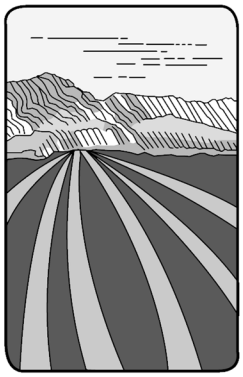

Oregon
Department
of Agriculture

Upper Grande Ronde Agricultural Water Quality Management Area Plan

Developed by the:

Upper Grande Ronde Local Advisory Committee

Oregon Department of Agriculture

With support from the:

Union Soil and Water Conservation District

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Acronyms and Terms Used in this Document

Ag Water Quality Program – Agricultural Water Quality Management Program
Area Plan – Agricultural Water Quality Management Area Plan
Area Rules – Agricultural Water Quality Management Area Rules
CAFO – Confined Animal Feeding Operation
CNPCP – Coastal Nonpoint Pollution Control Program
CWA – Clean Water Act
CZARA – Coastal Zone Act Reauthorization Amendments
DEQ – Oregon Department of Environmental Quality
GWMA – Groundwater Management Area
HUC – Hydrologic Unit Code
LAC – Local Advisory Committee
Management Area – Agricultural Water Quality Management Area
MOA – Memorandum of Agreement
NPDES – National Pollution Discharge Elimination System
NRCS – Natural Resources Conservation Service
OAR – Oregon Administrative Rules
ODA – Oregon Department of Agriculture
ODFW – Oregon Department of Fish and Wildlife
ORS – Oregon Revised Statute
OWEB – Oregon Watershed Enhancement Board
PMP – Pesticides Management Plan
PSP – Pesticides Stewardship Partnership
Regulations – Agricultural Water Quality Management Area Regulations
RUSLE – Revised Universal Soil Loss Equation
SWCD – Soil and Water Conservation District
T – Soil Loss Tolerance Factor
TMDL – Total Maximum Daily Load
USDA – United States Department of Agriculture
U.S. EPA – United States Environmental Protection Agency
WQPMT – Water Quality Pesticides Management Team

Foreword

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

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

Required Elements of Area Plans

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

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

Plan Content

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

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

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

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

Chapter 1: Agricultural Water Quality Management Program Purpose and Background

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

As part of Oregon's Agricultural Water Quality Management Program (Ag Water Quality Program), this Area Plan guides landowners and partners such as Soil and Water Conservation Districts (SWCDs) in addressing local agricultural water quality issues. The purpose of this 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 the Management Area (OAR 603-090-0000(3)) and to achieve and maintain water quality standards (ORS 561.191(2)). This Area Plan has been developed and revised by ODA, the Local Advisory Committee (LAC), with support and input from the SWCD and the Oregon Department of Environmental Quality (DEQ). Throughout the development and revision processes, the public was invited to participate. This included public comment at meetings and public hearings during the Area Plan approval process. This Area Plan is implemented using a combination of outreach and education, conservation and management activities, compliance, monitoring, evaluation, and adaptive management.

The provisions of this Area Plan do not establish legal requirements or prohibitions (ORS 568.912(1)). Each Area Plan is accompanied by OAR regulations that describe local agricultural water quality regulatory requirements. ODA will exercise its regulatory authority for the prevention and control of water pollution from agricultural activities under the Ag Water Quality Program's general regulations (OARs 603-090-0000 to 603-090-0120) and under the regulations for this Management Area (OARs 603-095-0400 to 603-095-0460). The Ag Water Quality Program's general OARs guide the Ag Water Quality Program, and the OARs for the Management Area are the regulations that landowners must follow.

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

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

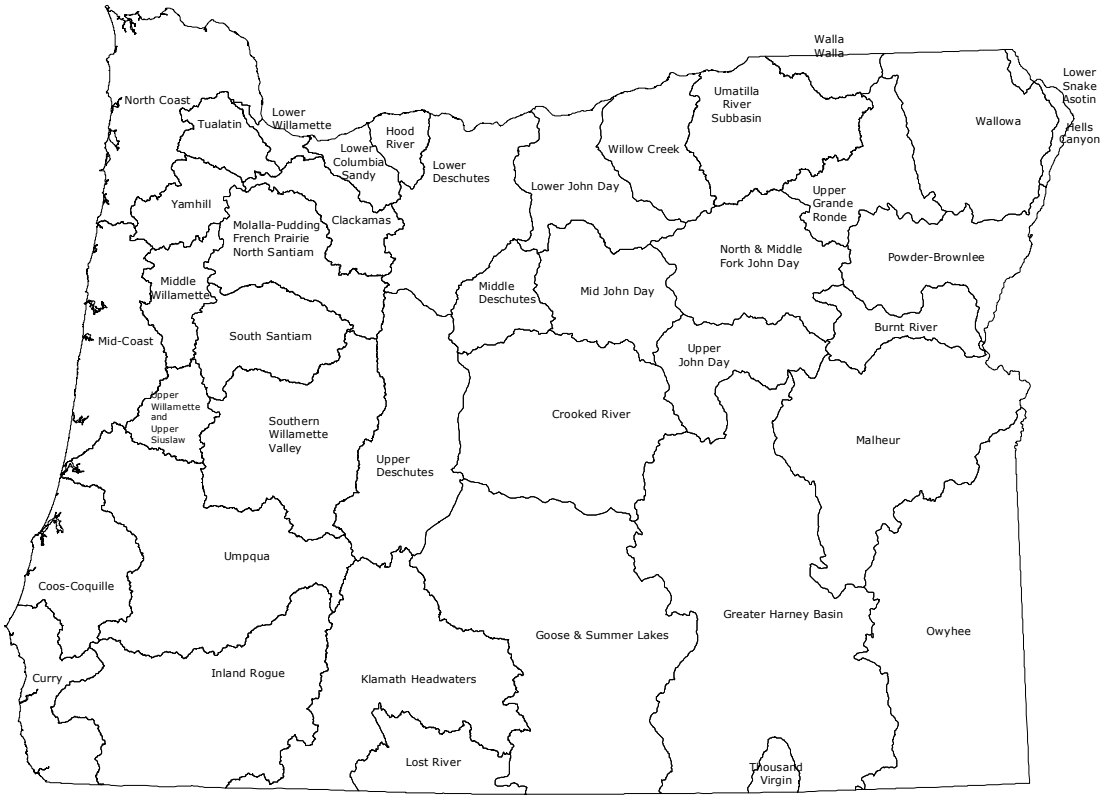
1.2 History of the Ag Water Quality Program

In 1993, the Oregon Legislature passed the Agricultural Water Quality Management Act, directing ODA to develop plans to prevent and control water pollution from agricultural activities and 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). This Area Plan and its associated regulations were developed and subsequently revised pursuant to these statutes.

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

- Providing education, outreach, and technical assistance to landowners.
- Implementing projects to improve agricultural water quality.
- Investigating complaints of potential violations of regulations.
- Conducting biennial reviews of Area Plans and regulations.
- Monitoring, evaluation, and adaptive management.
- Developing partnerships with SWCDs, state, federal, and tribal agencies, 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 (ODA)

ODA is the agency responsible for implementing the Ag Water Quality Program (ORS 568.900 to 568.933, ORS 561.191, OAR 603-090, and OAR 603-095). The Ag Water Quality Program is intended to meet the needs and requirements related to agricultural water pollution, including:

- State water quality standards.

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

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

The emphasis of this Area Plan is on voluntary action by landowners or operators to control the factors effecting water quality in the Management Area. The regulations are outlined as a set of minimum standards that must be met on all agricultural or rural lands. Landowners and operators who fail to address these regulations may be subject to enforcement procedures, which are outlined below.

Enforcement Action—ODA will use enforcement mechanisms where appropriate and necessary to gain compliance with water quality regulations. Any enforcement action will be pursued only when reasonable attempts at voluntary solutions have failed. 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, the landowner or operator will be directed by ODA to remedy the condition through required corrective actions under the provisions of the enforcement procedures outlined in OAR 603-090-060 through OAR 603-090-120. If a landowner does not implement the required corrective actions, civil penalties may be assessed for continued violation of the regulations. See the Compliance Flow Chart for a diagram of the compliance process. If and when other governmental policies, programs, or regulations conflict with this Area Plan or associated regulations, ODA will consult with the agency(ies) and attempt to resolve the conflict in a reasonable manner.

1.3.2 Local Management Agency

A Local Management Agency is an organization that ODA has designated to implement an Area Plan (OAR 603-090-0010). The legislative intent is for SWCDs to be Local Management Agencies 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 who voluntarily address natural resource concerns. Currently, all Local Management Agencies 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 (LAC)

For each Management Area, the director of ODA appoints an LAC (OAR 603-090-0020) with up to 12 members, to assist with the development and subsequent biennial reviews of the local Area Plan and regulations. The LAC serves in an advisory role to the director of ODA and to the Board of Agriculture. LACs are composed primarily of 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 regulations.
- Recommend strategies necessary to achieve goals and objectives in the Area Plan.
- Participate in biennial reviews of the progress of implementation of the Area Plan and regulations.
- Submit written biennial reports to the Board of Agriculture and the ODA director.

1.3.4 Agriculture's Role

Each individual landowner or operator in the Management Area is required to comply with the regulations, which set minimum standards. However, the regulations alone are not enough. To achieve water quality standards, individual landowners also need to attain land conditions that achieve the goals and objectives of the voluntary Area Plan. Each landowner or operator is not individually responsible for achieving water quality standards, agricultural pollution limits, or the goals and objectives of the Area Plan. These are the responsibility of the agricultural community collectively.

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

Area regulations only address impacts that result from agricultural activities. A landowner is responsible for only those conditions caused by activities conducted on land managed by the landowner or occupier. Conditions resulting from unusual weather events or other circumstances not within the reasonable control of the landowner or operator are considered when making compliance decisions. Agricultural landowners may be responsible for some of the above impacts under other legal authorities.

Under the Area Plan and associated regulations, agricultural landowners and operators are not responsible for mitigating or addressing factors that do not result from agricultural activities, such as:

- 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.

1.3.5 Public Participation

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

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

1.4 Agricultural Water Quality

1.4.1 Point and Nonpoint Sources of Water Pollution

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

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

1.4.2 Beneficial Uses and Parameters of Concern

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

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

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

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

A TMDL includes an assessment of water quality data and current conditions and describes a plan to restore polluted waterways to conditions that meet water quality standards. TMDLs specify the daily amount of pollution that a water body can receive and still meet water quality standards. Through the TMDL, point sources are assigned pollution limits as "waste load allocations" in permits, while nonpoint sources (agriculture, forestry, and urban) are assigned pollution limits as "load allocations." TMDLs are legal orders issued by the DEQ, so parties assigned waste or load allocations are legally required to meet them. The agricultural sector is responsible for meeting the pollution limit (load allocation) assigned to agriculture specifically, or to nonpoint sources in general, as applicable.

Total Maximum Daily Loads generally apply to an entire basin or subbasin, and not just to an individual water body on the 303(d) list. Once a TMDL is developed for a basin, the basin's impaired water bodies are removed from the 303(d) list, but they remain on the list of impaired water bodies. When data show that water quality standards have been achieved, water bodies will be identified on the list of water bodies that are attaining water quality standards.

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

The list of impaired water bodies (303(d) list) is attached in Appendix 3. The TMDLs, and the agricultural load allocations for the TMDLs that apply to this Management Area are summarized in Chapter 2.

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

Senate Bill 502 was passed in 1995, authorizing ODA as the state agency responsible for regulation of farming activities for the purpose of protecting water quality. A Department of Justice opinion dated July 10, 1996, states that "...ODA has the statutory responsibility for developing and implementing water quality programs and rules that directly regulate farming practices on exclusive farm use and agricultural lands." In addition, this opinion states, "The

program or rule must be designed to achieve and maintain Environmental Quality Commission's water quality standards."

To implement Senate Bill 502, ODA incorporated ORS 468B into all of the Area Plans and associated regulations in the state. A Department of Justice opinion, dated September 12, 2000, clarifies that ORS 468B.025 applies to point and nonpoint source pollution.

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 (ORS 468B.005)

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

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

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

1.4.5 Streamside Vegetation and Agricultural Water Quality

Across Oregon, the Ag Water Quality Program emphasizes streamside vegetation protection and enhancement to prevent and control agricultural water pollution. Streamside vegetation provides three primary water quality functions: shade for cooler stream temperatures, streambank stability, and filtration of pollutants. Other water quality functions include: water storage for cooler and later season flows, sediment trapping that builds streambanks and floodplains, narrowing and deepening of channels, and biological uptake of sediment, organic material, nutrients, and pesticides.

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

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

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, wildlife, fire, floods) and historical and current human influences (e.g., channelization, roads, invasive species, modified flows, past land management). Site-capable vegetation can be determined for a specific site based on: current streamside vegetation at the site, streamside vegetation at nearby reference sites with similar natural characteristics, site hydrology, NRCS soil surveys, and local or regional scientific research.

The goal for Oregon's agricultural landowners is to have site-capable vegetation along all streams flowing through agricultural lands. The agricultural water quality regulations for each Management Area require landowners to provide site-capable streamside vegetation.

In some cases, mature site-capable vegetation may not be needed. For example, on small streams, shrubs and grass may provide shade, protect streambanks, and filter pollutants. However, on larger streams, mature vegetation is important. Limited exceptions include:

- Junipers are mature site-capable vegetation in central and eastern Oregon, but they reduce bank stability and increase erosion
- Upland species (such as sagebrush) can be the dominant site-capable vegetation along streams with erosional down-cutting, but they do not improve water quality

The Ag Water Quality Program assesses streamside vegetation conditions across small watersheds, based on public domain aerial photos and ground-truthing from public vantage points. ODA and DEQ are working toward calibrating these streamside vegetation assessments with agricultural load allocations where TMDLs have been developed to quantify progress and establish milestones and timelines.

1.5 Other Water Quality Programs

1.5.1 Confined Animal Feeding Operation (CAFO)

ODA is the lead state agency for the CAFO Program. The CAFO Program was developed to ensure that operators and producers do not contaminate ground or surface water with animal manure. Since the early 1980s, CAFOs 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 surfacewater, ODA was directed by the 2001 Oregon State Legislature to convert the CAFO Program from a Water Pollution Control Facility permit program to a federal National Pollutant Discharge Elimination System (NPDES) program. ODA and DEQ jointly issued a NPDES CAFO Permit in 2003 and 2009. The 2009 permit will expire in May 2014, and it is expected that a new permit will be issued at that time. The NPDES CAFO Permit is compliant with all Clean Water Act requirements for CAFOs; it 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. CAFO NPDES Permits protect both surface and ground water resources.

1.5.2 Drinking Water Source Protection

Oregon implements its drinking water protection program through a partnership between DEQand the Oregon Health Authority. The program provides individuals and communities with information on how to protect the quality of Oregon's drinking water. DEQ and the Oregon Health Authority encourage community-based protection and preventive management strategies to ensure that all public drinking water resources are kept safe from future contamination. For more information see: www.deq.state.or.us/wq/dwp/dwp.htm. Agricultural activities are required to meet those water quality standards that contribute the safe drinking water.

1.5.3 Groundwater Management Areas

Groundwater Management Areas (GWMAs) are designated by DEQ when groundwater in an area has elevated contaminant concentrations resulting, at least in part, from nonpoint sources. Once the GWMA is declared, a local groundwater management committee comprised of affected and interested parties is formed. The committee then 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. These include the Lower Umatilla Basin GWMA, the Northern Malheur County GWMA, and the Southern Willamtte Valley GWMA. Each GWMA has a voluntary action plan to reduce nitrate concentrations in groundwater. If after a scheduled evaluation point DEQ determines that the voluntary approach is not effective, then mandatory requirements may become necessary.

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, DEQ, and the Oregon Health Authority. 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 can be addressed through multiple programs and partners, including the PSP Program described above.

Through the PSP Program, state agencies and local partners work together to monitor pesticides in streams and to improve water quality (www.deq.state.or.us/wq/pesticide/pesticide.htm). DEQ, ODA, and Oregon State University Extension Service work with landowners, SWCDs, watershed councils, and other local partners to voluntarily reduce pesticide levels while improving water quality and crop management. There has been noteworthy progress since 2000 in reducing pesticide concentrations and detections.

ODA led the development and implementation of a Pesticides Management Plan (PMP) for the state of Oregon (www.oregon.gov/ODA/PEST/water_quality.shtml). The PMP, completed in 2011, strives to protect drinking water supplies and the environment from pesticide contamination, while recognizing the important role that pesticides have in maintaining a strong state economy, managing natural resources, and preventing human disease. The PMP sets forth a process for preventing and responding to pesticide detections in Oregon's ground and surface water resources by managing the pesticides that are currently approved for use by the U.S. EPA and Oregon in both agricultural and non-agricultural settings.

1.5.5 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 salmon, because they have such great cultural, economic, and recreational importance to Oregonians, and because they are important indicators of watershed health. ODA's commitment to the Oregon Plan is to develop and implement Area Plans and associated regulations throughout Oregon.

1.6 Partner Agencies and Organizations

1.6.1 Oregon Department of Environmental Quality (DEQ)

The U.S. EPA has delegated authority to DEQ under the CWA authority for protection of water quality in Oregon. In turn, DEQ is the lead state agency with overall authority to regulate for

water quality in Oregon. DEQ coordinates with other state agencies, including ODA and Oregon Department of Forestry, to meet the needs of the CWA. DEQ sets water quality standards and and develops TMDLs for impaired waterbodies. In addition, DEQ develops and coordinates programs to address water quality including National Pollution Discharge Elimination Permits (for point sources), 319 program, Source Water Protection, 401 Water Quality Certification, and GWMAs. DEQ also coordinates with ODA to help ensure successful implementation of Area Plans as part of its 319 program.

The Department of Environmental Quality designated ODA as the Designated Management Agency for water pollution control activities on agricultural and rural lands in the state of Oregon to coordinate meeting agricultural TMDL load allocations. A Memorandum of Agreement (MOA) between DEQ and the ODA recognizes that ODA is the agency responsible for implementing the Ag Water Quality Program established under ORS 568.900 to ORS 568.933, ORS 561.191, and OAR Chapter 603, Divisions 90 and 95. The MOA between ODA and DEQ was updated in 2012 and describes how the agencies will work together to meet agricultural water quality requirements.

The MOA includes the following commitments:

- ODA will develop and implement a monitoring strategy, as resources allow, in consultation with DEQ.
- ODA will evaluate Area Plans and regulation effectiveness in collaboration with DEQ.
    - ODA will determine the percentage of lands achieving compliance with Management Area regulations.
    - ODA will determine whether the target percentages of lands meeting the desired land conditions, as outlined in the goals and objectives of the Area Plans, are being achieved.
- ODA and DEQ will review and evaluate existing information with the objective of determining:
    - 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 Plan.
    - Whether the rate of progress is adequate to achieve the goals of the Area Plan.

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

1.6.2 Other Partners

The Oregon Department of Agriculture and SWCDs work in close partnership with local, state, and federal agencies and organizations, including: DEQ (as indicated above), the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) and Farm Service Agency, watershed councils, Oregon State University Extension Service, 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 implemented 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 this progress. ODA is working with SWCDs, LACs, and our partners to develop and implement objectives and strategies that will produce measurable outcomes for agricultural water quality.

1.7.1 Measurable Objectives

Measurable objectives allow the Ag Water Quality Program to better evaluate progress toward meeting water quality standards and load allocations where TMDLs have been completed. Many of these measurable objectives relate to land condition and are mainly implemented through focused work in small geographic areas (section 1.7.3). The measurable objectives for this Area Plan are in Chapter 3, and progress toward achieving the objectives is summarized in Chapter 4.

At a minimum, the measurable objectives of the Ag Water Quality Program and this Area Plan are to:

- Increase the percentage of lands achieving compliance with the regulations.
- Increase the percentage of lands meeting desired land conditions outlined in the Area Plan.

1.7.2 Land Condition and Water Quality

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

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

- Landowners can see land conditions and have direct control over them.
- It can be difficult to separate agriculture's influence on water quality from other land uses.
- It requires extensive monitoring of water quality at an intensive temporal scale to evaluate progress; it is expensive and may fail to demonstrate short-term improvements.
- Improved land conditions can be documented immediately, but there may be a significant lag time or a need for more extensive implementation before water quality improves.
- Agricultural improvements in water pollution are primarily through improvements in land and management conditions.

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

1.7.3 Focused Implementation in Small Geographic Areas

Focus Areas

A Focus Area is a small watershed with significant water quality or land condition concerns that are associated with agriculture. ODA's intent in selecting Focus Areas is to deliver systematic, concentrated outreach and technical assistance in small geographic areas ("Focus Areas") through the SWCDs. A key component of this approach is measuring conditions before and after implementation to document the progress made with available resources. The focused implementation 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 can provide 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 the appropriate source specfic conservation practices and demonstrate the effectiveness of these conservation practices.
- A higher density of projects allows neighbors to learn from neighbors.
- A higher density of prioritized projects leads to greater connectivity of projects.
- Limited resources are used more effectively and efficiently.
- Work in one Focus Area, followed by other Focus Areas, will eventually cover the entire Management Area.

SWCDs choose 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 remainder of the Management Area will continue to be addressed through general outreach and technical assistance.

Strategic Implementation Areas

Strategic Implementation Areas are small watersheds selected by ODA, in cooperation with partners, and after review of water quality and other available information. ODA leads the assessment of current conditions and the landowner outreach. Strategic Implementation Areas and Focus Areas are both tools to concentrate efforts in small geographic areas to achieve water quality standards. As with Focus Areas, SWCDs and partners work with landowners to improve conditions that may impact water quality. However, Strategic Implementation Areas also have a

compliance evaluation and assurance process that allows ODA to proactively gain compliance with Ag water quality regulations.

1.8 Implementation, Monitoring, Evaluation, and Adaptive Management

Implementation of the Area Plan and associated regulations will be assessed by evaluating the status and trends in agricultural land conditions. Measurable objectives will be assessed across the entire Management Area and within the Focus Area. ODA conducts land condition and water quality monitoring at the statewide level and will analyze this and other agencies' and organizations' local monitoring data. The results and findings will be summarized 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), objectives, and strategies in Chapter 3, as needed.

1.8.1 Statewide Aerial Photo Monitoring of Streamside Vegetation

Starting in 2003, ODA began evaluating streamside vegetation conditions using aerial photos acquired specifically for this purpose. ODA focuses on land condition monitoring efforts on streamside areas because these areas have such a broad influence over water quality. Stream segments representing 10 to 15 percent of the agricultural lands in each Management Area were randomly selected for monitoring. ODA examines streamside vegetation at specific points in 90-foot bands along the stream from the aerial photos and assigns each sample stream segment a score based on ground cover. 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 one correct riparian index score. The main point is to measure positive or negative change. The results are summarized in Chapter 4 of the Area Plan.

1.8.2 Agricultural Ambient Water Quality Monitoring Assessment

The Oregon Department of Agriculture currently evaluates water quality data from monitoring sites in DEQ's water quality database that reflects agricultural influence on water quality. These data are also published in the DEQ water quality database and evaluated at the statewide level to determine trends in water quality at agricultural sites statewide. Results from monitoring sites in the Management Area, along with local water quality monitoring data, are described in Chapter 4.

1.8.3 Biennial Reviews and Adaptive Management

The Area Plan and associated regulations undergo biennial reviews by ODA and the LAC. As part of each biennial review, ODA, DEQ, SWCDs, and the LAC discuss and evaluate the progress on implementation of the Area Plan and associated regulations. This evaluation includes enforcement actions, landscape and water quality monitoring, and outreach efforts over the past biennium across the Management Area and for the Focus Area. In addition, progress toward achieving agricultural load allocations may be documented (if a TMDL has been established). As a result of the biennial review, the LAC submits a report to the Board of Agriculture and the director of ODA. This report describes progress and impediments to implementation, and recommendations for modifications to the Area Plan or associated regulations necessary to achieve the purpose of the Area Plan. The results of this evaluation will be used to update the goal(s), measurable objectives, and strategies in Chapter 3.

Chapter 2: Local Background

2.1 Local Roles and Responsibilities

2.1.1 Local Advisory Committee (LAC)

This Area Plan was developed with the assistance of a LAC. The LAC was formed in 1997 to assist with the development of the Area Plan and regulations and with subsequent biennial reviews. Current members are:

Name	Location	Description
Dale Counsell, Chair	Ladd Creek	Farmer / Rancher
Ross Bingaman	North Central	Farmer / Rancher
Allen Childs	Basin-wide	Habitat / CTUIR
Gene Hardy	North End	Rancher / SWCD
Jed Hassinger	Catherine Creek	Farmer
William Howell	Grande Ronde	Farmer / Rancher
Dave Ricker	Catherine Creek	Rancher
Maarteen Tromp Van Holst	Indian Creek	Rancher
John Schiller	Upper Grande Ronde	Rancher

2.1.2 Local Management Agency

The implementation of this Area Plan is accomplished through an Intergovernmental Agreement between ODA and the Union SWCD. This Intergovernmental Agreement defines the SWCD as the Local Management Agency for implementation of the Area Plan. The SWCD was also involved in development of the Area Plan and associated regulations.

2.2 Area Plan and Regulations: Development and History

The director of ODA approved the Area Plan and Area Rules in 1999.

Since approval, the LAC met in 2002, 2005, 2008, 2010, 2012, and 2015 to review the Area Plan and regulations. The review process included assessment of the progress of Area Plan implementation toward achievement of plan goals and objectives. The Area Plan was revised in 2012 to update the plan, to strengthen the goals and objectives, and to add language to support Total Maximum Daily Loads (TMDLs), focus areas and monitoring. In 2015, the Area Plan was reformatted to be consistent with other Area Plans and measurable objectives were established to aid in determining the effectiveness of the program.

2.3 Geographical and Physical Setting

2.3.1 Location and Agriculture

The Grande Ronde River flows through the Blue Mountains. Topography within the UGR Subbasin varies from rugged high elevation mountains to broad, nearly flat mountain-enclosed valleys. Elevations range from about 7,800 feet to slightly less than 2,300 feet. Average annual

precipitation ranges from 12 - 25 inches below 3,000 feet to more than 50-inches above 5,000 feet. Typical summers are hot and dry, and winters tend to be cold and wet. Peak flows in the main stem of the Grande Ronde generally occur in April or May when mean monthly flows usually are around 2,000 cubic feet per second. August and September are months of low flow, and the mean monthly flow for these months is at or below 30 cubic feet per second.

Perhaps the most prominent physical feature in the planning area is the 360 square-mile Grande Ronde Valley. This valley is the heart of agricultural and urban activities in the subbasin. Farmers and ranchers use their land to grow wheat, grass seed, mint, alfalfa, livestock and several other crops. Many ranchers graze their livestock in the summer months on private and publicly owned lands in the mountainous regions of the subbasin.

Estimated 2010 income from crops and livestock in Union County was $67,688,000. In terms of sales, the following crops were the most important:

- mint
- cattle and calves
- grains
- grass and legume seeds

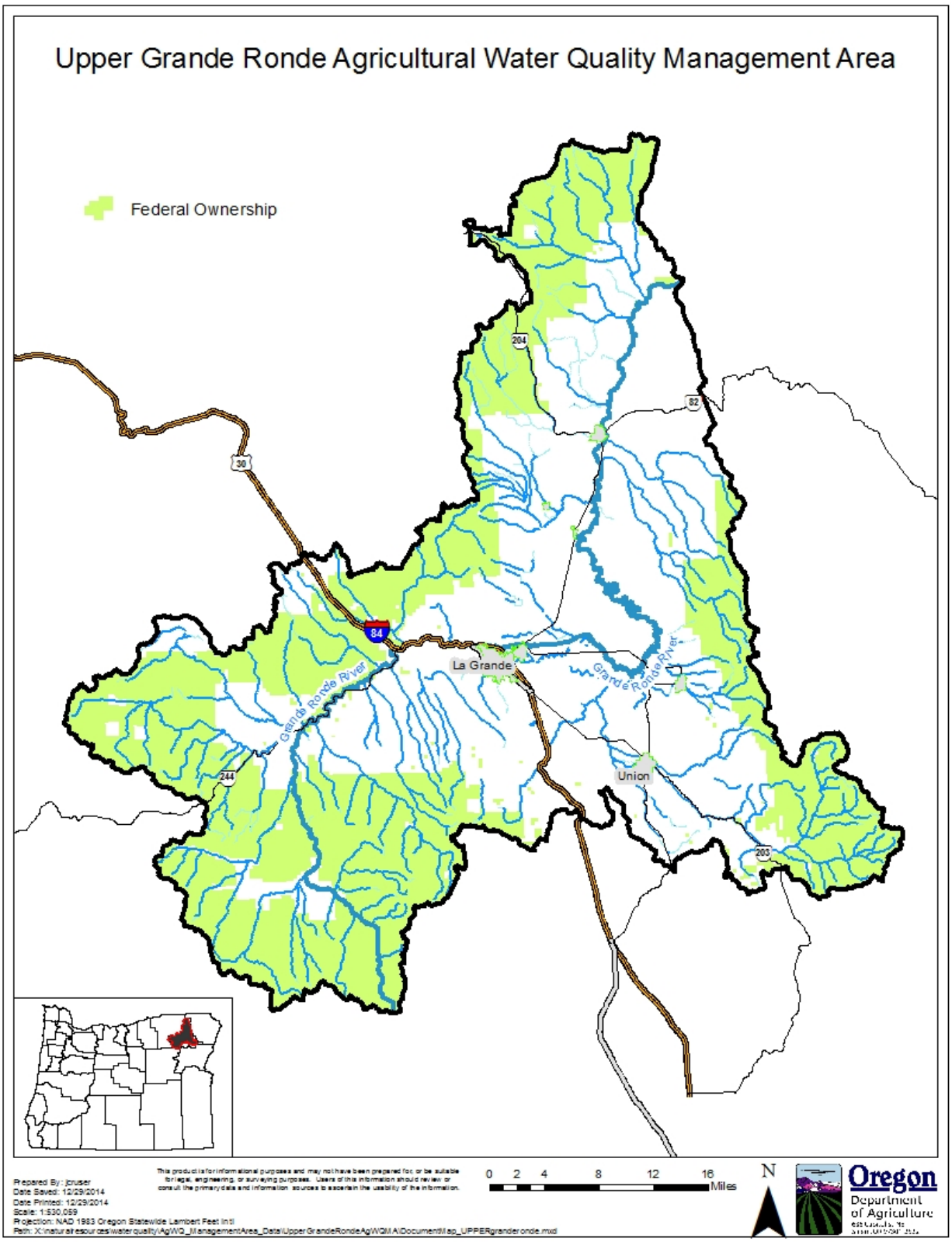
2.3.2 Geographic and Programmatic Scope

The area included in this planning effort stretches from the headwaters of the Grande Ronde River to its confluence with the Wallowa River, a land area of 1,640 square miles. This Plan will refer to this area as the Upper Grande Ronde Subbasin (UGR Subbasin), which conforms to the U.S. Geological Survey's system of naming drainages.

This plan encompasses all agricultural and rural lands in use, or where management has been deferred, or lying idle within the UGR Subbasin. Activities subject to the Forest Practices Act (FPA) are exempt. Provisions of this plan apply regardless of current productive agricultural use or profitability. Refer to OAR 603-095-0010(4) for the definition of agricultural use. Federal land managers will be responsible for water quality planning on their lands in the basin**.**

Designated management agencies (DMA) with jurisdiction and responsibilities in other geographic areas of the UGR Subbasin may adopt, by reference, the provisions outlined in this plan and the requirements indicated in the associated OARs.

2.3.3 Map of the Management Area



2.4 Agricultural Water Quality in the Management Area

2.4.1 Local Issues of Concern

This Area Plan addresses the following water quality issues and conditions related to lands in agricultural use:

- Erosion and surface water management,
- Nutrient management,
- Livestock management including Confined Animal Feeding Operations,
- Near-stream management areas.

2.4.2 303(d) List of Impaired Water Bodies

DEQ is required to establish TMDLs for pollutants on the list of impaired water bodies (303(d) list). TMDLs often apply to an entire basin or subbasin but can apply to an individual water body on the 303(d) list. Once TMDLs are completed for a basin, the water bodies with TMDLs are removed from the Category 5 list (water quality limited, TMDL needed) and are assigned to Category 4A (water quality limited, TMDL approved). In the future, when data show that water quality criteria have been met, water bodies will be assigned to Category 2 (attaining WQ standards).

See Appendix 3 for the current DRAFT 303(d) Water Quality Limited list.

2.4.3 Beneficial Uses and Parameters of Concern

Beneficial uses in the UGR include public, private and industrial water supply, irrigation, livestock watering, salmonoid fish rearing and spawning, anadromous fish passage, resident fish and aquatic life, wildlife and hunting, boating, fishing, water contact recreation, and aesthetics *(OAR 340-41-0151, Table151A*).

DEQ has determined that cold-water fish species are the most sensitive beneficial use not being adequately supported in the Grande Ronde. Spring/summer Chinook salmon, summer steelhead, bull trout, rainbow trout and brook trout are some of the cold-water fish species that use the UGR Subbasin for all or part of their life cycles.

Oregon's Department of Environmental Quality (DEQ) is responsible for determining which bodies of water are "water quality limited" under section 303(d) of the Clean Water Act (CWA). Many of the streams in the UGR Basin do not meet standards for one or more of the following seven factors:

- Dissolved oxygen
- pH
- Sediment
- Temperature
- Bacteria

2.4.3.1 pH and Dissolved Oxygen

Extremes in water pH and low levels of dissolved oxygen can harm fish and other aquatic life. Both conditions can be caused by the availability of nutrients, warm temperatures and light, all

of which stimulate aquatic plant or algae growth. Excessive aquatic plant growth can increase water pH, which may harm fish. The death and subsequent decomposition of aquatic plants can deplete the water of dissolved oxygen resulting in the death of fish and other aquatic animals. These conditions are usually aggravated by low stream flow. For waters identified as providing cold-water aquatic life, the dissolved oxygen shall not fall below 8.0 mg/l unless environmental conditions (barometric pressure, altitude, and temperature) preclude attainment (OAR 340-41-0016). The water quality standard for pH (hydrogen ion concentrations) values range from 6.5 to 9.0. (OAR 340-041-310(1).

2.4.3.2 Sediment

Sediment includes fine silt and organic particles suspended in the water column, settled particles, and larger gravel and boulders that move at high flows. Sediment movement and deposition is a natural occurrence 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 cause physical damage to fish and other aquatic life, modify behavior, and increase temperature by absorbing incoming sunlight. Sediment comes from erosion on range, forestland and croplands, erosion from streambanks and streambeds, and runoff from roads and developed areas. Nutrients, pesticides, and toxic substances can also be attached to sediment particles.

2.4.3.3 Temperature

Water temperature is primarily a summer concern, a season characterized by low flow and high air temperature for rearing of anadromous fish species, resident trout, and bull trout. Water temperatures above 70°F (21ºC) can be immediately lethal to salmonids due to a breakdown in their respiration and circulation systems. Temperatures between the mid 60's°F to 70°F (16º to 21ºC) are stressful to salmonids and fish survival is reduced as the salmonids are more susceptible to a variety of other agents. The sub-lethal effects associated with higher than optimum temperatures are disease, reduced metabolic energy for feeding, and reduced growth or reproductive behavior due to avoidance of areas with high temperatures.

The temperature standard (OAR 340-041-0028) provides numeric and narrative temperature criteria. Maps and tables provided in OAR 340-041-151 specify where and when the criteria apply. Biologically based numeric criteria, as measured using the seven-day average maximum stream temperature, include:

- 12.0^{o} C (53.6^{o} F) during times and at locations of bull trout spawning and juvenile rearing.
- 13.0° C (55.4^{o} F) during times and at locations of salmon and steelhead spawning.
- 16.0° C (60.8^{o} F) during times and at locations of core cold water habitat identification.
- 18.0° C (64.4^{o} F) during times and at locations of salmon and trout rearing and migration.

Determining whether the stream temperature is above or below the temperature standard is based on the average of the maximum daily water temperatures for the stream's warmest, consecutive seven-day period during the year. Water temperature measurements must be taken with continuous recording temperature sensors, in well-mixed and representative locations of streams. A one-time measurement above the standard is not a violation of the standard. When stream flow

is exceptionally low or air temperature is exceptionally high, the temperature criterion is waived (an example is when the flow is less than the expected ten-year low flow or the air temperature is above the 90th percentile of a seven-day average). (*Questions and Answers About DEQ's Temperature Standards*)

2.4.3.4 Bacteria

Bacteria counts are used to determine the safety for human contact recreation and domestic water supplies. High levels of *E. coli* bacteria can cause severe gastric illness and even death. Potential sources of bacteria include animal manure and septic systems. Streams may be listed as violating this criterion during the summer period (the highest use period for water contact recreation), or for the fall-winter-spring period. The DEQ standard sets a maximum level allowable over a 30-day period, as well as a single sample maximum of 406 *E. coli* organisms per 100 ml. (OAR 340-041-0009).

2.4.4 Basin TMDLs and Agricultural Load Allocations

The Upper Grande Ronde Subbasin TMDL was developed by DEQ and approved by the federal Environmental Protection Agency (EPA) in May 2000, to fulfill requirements of the CWA to develop pollution control targets and improvement plans for impaired waters within the plan area. TMDLs specify the daily amount of pollution that a water body can receive and still meet water quality standards. TMDL targets have been established to address temperature, dissolved oxygen, pH and sedimentation. The TMDL quantitatively focuses on temperature and nutrients relying on these objectives to address all other water quality limited issues. The UGR Basin TMDL can be accessed via the DEQ website:
(http://www.deq.state.or.us/wq/tmdls/granderonde.htm#ugrs)

The Department of Environmental Quality has set TMDLs for nitrogen and phosphorus for the UGR Subbasin as well. This was done because excess levels of nutrients spur algae growth, which is the main cause of the dissolved oxygen and pH problems in the subbasin.

Through the TMDL, nonpoint sources (including agriculture, forestry, and urban) are assigned "load allocations," while point sources are assigned "waste load allocations" in their permits. The agricultural sector is responsible for reducing agricultural nonpoint water pollution to meet the load allocation assigned to agriculture. This Area Plan serves as the implementation plan for agriculture's load allocation and may be revised to address the load allocations as they are implemented.

Table 1. Agricultural Load Allocations for various TMDLs.

Parameter	Standard	Load Allocation (LA)
Temperature	Temperature standard, targeting no measureable human-caused warming of streams.	Maximum radiant heat load, also expressed as LA surrogates with numeric targets for percent effective shade (longitudinal graph for mainstem, generic shade-channel width plots for tributaries), channel width, width/depth ratio, sinuosity. Qualitatively, instream flow protection is called for as well.
Bacteria	Bacteria standard: single sample and geometric mean targets for *E. coli*.	Relies on the temperature and nutrient LAs. No additional LAs are established. Monitoring is recommended to support ongoing targeting of the *E. coli* criteria.
Sedimentation	Narrative standard for bottom deposits.	Relies on temperature LA. No additional LAs are established.
Dissolved Oxygen (DO)/pH (Nutrients)	DO and pH standards, targeting minimum DO and maximum pH concentrations.	Maximum DIN* and orthophosphate concentrations are calculated to achieve DO and pH criteria. The LA is expressed as percent reductions of nutrient loads, varying by stream segment and based on nitrogen limitation. These LAs are assessed based on cooler streams via the temperature TMDL, or in the event that sufficient effort towards cooling is not achieved, on current riparian conditions.

*DIN: dissolved inorganic nitrogen (nitrite + nitrate + ammonia)

2.4.5 Sources of Impairment

Many agencies and groups have been collecting water quality data in the Grande Ronde Subbasin for several years. These data indicate that nonpoint source pollution contributes to water quality problems. For example, water quality problems begin upstream from the La Grande wastewater discharge point and persist well below both the La Grande and Union discharges.

Nonpoint source pollution is the result of many human activities that occur in a basin. Effects

from poor land management, while having a small influence on water quality locally, can accumulate and become significant problems at the watershed level. The opposite is true as well. Sound management may have only a small local effect, but broadly applied practices will lead, in time, to significant improvements overall. For these reasons, this management Area Plan will apply uniformly to all agricultural and rural lands in the subbasin. It is also important to treat all landowners in the planning area as fairly as possible.

Some general categories related to agriculture that could influence water quality are:

- Soil management
- Nutrient application
- Animal manure management
- Livestock management
- Near stream management

Clearly, agricultural activities do not cause all water quality problems in the Grande Ronde. For example, the city wastewater discharges are an important source of nutrients. Storm water runoff from the urban areas contribute nutrients as do poorly maintained septic tanks. Poorly maintained roads and bridges increase sediment loads in streams and rivers. Forestry activities can cause increases in stream temperatures, as well as sediment and nutrient concentrations in stream water. Many other activities not listed here can also influence water quality.

Other factors besides human management influence water quality. The geology of the subbasin influences both surface and groundwater quality. For example, the highly alkaline soils found in the subbasin can increase the pH of surface and ground water. This is especially true in the southern end of the subbasin, and in the portion of Catherine Creek downstream from the town of Union.

The climate and topography of the subbasin also have a profound influence on water quality. Because the Grande Ronde River originates in low elevation mountains, and eastern Oregon's climate is hot and dry, water temperatures are naturally high and flows are low late in the summer. Low flows concentrate nutrient levels, which along with high temperature, increase algae growth. Excessive algae growth is the main cause of the observed dissolved oxygen and pH fluctuations.

One way of correcting low late season flows is to build multi-purpose reservoirs. These reservoirs could capture spring runoff and augment flows for instream purposes during the dry season. As stated earlier, a higher volume of water requires more energy to heat. Higher flows could also help dilute the nutrient concentrations, thereby reducing the pH and dissolved oxygen problems in the Grande Ronde Valley. Another aspect that multipurpose reservoirs could help would be in controlling flooding in the valley. Many areas flood frequently in the spring, causing extensive damage to stream banks. This damage contributes to sedimentation problems, the nutrients bound to the sediment contribute to pH and dissolved oxygen problems, and the flooding can destroy existing riparian vegetation and impede the establishment of new vegetation.

In the past, several agencies have studied the feasibility of building reservoirs and have developed plans to do so. The limiting factor has been protecting the salmon and steelhead runs

in the basin. Among the options available that could protect the runs and store water is to build off-channel reservoirs or small dams on several tributaries of the Grande Ronde and Catherine Creek rivers. A study conducted by the Bureau of Reclamation (USDI – BOR), 1981, identified 40 potential dam sites on tributaries in the headwaters of these two rivers. The Bureau estimated that at least 20 small dams are needed to control a 10-year flood event (*Grande Ronde Cooperative River Basin Study, 1996)*.

Recently ODA applied for and was granted a water reservation for the purposes of storing water in the UGR Subbasin. The details of this reservation are found in the Water Resources Department's (WRD) Administrative Rules (OARs 690-508-110). The quantity and source of the reserved water are as follows:

- 14,900 acre-feet of Meadow Creek and its tributaries
- 12,000 acre-feet of the Grande Ronde River upstream of river mile 184
- 9,000 acre-feet of Catherine Creek above Ames Creek

If the WRD does not receive applications for these reservoirs by February 7, 2017, the water reservations will be repealed.

Another factor influencing current water quality is past management practices. One example is the State Ditch. This ditch captures the Grande Ronde River just downstream from Island City. It has changed what historically was 33 miles of meandering river channel. Most of this old river channel is now supplied with water only from Catherine Creek. The part of the old channel the State Ditch cut off is now farmed and houses and barns have been built in its path. Under this water quality Plan, we will assume that the State Ditch will remain intact.

It should be noted that landowners and agencies have implemented many practices and completed many projects to benefit water quality in this basin. Implementation of this Plan will encourage this work to continue and to expand. Water quality can only improve as a result.

2.5 Prevention and Control Measures

This is an Area Plan created by the UGR LAC, ODA, and the Union SWCD. The purpose of the Plan is to prevent and control water pollution from agricultural activities and soil erosion in the UGR Subbasin.

The LAC, ODA, and the SWCD believe proper agricultural practices and widespread adoption of these practices will result in improved water quality. They also believe that ensuring the economic viability of agriculture is necessary to achieve this improvement in water quality. Achieving the goals in the Area Plan, which includes maintaining the economic viability of agriculture, will lead to preserving and protecting beneficial uses.

This Area Plan is part of an adaptive management strategy. Periodically ODA, the LAC, and the SWCD will review this Plan and revise it, if necessary, to ensure that we are achieving our mission and goals. Monitoring will play a key role in this adaptive management. For example, a good monitoring program will help us determine more precisely agriculture's role in water quality concerns in the UGR Subbasin.

2.5.1 Area Rules

Area Rules are presented in this Area Plan, for information purposes, and indicated by bold type within a border.

Through adoption of OARs 603-095-0400 through 603-095-0460 formalizing specific requirements of this plan, the following conditions are prohibited:

603-095-0440 Prohibited Conditions

All landowners or operators conducting activities on lands in agricultural use shall be in compliance with the following criteria. A land occupier shall be responsible for only those prohibited conditions caused by activities conducted on land managed by the landowner or occupier. Criteria do not apply to conditions resulting from unusual weather events or other exceptional circumstances, which could not have been reasonably anticipated. Limited duration activities may be exempted from these conditions subject to prior approval by the department.

2.5.2 Soil Erosion Prevention and Control

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 ecological functions, including:

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

(1) Soil erosion: By January 1, 2003

(a) No agricultural land management or soil disturbing activity shall cause sheet or rill erosion in excess of the soil loss tolerance factor (T) on cropland, and no agricultural land management or soil disturbing activity shall cause active channel erosion that delivers sediment directly into the waters of the state, or

(b) No agricultural land management or soil disturbing activity shall exceed an alternative standard, approved by the Department, that assures protection of water quality, or

(c) No agricultural land management or soil disturbing activity shall cause a discharge of sediment to the waters of the state in excess of water quality standards.

(4) By January 1, 2003 construction and maintenance of surface drainage field ditches shall not result in sediment delivery to waters of the state from soil erosion caused by excessive channel slope, unstable channel cross-section or placement of disposed soils.

2.5.3 Nutrient Management

Crop nutrient applications, including manure, sludge, commercial fertilizer, and other added nutrient inputs, should always be done at a time and in a manner that reduces the possibility of runoff into any nearby stream or waterway. Fertilizers should be applied in accordance with nutrient budgets developed for each crop by the use of current yield estimates, water analysis, soil tests, tissue tests and/or other appropriate tests and information. Sources of information are found in the NRCS Field Office Technical Guide (FOTG) and OSU Extension informational fact sheets for most commercial crops.

Surface applied nutrients should not be applied to frozen soil, on snow, or when a significant rainfall (more than one-inch) is predicted as imminent (greater than a 67 percent probability within 24-hours of application) by the National Weather Service. Extra care shall be used when utilizing surface (rill or flood) irrigation to minimize nutrient contamination of tail water. In no case should chemigated or fertigated irrigation waters be applied in a manner such that a direct hydraulic connection occurs with waters of the state.

(3) By January 1, 2003 nutrient application rates and timing shall not exceed specific crop requirements. Crop requirements will be based on recommendations from the best available data applicable to a specific site.

2.5.4 Riparian/Streamside Area Management

Vegetation, both in the uplands and in the riparian area, plays a critical role in water quality. Extensive research conducted in eastern Oregon and throughout the west confirms this.

Generally, healthy plant communities:

- Hold soil in place,
- Protect stream banks,
- Capture, store and safely release precipitation,
- Filter nutrients from both the ground water and surface runoff,
- Provide shade to moderate water temperatures.

In addition to the water quality benefits, healthy terrestrial vegetation improves fish habitat. Riparian vegetation protects spawning, rearing and holding areas by trapping sediment that could smother eggs and improving the recruitment of large woody debris. This debris helps to create pools for fish to rest in, provides hiding cover and habitat diversity. Vegetation provides organic debris to feed aquatic insects. These insects are an essential element in the diets of many fish.

Out of 70 stream segments in the subbasin, 36 are on the 303(d) list because their temperatures exceed the water quality standards. Water temperatures affect most aspects of an aquatic environment. Research has shown that temperatures as high as 77°F can be lethal to Chinook salmon and steelhead if they are exposed to these temperatures for several hours. Temperatures of 70°F can cause 50 percent mortality, and water less than 70°F can still cause the fish problems. These sub-lethal temperatures can reduce growth, increase susceptibility to disease and increase competition from warm-water species.

Many factors influence stream temperatures. Some of the most important factors are:

- Volume of water flowing in the stream,
- Width-to-depth ratio of the stream,
- Ground water recharge,
- Shade.

Vegetation affects all these factors. Riparian vegetation can help narrow and deepen stream channels, which protects water from heating by exposing less stream surface area to the surrounding environment. Healthy vegetation in both the uplands and in the riparian area will capture, store and safely release water later in the season. Releasing water later in the summer will reduce temperatures in two ways. The first way is that a higher volume of water requires more energy to heat it. Secondly, infusion of ground water, usually between 45 and 55°F, can help hold down stream temperatures.

Shade, provided by tall vegetation, blocks solar radiation, and solar radiation is the single most important energy source for heating streams during daytime conditions (*Beschta, 1997*). Thus streamside vegetation, via the shade it produces, moderates summertime stream temperatures. In much of the UGR Subbasin, the historic and natural potential streamside vegetation is a natural riparian forest consisting variously of conifers or cottonwood, willow, alder, and other tree species as well as a herbaceous understory. The TMDL targets such 'system potential' vegetation to moderate solar heating and promote natural channel form and function that provides for water quality.

Clearly, restoring healthy, functioning vegetation communities, especially riparian vegetation, will improve critical fish habitat necessary to support the three endangered fish species in this subbasin.

(2) By January 1, 2003 no agricultural land management or soil disturbing activity shall cause streambanks to breakdown, erode, tension-crack, shear or slump beyond the level that would be anticipated from natural disturbances given existing hydrologic characteristics.

(5) By January 1, 2003 agricultural activities shall allow the development of riparian vegetation to control water pollution by providing control of erosion, filtering of sediments and nutrients, moderation of solar heating, and infiltration of water into the soil profile. Evaluation of riparian vegetation development will consider site-specific capabilities and anticipated levels of natural disturbance. Where cropping or resource protection activities have occurred, an adequate vegetative buffer or equally effective pollution control practice must be in place.

2.5.5 Waste Management

A landowner or operator's responsibility under this Area Plan is to prevent the introduction of waste materials into nearby bodies of water. There are existing statutes and rules that regulate water quality that remain in effect and are enforced by other designated management agencies.

See Section 1.4.4 for statute and definitions.

Wastes include livestock manure from situations like seasonal feeding and birthing areas, gathering pastures and corrals, rangelands and pasture, and any other situations not already

covered by Oregon's Confined Animal Feeding Operation laws. Indicators of noncompliance include 1) runoff flowing through areas of high livestock usage and carrying wastes into waters of the state, 2) livestock waste accumulated in drainage ditches or areas of flooding, and 3) fecal coliform (*E. coli*) counts that exceed state water quality standards. Livestock grazing is allowed to the extent it does not cause conditions that violate state water quality standards and complies with the Prevention and Control Measures in the Area Rules. Livestock facilities located near streams should employ an adequate runoff control system. Compliance with the riparian objectives will help keep wastes from running into waters of the state.

(6) Waste discharges: Effective upon adoption of these rules:

(a) No person conducting agricultural land management or earth disturbing practices shall cause pollution of any waters of the state or place or cause to be placed any wastes in a location where such wastes are likely to escape or be carried into the waters of the state by any means.

(b) No person conducting agricultural land management or earth disturbing practices shall discharge any wastes into any waters of the state if the discharge reduces the quality of such waters below the water quality standards established by rule by the Environmental Quality Commission.

(c) No person conducting agricultural land management or earth disturbing practices shall violate the conditions of any waste discharge permit issued pursuant to ORS 468B or ORS 568.

2.5.6 Livestock Management

A landowner or operator's responsibility under this Area Plan is to implement measures that prevent and control water pollution from livestock operations. Careful management of areas used for grazing, feeding, and handling is critical to the success of livestock operations and have potential to affect water quality.

Livestock management (including handling facilities, pastures, rangeland, and confinement areas) should be done in a manner that limits soil erosion and minimizes the delivery of sediment and animal wastes to nearby streams. A grazing management system should promote and maintain adequate vegetative cover, for protection of water quality, by consideration of intensity, frequency, duration and season of grazing.

Grazing near streams should be managed to prevent negative impacts to streambank stability, allow for recovery of plants, and leave adequate vegetative cover to ensure protection of riparian functions including shade and habitat. Off stream watering systems, upland water developments, feed, salt and mineral placement is examples of methods to be considered as ways to reduce impacts of livestock to streamside areas. Establishment and spread of noxious weeds should be prevented by appropriate weed control practices and grazing management.

Factors used to evaluate effectiveness of management may include:

- Safe diversion of runoff,
- Protection of clean water sources,
- Off stream watering systems,
- Lot maintenance; smoothing, mounding, seeding,
- Structural measures i.e.; filter strips, catch basins, berms,
- Waste collection, storage and application methods,

- Plant community is neither dominated by invasive annual plant species nor by overgrowth of native woody species,
- Plant cover (plants plus plant litter) is adequate to protect site,
- Distribution and amount of bare ground does not exceed what is expected for site,
- Livestock utilization patterns do not exhibit excessive sustained use in key areas,
- Plant vigor levels and regeneration are sufficient to protect long term site integrity.

Chapter 3: Goals, Objectives, and Strategies

3.1 Vision and Mission

3.1.1 Vision - Maintain and/or improve the water quality of streams in the UGR Subbasin.

3.1.2 Mission - Maintain the economic viability of the agricultural industry, while pursuing ecological integrity through maintenance, restoration, education, and monitoring.

3.2 Goal

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

3.3 Objectives

To achieve the Area Plan mission and goals, the following water quality related objectives are established:

- Protect economic viability
- Sustain and/or improve water quality by:
  - Reducing soil erosion from agricultural land in the basin,
  - Improving bank stability
  - Improving riparian conditions
  - Improving nutrient, animal waste, and irrigation management
- Achieve the following land conditions on agricultural lands throughout the management area that contribute to good water quality:
  - Ongoing, natural recruitment of desirable riparian or upland plant species that provide streambank stability, filtration of overland flow, and moderation of solar heating, consistent with site capability
  - Management activities maintain at least 50 percent of each year's growth of woody vegetation - both trees and shrubs
  - Management activities minimize the degradation of established native vegetation
  - Maintenance or recruitment of woody vegetation–both trees and shrubs
  - Streambank integrity capable of withstanding 25-year flood events
  - No visible sediment loss from cropland through precipitation or irrigation induced erosion
  - No significant bare areas within 50 feet of streams on pasturelands and/or rangelands
  - Active gullies have healed or do not exist on pasturelands
  - Livestock manure is stored under cover during the winter and in a location that minimizes risk to surface and groundwater
- Preserve private property rights

Refer to Section 3.3.3 (Best Management Practices) for those management practices that are generally accepted as the most effective, economical and practical for the area to address water

quality issues.

3.3.1 Measurable Objectives

Measurable objectives allow the Ag Water Quality Program to better evaluate progress toward meeting water quality standards and TMDL load allocations.

As stated in Section 1.7.1, at a minimum, the measurable objectives of the Ag Water Quality Program and this Area Plan are to:

- Increase the percentage of lands achieving compliance with the regulations,
- Increase the percentage of lands meeting desired land conditions outlined in the Area Plan.

To meet the Area Plan objectives, ODA is planning to work with LMAs to conduct land condition assessments at the management area level. These assessments will allow ODA and partners to track improvements in land conditions over time. Often, improvements in land conditions are detectable much earlier than changes in water quality. For example, when a landowner restores a streamside area, land conditions improve rapidly, even though it may take 20 years for streamside vegetation to reach the height that it can positively affect stream temperatures.

ODA will work with LMAs and other partners to design and conduct an assessment of streamside areas along agricultural lands in the management area prior to the next biennial review.

In the UGR Subbasin, DEQ, the SWCD, the U.S. Forest Service (USFS), and others have collected a great deal of water quality information in the last 10 years. The LAC strongly expressed a desire to see more extensive analysis of existing data and collection of new data to more precisely determine agriculture's contribution to water quality problems in this subbasin.

Many of these measurable objectives relate to land condition and are mainly implemented through focused work in small geographic areas (section 1.7.3).

3.3.2 Milestones and Timelines

The following measurable objectives with milestones and timelines were developed in cooperation with ODA, the LAC, and the SWCD. Focus Area Action Plans are developed as a tool with milestones and timelines for implementation of the Area Plan within a defined geographic area.

3.3.2.1 Prevent runoff of agricultural wastes:

By 2017, livestock operations along streams will be evaluated for likelihood of pollution from bacteria and sediment. The method consists of: looking for likely sources (manure piles and heavy use areas) during riparian vegetation survey and follow up with landowner to do site visit follow up by technical assistance if needed.

These results will help the LAC develop long-term targets at the 2017 Biennial Review. Likely targets include:

- By June 30, 2027, the number of livestock operations that are likely to pollute surface water is reduced by 10%.
- By June 30, 2037, fewer than 5% of livestock operations are likely to pollute surface water.

3.3.2.2 Control soil erosion on croplands to acceptable rates.
By 2017, uplands will be evaluated for erosion potential. The method consists of RUSLE2 evaluations based on average slopes for conventional and direct seed management practices and typical crop rotations. Soil loss will be estimated for 2016 and previous years.

These results will help the LAC develop long-term targets at the 2017 Biennial Review. Likely targets include:

- By June 30, 2027, estimated soil erosion rates on cropland will be reduced by 10% from 2017 levels.
- By June 30, 2037, estimated soil erosion rates on all cropland will be less than 5 tons/acre.

3.3.2.3 Provide adequate riparian vegetation for stream bank stability, stream shading and filtration of overland flows consistent with site capability.
By 2017, perennial stream reaches will be evaluated for vegetative water quality function (shading, bank stability, and filtration of potential pollutants in overland flows). The method consists of a combination of aerial photo evaluation and local knowledge to determine how similar the ground cover and canopy cover/shade are to what could be provided by site capable vegetation.

These results will help the LAC develop long-term targets at the 2017 Biennial Review. Likely targets include:

- By June 30, 2027, 70% of perennial streams in agricultural areas will have streamside vegetation that likely provides the full suite of water quality functions the site is capable of (i.e., shade, bank stability, filtration of overland flow).
- By June 30, 2037, 90% of perennial streams in agricultural areas will have streamside vegetation that likely provides the full suite of water quality functions the site is capable of (i.e., shade, bank stability, filtration of overland flow).

Programmatically, ODA has a long-term milestone to achieve 90% of site capable vegetation throughout all agricultural lands in the state. Achieving site capable vegetation does not guarantee that all water quality functions are present. *(Section 1.4.5)*

3.3.2.4 Achieve stable streambanks
By 2017, perennial streams will be evaluated for bank stability. The method is still to be determined. Long-term targets will be identified at the 2017 Biennial Review based on the results from the initial assessment. Possible targets include:

- By 2027, 80% of stream reaches will comply with the Streambank Erosion Rule (603-095-0440(2)).
- By 2047, 90% of stream reaches will comply with the Streambank Erosion Rule.

3.4 Strategies for Area Plan Implementation

The SWCD, acting as the LMA, will be responsible for day-to-day implementation of this Plan. The following guidelines will apply for public participation in implementation and review of the Area Plan. ODA and the SWCD intend to encourage participation in this water quality improvement program by the following strategies:

3.4.1 Education and Outreach

- ❖ *Providing educational programs to raise public awareness and understanding of water quality issues and solutions.*

As resources allow, the SWCDs, in partnership with other agencies and local organizations, will develop educational programs to improve the awareness and understanding of agricultural water quality issues. They will strive to provide the most current information in a manner that avoids conflict and encourages cooperative efforts to solve problems. Implementation of the Area Plan is a priority element in the SWCD's Annual Work Plan and Long-range Business Plan.

The following elements are part of an effective educational program:

- Develop an outreach strategy,
- Showcase successful projects and systems by conducting tours for landowners and media,
- Recognize successful projects and systems through appropriate media and newsletters,
- Promote cooperative on-the-ground projects to solve critical problems identified by landowners/operators and in cooperation with partner organizations,
- Conduct educational programs to promote public awareness of agricultural water quality,
- Evaluate current research and scientifically valid monitoring results.

3.4.2 Funding

- ❖ *Providing incentives for the development and implementation of best management practices for prevention and control of agricultural pollution.*

A variety of funding sources are available to private landowners to assist in implementing BMPs. Some examples are as follows:

- The Oregon Watershed Enhancement Board (OWEB),
- Bonneville Power Administration (BPA) through the Grande Ronde Model Watershed Program,
- Oregon Department of Fish and Wildlife's (ODFW) Access and Habitat Program,
- NRCS programs (e.g. EQIP, WHIP, WRP, CRP, CREP and others).

3.4.3 Best Management Practices (BMPs)

Agricultural BMPs for the UGR Subbasin are those management practices that are generally accepted as the most effective, economical and practical for the area, and they address water quality issues. These practices should also maintain the economic viability of agriculture in the subbasin. Appropriate management practices for individual farms and ranches may vary with the specific cropping, topographical, environmental and economic conditions that exist at a given site. Because of these variables it is not possible to recommend any uniform BMPs for farms or

ranches in the UGR Subbasin. However, the LAC discussed a variety of practices, which based on their experience are appropriate for this subbasin. The Natural Resources Conservation Service's (NRCS) Field Office Technical Guide contains extensive lists of BMPs as well.

The worksheets in Appendix A capture the LAC's discussions. Please refer to these pages to learn more details about the LAC's thoughts on BMPs. These worksheets are intended to increase awareness and provide information and education to the general public and the agricultural community. They are not intended to be mandates to farmers. The AgWQM program was designed to maintain as much flexibility in farming and ranching as possible. What follows is a summary of some of the BMPs that the ODA, SWCD, and the LAC will encourage landowners to adopt, if they have not already. Widespread adoption of these practices will address the water quality parameters of concern in the Grande Ronde River. Appendix A, *Resources Issue Worksheets*, provide more guidance for assistance available for implementation of BMPs and adoption of BMPs will be tracked through future monitoring efforts; BMPs are grouped by the water quality issues they influence.

3.4.3.1 Temperature and Aquatic Habitat

- Near Stream Management Area Practices,
  - Establish and maintain riparian buffers,
  - Site capable vegetation sufficient to protect channel form, provide stream shading and filter pollutants,
  - To the extent feasible, all streams should have riparian buffers on both sides throughout their length,
  - TMDL goals encourage trees and woody riparian vegetation.
- Improve livestock management and distribution through:
  - Riparian pastures as part of a rotational grazing scheme,
  - Off-stream water development,
  - Salting,
  - Herding,
  - Fencing where appropriate,
  - Improved management of big game herds.

3.4.3.2 Sediment

- Improve bank stability
  - Critical Area Planting where appropriate – Promote vegetation that is consistent with site capability,
  - Install rock barbs and rip-rap where appropriate - Designed to promote longterm stability and to minimize impairment of natural channel form and function,
  - Bank shaping where appropriate – Designed to promote longterm stability and to minimize impairment of natural channel form and function,
  - Improve riparian grazing management,
  - Harden (rock) water gaps and animal crossings.
- Ag field erosion
  - Plant and maintain buffer strips,
  - Use grass waterways,

- Plant perennial crops,
- Use conservation tillage where appropriate,
- Use sediment traps,
- Install terraces and diversion ditches,
- Plant windbreaks to control wind erosion.

3.4.3.3 Bacteria

- Animal waste management
  - Plant and protect buffer zones,
  - Install settling ponds to capture runoff,
  - Install clean water diversions around livestock concentration areas,
  - Grazing management,
  - Runoff controls,
  - Fencing,
  - Off-channel watering.

3.4.3.4 Nitrogen and Phosphorus (Dissolved Oxygen and pH)

- Fertilizer management
  - Encourage soil and foliage testing in support of minimizing exess application,
  - Plant and protect buffer strips to filter nutrients.
- Bank Stability and field erosion
  - Plant and protect buffer strips,
  - See Sediment Section.

3.4.3.5 Flow Modification

- Irrigation Management
  - Improve irrigation efficiency by:
    - Pump testing,
    - Sizing mainlines properly,
    - Use proper nozzle sizes,
    - Fix leaks,
    - Install headgates at diversion points and/or improve existing structures,
    - Conversion of surface systems to buried mainline,
    - Monitor soil moisture levels,
    - Line or pipe irrigation ditches.
- Alternative water for irrigation
  - Use city wastewater,
  - Use deep well water when feasible.
- Consider instream water rights, voluntary purchasing or leasing of water rights, OWRD conserved water program*)*

3.4.4 Voluntary Water Quality Farm Plans

- *Offering technical assistance for the development and implementation of voluntary water quality farm plans.*

Voluntary efforts of individual landowners will be the primary means of preventing and controlling nonpoint source pollution from agricultural and rural lands in the UGR Subbasin. Local, state, and federal agencies will assist by providing information, educational opportunities, technical and financial assistance. Both the SWCD and ODA believe this will be the most effective means to improve water quality. To determine the success of this Plan, the SWCD and ODA will participate in a monitoring program.

In keeping with the spirit of voluntary cooperation, the SWCD will encourage landowners to develop individual farm plans to address water quality. Land managers will develop these plans to help them make decisions about applying BMPs that will conserve soil, water, plant and animal resources. These plans will outline specific measures necessary to prevent and control water pollution. Depending on the operation and the specific site, they may contain any or all of the following elements:

- Erosion Control
- Nutrient Management
- Irrigation Management
- Animal Manure Management
- Livestock Management
- Near-stream Management

Voluntary Water Quality Farm Plans may be drawn up by landowners or operators, or by consultants or technicians working for the SWCD. These individual plans will be consistent with this basin-wide plan. The SWCD will review and approve these plans in concert with ODA.

3.4.5 Monitoring and Evaluation

❖ *Developing a monitoring program to identify current and potential water quality problems.*

Monitoring and assessment are critical parts of this water quality management plan. A good monitoring program will enable local land managers and agencies to determine if progress is being made towards meeting program goals.

3.4.5.1 Evaluation of Progress And Plan Modifications (Achievement of Goals)

An important part of the monitoring program is tracking the achievement of the goals of this plan. ODA, the SWCD and the LAC will assess progress towards goal achievement during the biennial review. During the biennial review process, ODA, the LMA, and the LAC will review:

- The activities that have occurred to achieve plan goals and objectives in the management area and the small focus area.
- Water quality and land condition assessment and monitoring data in the management area and the small focus area.
- Compliance activities conducted by ODA in the management area.

The LAC will review monitoring program data at the biennial review and it will be summarized in Chapter 4.

With this knowledge, the LAC, the SWCD, and ODA will be able to refine and improve this Plan in the coming years. We need the means to determine where our problems are and what we can do to correct them. This is part of our adaptive management strategy.

3.4.5.2 ODA monitoring and evaluation

The Oregon Department of Agriculture conducts monitoring at a statewide level and analyzes other agencies' and organizations' monitoring data to answer several monitoring questions related to agriculture and water quality.

- What are current water quality and landscape conditions in agricultural areas in Oregon?
- What are water quality trends?
- How well does the existing monitoring network assess agricultural water quality trends and streamside conditions in Oregon?
- What are riparian vegetation trends along agricultural lands in Oregon?
- How do riparian conditions compare with site capabilities?
- How do riparian vegetation conditions change in aerial photos of selected stream reaches?
- How do changes in riparian vegetation condition compare with trends in water quality in monitored watesheds?

To monitor trends in water quality, DEQ regularly collects water samples at over 150 sites on more than 50 rivers and streams across the state. This program began in the 1940's. In 2011, ODA received funding from the Oregon Legislature to fund water quality sampling at 19 additional sites around Oregon. These data, once sampling begins, will also be published in the DEQ Water Quality database and evaluated at the statewide level to determine trends in water quality at agricultural sites statewide.

Two sites in the UGR Subbasin provide data that meet the criteria. They are: Grande Ronde River at Peach Lane and Grande Ronde River at Highway 82 (Elgin). Data are reviewed every two years and summarized to the LACs and LMA during the biennial review process.

In addition, ODA evaluates aerial photos of stream segments in the 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. When combined with ground level information, the score is useful in assessing vegetation trends in relation to water quality and management practices.

In the UGR Subbasin, seven stream segments were selected for evaluation. The results are updated in Chapter 4.

3.4.5.3 Agriculture's contribution to water quality problems (effectiveness of management practices)

In the Management Area, an ongoing effort is needed to monitor and assess agriculture's contribution to local water quality problems. Targets are set forth in the Area Plan objectives that will track, over time, the improvement in land conditions that influence water quality. What follows is an outline of the monitoring and assessment process the SWCD, with funding and cooperation from the DEQ, ODA, the Grande Ronde Model Watershed Program (GRMW), the USFS, and the OWEB, will conduct, if resources are available, to address the LAC's concerns.

Nutrients

Potential nutrient loss varies greatly from site to site because of differing soil properties and other factors. Using existing information and resources, the monitoring program will assess the relative vulnerability of sites throughout the subbasin for nutrient loss using some of the following information:

- Soil erosion potential
- Site runoff class
- Current land use information

To better understand agriculture's contribution to water quality problems, if any, agencies currently collecting data need to expand their programs. Some examples of new activities are as follows:

- Sample water from irrigation ditches, drain tiles and drainage ditches,
- Set up a limited network of shallow groundwater sampling wells,
- Correlate this information with land uses, soil properties and other factors.

The agencies, in cooperation with landowners, need to implement more intensive "nutrient budget" demonstration project. A nutrient budget would entail among other things:

- Measuring the ground water before it passes under a field and after it leaves,
- Soil nutrient sampling,
- Nutrient analysis of irrigation water and natural precipitation,
- Nutrient analysis of the agricultural crop.

If done properly on a variety of soil and crop combinations, these projects can help assess agriculture's contribution and assess management practices.

Erosion

Agencies need to inventory and rank soil types on their potential to contribute sediment to the waters of the state in the UGR Subbasin. This inventory will help determine agriculture's potential contribution to water quality problems. This process should incorporate at least the following items:

- Erodibility of soils
- Bank erosion
- Slope
- Length of slope
- Presence and nature of cover

Non-Confined Animal Feeding Operations

Livestock operations not subject to CAFO permits are a potential source of nutrients, sediment, and bacteria. This is an instance where several "nutrient budget" demonstration projects could help identify agriculture's potential contribution to water quality problems. As with the suggested demonstration projects in the Nutrient section, these projects would monitor all sources of water entering and leaving winter feeding grounds, for example. Land managers could conduct several of these projects on several different soil types and topographical situations.

3.4.6 Focus Areas

- *Demonstrating the effectiveness of the water quality program and the efforts of landowners to address water quality concerns by selecting focus areas to focus implementation and monitoring.*

Focus Areas are selected to deliver systematic, concentrated outreach and technical assistance in small geographic areas through the SWCDs (*Section 1.7.2)*.

An Action Plan for the current biennium has been developed and approved by ODA outlining the key components of the process.

3.4.6.1 Focus Area Action Plans

A Focus Area Action Plan (FAAP) is developed as a tool with short-term (two-year) milestones and timelines for implementation of the Area Plan within a defined geographic area. The FAAP provides guidance for assessment, targeted outreach and landowner assistance. The SWCD reports implementation activities to ODA on a quarterly and biennial basis. The LAC evaluates progress through the Biennial Review and makes recommendations for future actions.

Refer to the current FAAP, for the specific timelines and milestones for expected outcomes and outputs associated with the assessments and targeted landowner outreach.

3.4.6.2 Focus Area Outcomes

Measurable Objective: 90% of the agricultural areas in the 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: (from pre-assessment)
- Milestone 1: 10% improvement
- Milestone 2: 10% improvement
- Milestone X: 90%

3.4.6.3 Focus Area Outputs

- The SWCD and LAC will identify the next Focus Area within the Management Area, where the local SWCD will focus outreach and technical assistance work for the next biennium.
- In 6 months, ODA and/or the SWCD will complete a pre-assessment in the Focus Area that identifies the current streamside vegetation conditions, in total acres or stream / streambank miles of each vegetation classification.

- In one year, the SWCD will have offered technical assistance to all landowners in the Focus Area with lands where agricultural activities do not appear to allow streamside vegetation to provide WQ functions.
- In two to four years, ODA and/or the SWCD will complete a post-assessment in the Focus Area that identifies the change in acres or stream / streambank miles of each vegetation classification over the two year period.
- ODA and the SWCD will compile information about the number, and size of water quality improvement projects completed in the Focus Area since Area Plan and Rules adoption, as resources allow.
- At the biennial review, the SWCD will report on the amount of lands where landowners accept voluntary assistance to establish streamside vegetation that provides WQ functions.

3.4.7. Biennial Reviews

❖ *Biennially review and assess the progress of implementation toward achievement of Area Plan goals and objectives.*

Refer to section 1.8.3 and 4.5

3.4.8 Enforcement Process And Resolution Of Complaints

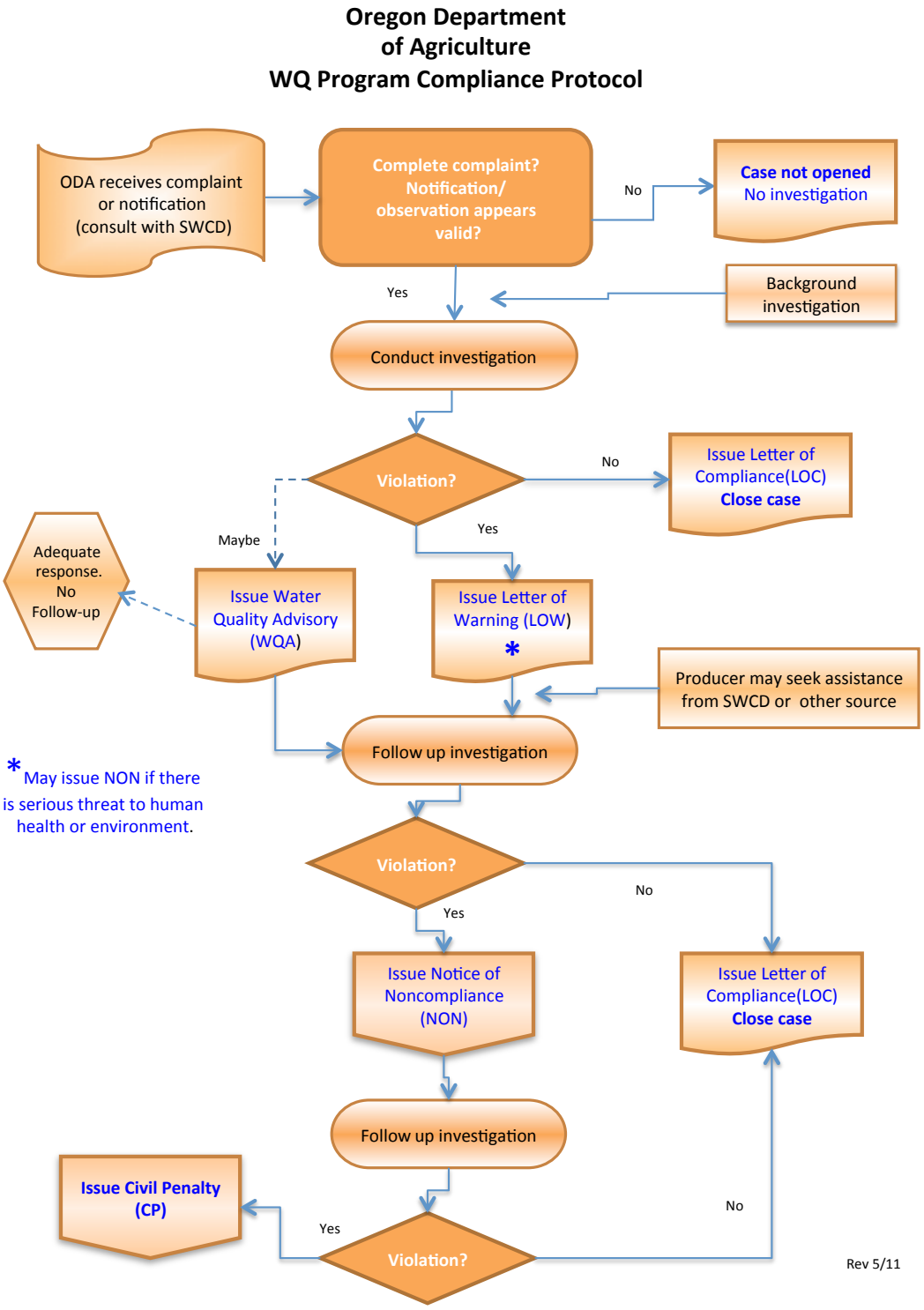
❖ *Following up on any water quality complaints and provide assistance in solving identified problems.*

In addition to the voluntary strategies listed above, this Plan includes regulatory backstops as directed by the AgWQM Act. ODA will use these regulatory mechanisms where appropriate and necessary to gain compliance, and ODA will take enforcement actions only when reasonable attempts at voluntary solutions have failed. ODA will be responsible for any activities related to determination of violations of prohibited conditions, or enforcement as outlined in the applicable rules, OAR 603-090-0060 through 603-090-0120.

The ODA has the responsibility for enforcing rules derived from the AgWQM Area Plan. Fines and civil penalties are used as a last resort in the effort to address management impacts on water quality. That is consistent with the direction given to ODA through OARs for AgWQM Program (OAR 603-090-0000 through 603-090-0120). This Plan includes an enforcement policy because it is a required element of a water quality plan and to provide a mechanism when reasonable attempts at voluntary solutions have failed.

The primary focus of the Area Plan is education toward voluntary compliance with the Plan, and even the enforcement procedure is designed to educate first and penalize only as a last resort. In the event that a situation comes to the attention of the ODA that may be in violation of the Area Rules, certain procedures will be followed, as indicated in OARs 603-095-0010 through 0040 and OARs 603-090-0000 through 0120.

3.4.8.1 Compliance Flow Chart



3.4.8.2 Definitions

A **Letter of Compliance** (LOC) tells the owner/operator that at the time of the inspector's site visit, the property was in compliance with all Area Rules and there were no conditions observed during the investigation, such as manure piles near drainages or heavily grazed areas, that are likely to cause a water quality problem in the near future.

A **Water Quality Advisory** (WQA) means the owner/operator is in compliance because there were no violations of Area Rules documented at the time of the inspector's visit, but the conditions on the property have the potential to violate the Area Rules in the future. Examples: a riparian area is in poor condition, and if management changes are not made, conditions will not improve; there is manure in a corral that could be transported to surface water in a rain event; there is build up of sediment in a sediment basin.

A Water Quality Advisory letter includes a description of the conditions that have the potential to violate the Area Rules, the statute or rule that may be violated, consequences of future documented violations, and a schedule of recommended corrective actions. The letter may also refer the landowner to other sources of technical assistance, and summarize other issues discussed during the investigation. The inspector will usually follow up to see if the changes effectively reduced the potential for a water quality problem.

A **Letter of Warning** (LOW) means the inspector found a violation of Area Rules during the investigation, but the pollution-causing activity was not egregious and was not done intentionally to cause water pollution. The Letter of Warning is an unofficial compliance action (not defined in Administrative Rule) that gives the landowner or operator at least one opportunity to correct the problem before he/she receives a Notice of Noncompliance. A Letter of Warning is not considered an enforcement action by the State.

A Letter of Warning includes a description of the conditions that violate the Area Rules, the statute or rule that is violated, consequences of future documented violations, and a schedule of recommended corrective actions. The letter may also refer the landowner to other sources of technical assistance, and summarize other issues discussed during the investigation. Although the landowner has the flexibility to choose the recommended actions or other practices best suited to correct the problem on the operation, the inspector will follow up to see if the violation has been addressed.

A **Notice of Noncompliance** (NON) means the inspector found a violation of Area Rules during the investigation, and the violation was either (1) egregious or done to intentionally cause water pollution, or (2) a second violation after being issued a Letter of Warning. A Notice of Noncompliance includes a description of the conditions that violate the Area Rules, the statute or rule that is violated, consequences of current documented violations, and a schedule of required corrective actions. The letter may also refer the landowner to other sources of technical assistance, and summarize other issues discussed during the investigation.

A **Plan of Correction** usually accompanies a NON if the corrective actions require more than 30 days and directs the landowner to take specific steps to correct the problem. An inspector will

follow up to confirm the landowner completed the required corrective actions and effectively addressed the violation.

A **Civil Penalty** (CP) is a fee that is assessed to a landowner whose agricultural activities caused either a willful and intentional violation of Area Rules, or who repeatedly failed to take steps to correct a violation. Oregon Department of Agriculture's Division 90 rules include a matrix for calculating the value of civil penalties for the Water Quality Program.

Chapter 4: Implementation, Monitoring, and Adaptive Management

4.1 Implementation and Accomplishments

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

4.1.1 Implementation summary

Outreach and Education*:*

- District staff participated in two annual Grande Ronde Model Watershed Outdoor days at Ladd Marsh teaching principals of water quality and watershed health.
- Completion and printing of two Annual report's with a total distribution of 11,000 annually.
- Outreach meetings were conducted totaling 66 landowner contacts; one workshop with 87 attendees, and three tours with 225 attendees including the annual crop and conservation tour.
- District water quality and restoration projects were featured in three newspaper articles.
- Thirty-nine brochures and fact sheets were distributed to landowners during walk ins, meetings and site visits.

Planning and Projects*:*

- District staff offered technical assistance to 147 landowners for windbreak, spring developments, riparian fencing, water quality, irrigation, grazing management, forestry and stream restoration projects throughout the valley.
- Sixty-four site visits were conducted assessing need and prioritizing projects.
- Two large scale river restoration projects were implemented on Catherine Creek.
- Installed 5,400 ft. of irrigation pipeline across four landowners on Catherine Creek.
- Total acreage for water quality and restoration activities = 2,606 acres.

Monitoring*:*

- District staff continue to monitor current and former water quality projects including:
    - Seven OWEB small grants,
    - Two OWEB large grants, and
    - Two BPA (GRMW) funded projects.

Funding and Grants*:*

- Fourteen project proposals for upland grazing and stream restoration were completed and submitted for funding through OWEB, DEQ, GRMW, WNTI, and NFF.
- Five OWEB small grant projects were implemented throughout the valley; three of which were water quality driven.
- One OWEB large grant improving water quality and fish passage on the Grande Ronde River was implemented.

4.2 Water Quality Monitoring—Status and Trends

4.2.1 Ambient Sites

Data available in LASAR for the following sites:

- Grande Ronde River at Peach Lane
- Grande Ronde River at Highway 82 (Elgin)

Neither of these sites had notable problems with the contaminants of concern. Elevated temperature did lower WQI scores for these sites to between 73 and 88, however.

March **2008**, data for the Highway 82 site showed some elevated pH values (up to 8.80), but no other notable change. The Peach Lane site did not have any notable changes in water quality.

June **2010,** the Highway 82 monitoring site did not have elevated pH levels, but it did have one high turbidity reading (42) in April, 2008. The Grande Ronde at Peach Lane also had one high turbidity reading – 32 – in February, 2008. No other notable changes in water quality were evident.

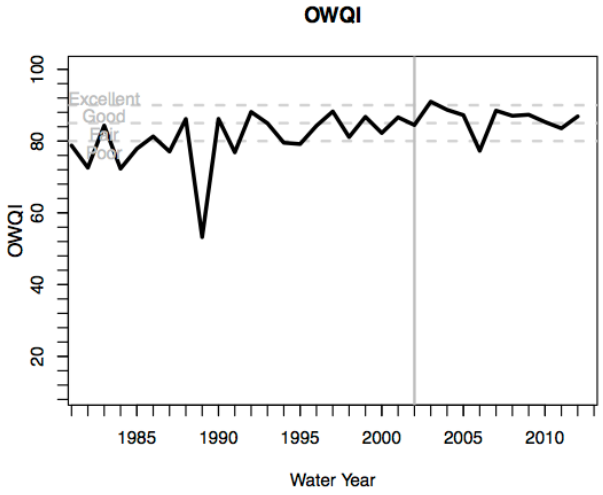
Turbidity and total phosphorus were elevated in two samples from the Peach Tree Lane site, with December 2010 and April 2011 samples showing 37 and 53 NTU, respectively, and 0.16 and 0.17 mg/l total phosphorus. Nearly all the samples from the Highway 82 site had total phosphorus at or above 0.08 mg/l, plus one low dissolved oxygen saturation (66% in August 2012) and one elevated turbidity (41 NTU in April 2011).

In **2014**, the Highway 82 site has elevated BOD and total phosphorus, but no other problems. The Peach Lane site had no problems with the analyses for which we are typically concerned.

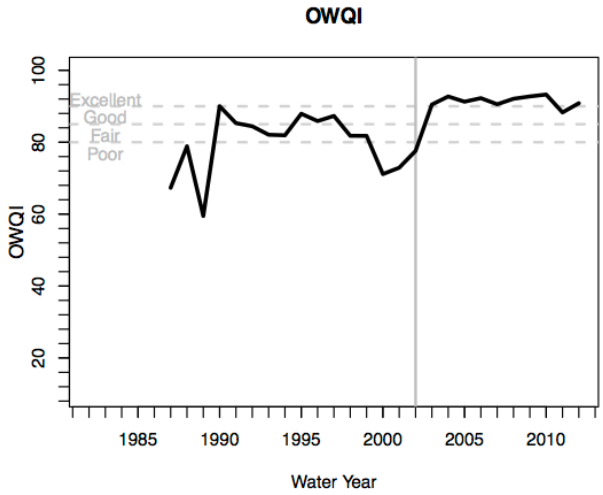
4.2.2 Oregon Water Quality Index (OWQI)

Water quality variables included are dissolved oxygen (percent saturation and concentration), biochemical oxygen demand, pH, total solids, ammonia and nitrate nitrogen, total phosphorus, temperature and bacteria. OWQI scores range from 10 (worst case) to 100 (ideal water quality).

Oregon Water Quality Index 2013 scores and ten-year trends available for Grande Ronde River at Peach Lane and at Highway 82.



- 82 (fair) for Grande Ronde at Highway 82 - with no trend



- 90 (excellent) for Grande Ronde at Peach Lane - with no trend

4.3 Progress Toward Measurable Objectives

4.3.1 Focus Area Assessment

The current Focus Area for this Management Area is Little Creek, a tributary of Catherine Creek. Riparian vegetation was scored by the USWCD for individual tax lots based on Class's I-IV.

Percent of Stream Miles Within Focus Area			
	2013	2015	Change
Class 1	13%		
Class II	21%		
Class III	33%		
Class IV	0		
Not surveyed	33%		

Note - Sections where access was denied USWCD staff drove by as close as possible to obtain any visible information from the road. However, ODFW and other partner agency staff stated at the April, 2013 Little Creek Assessment update meeting that it would not be possible to obtain accurate assessment information from distant visual observations. The above information will act as baseline data for USWCD.

Streamside Vegetation Assessment		
Percent area in each map category in areas where ODA program applies		
Map Category	**Acres**	**Percent**
Grass-Ag	57.67	38
Shrub	55.26	37
Tree	26.70	18
Water	6.82	5
Grass	2.62	2
Ag infrastructure	0.46	0
Bare-Ag	0.27	0
Bare	0	0
Tree-Ag	0	0
Shrub-Ag	0	0
Total	**149.8**	**100**

4.3.2 Focus Area Summary

Little Creek remains the Focus Area. To date, the first irrigation diversion on the system has been removed and replaced with a more efficient, fish friendly structure. Construction was completed in 2011 and is monitored annually by District staff. Additionally, upon the completion of construction, the landowner began planning a stream restoration project. The project moves to improve water quality and salmonid habitat through planting of native species, removal of rip rap bank stabilization, and installation of wood structures.

4.4 Aerial Photo Monitoring of Streamside Vegetation

ODA conducted aerial photo monitoring in the Upper Grande Ronde in 2005. The 2010 follow-up was not repeated due to budget cuts but flights are scheduled for spring 2015.

Stream	2005 Score	2015 Score
Clark Creek	50.1	
Fir Creek	40.2	
Gordon Creek	47.8	
Little Creek	37.7	
Lookingglass Creek	60.7	
Murphy Creek	34.3	
Pyles Creek	34.9	

Lookingglass Creek had the greatest density of trees observed, with tree percentages ranging from 46 to 84 percent. Pyles and Murphy creeks had the least, with a range of 3 to 19 percent. Murphy Creek also had the greatest percentage of bare agricultural land – up to 12 percent in the 90L band.

About 5 percent of Pyles Creek had visibly eroding streambanks, and around 85 percent of the reach was ditched or channelized. Approximately 30 percent of Murphy Creek was also ditched,

but some ditched areas were visibly showing lateral movement (i.e. onset of meander development). Little Creek also had some channelized stretches, but these were scattered throughout the reach examined. The reach examined of Fir Creek had a very narrow channel (<10 feet) with about 10 percent of its length ditched. Some sections of the creek appeared to be anastomosing.

4.5 Biennial Reviews and Adaptive Management

The sixth Biennial Review of the Upper Grande Ronde Agricultural Water Quality Plan was held on February 17, 2015, at the OSU Extension Conference Room in La Grande. Four members of the LAC were present as well as representatives of the Union SWCD, DEQ, and ODA.

The SWCD reported on the implementation activities of the SWCD during the past two years. They presented the results of the focus area (Little Creek) assessment and landowner contacts.

The Oregon Department of Agriculture presented an update on Ag Water Quality Program activities including the ODA/DEQ MOA, focus areas and strategic implementation areas. No complaints were received or investigated during the past two years.

The reformatted Area Plan was presented and discussed. Additional explanatory information was added to the Agricultural Water Quality in the Management Area section (2.4) and the Prevention and Control Measures section (2.5) of the Area Plan. Discussion was held regarding the proposed measurable objectives, timelines and milestones (3.3). The LAC recommended approval of the proposed Area Plan revisions.

APPENDIX A - RESOURCES ISSUE WORKSHEETS

STREAM TOPOGRAPHY

Needs	Recommended Practices	Done by Whom
Bank Stability		
Reasonably stable banks are important for agricultural production and water quality for several reasons.	Pursue Multi-purpose Upstream Storage – could control peak flows, which can cause some of the excessive erosion seen in the valley. Storing some of the peak flows could provide water to increase late summer and early fall flows.	-Landowners -Advocacy groups - ODA
Protect structures (protect a barn for example).	Restoration of stream bank and channel. See Bureau of Reclamation's report for the Imbler Floodplain Management group. Contact Union SWCD for a copy. • Critical area planting where conditions permit, • Barbs and rip-rap where appropriate,- Bank shaping/sloping where appropriate, • Dike set backs combined with vegetation restoration can increase carrying capacity of the river and trap sediments, filter nutrients and prevent erosion.	NRCS*, SWCD, OSU Ext., ODFW, GRMWP – technical assistance and some financial assistance. SWCD, ODA- information and education Landowners – riparian area management.
Protect productive ag fields from flooding and channel changes.	See stream bank and channel restoration.	See Protecting Structures
Excessive erosion contributes to high sediment loads.	See stream bank and channel restoration.	See Protecting Structures
Erosion is one of the main ways excessive levels of phosphorus enter streams and rivers. Research suggests 60-90 percent of phosphorus enters streams this way.	See stream bank and channel restoration	See Protecting Structures
Lack of vegetation reduces bank stability. Plant roots can	Critical area planting where conditions permit.	See Protecting Structures

do a good job of holding soil in place.		
Ice flows combined with natural and artificial blockages can cause bank scouring and erosion even with vegetation in place.	Modify blockages such as bridges and culverts, if possible, to prevent ice jam buildups. Important to assess structures frequently.	See Protecting Structures
A river's tendency to meander, especially in flat valleys like the Grande Ronde.	See stream bank and channel restoration. It is important to inform the public about stream dynamics (one example is the Proper Functioning Condition assessment methods).	See Protecting Structures
Livestock/wildlife disturbing the banks.	Create opportunities for animal control through off- stream water, fencing, rocking water gaps among many other practices. Provide input to ODFW on big game issues.	See Protecting Structures

*Note Appendix B for an explanation of abbreviations.

CROP MANAGEMENT

Needs	Recommended Practices	Done by Whom
Nutrient management	• Encourage soil and foliage testing to determine proper nutrient application needs • Increase operator awareness of crop nutrient needs through educational outreach	NRCS, SWCD, OSU Extension, ODFW, GRMWP, crop consultants, technical assistance SWCD, ODA – information and education Landowners – management

IRRIGATION

Needs	Recommended Practices	Done by Whom
More water	• Pursue upstream structural storage. • Increase the quantity of late-season water if conditions upstream improve.	Storage: WRD, Landowners, ODAManagement:

	We can accomplish this through better forest, grazing, road and recreation management.	Landowners, US Forest Service
Improve efficiency of the use of available water for irrigation	• Recognizing that crop water needs are a complex issue, irrigation timing could be done by monitoring soil moisture (no over or under application of water). OSU Extension is currently testing this idea here in the Grande Ronde. • With the conversion to sprinkler irrigation, it should be recognized that farmers are not too far from peak efficiency already.	Education – SWCD, ODA, OSU Extension, WRD, others Landowners - management
Delivery system efficiency	Efficiency can be improved by doing some of the following things: • Pump testing • Sizing mainlines properly • Using proper nozzle size • Fixing leaks • Installing headgates at diversion points • Improve existing diversion structures • Conversion of surface systems to buried main lines (bring back ACP cost share. Can EQIP dollars pay for this? Yes) • Line or pipe water through irrigation ditches Concerns: Costs are prohibitive for most ditch companies to do this. Public funds are not available. However, landowners have concerns about the government requiring in-stream rights as a condition for using public money. A possible solution may be the conserve water statutes that allow for increased water for both irrigators and streams.	Education – SWCD, ODA, OSU Extension, WRD, others Management - Landowners
Erosion from irrigation	Erosion from irrigation can be reduced by: • Managing irrigation so that you eliminate surface runoff • Use settling ponds where appropriate • Buffer strips to catch sediment and prevent erosion (among other things)	Education – SWCD, ODA, OSU Extension, WRD, others Management - Landowners
Explore alternate sources of	• Some farmers could use the effluent	Education –

water	from the cities of Union and La Grande sewage treatment plants. • Where it is economically feasible, some farmers could convert from surface sources to deep well water. Concerns with this option:- Is there overuse of the ground water resource? Plenty of water available now, but how long is it going to be there?- Preliminary studies show some evidence of deep groundwater recharge. A study continues of the area's geology. The results of this study will help us understand these aquifers better.	SWCD, ODA, OSU Extension, WRD, others Management - Landowners
Recognition that irrigation is listed as a beneficial use of water. Additionally, it must be recognized that water enhances the profitability and value of the land.	The agricultural community and agencies need to educate the public about this fact.	

SOIL MANAGEMENT

Needs	**Recommended Practices**	**Done by Whom**
Erosion	• Plant buffer strips around edges of fields and near waterways • Grass and sod waterways to stabilize banks • Plan perennial crops to build soil and provide ground cover year round • Install runoff/settling ponds to trap sediment coming off fields • For crops such as winter wheat, early fall planting will help to minimize water and wind erosion • Employ conservation tillage techniques where appropriate to reduce soil disturbance • Install diversion ditches and terraces to reduce surface runoff	NRCS, SWCD, OSU Extension, ODFW, GRMWP – technical assist. Landowners – Implement management
Minimize bare soil		

Improve upland conditions	• Utilize sound grazing management. Encourage landowners to develop grazing management plans. • Prevent and control the spread of noxious weeds.	NRCS, SWCD, OSU Extension, ODFW, GRMWP – technical assistance. Landowners – Implement management

GRAZING

Needs	Recommended Practices	Done by Whom
Improved Livestock Management and Distribution	Fencing, cross fencing, water development, salting, herding, and rotational grazing are all potential solutions, but each situation is different. Landowner education is key.	SWCD, OSU Extension, ODA – education NRCS – technical assist Landowners – management
Efficient Use of Resources (vegetation)- avoid over and/or under utilization of vegetation	See Actions for Improved Livestock Management and Distribution	SWCD, OSU Extension, ODA – education NRCS – technical assist Landowners – management
Uniform and consistent protocols for utilization monitoring on Forest Service and private lands	Pursue improved protocols and once they are established, promote private landowners using them on their own lands.	USFS, OSU Range Department. Landowners
Controlling Noxious Weeds	Use herbicides, biological controls and proper grazing management for prevention and control of weed invasions	SWCD and ODA County, tri-county weed board – education NRCS – technical assist Landowners – management
Maintain economic viability by protecting grazing opportunities	• Educating landowners • Manage grazing to a certain stubble height to control the vegetation composition in riparian areas.	

Address habitat degradation by wildlife. Big game can cause damage in a number of ways. Among them are: trampling and soil compaction during the wet season Heavy grazing at inappropriate times- disturbance to riparian areas, especially shrub browsing Damage hurts the landowner's farming/ranching operations. Concerned their livestock will be blamed for damage. Big game forage usage could also make it impossible to meet some of the utilization standards on some public lands.	• Provide landowner input to ODFW on big game management • Educate landowners about programs available to manage big game on their property. • Compensation for damage by wildlife.	Landowners and ODFW
Riparian area grazing	• Manage as appropriate to maintain desirable vegetation composition. • Allowing grazing in riparian areas might be better for water quality than cropping right to the stream's edge. • Establish riparian pastures. • Use grazing as a tool. With proper timing and intensity of grazing woody vegetation in riparian areas can increase with time. An example is the Hall Ranch on Catherine Creek. • See Actions for Improved Distribution and Control.	SWCD, OSU Extension, ODA – education NRCS – technical assist Landowners – management
Rangeland Restoration	• Must control noxious weeds. See Actions for Noxious Weed Control Section. • Rangeland seeding can be very beneficial. Proper management and utilization can go a long way to restore rangeland. See Actions for Livestock Control.	SWCD, OSU Extension, ODA – education NRCS – technical assist Landowners – management

	• Landowner education/management is key.	
Winter Feeding Runoff management – prevent animal waste from running directly into creek	Grass buffer zones can work. These zones can also be grazed in the summer. Divert runoff so that water runs through vegetation to filter nutrients and bacteria. Settling ponds work well. Land managers should consider clean water diversions. Lot surface maintenance, such as scraping or mounding, improve things as well.	SWCD, OSU Extension, ODA – education NRCS – technical assist Landowners – management
Noxious weeds from hay	Feed weedless hay.	
Trampling and compaction of streambanks resulting from cows going to creek for water	• Rock water gaps to prevent erosion. • Provide off-stream water.	SWCD, OSU Extension, ODA – education NRCS – technical assist Landowners – management
Trampling and compaction of pastures from having cows and wildlife on field during wet times of the year.	Rotate where cattle are fed.	SWCD, OSU Extension, ODA – education NRCS – technical assist Landowners – management
Waste management is especially critical for "small feedlot" area.	See Actions for the Runoff management section. Again, education is the key along with financial assistance.	SWCD, OSU Extension, ODA – education NRCS – technical assist Landowners – management
Grazing on Small Hobby Farms Noxious weeds are a large problem on these lands.	Education and outreach are critical for progress to be made. Need to explore new avenues to reach these landowners. Some possible ways are through the local schools and through programs put on by local veterinarians and horse clubs.	SWCD, OSU Extension, ODA – education NRCS – technical assist Landowners – management

APPENDIX B - DEFINITIONS

Waste

Sewage, industrial wastes, and all other liquid, gaseous, solid, radioactive or other substances which will or may cause pollution or tend to cause pollution of any waters of the state. ORS 468B.005(7)

Pollution or Water Pollution

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 habitat thereof.

Active Channel Erosion

Gullies or channels which at the largest dimension have a cross sectional area of at least one square foot and which occur at the same location for two or more consecutive years. OAR 603-095-0010(1).

Surface Drainage Field Ditch

A graded ditch for collecting excess water in a field. OAR 603-095-0010(47)

Riparian Vegetation

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

APPENDIX C

2012 - 303(d) List			
Category 4 (TMDL Approved)			
Stream	**Segment (River Mile)**	**Parameter**	**Season**
Bear Cr.	0 – 7.7	Temperature	Summer
Beaver Cr.	0 – 13.5	Temperature Sedimentation	Summer Undefined
Burnt Corral Cr.	0 – 7.9	Temperature	Summer
Catherine Cr.	0 – 11.7 0 – 31.3	Aquatic Weeds or Algae Dissolved Oxygen Phosphorus pH Temperature	Summer June 1 – Sept 30 Summer Summer Summer
Catherine Cr., M.F.	0 – 2.5	Temperature	Summer
Catherine Cr., N.F.	0 – 2.8	Temperature Sedimentation	Summer Undefined
Catherine Cr., S.F.	5.2 – 8.3	Temperature Sedimentation	Summer Undefined
Chicken Cr.	0 – 2.4	Temperature Sedimentation	Summer Undefined
Clark Cr.	0 – 16.6	Temperature	Summer
Clear Cr	0 – 7.2	Sedimentation	Undefined
Dark Canyon Cr.	0 – 9.6	Temperature Sedimentation Dissolved Oxygen	Summer Undefined Year Round (non-spawning)
Fivepoints Cr.	0 – 8.7	Temperature	Summer
Fly Cr.	0 – 13.3	Temperature Sedimentation	Summer Undefined
Gekeler Slough	7.7 – 9.8	Temperature	Summer
Grande Ronde R.	80.7 – 196.2	Temperature	Summer
	80.7 – 162.4	Aquatic Weeds or Algae	Summer
	80.7 – 162.4	Phosphorus	Summer
	80.7 – 200.6	pH	Summer
	80.7 – 204.8	Sedimentation	Undefined
	35.6 – 172.4	Temperature	Year Round (non-spawning)
Indian Cr.	0 – 9.3	Temperature	Summer
Indiana Cr.	0 – 2.1	Temperature	Summer
Jarboe Cr	0 – 8.3	Temperature	Summer
Jordan Cr	0 - 8	Sedimentation	Undefined
Lick Cr.	0 - 4	Temperature	Summer

Limber Jim Cr.	0 – 8.1 0 - 5	Temperature Sedimentation	Summer Undefined
Limber Jim Cr., S.F.	0 – 2.8	Temperature	Summer
Little Catherine Cr	0 – 8.6	Sedimentation	Undefined
Little Fly Creek	0 – 7.2	Temperature Sedimentation	Summer Undefined
Little Lookingglass Cr.	0 – 10.8	Temperature	Summer
Lookingglass Cr.	0 – 0.7 0 – 11.1	Temperature Sedimentation	Summer Undefined
Lookout Cr.	0 - 6	Temperature Sedimentation Dissolved Oxygen	Summer Undefined Year Round (non-spawning)
McCoy Cr.	0 – 18.3	Temperature Sedimentation	Summer Undefined
McIntyre Cr	0 – 7.3	Sedimentation	Undefined
Meadow Cr.	0 – 23.5	Temperature Sedimentation pH	Summer Undefined Summer
Mottet Cr.	0 – 10.3	Temperature Sedimentation	Summer Undefined
Pelican Cr.	0 – 9.1	Temperature	Summer
Rock Cr.	0 – 16.4	Temperature	Summer
Sheep Cr.	0 – 5.1 0 – 10.8	Temperature Sedimentation	Summer Undefined
Sheep Cr., E.F.	0 – 6.7	Temperature	Summer
Spring Cr.	0 – 2.8	Temperature	Summer
State Ditch	0 - 4.4	Temperature Aquatic Weeds or Algae Phosphorus pH	Summer Summer Summer Summer
Waucup Cr.	0 – 6.9	Temperature	Summer
West Chicken Cr.	0 – 1.6	Temperature	Summer
Category 5 – TMDL Needed			
Limber Jim Cr.	0 – 1.3	Biological Criteria	Year Round
Little Rock Creek	0 – 9.7	Biological Criteria	Year Round
Grande Ronde R.	97.5 – 122.8 65.9 – 104.9	E coli Dissolved Oxygen	Summer Jan 1 – May 15
McCoy Cr.	0 – 1.7	Biological Criteria	Year Round
Meadow Cr.	12.7 – 23.5	Biological Criteria	Year Round
Mill Creek	0 – 10.3	E coli	Summer
Mill Creek	0 – 7.6	E coli	Summer
Pelican Cr.	0 – 9.1	Biological Criteria	Year Round
Unnamed Cr	0 – 3	Biological Criteria	Year Round