonally-flooded bottomlands.

Morton Creek (July 2016-July 2018)
Landowners provided with technical assistance: 8 Funding applications: 2, Agricultural water quality projects implemented: 1, Total acres in agricultural water quality projects: 0.1

Tree/Shrub establishment 0.1 acres

Funding source: BLM
Conditions of 192.41 agricultural acres within 35 feet of a stream
2017: [Grass-Ag + Bare-Ag] = 44.66 acres

Focus Area Milestone
By June 30, 2017: Reduce [Grass-Ag + Bare-Ag] by 2.5 acres to 42.30 acres

The 2017 milestone was not achieved because the SWCD was working with new landowners unfamiliar with the SWCD and its programs, so it took longer to develop and implement projects than anticipated. Building relationships with landowners, gaining an understanding of their operations, and developing tailored solutions that address potential water quality concerns for those operations can be a long process; however, it lays the groundwork that is essential to implementing successful and effective projects. Thus, while the 2017 milestone, which is a measure of progress in terms of implemented projects, was not met, progress toward that goal was made through relationship development. Three properties remain to be addressed in the Focus Area; two of the three landowners/operators of those properties are currently working with the SWCD to identify and implement solutions to potential water quality concerns.

4.3 Activities and Accomplishments

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

Accomplishments in the Management Area for the July 2016 – June 2018 Biennium

Curry SWCD
Riparian Forest Buffer: 38.6 acres
Tree/shrub preparation = 2.5 acres
Tree/Shrub Establishment: 53.4 acres
Grade stabilization structure = 4
Hillslope pasture gully stabilization = 70 acres
Stream crossing = 3 sites
Access control = 0;1 acres (riparian fenced)

Funding sources include: Wild Rivers Coast Alliance, OWEB, BLM, and landowners,

CREP (Conservation Reserve Enhancement Program)
Technical Assistance and planning: 25 landowners; 100.8 acres enrolled; 7.45 stream miles protected with new enrollments; 10 CREP contracts approved by Farm Service Agency supported with Conservation Plans, Practice Specifications, and other planning/inventory support.

NRCS (Natural Resources Conservation Service) for both Coos and Curry Counties
Presentations: 7 with 385 attendees; Workshops: 1 with 19 attendees; Events with Displays: 5 with 600+ visitors; Ag Water quality, farm planning and program information sheets distributed:600+; 3 Nationally distributed Success Stories, 7 Newspaper articles published: (countywide circulation); Brief Technical Assistance to Landowners and Producers: 108

Farm Plans written with: Conservation applied to improve water quality: 330 acres, conservation applied to improve soil quality: 338 acres, conservation applied to improve irrigation efficiency: 641 acres,
conservation applied to improve agricultural irrigation water mgmt.: 574 acres, conservation applied to improve Environmental Quality: 1,933 acres

Projects implemented to improve water quality on agricultural lands:

Funding and Grants:
Coos & Curry County EQIP 2016 $228,054.35
Coos & Curry County EQIP 2017 $886,790.24
Coos & Curry County EQIP 2018 $749,674.22

4.4 Water Quality Monitoring—Status and Trends

4.4.1 Pesticide Stewardship Partnership (PSP)

The Curry SWCD, in partnership with the PSP program, DEQ, and ODA, sampled water from Euchre Creek, Sixes River, and Croft Lake outlet. Some amount of pesticides were present in all the streams sampled, however amounts were low enough that the area was not selected for a 2015-2017 PSP area. More information regarding the PSP can be found at: http://www.oregon.gov/ODA/programs/Pesticides/Water/Pages/PesticideStewardship.aspx

4.4.2 Statewide monitoring and evaluation of streamside conditions on agricultural lands

ODA evaluates aerial photos of stream segments in each management area that are selected at random along agricultural lands. Based on the streamside vegetation present at the time of the assessment, each stream segment receives a score. The same stream segments are re-photographed and re-scored every five years to track changes in streamside vegetation conditions. By itself, a score does not tell whether streamside vegetation is in good or poor condition. A score provides some idea of the mixture of bare ground, grasses, shrubs, and trees present at a site, but it does not compare the vegetation that is there with the types of vegetation that can be expected given the site capability.

The following information is from the latest survey in 2011. The streams will be reassessed using a new aerial photography captured in 2016. An update of this information will be available at the 2020 biennial review.

In the Curry Management Area, monitored stream segments are located in the New River, Elk River, and Sixes River watersheds. Data were first collected in these watersheds in 2006, and the second round of data collection occurred in 2011. Four streams in the Curry County basin were examined for this project. The New River, Elk River, and Sixes River all were very similar in terms of physical setting, though they did possess different landscape cover percentages. Langlois Creek was added in 2011 at the request of the Curry SWCD, and this stream differs from the others in several ways. The New River had the smallest percentage of tree cover, with no bands having more than 5 percent trees. This stream showed a significant improvement in its riparian index score, with an increase of 5 percent. It should be noted that nearly all of the right bank of this stream was located along a beach, and ocean waves appeared to overtop the right bank of the stream on a regular basis. Because of this, it is not likely that riparian vegetation could be established there. BLM has ownership over the streambank adjacent to the beach. There were no significant increases in T percentage; the increased RIS appeared to be the result of a decrease in bare land and an increase in the amount covered by water. The Elk River had the highest percentage of tree cover, with percentages up to 62 percent in the 30-foot bands. No significant change in RIS were seen for
the Elk or Sixes. Langlois Creek had a RIS of 45.44. This stream was dominated by shrub cover in the 30 foot bands, and grass in the 90 foot bands. Tree cover ranged from 10 to 20 percent among the bands. Bare and bare-ag ground was less than 1 percent in most bands.

**From 2014 Biennial Review**

**2006 analysis**
The New River, Elk River, and Sixes River were all very similar in terms of physical setting, though they did possess different landscape cover percentages. The New River had the smallest percentage of tree cover, with no bands having more than 5 percent trees. This stream also had the greatest percentage of bare agricultural land, and the lowest riparian index score (33.13). It should be noted that nearly all of the right bank of this stream was located along the beach, and ocean waves appeared to overtop the right bank of the stream on a regular basis. Because of this, it is not likely that riparian vegetation could be established there. Most of this area was described as bare land. The Elk River had the highest percentage of tree cover, with percentages up to 62 percent in the 30-foot bands.

All three streams had large sandbars in the channels, and they all had channel widths of up to 120 feet wide.

**2011 analysis**
The 2011 photos show significant improvement in the New River. The right bank of the river produced more riparian vegetation, indicating that the stream and stream bank have been relatively stable from 2006 to 2011. The riparian score for 2006 was 33.15, increasing to 34.99 in 2011. The main difference was an increase in shrub growth on the right bank, and reduced bare land along the same bank.

The monitored segments of Elk River and Sixes River remained relatively unchanged from 2006 to 2011.

In 2011, Langlois Creek was assessed for the first time. Langlois Creek is shrub dominated, with an engineered channel through most of the reach (straightened, ditched, 90° turns). Its riparian score was 45.44. There were no more than 20.21 percent trees along any band.

**4.4.3 Water quality data assessment**

For each Management Area, ODA currently evaluates other agencies’ and organizations’ water quality data to answer the following questions.

- What water quality and land condition data from agricultural watersheds are available?
- What are trends in available water quality and land condition data in agricultural watersheds since Area Plan and Rule adoption?
- What is the status of water quality in the management area since the last biennial review?

**DEQ**
For this biennial review, DEQ reviewed data from 387 monitoring stations, of which 13 had sufficient data for this status and trends analysis (DEQ. *Curry County AgWQ Management Area: DEQ’s Water Quality Status and Trends Analysis for the Oregon Department of Agriculture’s Biennial Review of Agricultural Area Rules and Plan*. 92pp. 2018). Of these 13, approximately half are potentially influenced by agriculture based on location and extent of agricultural activities. The station at Harris Beach State Park is excluded from this Area Plan summary because it was only evaluated for Enterococcus and was not likely influenced by agriculture.
Unfortunately, this DEQ report is a very limited analysis and did not include many of the data collected in this Management Area, especially by volunteer monitors. Temperature analyses are especially needed. The LAC requests that DEQ analyze all data in future analyses.

The main agricultural water quality concerns are highlighted in grey and discussed below. See the DEQ report for all graphs (https://www.oregon.gov/deq/wq/programs/Pages/wqstatustrends.aspx).

### E. coli

There were few exceedances and most of the values were < 100 MPN/100 mL (grab sample standard is 406). Most of the stations showed degrading trends, but the trends were barely discernable on the graphs (other than Pistol River) and the trend lines all appeared to be less than 25 MPN/100 mL. The Pistol River location showed a stronger increasing trend, but levels were still low.

### pH

All except two stations consistently met the standard. All but one exceedance for the Pistol and Sixes rivers occurred before 2010.

### Dissolved Oxygen

Dissolved oxygen was the parameter of most widespread concern in this analysis. The dissolved oxygen standard is complex, and DEQ has several criteria that apply to this Management Area, including cold water and aquatic life beneficial use that requires > 8 mg/L dissolved oxygen and applies year-round, except for October 15 to May 15 when the spawning criterion of 11 mg/L applies. All the lowland stations (including forested sites) had exceedances in the last 10 years except for Rogue River at Lobster Creek bridge, and the stations with the highest percent exceedances were likely influenced by agriculture. Almost all the exceedances were for the spawning criterion only, except for the Pistol River sampling site, which is a rearing and migration corridor and often failed to meet the 8 mg/L threshold. Encouragingly, dissolved oxygen levels have been increasing significantly at the Sixes and Elk River sites.

<table>
<thead>
<tr>
<th>Site ID</th>
<th>Site Description</th>
<th>E. coli (mpn/100mL)</th>
<th>pH</th>
<th>Dissolved Oxygen (mg/L)</th>
<th>Temperature (deg C)</th>
<th>Total Phosphorus (mg/L)</th>
<th>Total Suspended Solids (mg/L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10533</td>
<td>Sixes R @ Hwy 101 bridge</td>
<td>2/116¹ 0/122 24/122²⁶</td>
<td>0/122</td>
<td>-</td>
<td>0.02/124³</td>
<td>1/101</td>
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</tr>
<tr>
<td>10537</td>
<td>Winchuck R 1.3 miles u/s of Hwy 101</td>
<td>1/121⁴ 0/128³ 29/130</td>
<td>-</td>
<td>-</td>
<td>0.02/132³</td>
<td>1/104⁵</td>
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<tr>
<td>11493</td>
<td>Pistol R @ Pistol R Loop Rd</td>
<td>1/115⁴ 9/134 26/135</td>
<td>-</td>
<td>-</td>
<td>0.02/123</td>
<td>1/121</td>
<td></td>
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<tr>
<td>11905</td>
<td>Elk R @ Hwy 101</td>
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<td>-</td>
<td>0.02/126³</td>
<td>1/95</td>
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<tr>
<td>12590</td>
<td>Floras Ck @ Hwy 101 south of Langlois</td>
<td>3/117⁴ 0/137 19/138</td>
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<td>-</td>
<td>0.02/130</td>
<td>2/125</td>
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<tr>
<td>30670</td>
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<td>-</td>
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<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>10414</td>
<td>Rogue R @ Lobster Ck bridge</td>
<td>0/113⁴ 2/126 4/127</td>
<td>-</td>
<td>-</td>
<td>0.05/133⁵</td>
<td>3/109³⁶</td>
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<tr>
<td>11483</td>
<td>Chetco R @ USGS gage (10 miles u/s of Brookings)</td>
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<td>-</td>
<td>0.01/104</td>
<td>1/94⁴</td>
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<tr>
<td>28303</td>
<td>Elk Ck @ ODFW Hatchery</td>
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<tr>
<td>35794</td>
<td>Elk R NF @ RM 0.4</td>
<td>0/2 0/3</td>
<td>-</td>
<td>-</td>
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<td>-</td>
<td></td>
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<tr>
<td>14372300</td>
<td>Rogue R nr Agness</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>2069/6670</td>
<td></td>
</tr>
</tbody>
</table>

¹ N = total # of observations
² DEQ benchmark for potential water quality concerns = 0.05 mg/L (“Methodology for Oregon’s 2012 Water Quality Report and List of Water Quality Limited Waters”)
³ DEQ has no benchmark for TSS in this Management Area
⁴ Statistically significant degrading trend
⁵ Statistically significant improving trend
⁶ Statistically significant seasonal patterns
**Temperature:** Unfortunately, only one location was included in DEQ’s analysis, even though more data exists for the watershed. The LAC is very concerned that DEQ did not include the large amount of instream monitoring data collected by the Curry Watershed Partnership because 1) the DEQ report paints a very incomplete picture and 2) it looks like local conservation partnerships aren’t even looking at stream temperatures. Summer water temperatures exceeded the criterion every year at the one station evaluated by DEQ for this report. Temperature analyses are needed for the other sites.

Because warm water holds less oxygen, high temperatures may be driving the dissolved oxygen exceedances at other sites. More tributary water temperatures need to be tracked to show benefits from improved land management, because water temperatures are likely to change very slowly in the mainstem.

**Total Phosphorus and Total Suspended Solids (TSS):** Oregon has no standard for total phosphorus or TSS. DEQ uses 0.05 mg/L total phosphorus to evaluate whether water bodies are a potential concern for not meeting standards. There is no benchmark for TSS, but rather the data are used to establish and track TSS trends within a system.

The phosphorus median for all sites was less than the DEQ benchmark, except for the Rogue River at Lobster Creek. Total phosphorus levels in the agricultural areas were slightly higher than those in the forested areas, and the median for Chetco River in the agricultural area was twice that in the forest area. Most of the highest values were measured in 2005-2008. Since 2010, the Pistol River site tended to most consistently have values > 0.05 mg/L.

The highest TSS values were recorded for the Pistol and Floras Rivers. Phosphorus can enter streams either dissolved or adsorbed to soil particles. Comparison of values in the phosphorus and TSS graphs suggests that eroding soil may contribute phosphorus to the Pistol and Sixes Rivers.

**From 2014 Biennial Review**

**Local Monitoring Efforts**

**Edson and Ranch Creek Ranch Runoff Source Detection**

The South Coast Watershed Council conducted water quality sampling in Edson and Ranch Creeks, two tributaries to the Rogue River Estuary, to characterize the relative effects of livestock grazing, livestock grazing with riparian exclusion fence, and elk herd grazing on water quality. The council selected these streams for further monitoring after earlier storm event sampling found them among the four streams with highest bacteria levels.

Ten sample sites were located along stream reaches of Ranch and Edson Creeks to isolate pasturelands grazed by elk, from fenced pastures having both excellent and poor riparian buffers. The sites were sampled during a relatively intense spring storm, and a second spring storm.

Results of the sampling indicate that *E. coli* sources occur in the uplands of both Edson and Ranch Creeks. In both watersheds, *E. coli* concentrations were elevated above state standards at sites draining upland areas grazed by livestock (and possibly elk herds). In Edson Creek, a site located upstream of grazing was lower than the other sites. Limited sampling also supports an observation from a previous ranch runoff study, which found that *E. coli* runoff contributed by bottomland pastures is less than from upland pastures.

Livestock exclusion among major streams adjacent to bottomland pastures has been a priority for restoration programs; the results of this study suggest that upland pastures need more attention in the future to address runoff of *E. coli*. The council’s report from the sampling recommended targeting
technical assistance towards areas contributing the highest levels of *E. coli*, including North Fork Edson, upper Ranch Creek, West Fork of Ranch Creek, and other upland tributaries draining into the reach between the West Fork of Ranch and one of the Ranch Fork sampling sites.

**Crook Creek Water Quality Restoration Monitoring**

After a ranch in the Crook Creek watershed implemented road erosion control and pasture management projects, the South Coast Watershed Council and Curry SWCD conducted monitoring to determine the water quality benefits of the projects. Monitoring determined that the road improvements and livestock exclusion in the vicinity of 14 road-stream crossings and seeps, improved water quality in Crook Creek.

The water quality improvement was measured in decreased turbidity during storm events. Prior to changes in grazing management and road treatment, the average turbidity level in tributaries to Crook Creek was 257 NTU; after improvements were implemented, the mean turbidity was 53 NTU.

Prior to the projects, only one stream had the same or lower turbidity downstream of the road crossing, compared with upstream. During the largest storm in the second year after improvements, eight crossings had the same or lower turbidity downstream. Of the remaining crossings that had higher turbidity downstream, turbidity increased the most at two crossings where discharge was low. For the remaining crossings, turbidity increased an average of 11 percent.

Results indicated that road drainage relief at some of the crossings needed more control. However, the overall decrease in sedimentation, documented by turbidity measurements as well as photo points, is so compelling that all participants were proud of the outcome.

### 4.5 Biennial Reviews and Adaptive Management

This biennial review was less comprehensive than usual due to workload issues for ODA staff. ODA recommended only the following changes to the Area Plan: updated 303(d) list, updated information on implementation activities and Focus Areas, and replacing OWQI monitoring results with summary information from DEQ’s new process for evaluating water quality for Area Plans. The LAC agreed to these changes after discussion and some edits.

The LAC agreed that landowners were willing to work on projects, and the SWCD has a good reputation with landowners.

The LAC identified the following impediments to Area Plan success:

- Lack of funding for seasonal fencing
- Curry Watersheds Partnership does not have enough funding to hire staff to meet demand
- Lots of data exist but are not being evaluated in ways that get translated into action
- Agricultural landowners are aging out and their properties are being converted to hobby farms

The LAC recommended that:

- DEQ include volunteer monitoring data in their Status and Trends reports
- There be more focus on hanging on to the land base for agriculture and habitat

**Compliance summary**

Three cases were investigated in the last biennium. A livestock operation received a letter of compliance after installing exclusion fencing along a river. A greenhouse received a letter of compliance after installing adequate practices to prevent nutrients and sediment from leaving the greenhouse area. The third case was a horse facility with erosion issues due to land clearing for pastures. The landowner has received a letter with recommendations.
References


Ibid. 2001b. Sixes River Watershed Assessment. South Coast Watershed Council, Gold Beach, OR

Ibid. 2001c. Elk River Watershed Assessment. South Coast Watershed Council, Gold Beach, OR

Ibid. 2001d. Port Orford Watershed Assessment. South Coast Watershed Council, Gold Beach, OR

Ibid. 2001e. Euchre Creek Watershed Assessment. South Coast Watershed Council, Gold Beach, OR

Ibid. 2001f. Hunter Creek Watershed Assessment. South Coast Watershed Council, Gold Beach, OR

Ibid. 2001g. Pistol River Watershed Assessment. South Coast Watershed Council, Gold Beach, OR

Ibid. 2001h. Chetco River Watershed Assessment. South Coast Watershed Council, Gold Beach, OR

Ibid. 2001i. Winchuck River Watershed Assessment. South Coast Watershed Council, Gold Beach, OR


Oregon Department of Agriculture. 2000. Relationship Between Agricultural Water Quality Management Area Plan Conditions and Water Quality Standards. Oregon Department of Agriculture, Salem, OR


Appendix A: Available Technical and Financial Assistance

Many agricultural landowners are unable to make a living directly from their land-based enterprise. Financial incentives are essential to encourage basin-wide adoption of sound and sustainable management practices.

- **CREP** - Conservation Reserve Enhancement Program (541-396-4323) made available $250 million dollars to pay landowners to set aside areas immediately adjacent to anadromous fish-bearing streams. It is intended to protect water quality and enhance spawning, rearing, and habitat quality.

- **OWEB** - Oregon Watershed Enhancement Program (541-471-2886) provides funding for watershed enhancement projects under the general categories of education/public awareness, monitoring, management, and assessment/action planning.

- **EQIP** - Environmental Quality Incentives Program (541-396-4323) pays landowners a majority cost-share for on-farm projects that protect natural resources and improve wildlife (including fish) habitat. EQIP information can also be obtained from the Farm Service Agency.

- **EPA 319** - Environmental Protection Agency administers the 1972 Clean Water Act section 319 grants through ODEQ (541-269-2721x27) to help meet their water quality mandates. The projects EPA likes to fund are those with directly measurable benefits for water quality and endangered species. Check out EPA’s Ag Info Center: http://es.epa.gov/oeca/ag/index.html

- **NRCS** - Natural Resources Conservation Service (541-396-4323) can provide technical assistance and administers a number of cost-share programs for on-farm projects that improve farm production while protecting natural resources and improving wildlife (including fish) habitat.

- **The Freshwater Trust** (503-222-9091 in Portland) offers lease and buy-out options for abandoned or unused water rights. This market-based approach to increasing stream flow may also be used to fund irrigation system changes in watersheds identified as priorities for OWT.

- **OSU Cooperative Extension** (1-800-356-3986 in Curry County) offers a wide variety of levels of technical assistance and planning help. OSU has been instrumental in the Oregon Cattlemen's extremely successful Watershed Ecosystem Education Program. Since its inception, it has grown into several distinct natural resource related workshops that are offered to ranchers and farmers free of charge. The Watershed Ecosystem Education Program workshops help ranchers and farmers understand their watersheds and stream function better through assessments and monitoring. OSU has also been providing Proper Functioning Condition (PFC) Workshops and assessments with landowners. PFC assessment should be a major component of a conservation plan.

Watershed Councils and Soil and Water Conservation Districts are a primary resource for finding technical and financial assistance. Contact the Curry SWCD at 541-274-2755.

Curry County hosts several watershed councils unique to their basins of concern. A call to the Curry SWCD can give you contact information for those unique watershed councils.
Appendix B: Coastal Zone Management Act Measures

In 1990, the Federal Coastal Zone Reauthorization Amendments were enacted. This law mandated that all states and territories with approved coastal zone management programs develop and implement coastal nonpoint pollution control programs. Listed below are the Coastal Zone Management measures that were developed for use in Oregon for coastal basins such as Curry County.

The following section contains the approved management measures for coastal nonpoint pollution in Oregon as developed for the Coastal Zone Reauthorization Amendments. For more detailed information on how to implement any of the recommendations below, consult one of the technical groups in Appendix A or publications included in the References section.

Sedimentation

- Apply the erosion component of a Resource Management System as defined in the Field Office Technical Guide of the U.S. Department of Agriculture, Natural Resources Conservation Service to minimize the delivery of sediment to surface waters.
- Design and install a combination of management and physical practices to settle the settleable solids and associated pollutants in runoff delivered from the contributing area for storms of up to and including a 10-year, 24-hour frequency.

Eroding Streambanks and Shorelines

- Where streambank or shoreline erosion is a nonpoint source pollution problem, streambanks and shorelines should be stabilized. Vegetative methods are strongly preferred unless structural methods are more cost-effective, considering the severity of wave and wind erosion, offshore bathymetry, and the potential adverse impact on other streambanks, shorelines, and offshore areas.
- Protect streambank and shoreline features with the potential to reduce Non Point Source (NPS) pollution.
- Protect streambanks and shorelines from erosion due to uses of either the shorelands or adjacent surface waters.

Nutrients

- 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.

Pesticides

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

Riparian Areas
- Exclude livestock from riparian areas that are susceptible to overgrazing and when there is no other practical way to protect the riparian area when grazing uplands.
- Provide stream crossings and hardened access areas for watering.
- Provide alternative drinking water locations.
- Locate salt and shade away from sensitive riparian locations.
- Include riparian areas in separate pastures with separate management objectives and strategies.
- Fence, or where appropriate, herd livestock out of areas for as long as necessary to allow vegetation and streambanks to recover.
- Control the timing of grazing to: (1) keep livestock off streambanks where they are most vulnerable to damage, and (2) coincide with the physiological needs of target plant species.

Irrigation
- Operate the irrigation system so that the timing and amount of water match crop water needs. This will require, at a minimum: (a) the accurate measure of soil water depletion and the volume of irrigation applied, and (b) uniform application of water.
- When chemigation is used, include backflow preventers for wells, minimize the harmful amounts of chemigated waters from the field, and control deep percolation.
- In cases where chemigation is performed with furrow irrigation systems, a tailwater management system may be needed.
- In some locations, irrigation return flows are subject to other water rights or are required to maintain stream flow(s). In these special cases, on-site use could be precluded and would not be considered part of the management measures for such locations.
- In some locations, leaching is necessary to control salt in the soil profile. Leaching for salt control should be limited to the leaching requirement for the root zone.
- Where leakage from delivery systems or return flows support wetlands or wildlife refuges, it 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.
- 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.

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.

Wetlands and Riparian Areas

- Protect from adverse effects wetlands and riparian areas that are serving a significant NPS abatement function and maintain this function while protecting the other existing functions of these wetlands and riparian areas as measured by characteristics such as vegetative composition and cover, hydrology of surface water and ground water, geochemistry of the substrate, and species composition.
- Promote the restoration of the pre-existing functions in damaged and destroyed wetlands and riparian systems in areas where the systems will serve a significant NPS pollution abatement function.
- Promote the use of engineered vegetated treatment systems such as constructed wetlands or vegetated filter strips where these systems will serve a significant NPS pollution abatement function.
Appendix C: Common Agricultural Water Quality Parameters of Concern

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

Parameters

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

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

Dissolved Oxygen: Dissolved oxygen criteria apply to specific designated uses (such as fish spawning), and are applied in the time periods when the designated use is present and in the segment that is designated for that use. The dissolved oxygen spawning criteria are applied in the waters and in the time periods when salmon, steelhead, bull trout, or resident trout spawning uses are present. The dissolved oxygen criteria applicable to other designated fish uses are applied year-round. During non-spawning periods, the dissolved oxygen criteria depends on a stream’s designation as providing for cold, cool, or warm water aquatic life, each defined in OAR 340 Division 41.

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

Mercury: Mercury occurs naturally and is used in many products. It enters the environment through human activities and from volcanoes, and can be carried long distances by atmospheric air currents. Mercury passes through the food chain readily, and has significant public health and wildlife impacts from consumption of contaminated fish. Mercury in water comes from erosion of soil that carries naturally occurring mercury (including erosion from agricultural lands and streambanks) and from deposition on land or water from local or global atmospheric sources. Mercury bio-accumulates in fish, and if ingested, can cause health problems.
Nitrate: While nitrate occurs naturally, the use of synthetic and natural fertilizers can increase nitrate in drinking water (ground and/or surface water). Applied nitrate that is not taken up by plants is readily carried by runoff to streams or infiltrates into 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 that 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. Agricultural pesticide applications, mixing-loading, and disposal activities may also contribute to pesticide detections in surface water. For more information, see: www.deq.state.or.us/wq/standards/toxics.htm.

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

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

Temperature: Oregon’s native cold-water aquatic species, including salmonids, are sensitive to water temperature. Several temperature criteria have been established to protect various life stages and fish species. Many conditions contribute to elevated stream temperatures. On agricultural lands, inadequate streamside vegetation, irrigation water withdrawals, warm irrigation water return flows, farm ponds, and land management that leads to widened stream channels contribute to elevated stream temperatures. Elevated stream temperatures also contribute to excessive algal growth, which leads to low dissolved oxygen levels and high pH levels.
## Appendix D: 2012 Impaired Waterbodies on the 303d List in the Curry County Agriculture WQMP Area

### Sixes Sub-basin 2012 303d Listed Parameters Requiring a TMDL

<table>
<thead>
<tr>
<th>Waterbody (Stream/Lake)</th>
<th>River Miles</th>
<th>Parameter</th>
<th>Season</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boulder Creek / Floras Lake</td>
<td>0.8 to 1.4</td>
<td>Aquatic Weeds</td>
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<td>Fourmile Creek</td>
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<tr>
<td>North Fork Sixes River</td>
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<td>15.1 to 30.1</td>
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<td>Sunshine Creek</td>
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<td>Boulder Creek / Floras Lake</td>
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<td>Fall-Winter-Spring</td>
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<td>Boulder Creek</td>
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<td>Dissolved Oxygen</td>
<td>Oct 15 - May 15</td>
</tr>
<tr>
<td>Floras Creek</td>
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<td></td>
<td>May 16 - Oct 14</td>
</tr>
<tr>
<td>North Fork Floras Creek</td>
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<td>May 16 - Dec 31</td>
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<tr>
<td>Garrison Lake</td>
<td>0 to 0</td>
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<tr>
<td>Bald Mountain Creek</td>
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<td>Temperature</td>
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<td>Pea Creek</td>
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### Sixes Sub-basin 2012 303d Listed Parameters Requiring a TMDL

<table>
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<th>River Miles</th>
<th>Parameter</th>
<th>Season</th>
</tr>
</thead>
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<tr>
<td>Boulder Creek</td>
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### Chetco Sub-basin 303d Listed Parameters Requiring a TMDL

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<th>Parameter</th>
<th>Season</th>
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<tr>
<td>Chetco River</td>
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<td>Hunter Creek</td>
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<tr>
<td>Hunter Creek</td>
<td>0 to 7.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>South Fork Pistol River</td>
<td>0 to 0.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chetco River</td>
<td>0 to 57.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Deep Creek</td>
<td>0 to 2.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>East Fork Winchuck River</td>
<td>0 to 7.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hunter Creek</td>
<td>0 to 18.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jack Creek</td>
<td>0 to 1.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>North Fork Chetco River</td>
<td>0 to 12.1</td>
<td>Temperature</td>
<td>Year Around (Non-spawning)</td>
</tr>
<tr>
<td>North Fork Hunter Creek</td>
<td>0 to 4.8</td>
<td></td>
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</tr>
<tr>
<td>North Fork Smith River</td>
<td>0 to 1.6</td>
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</tr>
<tr>
<td>Pistol River</td>
<td>0 to 19.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Winchuck River</td>
<td>0 to 11.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boulder Creek</td>
<td>0 to 9.5</td>
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</tr>
<tr>
<td>Crook Creek</td>
<td>0 to 2.3</td>
<td></td>
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</tr>
<tr>
<td>Eagle Creek</td>
<td>0 to 6.8</td>
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<td></td>
</tr>
<tr>
<td>East Fork Pistol River</td>
<td>0 to 4.6</td>
<td></td>
<td></td>
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<tr>
<td>Emily Creek</td>
<td>0 to 8.1</td>
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<td></td>
</tr>
<tr>
<td>Fourth of July Creek</td>
<td>0 to 4.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>North Fork Pistol River</td>
<td>0 to 2.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Turner Creek</td>
<td>0 to 1.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wheeler Creek</td>
<td>0 to 11</td>
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</tr>
</tbody>
</table>

### Lower Rogue 303d Listed Parameters Requiring a TMDL

<table>
<thead>
<tr>
<th>Waterbody (Stream/Lake)</th>
<th>River Mile</th>
<th>Parameter</th>
<th>Season</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coyote Creek</td>
<td>0 – 7.4</td>
<td>Biological Criteria</td>
<td>Year Around</td>
</tr>
<tr>
<td>Flora Dell Creek</td>
<td>0 – 1.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grave Creek</td>
<td>0 – 37.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jim Hunt Creek</td>
<td>0 – 4.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jumpoff Joe Creek</td>
<td>0 - 14</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Squirrel Camp Creek</td>
<td>0 – 2.7</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Unnamed (LASAR for Poorman Creek east of Glendale??)</th>
<th>0 – 1.6</th>
<th>0 – 27.2</th>
<th>33.8–131.8</th>
<th>83.4 – 90.9</th>
<th>68.3 – 94.9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lower Rogue</td>
<td>Fecal Coliform</td>
<td>Year Around</td>
<td>October 15 – May 15</td>
<td>Fall Winter Spring</td>
<td>Summer</td>
</tr>
<tr>
<td></td>
<td>Dissolved Oxygen</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>pH</td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>
Appendix E: Water Quality Standards for 303d Listed Parameters in the Curry County Agriculture WQMP Area

Oregon water quality standards include statewide narrative criteria established in OAR 340-041-0007. Oregon water quality standards for specific pollutants are established in OAR 340-041-0009 (Bacteria) through OAR 340-041-0036 (Turbidity). Oregon water quality standards for specific pollutants are summarized in the table below. These standards often are accompanied by information regarding how many samples are needed to apply the standard.

Statewide Narrative Criteria
(1) Notwithstanding the water quality standards contained in this Division, the highest and best practicable treatment and/or control of wastes, activities, and flows must in every case be provided so as to maintain dissolved oxygen and overall water quality at the highest possible levels and water temperatures, coliform bacteria concentrations, dissolved chemical substances, toxic materials, radioactivity, turbidities, color, odor, and other deleterious factors at the lowest possible levels.

(2) Where a less stringent natural condition of a water of the State exceeds the numeric criteria set out in this Division, the natural condition supersedes the numeric criteria and becomes the standard for that water body. However, there are special restrictions, described in OAR 340-041-0004(9)(a)(D)(iii), that may apply to discharges that affect dissolved oxygen.

(4) No discharges of wastes to lakes or reservoirs may be allowed except as provided in section OAR 340-041-0004(9).

(10) The development of fungi or other growths having a deleterious effect on stream bottoms, fish or other aquatic life, or that are injurious to health, recreation, or industry may not be allowed;

(11) The creation of tastes or odors or toxic or other conditions that are deleterious to fish or other aquatic life or affect the potability of drinking water or the palatability of fish or shellfish may not be allowed;

(12) The formation of appreciable bottom or sludge deposits or the formation of any organic or inorganic deposits deleterious to fish or other aquatic life or injurious to public health, recreation, or industry may not be allowed;

(13) Objectionable discoloration, scum, oily sheens, or floating solids, or coating of aquatic life with oil films may not be allowed;

(14) Aesthetic conditions offensive to the human senses of sight, taste, smell, or touch may not be allowed;

(15) Radioisotope concentrations may not exceed maximum permissible concentrations (MPC's) in drinking water, edible fishes or shellfishes, wildlife, irrigated crops, livestock and dairy products, or pose an external radiation hazard;
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Beneficial Uses Affected</th>
<th>Criterion/Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Aquatic Weeds or Algae</strong></td>
<td>Domestic and Industrial Water Supply, Irrigation, Livestock Watering, Fish and Aquatic Life, Fishing, Boating, Water Contact Recreation, Aesthetic Quality</td>
<td>The development of fungi or other growths having a deleterious effect on stream bottoms, fish or other aquatic life, or that are injurious to health, recreation, or industry may not be allowed.</td>
</tr>
<tr>
<td><strong>Bacteria - <em>Escherichia coli</em></strong></td>
<td>Water Contact Recreation <em>Bacterial pollution or other conditions deleterious to waters used for domestic purposes, livestock watering, irrigation, bathing, or shellfish propagation, or otherwise injurious to public health may not be allowed.</em></td>
<td>90-day log mean of 126 <em>E. coli</em> organisms/100 mL; no single sample may exceed 406 <em>E. coli</em> organisms/100 mL.</td>
</tr>
<tr>
<td><strong>Bacteria - <em>Enterococci</em></strong></td>
<td>Water Contact Recreation <em>Bacterial pollution or other conditions deleterious to waters used for domestic purposes, livestock watering, irrigation, bathing, or shellfish propagation, or otherwise injurious to public health may not be allowed.</em></td>
<td>A geometric mean for samples collected over a seasonal sampling period below 35 Enterococci/100 mL.</td>
</tr>
<tr>
<td><strong>Bacteria - Fecal Coliform</strong>*</td>
<td>Shellfish Growing, Recreational Contact <em>Bacterial pollution or other conditions deleterious to waters used for domestic purposes, livestock watering, irrigation, bathing, or shellfish propagation, or otherwise injurious to public health may not be allowed.</em></td>
<td>A fecal coliform median concentration of 14 organisms/100 mL, with not more than 10% of the samples exceeding 43 organisms/100 mL.</td>
</tr>
<tr>
<td><strong>Biocriteria</strong></td>
<td><strong>Data collected at a sampling site is used to generate a number for the observed versus expected (O/E) macroinvertebrate taxa. This number represents the “missing” taxa at a site, and can be expressed as “% taxa loss”</strong></td>
<td>Waters of the State must be of sufficient quality to support aquatic species without detrimental changes in the resident biological communities.</td>
</tr>
<tr>
<td><strong>Chlorophyll a</strong></td>
<td>Water Contact Recreation, Aesthetics, Fishing, Water Supply, Livestock Watering</td>
<td>Average Chlorophyll a values for (A) Natural lakes that thermally stratify: 0.01 mg/L; (B) Natural lakes that do not thermally stratify, reservoirs, rivers and estuaries: 0.015 mg/L.</td>
</tr>
<tr>
<td><strong>Dissolved Oxygen</strong></td>
<td>Fish and Aquatic Life, Salmon Steelhead and Resident Trout Spawning, Cool-Water Aquatic Life, Warm-Water Aquatic Life, Estuarine Water</td>
<td>Spawning: Not less than 11.0 mg/L or 95% saturation. If minimum intergravel dissolved oxygen is 8.0 mg/L or greater, then the DO criterion is 9.0 mg/L. Cold-water aquatic life: Not less than 8.0 mg/L absolute minimum or 90% saturation. Estuarine water: Not less than 6.5 mg/L.</td>
</tr>
<tr>
<td><strong>pH</strong></td>
<td>Resident Fish and Aquatic Life Water Contact Recreation</td>
<td>Estuarine and fresh waters 6.5 to 8.5</td>
</tr>
<tr>
<td><strong>Temperature</strong></td>
<td>Salmon and Steelhead Spawning, Core Cold Water Habitat, Salmon and Trout</td>
<td>Seven-day-average maximum temperature may not exceed:</td>
</tr>
<tr>
<td>Temperature protection of cold water</td>
<td>Salmon, steelhead, bull trout</td>
<td>Seven-day-average maximum ambient temperatures, colder than the biologically based criteria, may not be warmed by more than 0.3 degrees Celsius (0.5 degrees Fahrenheit) above the colder water ambient temperature</td>
</tr>
<tr>
<td>-------------------------------------</td>
<td>-----------------------------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Toxic Substances</td>
<td>Aquatic Life – Fresh Water and Marine Water, Human Health – Water and Fish Ingestion, Fish Consumption, Drinking Water</td>
<td>Levels of toxic substances in waters of the state may not exceed the applicable criteria listed in Tables 20, 33A, and 33B.</td>
</tr>
</tbody>
</table>
Appendix F:  Pesticide Management for Water Quality Protection

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

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

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

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

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

Watch for a pesticide waste collection day in your area. These events allow individuals to safely and anonymously drop off unwanted, unused, or out of date agricultural pesticides, along with some empty containers.
Appendix G: Drinking Water

The sensitive areas within the drinking water protection area generally include areas with high soil permeability, high soil erosion potential, high runoff potential and areas within 1,000’ from the river/streams. The sensitive areas are those where the potential contamination sources, if present, have a greater potential to impact the water supply.

The drinking water for Langlois Water District is supplied by an intake on the Floras Creek. This public water system serves approximately 250 citizens. The intake is located in the New River Watershed in the Sixes Sub-Basin of the Southern Oregon Coastal Basin. The geographic area providing water to Langlois’ intake (the drinking water protection area) extends upstream approximately 93 miles in an easterly direction and encompasses a total area of 61 square miles. Included in this area are a number of tributaries to the main stem, including Jenny, Johnson, Clear, Horner, Dwyer, White Rock, and Huff creeks as well as the North, South, East and West Forks of Flores Creek.

The drinking water for the city of Port Orford is supplied by an intake on the North Fork of Hubbard Creek. This public water system serves approximately 1,000 citizens. The intake is located in the Hubbard Creek Watershed in the Sixes Sub-Basin of the South Coast Basin. The geographic area providing water to Port Orford’s intake (the drinking water protection area) extends upstream approximately two miles in a northerly direction and encompasses a total area of approximately one square mile.

Over-application or improper handling of pesticides and/or fertilizers may impact drinking water. Some agricultural practices may result in excess sediments discharging to surface waters, but non-irrigated crops are generally considered to be a low risk. Excessive irrigation may transport contaminants or sediments to groundwater/surface water through runoff. Drip-irrigated crops are considered to be a low risk. The improper storage and management of animal wastes may impact drinking water supply. Concentrated livestock may contribute to erosion and sedimentation of surface water bodies.