Wallowa Agricultural Water Quality Management Area Plan

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Developed by the

Oregon Department of Agriculture

and the

Wallowa Local Advisory Committee

with support from the

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Acronyms and Terms

Ag Water Quality Program – Agricultural Water Quality 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
LAC – Local Advisory Committee
LMA – Local Management Agency
Management Area – Agricultural Water Quality Management Area
NPDES – National Pollution Discharge Elimination System
NRCS – Natural Resources Conservation Service
OAR – Oregon Administrative Rules
ODA – Oregon Department of Agriculture
ODF – Oregon Department of Forestry
ORS – Oregon Revised Statute
OWEB – Oregon Watershed Enhancement Board
OWRI – Oregon Watershed Restoration Inventory
PMP – Pesticides Management Plan
PSP – Pesticides Stewardship Partnership
SIA – Strategic Implementation Area
SWCD – Soil and Water Conservation District
TMDL – Total Maximum Daily Load
USDA – United States Department of Agriculture
US EPA – United States Environmental Protection Agency
WPCF – Water Pollution Control Facility
WQPMT – Water Quality Pesticides Management Team

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Foreword

This Agricultural Water Quality Area Plan (Area Plan) provides guidance for addressing water quality related to agricultural activities in the Agricultural Water Quality Management Area (Management Area). The Area Plan identifies strategies to prevent and control water pollution from agricultural lands.

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

Required Elements of Area Plans

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

Plan Content

Chapter 1: Agricultural Water Quality Program Purpose and Background. Presents consistent and accurate information about the Ag Water Quality Program.

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

Chapter 3: Implementation Strategies. Presents goal(s), measurable objectives, strategic initiatives, proposed activities, and monitoring.

Chapter 4: Progress and Adaptive Management. Describes progress toward achieving the goal of the Area Plan and summarizes results of water quality and land condition monitoring.

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Chapter 1: Agricultural Water Quality Program

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

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

The provisions of the Area Plan do not establish legal requirements or prohibitions (ORS 568.912(1)).

Each Area Plan is accompanied by Area Rules that describe local agricultural water quality regulatory requirements. ODA will exercise its regulatory authority for the prevention and control of water pollution from agricultural activities under the Ag Water Quality Program's general regulations (OAR 603-090-0000 to 603-090-0120) and under the Area Rules for this Management Area (OAR 603-095-1800). The general regulations guide the Ag Water Quality Program, and the Area Rules for the Management Area are the regulations with which landowners must comply. Landowners are encouraged through outreach and education to implement conservation and management activities.

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

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

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

1.2 History of the Ag Water Quality Program

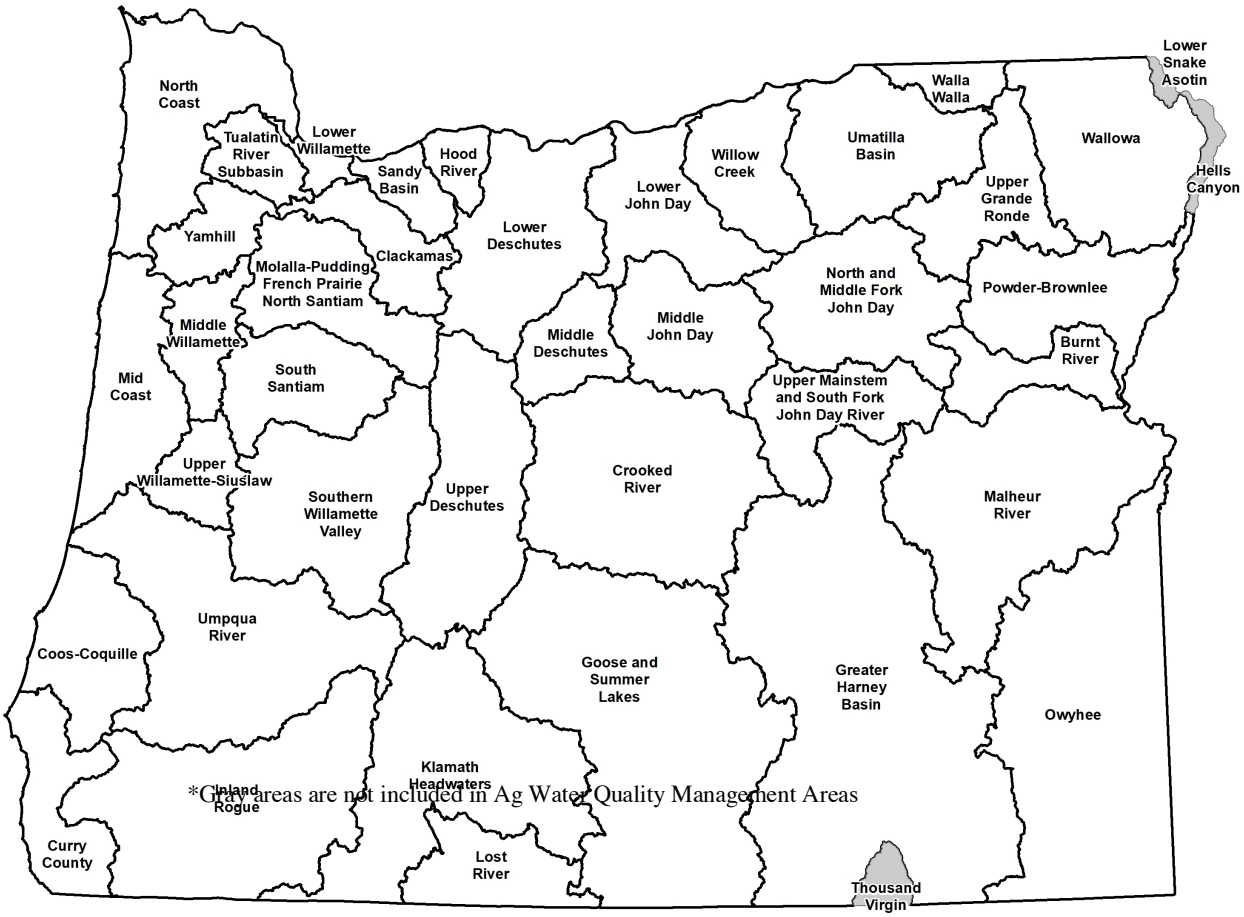
In 1993, the Oregon Legislature passed the Agricultural Water Quality Management Act directing ODA to develop plans to prevent and control water pollution from agricultural activities and soil erosion and to achieve water quality standards (ORS 568.900 through ORS 568.933). The Oregon Legislature passed additional legislation in 1995 to clarify that ODA is the lead agency for regulating agriculture with respect to water quality (ORS 561.191).

Between 1997 and 2004, ODA worked with LACs and SWCDs to develop Area Plans and Area Rules in 38 watershed-based Management Areas across Oregon (Figure 1.2). Since 2004, ODA, LACs, SWCDs, and other partners have focused on implementation including:

- Providing education, outreach, and technical assistance to landowners,
- Implementing projects to improve agricultural water quality,

- Investigating complaints of potential violations of Area Rules,
- Conducting biennial reviews of Area Plans and Area Rules,
- Monitoring, evaluation, and adaptive management,
- Developing partnerships with state and federal agencies, tribes, watershed councils, and others.

Figure 1.2 Map of 38 Agricultural Water Quality Management Areas*



*Gray areas are not included in Ag Water Quality Management Areas

1.3 Roles and Responsibilities

1.3.1 Oregon Department of Agriculture

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 was established to develop and implement water quality management plans for the prevention and control of water pollution from agricultural activities and soil erosion. State and federal laws that drive the establishment of an Area Plan include:

- State water quality standards,
- Load allocations for agricultural or nonpoint source pollution assigned under Total Maximum Daily Loads (TMDLs) issued pursuant to the federal Clean Water Act (CWA), Section 303(d),
- Approved management measures for Coastal Zone Act Reauthorization Amendments (CZARA),

- Agricultural activities detailed in a Groundwater Management Area (GWMA) Action Plan (if DEQ has established a GWMA in the Management Area and an Action Plan has been developed).

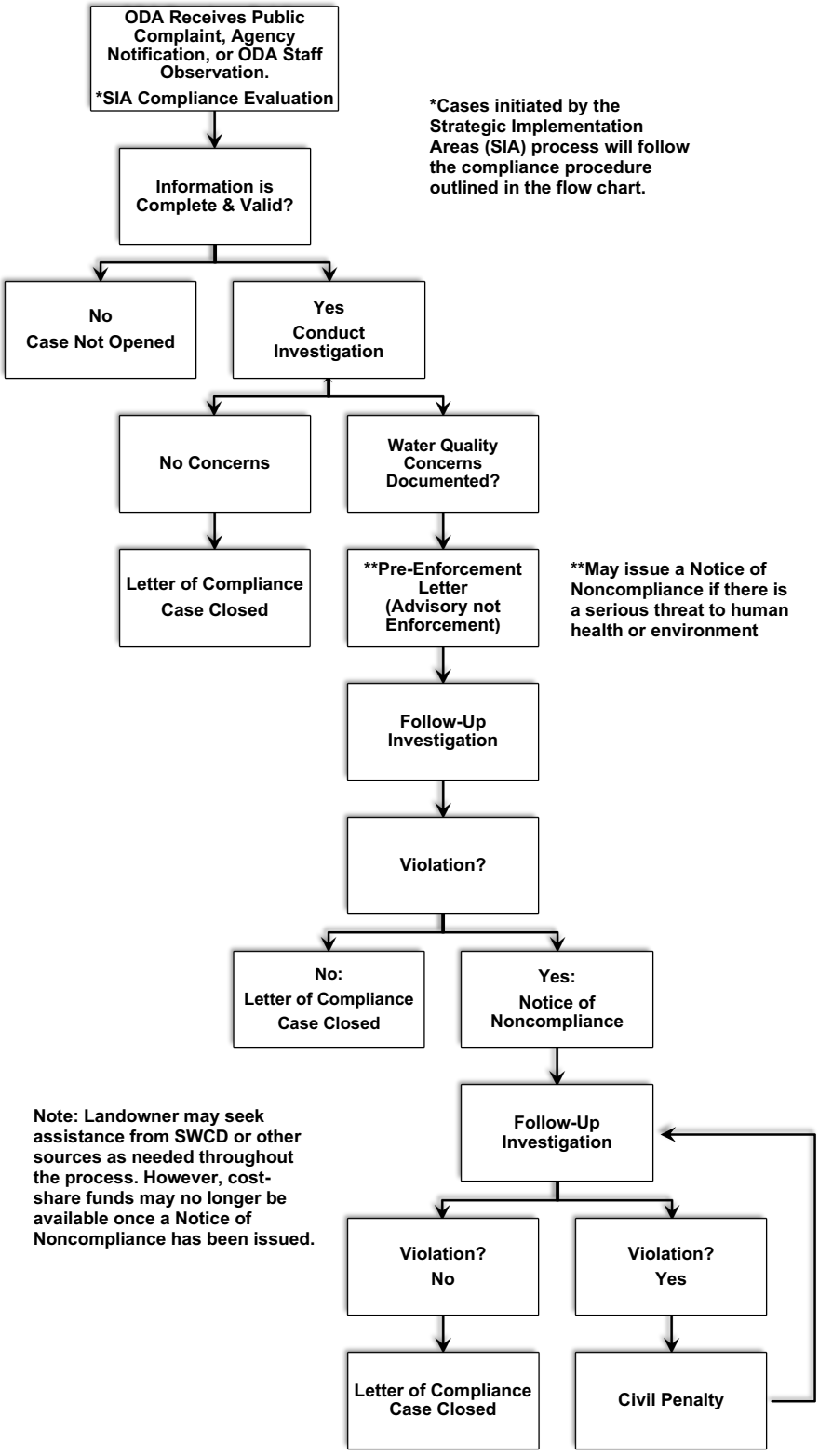
ODA bases Area Plans and Area Rules on scientific information (ORS 568.909). ODA works in partnership with SWCDs, LACs, DEQ, and other partners to implement, evaluate, and update the Area Plans and Area Rules. If and when other governmental policies, programs, or rules conflict with the Area Plan or Area Rules, ODA will consult with the appropriate agencies to resolve the conflict in a reasonable manner.

ODA is responsible for any actions related to enforcement or determination of noncompliance with Area Rules (OAR 603-090-0080 through OAR 603-090-0120). ORS 568.912(1) and ORS 568.912(2) give ODA the authority to adopt rules that require landowners to perform actions necessary to prevent and control pollution from agricultural activities and soil erosion.

The Area Rules are a set of standards that landowners must meet on all agricultural or rural lands. "Landowner" includes any landowner, land occupier, or operator per OAR 603-95-0010(24). All landowners must comply with the Area Rules. ODA will use enforcement where appropriate and necessary to achieve compliance with Area Rules. Figure 1.3.1 outlines ODA's compliance process. ODA will pursue enforcement action only when reasonable attempts at voluntary solutions have failed (OAR 603-090-0000(5)(e)). If a violation is documented, ODA may issue a pre-enforcement notification or an enforcement order such as a Notice of Noncompliance. If a Notice of Noncompliance is issued, ODA will direct the landowner to remedy any conditions 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, ODA may assess civil penalties for continued violation of the Area Rules.

Any member of the public may file a complaint, and any public agency may file a notification of a potential violation of the Area Rules. ODA also may initiate an investigation based on its own observation or from cases initiated through the Strategic Implementation Area process (See Figure 1.3.1).

Figure 1.3.1 Compliance Flow Chart



1.3.2 Local Management Agency

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

The day-to-day implementation of the Area Plan is accomplished through an Intergovernmental Grant Agreement between ODA and each SWCD. Every two years, each SWCD submits a scope of work to ODA to receive funding to implement the Area Plan. Each SWCD implements the Area Plan by providing outreach and technical assistance to landowners. SWCDs also work with ODA and the LAC to establish implementation priorities, evaluate progress toward meeting Area Plan goals and objectives, and revise the Area Plan and Area Rules as needed.

1.3.3 Local Advisory Committee

For each Management Area, the director of ODA appoints an LAC (OAR 603-090-0020) with up to 12 members. The LAC serves in an advisory role to the director of ODA and to the Board of Agriculture. The role of the LAC is to provide a high level of citizen involvement and support in the development, implementation, and biennial reviews of the Area Plan and Area Rules. The LAC's primary role is to advise ODA and the LMA on local agricultural water quality issues as well as evaluate the progress toward achieving the goals and objectives of the Area Plan. LACs are composed primarily of agricultural landowners in the Management Area and must reflect a balance of affected persons.

The LAC is convened at the time of the biennial review, however, the LAC may meet as frequently as necessary to carry out its responsibilities, which include but are not limited to:

- Participate in the development and subsequent revisions of the Area Plan and Area Rules,
- Recommend strategies necessary to achieve the goals and objectives in the Area Plan,
- Participate in biennial reviews of the progress of implementation of the Area Plan and Area Rules,
- Submit written biennial reports to the Board of Agriculture and the ODA director.

1.3.4 Agricultural Landowners

The emphasis of the Area Plan is on voluntary action by landowners to control the factors affecting water quality in the Management Area. In addition, each landowner in the Management Area is required to comply with the Area Rules. To achieve water quality goals or compliance, landowners may need to select and implement an appropriate suite of measures. The actions of each landowner will collectively contribute toward achievement of water quality standards.

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

Under the Area Plan and Area Rules, agricultural landowners are not responsible for mitigating or addressing factors that are caused by non-agricultural activities or sources, such as:

- Hot springs, glacial melt water, unusual weather events, and climate change,
- Septic systems and other sources of human waste,
- Public roadways, culverts, roadside ditches, and shoulders,

- Dams, dam removal, hydroelectric plants, and non-agricultural impoundments,
- Housing and other development in agricultural areas,
- Impacts on water quality and streamside vegetation from wildlife such as waterfowl, elk, and feral horses,
- Other circumstances not within the reasonable control of the landowner.

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

1.3.5 Public Participation

ODA, LACs, and LMAs conduct biennial reviews of the Area Plan and Area Rules. Partners, stakeholders, and the general public are invited to participate in the process. Any revisions to the Area Rules will include a formal public comment period and a formal public hearing.

1.4 Agricultural Water Quality

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

1.4.1 Point and Nonpoint Sources of Water Pollution

There are two types of water pollution. Point source water pollution emanates from clearly identifiable discharge points or pipes. 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 all permitted CAFOs are subject to ODA's CAFO Program requirements. Irrigation return flow from agricultural fields may drain through a defined outlet, but is exempt under the CWA and does not currently require a permit.

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

1.4.2 Beneficial Uses and Parameters of Concern

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

Many waterbodies throughout Oregon do not meet state water quality standards. The most common water quality concerns statewide related to agricultural activities are temperature, bacteria, biological criteria, sediment and turbidity, phosphorous, nitrates, algae, pH, dissolved oxygen, harmful algal blooms, pesticides, and mercury. Water quality impairments vary across the state; they are summarized for this Management Area in Chapter 2.

1.4.3 Impaired Waterbodies and Total Maximum Daily Loads

Every two years, DEQ is required by the CWA to assess water quality in Oregon, resulting in the "Integrated Report." CWA Section 303(d) requires DEQ to identify waters that do not meet water quality standards. The resulting list is commonly referred to as the "303(d) list" (http://www.oregon.gov/deq/wq/Pages/WQ-Assessment.aspx). In accordance with the CWA, DEQ must establish TMDLs for pollutants on the 303(d) list. For more information, visit www.oregon.gov/deq/wq/tmdls/Pages/default.aspx.

A TMDL includes an assessment of conditions (based on water quality data, land condition data, and/or computer modeling) and describes a plan to achieve water quality standards. TMDLs specify the daily amount of pollution a waterbody can receive and still meet water quality standards. TMDLs generally apply to an entire basin or subbasin, not just to an individual waterbody on the 303(d) list. In the TMDL, point sources are assigned waste load allocations that are then incorporated into National Pollutant Discharge Elimination System (NPDES) permits. Nonpoint sources (agriculture, forestry, and urban) are assigned a load allocation.

As part of the TMDL process, DEQ identifies Designated Management Agencies and Responsible Persons, which are parties responsible for submitting TMDL implementation plans. TMDLs designate ODA as the lead agency responsible for implementing the TMDL on agricultural lands. ODA uses the applicable Area Plan(s) as the implementation plan for the agricultural component of the TMDL. Biennial reviews and revisions to the Area Plan and Area Rules must address agricultural or nonpoint source load allocations from relevant TMDLs.

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

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

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

To implement the intent of ORS 561.191, ODA incorporated ORS 468B.025 and 468B.050 into all 38 of the Area Rules in Oregon.

ORS 468B.025 (prohibited activities) states that:
"(1) Except as provided in ORS 468B.050 or 468B.053, no person shall:
(a) Cause pollution of any waters of the state or place or cause to be placed any wastes in a location where such wastes are likely to escape or be carried into the waters of the state by any means.
(b) Discharge any wastes into the waters of the state if the discharge reduces the quality of such waters below the water quality standards established by rule for such waters by the Environmental Quality Commission.
(2) No person shall violate the conditions of any waste discharge permit issued under ORS 468B.050."

ORS 468B.050 identifies the conditions when a permit is required. A permit is required for CAFOs that meet minimum criteria for confinement periods and have large animal numbers or have wastewater facilities. The portions of ORS 468B.050 that apply to the Ag Water Quality Program state that:

"(1) Except as provided in ORS 468B.053 or 468B.215, without holding a permit from the Director of the Department of Environmental Quality or the State Department of Agriculture, which permit shall specify applicable effluent limitations, a person may not:
(a) Discharge any wastes into the waters of the state from any industrial or commercial establishment or activity or any disposal system."

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

' "Pollution" or "water pollution" means such alteration of the physical, chemical, or biological properties of any waters of the state, including change in temperature, taste, color, turbidity, silt or odor of the waters, or such discharge of any liquid, gaseous, solid, radioactive, or other substance into any waters of the state, which will or tends to, either by itself or in connection with any other substance, create a public nuisance or which will or tends to render such waters harmful, detrimental or injurious to public health, safety or welfare, or to domestic, commercial, industrial, agricultural, recreational, or other legitimate beneficial uses or to livestock, wildlife, fish or other aquatic life or the habitat thereof.' (ORS 468B.005(5)).

' "Water" or "the waters of the state" include lakes, bays, ponds, impounding reservoirs, springs, wells, rivers, streams, creeks, estuaries, marshes, inlets, canals, the Pacific Ocean within the territorial limits of the State of Oregon and all other bodies of surface or underground waters, natural or artificial, inland or coastal, fresh or salt, public or private (except those private waters which do not combine or affect a junction with natural surface or underground waters), which are wholly or partially within or bordering the state or within its jurisdiction.' (ORS 468B.005(10)).

' "Wastes" means sewage, industrial wastes, and all other liquid, gaseous, solid, radioactive or other substances, which will or may cause pollution or tend to cause pollution of any waters of the state.' (ORS 468B.005(9)). Additionally, the definition of "wastes" given in OAR 603-095-0010(53) 'includes but is not limited to commercial fertilizers, soil amendments, composts, animal wastes, vegetative materials or any other wastes.'

1.4.5 Streamside Vegetation and Agricultural Water Quality

Across Oregon, the Ag Water Quality Program emphasizes streamside vegetation protection and enhancement. Streamside vegetation can provide three primary water quality functions: shade to reduce stream temperature warming from solar radiation, streambank stability, and filtration of pollutants. Other water quality functions from streamside vegetation include: water storage in the soil for cooler and later season flows, sediment trapping that can build streambanks and floodplains, narrowing and deepening of channels, and biological uptake of sediment, organic material, nutrients, and pesticides. In addition, streamside vegetation provides habitat for numerous species of fish and wildlife. Streamside vegetation conditions can be monitored to track progress toward achieving conditions that support water quality.

Site-Capable Vegetation

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

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

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

In many cases, invasive, non-native plants, such as introduced varieties of blackberry and reed canarygrass, grow in streamside areas. This type of vegetation has established throughout much of Oregon due to historic and human influences and may provide some of the water quality functions of site-capable vegetation. ODA's statutory authority does not require the removal of invasive, non-native plants, however, ODA encourages landowners to remove these plants voluntarily. In addition, the Oregon State Weed Board identifies invasive plants that can impair watersheds. Public and private landowners are responsible for eliminating or intensively controlling noxious weeds, as described in state and local laws. For more information, visit www.oregon.gov/ODA/programs/weeds.

1.4.6 Soil Health and Agricultural Water Quality

An increasingly important concept in Oregon and across the United States is soil health. The Ag Water Quality Program promotes soil health to reduce erosion and keep sediment out of surface waters, thereby helping to maintain and improve water quality. Healthy soils have relatively high organic matter and well-formed soil structure. These characteristics may resist erosion and increase water infiltration, leading to less surface runoff and greater groundwater recharge; the resultant groundwater flows in some cases can help moderate stream water temperatures. According to the NRCS and others, there are four Soil Health Principles that together build highly productive and resilient soils: minimize disturbance and maximize cover, continuous living roots, and diversity above and below the surface.

Healthy soils make farms and ranches more resilient. The western United States is experiencing higher temperatures, more weather variability, and greater storm intensity. Forecasts predict continued high-intensity storms in the winter and spring, combined with more frequent droughts, which may result in more erosion, especially on bare ground. Building soil health increases resiliency to extreme weather, protects water quality, and helps keep farms and ranches viable. Incorporating soil health practices can help landowners adapt and reduce risks. For more information, visit www.nrcs.usda.gov/wps/portal/nrcs/detail/or/soils/health.

1.5 Other Water Quality Programs

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

1.5.1 Confined Animal Feeding Operation Program

ODA is the lead state agency for the CAFO Program, which was developed to ensure that operators do not contaminate ground or surface water with animal manure or process wastewater. The CAFO Program coordinates with DEQ to issue permits. These permits require the registrant to operate according to a site-specific, ODA-approved, Animal Waste Management Plan that is incorporated into the CAFO permit by reference. For more information, visit oda.direct/CAFO.

1.5.2 Groundwater Management Areas

Groundwater Management Areas (GWMAs) are designated by DEQ where groundwater is polluted from, at least in part, nonpoint sources. After designating a GWMA, DEQ forms a local groundwater management committee comprised of affected and interested parties. The committee works with and advises the state agencies that are required to develop an action plan to reduce groundwater contamination in the area.

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

1.5.3 The Oregon Plan for Salmon and Watersheds

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

1.5.4 Pesticide Management and Stewardship

ODA's 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, Oregon formed the interagency Water Quality Pesticide Management Team (WQPMT) to expand efforts to improve water quality in Oregon related to pesticide use. 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 federal, state, and local monitoring programs to assess the possible impact of pesticides on Oregon's water quality. Pesticide detections in Oregon's streams can be addressed through multiple programs and partners, including the PSP.

Through the PSP, state agencies and local partners work together to monitor pesticides in streams and to improve water quality (www.oregon.gov/ODA/programs/Pesticides/Water/Pages/PesticideStewardship.aspx). ODA, DEQ, and Oregon State University Extension Service work with landowners, SWCDs, watershed councils, and other local partners to voluntarily reduce pesticide levels while improving water quality and crop management. Since 2000, the PSPs have made noteworthy progress in reducing pesticide concentrations and detections.

ODA led the development and implementation of a Pesticides Management Plan (PMP) for the state of Oregon (www.oregon.gov/ODA/programs/Pesticides/water/pages/AboutWaterPesticides.aspx). The PMP, completed in 2011, strives to protect drinking water supplies and the environment from pesticide contamination, while recognizing the important role that pesticides have in maintaining a strong state economy, managing natural resources, and preventing human disease. By managing the pesticides that are

approved for use by the US EPA and Oregon in agricultural and non-agricultural settings, the PMP sets forth a process for preventing and responding to pesticide detections in Oregon's ground and surface water.

1.5.5 Drinking Water Source Protection

Oregon implements its drinking water protection program through a partnership between DEQ and 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 preventive management strategies to ensure that all public drinking water resources are kept safe from current and future contamination. For more information, visit www.oregon.gov/deq/wq/programs/Pages/dwp.aspx.

1.6 Partner Agencies and Organizations

1.6.1 Oregon Department of Environmental Quality

The US EPA delegated authority to DEQ to implement the federal CWA in Oregon. DEQ is the lead state agency with overall authority to implement the CWA in Oregon. DEQ works with other state agencies, including ODA and the Oregon Department of Forestry (ODF), to meet the requirements of the CWA. DEQ sets water quality standards and develops TMDLs for impaired waterbodies, which ultimately are approved or disapproved by the US EPA. In addition, DEQ develops and coordinates programs to address water quality including NPDES permits for point sources, the CWA Section 319 grant program, the Source Water Protection Program, the CWA Section 401 Water Quality Certification, and Oregon's Groundwater Management Program. DEQ also coordinates with ODA to help ensure successful implementation of Area Plans.

A Memorandum of Agreement between DEQ and ODA recognizes that ODA is the state agency responsible for implementing the Ag Water Quality Program. ODA and DEQ updated the Memorandum of Agreement in 2012 and reviewed and confirmed it in 2018 (http://www.oregon.gov/ODA/shared/Documents/Publications/NaturalResources/DEQODAmoa.pdf).

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

1.6.2 Other Partners

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

1.7 Measuring Progress

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

1.7.1 Measurable Objectives

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

The Ag Water Quality Program is working throughout Oregon with SWCDs and LACs toward establishing long-term measurable objectives to achieve desired conditions. ODA, the LAC, and the SWCD will establish measurable objectives and associated milestones for each Area Plan. Many of these measurable objectives relate to land conditions and primarily are developed for focused work in small geographic areas (section 1.7.3). ODA's longer-term goal is to develop measurable objectives, milestones, and monitoring methods at the Management Area scale.

The State of Oregon continues to improve its ability to use remote-sensing technology to measure current streamside vegetation conditions and compare these to the conditions needed to meet stream shade targets. As the State's use of this technology moves forward, ODA will use the information to help LACs and LMAs set measurable objectives for streamside vegetation. These measurable objectives will be achieved through implementing the Area Plan, with an emphasis on voluntary incentive programs.

At each biennial review, ODA and its partners will evaluate progress toward measurable objectives and milestone(s) and why they were or were not achieved. ODA, the LAC, and LMA will evaluate whether changes are needed to continue making progress toward the measurable objective(s) and will revise strategies to address obstacles and challenges.

The measurable objective(s) and associated milestone(s) within the Management Area are in Chapter 3 and progress toward achieving the measurable objective(s) and milestone(s) is summarized in Chapter 4.

1.7.2 Land Conditions and Water Quality

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

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

- Landowners can see land conditions and have direct control over them,
- Improved land conditions can be documented immediately,
- Water quality impairments from agricultural activities are primarily due to changes in land conditions and management activities,
- It can be difficult to separate agriculture's influence on water quality from other land uses,

- There is generally a lag time between changes on the landscape and the resulting improvements in water quality,
- Extensive monitoring of water quality would be needed to evaluate progress, which would be expensive and may not demonstrate improvements in the short term.

Water quality monitoring data will help ODA and partners to measure progress or identify problem areas in implementing Area Plans. However, as described above, water quality monitoring may be slower to document changes than land condition monitoring.

1.7.3 Focused Implementation in Small Geographic Areas

Focus Areas
A Focus Area is a small watershed with water quality concerns associated with agriculture. The Focus Area process is SWCD-led, with ODA oversight. The SWCD delivers systematic, concentrated outreach and technical assistance. A key component is measuring conditions before and after implementation to document the progress made with available resources. The Focus Area approach is consistent with other agencies' and organizations' efforts to work proactively in small watersheds.

Focus Areas have the following advantages: a proactive approach that addresses the most significant water quality concerns, multiple partners that coordinate and align technical and financial resources, a higher density of projects that may lead to increased connectivity of projects, and a more effective and efficient use of limited resources.

The current Focus Area for this Management Area is described in Chapter 3.

Strategic Implementation Areas
Strategic Implementation Areas (SIAs) are small watersheds selected by ODA, in consultation with partners, based on a statewide review of water quality data and other available information. ODA conducts an evaluation of likely compliance with Area Rules and contacts landowners with the results and next steps. The Oregon Watershed Enhancement Board (OWEB) and other partners make funding and technical assistance available to support conservation and restoration projects. These efforts should result in greater ecological benefit than relying solely on compliance and enforcement. Landowners have the option of working with the SWCD or other partners to voluntarily address water quality concerns. ODA follows up, as needed, to enforce the Area Rules. Finally, ODA completes a post-evaluation to document progress in the SIA.

Any SIAs in this Management Area are described in Chapter 3.

1.8 Progress and Adaptive Management

1.8.1 Biennial Reviews

The ODA, LAC, LMA, and partners evaluate progress of Area Plan implementation through the biennial review process. At each biennial review, they discuss: 1) progress toward meeting measurable objectives and implementing strategies, 2) local monitoring data from other agencies and organizations, including agricultural land conditions and water quality, and 3) ODA compliance activities. As a result of these discussions, ODA and partners revise implementation strategies and measurable objectives in Chapter 3 as needed.

ODA provides information from the Oregon Watershed Restoration Inventory (OWRI) on restoration project funding and accomplishments at biennial reviews and uses the information for statewide reporting. The majority of OWRI entries represent voluntary actions of private landowners who have worked in partnership with federal, state, and local groups to improve aquatic habitat and water quality conditions. OWRI is the single largest restoration information database in the western United States. For more information, visit www.oregon.gov/oweb/data-reporting/Pages/owri.aspx.

1.8.2 Water Quality Monitoring

In addition to monitoring landscape conditions, ODA relies on water quality monitoring data where available. These data may be provided by other state or federal agencies or local entities; ODA seldom collects water quality samples outside of compliance cases.

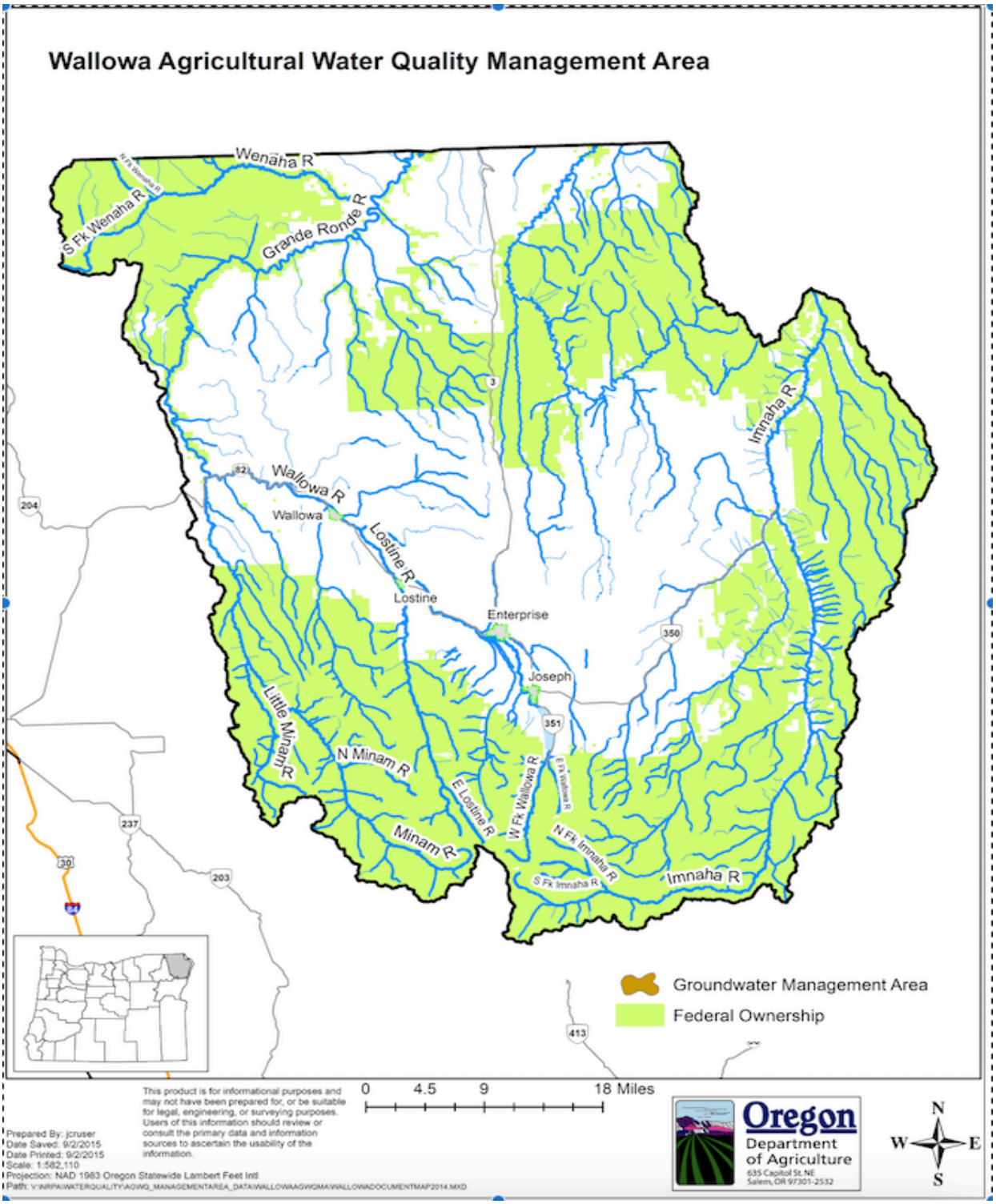
As part of monitoring water quality status and trends, DEQ regularly collects water samples every other month throughout the year at over 130 sites on more than 50 rivers and streams across the state. Sites are located across the major land uses (forestry, agriculture, rural residential, and urban/suburban).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

DEQ provides status and trends reports for selected parameters in relation to water quality standards. ODA will continue to work with DEQ to summarize the data results and how they apply to agricultural activities.

Water quality monitoring efforts in this Management Area are described in Chapter 3, and the data are summarized in Chapter 4.

Chapter 2: Local Background

This region consists of the Lower Grande Ronde, Imnaha, and Wallowa Subbasins.



2.1 Local Roles

2.1.1 Local Advisory Committee

The Area Plan was developed with the assistance of the LAC. The LAC was formed to assist with the development of the Area Plan and Area Rules and with subsequent biennial reviews. Table 2.1.1 lists the current members of the LAC.

Table 2.1.1 Current LAC members

Name	Geographic Representation	Agricultural Product or Interest Representation
Ron Childers (Chair)	Enterprise	Farmer - Grain
Chris Cunningham	Enterprise	Farmer - Grain
Kevin Melville	Joseph	Farmer - Hay
Heather Melville	Joseph	Forester
Bob Stangle	Enterprise	Rancher
Dan Warnock	Imnaha	Rancher
Kelly Birkmaier	Enterprise	Rancher

2.1.2 Local Management Agency

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

The LMA implements the Area Plan by conducting the activities detailed in Chapter 3, which are intended to achieve the goals and objectives of the Area Plan.

2.2 Area Plan and Area Rules: Development and History

The director of ODA initially approved the Area Plan and Area Rules in 2001.

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

2.3 Geographical and Physical Setting

2.3.1 Geographic Area

Wallowa County is in the northeast corner of Oregon and covers 3,153 square miles. In the southern part of the county, the Wallowa Mountains reach a height of 10,000 feet and it is in these mountains that the Wallowa River originates. This headwater area contains perennial snow, steep slopes and many small lakes. The largest lake in the county, Wallowa Lake, is located at the foot of the Wallowa Mountains. This lake, which has a surface area of 1,600 acres, captures the flow from the West and East Forks of the Wallowa River. The main stem of the Wallowa River drains the lake in a northwesterly direction. Major tributaries such as the Lostine River, the Minam River, Bear Creek, and Hurricane Creek all originate in the Wallowa Mountains, flow mostly north and west and enter the main stem at its south bank. The Wallowa River then flows into the Grande Ronde River at River Mile (RM) 82.

The Wallowa River Subbasin is one of the three subbasins covered by this Area Plan. The other two are the Lower Grande Ronde River and the Imnaha River.

The Grande Ronde River flows along the northwestern fringe of the county and its subbasin covers the northern third of the county. The river enters the Snake River in Washington state. Joseph Creek and the Wenaha River are the main tributaries to the Grande Ronde River in this area.

The Imnaha River Subbasin is in the eastern part of the county. This river originates in the Wallowa Mountains and runs nearly 80 miles until it empties directly into the Snake River. Big Sheep Creek is its largest tributary.

2.3.2 Climate

Average annual precipitation varies from 8 to 60 inches within the county. The Wallowa Valley, where much of the agricultural activity takes place, typically has 13 to 17 inches of precipitation per year. The length of the growing season varies with elevation. At Joseph, elevation 4,235 feet, it is 108 days and in Wallowa, elevation 2,923, it is 130 days. Frosts can occur at any time.

Temperatures are generally high in the late spring and summer throughout the Management Area. Daytime highs can reach the upper 90s. The Imnaha area tends to be much warmer than the Wallowa Valley. In August, average temperatures are eight degrees higher in the Imnaha area than in Enterprise.

Floods can be frequent and devastating throughout the county. Particularly bad floods occur when a cold spell freezes the ground, a storm drops several inches of snow, and then a warm front moves in carrying rain. These rain-on-snow events can lead to large amounts of sediment being delivered to rivers, banks being heavily eroded, and riparian vegetation being severely damaged. Normal yearly peak flows can cause large amounts of erosion as well.

Under the right conditions, ice jams can form in the rivers and creeks in Wallowa County. Often the ice first forms on the bottom of the stream channel and gradually forms large blocks of ice. As the ice moves down a channel, it can gouge banks, move streambed gravel and large rocks, ravage riparian vegetation, uproot entire trees and cause rivers to go outside their channel. The ice can dig swaths several hundred yards outside the normal streambank. Significant amounts of sediment are delivered into the river systems as a direct result of the ice and indirectly because of the unstable banks left by the ice event. This kind of damage to riparian areas can take years to be repaired. Casual observers may be misled as to the cause of the damage if they are not aware of any recent ice flow events occurring in the area. These ice jams can occur several times within any ten-year period.

Violent hail and rainstorms can occur in the Management Area. These storms, combined with steep topography and shallow soils, lead to significant landslides. Landslides often occur where soils overlay an impenetrable clay layer. When these soils become saturated, such as after a long wet period, they tend to slide easily. Thunderstorms on July 27, 2010, produced 0.75 inches of precipitation in less than two hours. This caused debris jams to fail in Doc Creek, a tributary to Bear Creek, and widened the channel. A large sediment load in Bear Creek due to the high water resulted in loss of aquatic life including juvenile and adult salmon and steelhead/rainbow trout. Slumps have occurred near Hurricane and Lightning creeks as well.

2.3.3 Land Use

Timber and agriculture are the dominant uses of the land in Wallowa County. Forests cover about 48 percent of the land base. Forestry activities take place on all these acres except in the three designated wilderness areas within the county. Readers should note that nearly all of the major waterways originate in wilderness areas. In many cases, agriculture and timber uses occur on the same acre because livestock

seasonally graze many of the forested areas. The public owns approximately 66 percent of the land base in the county. The majority of the 34 percent in private ownership is used for agriculture.

According to 2010 data from the U.S. Census Bureau, 15 percent of the jobs in the county were in agricultural services and forestry related fields. Though employment is decreasing, natural resources particularly agriculture, still remain the basis for the economy in Wallowa County. Nationally, agriculture remains a vital part of the economy and civilization itself. Despite being less than two percent of the population, farmers and ranchers provide abundant food and fiber for a growing population.

Because of the hot and dry summers in the Mangagement Area, irrigation is vital to agriculture. Crops such as hay could not be economically grown without irrigation. Dryland farming (growing crops such as winter wheat without supplemental water) is limited to certain parts of the county because of short growing seasons and the susceptibility to frosts.

A complex system of diversions and irrigation canals supply water to the fields. A large percentage of farmers and ranchers in the area use sprinklers to water their fields. However, flood irrigation remains an economical method used to deliver water to crops.

Irrigation has many benefits besides improving crop yields. It can charge shallow groundwater aquifers, and this groundwater can return to streams cooler, cleaner, and later in the summer. Another benefit is that riparian vegetation communities have developed along irrigation ditches. This vegetation provides habitat for a variety of wildlife, and protects and enhances water quality. Improved crop yields associated with irrigation can reduce soil erosion because of the enhanced ground cover. A high level of vegetative ground cover also increases the infiltration of precipitation into the soil, which reduces runoff.

2.3.4 Environmental Benefits of Agricultural Production

Natural resources (e.g. soil, water, air, plants, and animals) are the backbone of agriculture. To be successful, farmers and ranchers must conserve these resources, and when they do, they provide an abundance of benefits to the general public.

Some examples of agricultural environmental benefits include:

- Open space
- Recreation
- Wildlife habitat
- Atmospheric carbon dioxide removal

With good management, agriculture can improve soil quality through practices such as crop rotation and residue management. With improved soil conditions, water quality will improve as well because rain and snow will infiltrate the ground better, and the water will enter streams cleaner and cooler. Proper range management through grazing leads to grasslands with diverse and healthy plant communities. Healthy vegetation is key to maintaining and improving water quality.

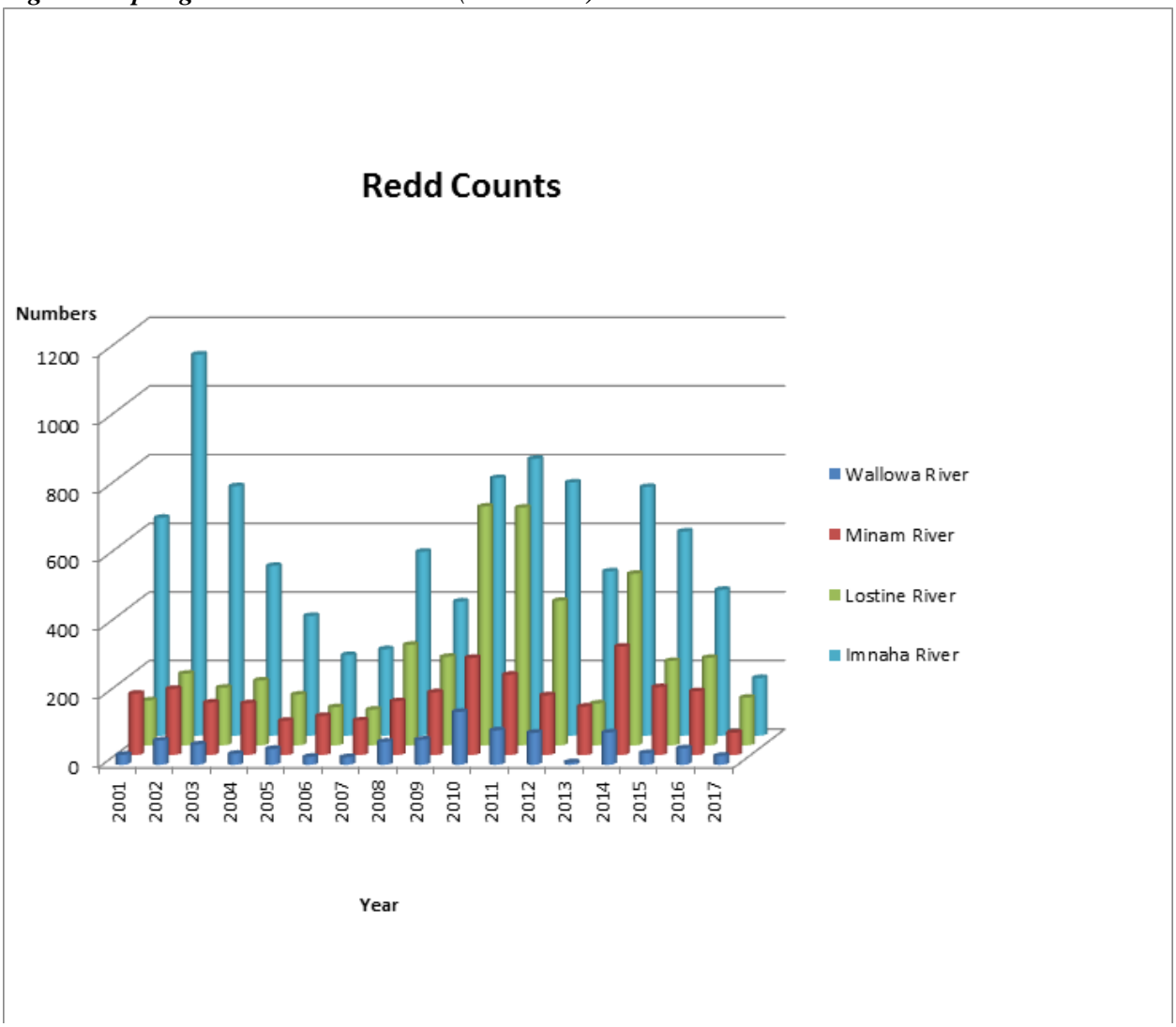
2.3.5 Relation to Fish Recovery Plans

The LAC and ODA want to support and assist existing conservation efforts such as the Wallowa County Salmon Habitat Recovery Plan and Multi-Species Strategy and existing Natural Resource Conservation Service (NRCS) farm plans. Farmers and ranchers in the area have been practicing good land stewardship in conjunction with these programs and on their own for many years.

The LAC and ODA want to emphasize to readers that solving water quality problems in Wallowa County will not by itself recover the federally listed bull trout, salmon and steelhead stocks. It will no doubt help

a great deal, but many factors are responsible for the decline of these species. Some of these factors, such as ocean conditions and natural predation, are beyond the control of landowners in Wallowa County. Figure 1 - documents the status of spring Chinook redd counts over the from 2001 to 2017 wilderness streams (e.g. the Wenaha River) show similar counts as streams that have been more heavily managed. This lends credence to the concept that out-of basin-issues (e.g. eight mainstem dams, a changed estuary, ocean harvest) are having a far more deleterious effect than in-basin issues (Don Bryson, personal communication).

Figure 1: Spring Chinook Redd Counts (2001-2017)



Note: The Lostine adult Chinook weir was not operational for much of the 2010 and 2011 migration seasons. This allowed large numbers of hatchery-origin Chinook to spawn in the wild; many of them in the index area. Index counts would have been less had the weir been operating.

2.4 Agricultural Water Quality

2.4.1 Water Quality Issues

2.4.1.1 Beneficial Uses

Beneficial uses in the Management Area include drinking water, irrigation, livestock watering, aquatic life, boating and fishing, water contact recreation, and aesthetics. Uses related to federally listed species and other resident fish and aquatic life are the most sensitive. Chinook salmon, steelhead, and bull trout have been listed as threatened under the Endangered Species Act.

2.4.1.2 WQ Parameters and 303(d) list

Upon completion of the Lower Grande Ronde TMDL, those stream segments in the Management Area that were declared water quality limited for temperature and bacteria were removed from the 303(d) Category 5 list (Water Quality Limited – TMDL needed) and assigned to the Category 4A list (Water Quality Limited – TMDL Approved). Category 5 water quality limited listings (303(d)) remain for other parameters including: biological criteria, copper, pH, dissolved oxygen, and sedimentation (Appendix A).

2.4.1.3 TMDLs and Agricultural Load Allocations

The Lower Grande Ronde TMDL, which includes this Management Area, was approved in 2010. It addresses stream temperature and bacteria. This Area Plan serves as the implementation plan for agriculture's load allocation and may be revised to address the load allocations as land use practices are implemented.

Stream pollution is closely tied to land use. In the Wallowa Basin, 48 percent of the land is forested and a majority is in agricultural use. Other uses include urban, rural residential, parkland, and industrial. The TMDL planning applies to all land uses that contribute pollution to the basin's streams and rivers.

2.4.1.4 Drinking Water

Several communities obtain domestic drinking water from surface and groundwater sources in the Wallowa Agricultural Water Quality Management Area. Drinking water is an important beneficial use under the federal CWA. When CWA standards are met in source waters, a drinking water treatment plant using standard technology can generate water meeting the Safe Drinking Water Act contaminant limits. There are six active public water systems using groundwater wells in the Plan area serving approximately 4,565 people on a regular basis, in addition to visitors at recreation sites. There is one community public water system using both surface water and groundwater (city of Joseph) in the Wallowa WQMA serving approximately 1,120 people regularly. There are four community water systems using only groundwater in the area: the cities of Lostine (population 215), Wallowa (population 840), and Enterprise (population 1,985) and the Wallowa Lake County Service District (population 350). There is also Wallowa Forest Products, a non-transient non-community workplace public water system using groundwater and serving 55 persons regularly.

There are also the Imnaha Water System, Minam Recreational Area North and South (Oregon Parks and Recreation Department), Mountain View Motel and RV Park, Troy Resort, Lakeshore Water and Development Co-op, Wallowa Lake Tramway, and Wallowa Mountain Visitor Center non-community systems. Agricultural land uses (especially grain crops, alfalfa, hay, pasture, and livestock) are present near most public water system wells and springs in the area. US Forest Service land is prevalent in the uplands, providing the contributing areas for numerous springs and creeks (many used for public and private domestic water supply), as well as grazing, in the WQMA.

Some public water systems in the management area have recent alerts for detections of total coliform and/or *E. coli* in the distribution system and/or source: Enterprise (source only), Joseph (source only), Lostine (source, distribution), Wallowa (distribution), Imnaha (distribution), Troy Resort (source, distribution), Lakeshore Water & Development Co-op (distribution), Wallowa Lake Tramway (distribution), and Wallowa Mountain Visitor Center (source, distribution). Nitrate alerts (generated when nitrate exceeds 5 mg/l) exist for only Wallowa Mountain Visitor Center (five alerts in 10 years @ a range of 5.2-6.12mg/L). The drinking water MCL for nitrates is 10 mg/L. These contaminants are often related to animal and cropland agriculture. The Wallowa Mountain Visitor Center well with high nitrate is near the west side of Enterprise. This differs from the location of the two private wells with nitrate concentrations >5mg/L (see below), one of which is near the source area for Enterprise's springs (west of Joseph); those springs had a nitrate test result of 4.74 mg/L in 2017 (just below the alert level). Nitrate alerts, public or private, are few and widely scattered. What these sites have in common is the wells' location over sites with high nitrate leaching potential, according to the Natural Resources Conservation Service.

Oregon Health Authority rated many of the public water system wells in the Ag WQMA for contaminant susceptibility (others such as city of Joseph's well and Wallowa Forest Products' well are unrated). All evaluated PWSs rate as moderate to high susceptibility for land use impacts to drinking water sources based on Source Water Assessments, aquifer characteristics, and well locations and construction. The now-inactive Joseph Timber Company well showed consistent atrazine (an herbicide) alerts until the system closed, demonstrating some localized penetration of this chemical into the aquifer.

DEQ only addresses drinking water issues identified for PUBLIC water systems. A query of Oregon Water Resources' water rights database for private domestic points of diversion (using a threshold of 0.005 cfs for domestic water rights that are household use only, not irrigation) identified 239 private domestic water rights in the Wallowa WQMA. There are also numerous private groundwater wells for domestic use. The Domestic Well Testing Act database (real estate transaction testing data) for 1989-2018 indicates two significant detections of nitrate (>7mg/L) in private wells out of 11 wells included in the database for this area. One well west of Joseph near Enterprise's springs had a value of 8.13mg/L, while another east of Joseph and Enterprise had a value of 6.89mg/L. Given that most tests were <7mg/L in this same area, attention may be needed to well depth, well construction, and proximity to nutrient sources such as septic systems, fertilizer use sites, and high concentrations of livestock.

Drinking Water Protection staff are happy to provide additional details, maps, and recommendations upon request.

2.4.2 Sources of Impairment

Stream Temperatures

Water temperature is important because it affects most aspects of an aquatic environment and many factors influence stream temperatures. Natural factors such as climate, air temperature, topography, and stream hydrology have a large influence. Humans have no, or at best, a modest ability to change these parameters. Human influence is limited to activities that affect:

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

Vegetation affects all these factors and humans have, depending on the site, a direct influence on vegetation. 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 improve soil conditions and that will improve water infiltration. This helps to capture, store, and safely release water later in the season. Releasing water later in the summer will reduce temperatures in two ways: 1) a higher volume of water requires more energy to heat it, and 2) infusion of groundwater, usually between 45 and 55°F (7.2 - 12.8°C), can help hold down stream temperatures.

Shade, provided by tall vegetation, blocks solar radiation. Solar radiation is the single most important energy source for heating streams during daytime conditions. Thus, streamside vegetation, via the shade it produces, moderates summertime stream temperatures. Shade does not cool water it merely reduces the rate at which water temperature increases. Another benefit from shade is that summer air temperatures under a dense canopy can be cooler, thus further reducing the rate of increase in stream temperature. In winter, the vegetation can act as an insulator helping maintain the steady temperatures, which are important for fish.

Given the general trend that streams are cool at the headwaters and temperatures gradually increase as the water progresses to the mouth, attempts to reduce the rate of heating should focus on the small streams high in the watershed. Humans have much more influence on these types of streams than on larger rivers. It is important to note that the small streams that human management can affect represent the majority of stream miles in this and other watersheds. This is not to say that reaches lower in the system should be ignored.

Clearly, developing healthy, functioning riparian vegetation communities, and stabilizing streambanks in Wallowa County will improve critical aquatic and riparian habitat. However, because of the natural factors listed above and the technical and biological challenges (e.g. site vegetation capability, and beaver, ungulate, and rodent damage) of developing riparian vegetation it is unlikely that portions of most stream segments will meet the temperature criteria. But the numerical criteria are only part of the temperature standard. The standard itself focuses on limiting human-caused warming of surface waters to the extent it is feasible.

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 applicable to the Lower Grande Ronde Subbasins, as measured using the seven-day average maximum stream temperature, include:

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

Industries, agencies, cities, and other groups including agriculture are required to write and implement a basin-wide management plan, such as this Area Plan, that describes how these groups will attempt to control stream temperatures if a stream in the basin exceeds the temperature criterion. In areas where a TMDL has been approved, Area Plans and Area Rules must be sufficient to meet the TMDL load allocations.

The climate and topography of Wallowa County also have a profound influence on stream temperatures. Because eastern Oregon's climate is hot and dry, water temperatures are naturally high and flows are low

late in the summer. One way of correcting low late season flows is to build multipurpose reservoirs or some other method of upstream storage.

An innovative storage method, which requires much more study than has been done to date, is underground injection of spring runoff water. This water would be stored as groundwater and then pumped out later in the season when needed to augment flows for fish, water quality, and irrigation. As stated earlier, a higher volume of water requires more energy to heat. Increased flows could help decrease stream temperatures.

Another aspect that storage could help would be in controlling excessively high spring runoff. Many areas have high runoff frequently in the spring and some areas experience extensive damage to streambanks. This damage contributes to sedimentation problems, and excessive streambank instability can destroy existing riparian vegetation and impede the establishment of new vegetation.

Another example of challenges to establishing riparian vegetation is the presence of noxious weeds, which can harm water quality. Some examples are:

- Reduced ground cover resulting in increased erosion,
- Reduced infiltration of precipitation into the soil,
- Crowding out of vegetation appropriate to each site.

If noxious weeds are present in large enough numbers to be a serious problem along all segments of the Wallowa Management Area, water quality, fish, and wildlife habitat will suffer. Landowners and public land managers need to be vigilant in their weed control efforts.

Bacteria

Bacteria levels, particularly, *Escherichia coli* (*E. coli)* pose a threat to water contact recreationists and domestic water supplies. Potential sources of bacteria include animal manure (livestock, wildlife and fowl) and septic systems.

The DEQ bacteria standard (OAR 340-41-0009(1)(a) states that organisms of the coliform group commonly associated with fecal sources shall not exceed a 30-day log mean of 126 *E. coli* organisms per 100 ml, based on a minimum of five samples and no single sample shall exceed 406 *E. coli* organisms per 100 ml.

For bacteria, the TMDL used load duration curves to determine the load reduction that needed to meet water quality criteria on the Wallowa River. For Spring Creek, Prairie Creek and other Wallowa River tributaries, *E. coli* limits are expressed as percent reductions needed to meet water quality criteria.

Nonpoint source load allocation surrogate measures for bacteria				
	Wallowa River	**Spring Creek**	**Prairie Creek**	**Other Wallowa River tributaries**
Percent Reduction needed to meet 126 *E. coli* per 100 ml criterion	44%	63%	18%	44%
Percent Reduction needed to meet 406 *E. coli* per 100 ml criterion	32%	76%	49%	32%

Parameters Not Being Addressed by the Lower Grande Ronde TMDL

Biological Criteria – The biocriteria standard (OAR 340-041-0011) states: *Waters of the State must be of sufficient quality to support aquatic species without detrimental changes in the resident biological communities*.

Copper – The Toxic Substances Narrative (340-041-0033 (1)) states: *Toxic substances may not be introduced above natural background levels in waters of the state in amounts, concentrations, or combinations that may be harmful, may chemically change to harmful forms in the environment, or may accumulate in sediments or bioaccumulate in aquatic life or wildlife to levels that adversely affect public health, safety, or welfare or aquatic life, wildlife or other designated beneficial uses*.

Dissolved Oxygen - Low levels of dissolved oxygen can harm fish and other aquatic life. The availability of nutrients, warm temperatures, and light stimulate aquatic plant and algae growth that reduces the oxygen content of water. Animal manure (livestock, wildlife, and fowl) and other organic wastes break down and also remove oxygen from water.

The dissolved oxygen standard (OAR 340-041-0016(3)) for water bodies identified as providing cool-water aquatic life habitats is*: dissolved oxygen may not be less than 6.5 mg/l as an absolute minimum*.

There has not been enough data collected since then to adequately evaluate the sources of impairment to dissolved oxygen on these creeks. Once the necessary data has been collected for these creeks, a TMDL will be developed to address dissolved oxygen at a later date.

pH - There has not been enough data collected to adequately evaluate the causes of pH violations, however, it is likely that nutrient reductions and stream temperature decreases will improve the pH condition. Once the necessary data has been collected, a TMDL will be developed to address pH at a later date.

Sedimentation - DEQ is reviewing the sedimentation criteria assessment methodology for determination of water quality impairment. Currently, sedimentation lacks quantitative listing criteria. TMDLs for the sedimentation listings will be developed at a future date once criteria are selected and a TMDL approach determined.

In the meantime, much restoration work is already taking place that will reduce sources of sediment to streams, improve stream pH and dissolved oxygen through reductions in temperature and sources of nutrients. Much of this work is being done under the guidance of the Wallowa County Salmon Habitat Recovery Plan with Multi-Species Habitat Strategy (1999) and will also be addressed through implementation of the temperature portion of the Lower Grand Ronde TMDL.

2.5 Regulatory and Voluntary Measures

The LAC and ODA established the following water quality related strategies for agricultural land in the plan area to aid in accomplishing the program goals and objectives. Some specific guidance about the requirements of this Area Plan is as follows:

Voluntary efforts are the focus of ODA, the SWCD, and the LAC. However, situations may arise when a particular landowner refuses to correct the conditions on his or her property. In this case, ODA has regulatory authority to ensure pollution control. At the same time, ODA does not want to mandate or

prohibit any specific agricultural activity. To maintain this flexibility, the Area Rules describe Prohibited Conditions.

This Area Plan is only a guidance document; by itself, it is not regulatory. However, it does refer to Area Rules that set requirements for landowners. To help distinguish between this Area Plan and the Area Rules, all rule language is separated from the rest of the text by a border of solid lines.

The Prohibited Conditions in the Area Rules relate to the primary water quality parameters that are of concern in some of the rivers and streams:

- Sediment
- Temperature
- Bacteria

Less widespread problems are:

- Dissolved oxygen
- pH

Flow and habitat modification are not directly addressed in the Area Rules. The Oregon Water Resources Department regulates the use of water for irrigation. The ODA, the District, and other local entities are actively encouraging landowners to conserve water through a variety of voluntary measures. Maintaining and improving riparian areas will help address habitat issues.

Area Rules are presented in this Area Plan are indicated by bold type within a border.

Prohibited Conditions – OAR 603-095-1840
(1) Limitations
A landowner shall be responsible for only those conditions caused by activities conducted on land managed by the landowner. Criteria do not apply to conditions resulting from unusual weather events or other exceptional circumstances, which could not have been reasonably anticipated.

The strategies identified in this Area Plan for preventing and controlling pollution from agricultural and rural lands are consistent with goals for nonpoint source pollution reduction established in the Lower Grande Ronde TMDL. It is expected that adoption of management practices aligned with the following Prevention and Control Measures will, over time, result in achievement of TMDL goals and meeting water quality standards.

2.5.1 Sheet and Rill Erosion

- **Sheet and rill erosion will be within applicable soil loss tolerance factors set by USDA.**

Sheet and rill erosion on all cropland, not just land designated as Highly Erodible Land, will be reduced as set forth above. Reduction of soil erosion will be calculated by the Revised Universal Soil Loss Equation, with supporting data from the NRCS Field Office Technical Guide, and similar data from other credible sources.

"T" means maximum average annual amount of soil loss from erosion, expressed in tons per acre per year that is allowable on a particular soil. This represents the tons of soil (related to the specific soil series), which can be lost through erosion annually without causing significant degradation of the soil or potential for crop production. Thus, if a field is eroding at a rate of "T" or less, the amount of soil loss will still

permit a high level of crop production to be sustainable economically. In fact, certain cropping sequences or maintaining land in pasture will not only prevent erosion, but will help build soil.

A ton of soil per acre per year may seem like a large amount of soil to lose, but the reality is that it is not. Note the following facts:

- 1 ton/acre/year = loss of about the thickness of a piece of paper across the entire field
- 5 tons/acre/year = loss of about the thickness of a dime across the entire field

The NRCS and other organizations have developed many combinations of tillage systems, conservation practices, and cropping rotations that will help reduce sheet and rill erosion to acceptable levels. Landowners can contact the local agencies if they need guidance in choosing a system that will work for them.

(2) Excessive Sheet and Rill Erosion

(a) By January 1, 2006, soil erosion will be reduced to the "Soil Loss Tolerance Factor" or "T".

(b) For croplands, which the department determines cannot practically or economically achieve "T," soil erosion will be reduced to 5 tons per acre per year averaged over the length of the rotation.

(c) Reduction of soil erosion will be calculated by the Revised Universal Soil Loss Equation (RUSLE), with supporting data from the Natural Resource Conservation Service Field Office Technical Guide and similar data from other credible sources.

2.5.2 Excessive Gully Erosion

- **Gullies will be addressed to the extent that it is economically and practically feasible.**

Gully erosion occurs frequently in Wallowa County and in most cases is not a result of human activity. The majority of landowners in the area strive to prevent gullies and work to rehabilitate them when they occur. If landowners have trouble preventing or rehabilitating gully erosion, they can seek technical assistance from the local county, state, and federal agencies.

(3) Excessive Gully Erosion

(a) By January 1, 2006, no person shall cause conditions on the land that contribute to gully erosion delivering sediment directly to the waters of the state. Gullies are defined as 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.

(b) No violation of this condition will be deemed to have occurred if the affected landowner has established and maintained a department or local Designated Management Agency approved effective management program. An effective management program shall provide assurance that reasonable steps have been taken to lessen and manage gully formation.

2.5.3 Streambank Erosion

- **Active streambank erosion will not exceed acceptable levels for the reaches' vegatative site capability,**
- **Stream channel modification caused by short-term erosion will be minimal.**

Site capability in this instance is defined as the highest ecological status an area can attain given political, social, or economic constraints, (e.g. the presence of Highway 82) which are often referred to as limiting factors. Capability does not apply to uses such as grazing, farming, recreation, and timber practices,

which can be changed. While these uses can affect the condition of a riparian area, they do not prevent it from achieving capability. Capability only applies to constraints that the land manager cannot eliminate or change through a management action.

2.5.4 Streamside and Riparian Vegetation

- **Riparian vegetation will be able to respond and function within the site's capabilities.**

Vegetation, both in the uplands and in the riparian area, plays a critical role in water quality. Generally, healthy plant communities:

- Hold soil in place,
- Protect streambanks,
- Capture, store and safely release precipitation,
- Filter nutrients from both the groundwater 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. Vegetation improves 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, which are an essential element in the diets of many fish.

Healthy riparian vegetation benefits farmers and ranchers too. Some benefits include increased forage production, less streambank erosion, increased late season flows, and stable stream channels. Techniques that improve riparian area management can lead to economic benefits as well.

Riparian vegetation, consistent with site capability, is a cost effective means of reducing streambank erosion and heating from solar radiation. It is important to note that research and practical examples have shown that land managers can maintain riparian health and conduct agricultural activities as well.

State and federal governments have several cost-share programs to aid landowners in improving riparian areas. These programs help pay for fencing to establish riparian pastures, pay an annual rental fee for planting woody vegetation along streams, assist in developing off-stream watering sources that will help keep cattle out of the riparian area, and many other options. Some of the programs available include:

- Continuous Conservation Reserve Program (CRP)
- Conservation Reserve Enhancement Program (CREP)
- Oregon Watershed Enhancement Board (OWEB)
- Environmental Quality Incentives Program (EQIP)
- Bonneville Power Administration (BPA)
- Conservation Stewardship Program (CStP)

(5) Streamside Conditions
By January 1, 2006, no person may contribute to conditions that preclude establishment and development of adequate riparian vegetation for streambank stability and shading, consistent with site capability.

2.5.5 Waste Management

- **Placement, delivery or sloughing of suspended solids to rivers and streams will be minimized,**

- **Location and condition of waste with respect to waters of the state will be managed according to existing state law.**

Suspended solids mean any material, manure, dirt particles or other organic matter that remains suspended in the water column.

Management of animal waste from confined areas is a local and national priority. The LAC discussed confined animal feeding areas several times, and while they did not recommend that ODA adopt new rules on this topic, they encourage livestock operators to assess their feeding area management for any possible discharges of pollution to the waters of the state. Operators may contact local, county, state, and federal agencies for technical assistance and evaluation.

Operators should consider:

- Animal waste collection, storage, and disposal at agronomic rates,
- Excluding waters of the state from confinement areas,
- Control of surface runoff to and from the waste storage and confinement areas,
- Off-stream water development.

See Section 1.4.4 Water Pollution Control Law, page 9, for applicable text of 468B.025 and definitions of terms.

(4) Pollution Control and Waste Management

Effective on rule adoption: No person subject to these rules shall violate any provisions of ORS 468.025 or ORS 468B.050. (*See Section 1.4.4 Water Pollution Control Law, page 8, for complete text of 468B rules and definitions*)

2.5.6 Irrigation Management

- **Irrigation surface water return flows will be managed to minimize contributions to water quality problems.**

With irrigation, it is difficult to avoid some overland flow returning to creeks and rivers especially when fields are uneven. Landowners can avoid contributing to water quality problems by implementing a variety of management practices. Assistance is available by contacting local natural resource agencies.

(6) Irrigation Return Flow

(a) By January 1, 2006, no person may cause bacteria levels in irrigation tailwater to exceed state water quality standards. When the irrigation water at the point of initial application already exceeds the bacteria standard, then the bacteria level in the tailwater cannot be higher than the level in the irrigation water at the point of initial application.

(b) A landowner shall be responsible for only those conditions caused by activities conducted on land managed by the landowner. Criteria do not apply to conditions resulting from unusual weather events, natural background levels of bacteria or other exceptional circumstances, which could not have been reasonably anticipated.

Chapter 3: Implementation Strategies

Goal

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

The LAC established these objectives to achieve the Area Plan goal:

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

The following conditions on agricultural lands contribute to good water quality in this Management Area:

1. Sufficient site-capable vegetation is established along streams to stabilize streambanks, filter overland flow, and moderate solar heating,
2. Crop lands are covered throughout the year with either production crops, crop residues, or cover crops,
3. Pastures have minimal bare ground,
4. Irrigation runoff does not deliver sediment, nutrients, or chemicals to streams,
5. Leachate and residues from livestock manure are not entering streams or groundwater.

3.1 Measurable Objectives and Strategic Initiatives

Measurable objectives allow the Ag Water Quality Program to evaluate progress toward meeting water quality standards and TMDL load allocations. Any measurable objectives are stated here. Progress is reported in Chapter 4.

3.1.1 Management Area

3.1.1.1 Measurable Objective #1: Provide adequate riparian vegetation for stream bank stability and stream shading consistent with site capability.

Assessment Method: By 2022, 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.

Measurable Objective and Associated Milestones:
These results will help the LAC develop long-term targets at the 2022 Biennial Review. Likely targets include:

- By June 30, 2030, 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, 2040, 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).

3.1.1.2 Measurable Objective #2: Prevent runoff of agricultural wastes

Assessment Method: By 2022, 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 (site visit followed up by technical assistance if needed).

Measurable Objective and Associated Milestones: These results will help the LAC develop long-term targets at the 2022 Biennial Review. Likely targets include:

- By June 30, 2030, the number of livestock operations that are likely to pollute surface water is reduced by 10%;
- By June 30, 2040, fewer than 5% of livestock operations are likely to pollute surface water.

3.1.2 Focus Area

3.1.2.1 Bear Creek Focus Area

The Bear Creek Focus Area is part of ODA's Focus Area strategic initiative. Bear Creek was chosen because there was a lot of work in the riparian area done 15 years ago and the SWCD would like to know if there are any other projects that could be done in this watershed. Also, Oregon Department of Forestry is starting to focus on thinning projects in this area. The SWCD is interested in the return flows back to Bear Creek as the NRCS will be moving in this area for irrigation efficiency projects to better manage all water quantity projects.

Assessment Method: Streamside vegetation was evaluated with ODA's Streamside Vegetation Assessment (SVA) to characterize the type of ground cover within 35 feet of the stream. The metric is the percent of different types of land cover viewed on aerial photographs. Categories are: agricultural infrastructure; water; and bare ground, grass, shrubs, and trees (designated as agricultural or not).

Measurable Objectives and Associated Milestones: To be determined by June 2020

3.2 Proposed Activities

ODA encourages the LMA and other partners to develop targets for all the activities in Table 3.2. Activities with targets will be tracked every 2 years (and reported in the plan every 4 years) to gauge how well the plan is being implemented locally. Following an LAC and LMA discussion of these results, they *will adaptively change the plan activities and targets*.

ODA, the LAC, the LMA, and other partners have identified the following priority activities, described in Table 3.2, to track progress toward meeting the goal and objectives of the Area Plan.

Table 3.2 Planned Activities for 2019-2022

Activity	4-year Target	Description
Community and Landowner Engagement		
# active events that target landowners/managers (workshops, demonstrations, tours)	10	
# landowners/managers participating in active events	500	
Technical Assistance (TA)		
# landowners/managers provided with TA (via phone/walk-in/email/site visit)	250	
# site visits	40	
# conservation plans written*	8	
On-the-ground Project Funding		
# funding applications submitted	25	
* Definition: any written management plan to address agricultural water quality. Can include NRCS-level plans. Can include: nutrients, soil health, grazing, riparian planting, forest thinning to improve upland pastures to reduce livestock pressure on riparian areas, etc. Cannot include projects with no or weak connection to agricultural water quality (weed eradication not for riparian restoration, fuels reduction, alternative energy, rain gardens/rain harvesting, non-agricultural culvert replacement, and instream habitat enhancement that does not also improve water quality)		

3.3 Water Quality and Land Condition Monitoring

3.3.1 Water Quality

There are two primary monitoring efforts in the Management Area.

The SWCD evaluated water quality throughout Prairie Creek from April 2012 through March 2015. Stream temperature, nitrate, dissolved and total phosphorus, nitrogen, potassium, total suspended solids, and turbidity were measured monthly at twelve sites; macroinvertebrates two times at three sites.

DEQ monitors two sites in the Management Area as part of their ambient monitoring network (Minam and Wallowa rivers at the town of Minam).

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

Chapter 4: Progress and Adaptive Management

4.1 Measurable Objectives and Strategic Initiatives

The following tables provide the assessment results and progress toward measurable objectives and milestones in the last four years. See Chapter 3.1 for background and assessment methods.

4.1.1 Management Area

Measurable objectives will be determined after baseline data are collected.

4.1.2 Focus Areas

4.1.2.1 Bear Creek Focus Area

By June 30, 2020, measurable objectives will be developed by the SWCD after remote sensing results are ground-truthed.

4.2 Activities and Accomplishments

ODA, the LAC, the LMA, and other partners identified the following priority activities to track progress toward meeting the goal and objectives of the Area Plan. ODA will review the four-year results and then provide a report at the end of the 2021-2023 Biennium.

Future Area Plans will compare results and targets in Table 4.2a.

Table 4.2a Activities conducted in 2015-2019 by Wallowa SWCD.

Activity	4-year results	Description
Community and Landowner Engagement		
# active events that target landowners/ managers (workshops, demonstrations, tours)	10	
# landowners/managers participating in active events	1,049	
Technical Assistance (TA)		
# landowners/managers provided with TA (via phone/walk-in/email/site visit	371	
# site visits	85	
# conservation plans written*	7	
On-the-ground Project Funding		
# funding applications submitted	32	
# funding applications awarded	26	
* Definition: any written management plan to address agricultural water quality. Can include NRCS-level plans or simpler plans. Can include: nutrients, soil health, water quality, irrigation, grazing, riparian planting, forest thinning to improve upland pastures to reduce livestock pressure on riparian areas, etc. Cannot include projects with no or weak connection to ag water quality (weed eradication that is not for riparian restoration, fuels reduction, alternative energy, non-ag rain gardens/rain harvesting, non-ag culvert replacement, and instream habitat enhancement that does not also improve water quality)		

Table 4.2b and 4.2c summarize information from the OWRI on restoration project funding and accomplishments on agricultural lands in the Management Area. The majority of OWRI entries represent voluntary actions of private landowners who have worked in partnership with federal, state, and local groups to improve aquatic habitat and water quality conditions.

Table 4.2b Implementation funding (cash and in-kind) for projects on agricultural lands reported 1997-2018 (OWRI data include most, but not all projects, implemented in the Management Area).

Landowners	OWEB	USFS	NRCS	ODFW	BPA	All other sources*	TOTAL
1,134,816	4,721,472	322,784	799,764	307,324	2,183,562	4,314,995	$13,784,717

*includes city, county, tribal, other state and federal programs, and non-profit organizations. There were too many entities to list.

Table 4.2c Miles and acres treated on agricultural lands reported 1997-2018 (OWRI data include most, but not all projects, implemented in the Management Area).

Activity Type	Miles	Acres	Count*	Activity Description
Riparian	362	2,842	-	Riparian vegetation treatments/ Weed control/ Riparian tree plantings
Fish Passage	107	-		Fish screens installed
Instream	27	-	-	
Wetland	-	24	-	
Road	16	-	109	Culverts
Upland	-	-	-	
TOTAL	512	2,866	109	

* # of hardened crossings, culverts, etc.

4.3 Water Quality and Land Condition Monitoring

4.3.1 Water Quality

DEQ analyzed data for *E. coli*, pH, dissolved oxygen, total suspended solids, total phosphorus, and temperature in the Management Area. (DEQ. Wallowa-Imnaha-Lower Grande Ronde Subbasin Water Quality Status and Trends Analysis 2019.)

Wallowa River drains 608,000 acres of primarily irrigated pasture, rangelands, and forest. It enters the Grande Ronde north of the of the confluence with the Minam River. The Imnaha River drains about 550,000 acres primarily rangemand and forest. The Lower Grande Ronde Subbasin drains a little over 975,000 acres of primarily rangeland and forest. The site at Minam River at Minam is part of DEQ's ambient monitoring network, where grab samples have been collected every two months since 2000.

Table 4.3.1 Attainment of water quality standards for 2015-2018

Parameter	Minam River at Minam (up to 20 sites)	Imnaha (up to 21 sites)	Lower Grande Ronde (up to 22 sites)
Dissolved oxygen	Nine do not attain. Ten with insufficient data.	No data	No data
E. coli	About half of the samples (5/17) attain, and the average concentration is around half the standard for grab samples. 9 sites insufficient data. Only 3 sites are not attaining.	No data	No data
pH	Ten attain. Eight with insufficient data.	No data	No data
Total phosphorus[1]	No sites with sufficient data.	No data	No data
Temperature	Three sites with insufficient data.	Concern. For 21 sites: 1 attains (on Imnaha), 7 insufficient data, rest exceed. No data collected after 2017.	3 attain. 7 with insufficient data. 12 sites not attaining with one of the sites with improving trends. 2 with declining trends. All were collected on the Wallowa Whitman National Forest.
TSS[2]	20 sites with insufficient data. Some sites are showing above 25 Mg/L and the site at Minam is showing a degrading trend.	No data	No data

[1] DEQ has no benchmark for total phosphorus in this Management Area; ODA benchmark for potential water quality concerns = 0.08 mg/L

[2] DEQ has no benchmark for TSS in this Management Area

4.4 Biennial Reviews and Adaptive Management

ODA, the LAC, the LMA, and other partners met on February 27, 2020 to review implementation of the Area Plan and provided recommendations for the future (Tables 4.4a and 4.4b).

Table 4.4a Summary of biennial review discussion

Summary of Progress and Impediments
• Activity targets are being met. • Wallowa SWCD has lost staff and a lot of data were destroyed when the SWCD office burned a few years ago. There are existing photo points and water quality data from Bear Creek. ODA will look into these two data sets and report at the next Biennial Review. • The LAC said large-acre landowners understand the need for water quality protection, but the small acreage landowners are hard to get to and get them to improve land use to improve water quality.
Recommended Modifications and Adaptive Management
• Update the assessments being done on Bear Creek, which is the SWCD's new Focus Area. This includes looking at data collected back in the 1990s to determine if any changes have happened within that watershed and where to go in the future with this Focus Area. • Look at the BOR samples collected in the Prairie Creek area before all the irrigation projects went in over the past four years. • Reach out more to FFA/4H and equine groups and provide workshops and flyers on water quality.

Table 4.4b Number of compliance actions in 2016-2019.

Actions	Letter of Compliance	Pre-Enforcement Notification	Notice of Noncompliance	Civil Penalty
Outside SIA(s)	1	0	0	0
Within SIA(s)	0	0	0	0

Appendix A: 2012 DEQ 303(d) List of Impaired Water Bodies

Category 4A – TMDL Approved				
Lower Grande Ronde Subbasin				
Water Body	**Reach - RM**	**Pollutant**	**Season**	**Criteria**
Chesnimnus Ck	0 - 26.4	Temperature	Year Round	Salmon/Trout – rearing & migration
Courtney Ck	0 - 14.3	Temperature	Year Round	Salmon/Trout – rearing & migration
Crow Ck	0 - 20.2	Temperature	Year Round	Salmon/Trout – rearing & migration
Elk Ck	0 - 13.7	Temperature	Summer	Rearing
Grouse Ck	0 - 1.4	Temperature	Year Round	Core cold water habitat
Joseph Ck	8.1 - 48.2	Temperature	Year Round	Salmon/Trout – rearing & migration
Mud Ck	0 - 23	Temperature	Year Round	Salmon/Trout – rearing & migration
Peavine Ck	0 - 5.3	Temperature	Summer	Rearing
Salmon Ck	0 - 13.6	Temperature	Summer	Rearing
Sickfoot Ck	0 - 7.5	Temperature	Year Round	Salmon/Trout – rearing & migration
Wallupa Ck	0 - 10.1	Temperature	Year Round	Salmon/Trout – rearing & migration
Wenaha River	0 - 10.3	Temperature	Year Round	Core cold water habitat
	6.7 - 10.3	Temperature	Aug 15-June 15	Salmon/steelhead spawning
Wildcat Ck	0 - 16	Temperature	Year Round	Salmon/Trout – rearing & migration
Grande Ronde River	35.6 – 172.4	Temperature	Year Round	Salmon/Trout – rearing & migration
Wallowa Subbasin				
Bear Ck	0 – 7.5	Temperature	Year Round	Core cold water habitat
Bear Ck	2.8 - 9	Temperature	Aug 15-June 15	Salmon-steelhead spawning
Deer Ck	0 – 10.2	Temperature	Summer	Bull Trout
Fisher Ck	0 – 0.5	Temperature	Jan 1 – June 15	Salmon-steelhead spawning
Fisher Ck	0 – 5.1	Temperature	Year Round	Core cold water habitat
Howard Ck	0 – 9	Temperature	Jan 1 – June 15	Salmon-steelhead spawning
Howard Ck	0 – 11.2	Temperature	Year Round	Core cold water habitat
Little Bear Ck	0 – 8	Temperature	Summer	Bull Trout
Minam River	0 – 12.6	Temperature	Year Round	Core cold water habitat
Prairie Ck	0 – 12.5	E. coli	Summer	Water contact recreation
Prairie Ck	0 – 12.5	Fecal coliform	Fall/winter/spring	Water contact recreation
Spring Ck	0 – 4.5	Fecal coliform	Fall/winter/spring	Water contact recreation
Wallowa River	0 – 50	E. Coli	Summer	Water contact recreation
Wallowa River	0 – 50	Fecal coliform	Summer	Water contact recreation
Wallowa River	0 – 53.7	Temperature	Year Round	Core cold water habitat
Imnaha Subbasin				
Big Sheep Ck	0 - 10	Temperature	Year Round	Salmon/Trout- rearing and migration
Crazyman Ck	0 - 6.8	Temperature	Year Round	Bull Trout
Dry Ck	0 – 4.2	Temperature	Year Round	Bull Trout
Freezeout Ck	0 – 8.5	Temperature	Year Round	Salmon/Trout- rearing and migration
Grouse Ck	0 – 17.3	Temperature	Jan 1 – June 15	Salmon and steelhead spawning
Grouse Ck	0 – 17.3	Temperature	Year Round	Core cold water habitat
Gumboot Ck	0 – 7.4	Temperature	Year Round	Bull Trout
Imnaha River	0 – 35.8	Temperature	Year Round	Salmon/Trout- rearing and migration
Imnaha River	35.7 – 42.7	Temperature	Aug 1 – June 15	Salmon and steelhead spawning
Imnaha River	35.8 – 42.7	Temperature	Year Round	Core cold water habitat
Imnaha River	42.7 – 72.2	Temperature	Year Round	Bull Trout
Lightning Ck	0 – 24.8	Temperature	Summer	Salmonid fish rearing; anadromous fish passage
Little Sheep Creek	0 - 26	Temperature	Year Round	Salmon/Trout- rearing and migration

Category 5 – TMDL needed				
Lower Grande Ronde Subbasin				
Water Body	**Reach – RM**	**Pollutant**	**Season**	**Criteria**
Beaver Ck	0 – 3.9	Biological Criteria	Year Round	Biocriteria
Chesnimnus Ck	0 – 26.4	Sedimentation	Undefined	Resident fish/aquatic life; Salmonid rearing; salmonid spawning
Elk Ck	0 – 13.7	Sedimentation	Undefined	Resident fish/aquatic life; Salmonid rearing; salmonid spawning
Grande Ronde River	36.3 – 80.7	Sedimentation	Undefined	Resident fish/aquatic life; Salmonid rearing; salmonid spawning
Grande Ronde River	65.9 – 104.9	Dissolved Oxygen	Jan 1 – May 15	Salmon/steelhead spawning
Wallowa Subbasin				
Bear Ck	0 – 7.5	Sedimentation	Undefined	Resident fish/aquatic life; Salmonid rearing; salmonid spawning
E. Lostine River	0 – 6.3	Biological Criteria	Year Round	Biocriteria
Hurricane Ck	0 – 7.6	Sedimentation	Undefined	Resident fish/aquatic life; Salmonid rearing; salmonid spawning
Lostine River	0 – 9	Sedimentation	Undefined	Resident fish/aquatic life; Salmonid rearing; salmonid spawning
Minam River	0 – 49.4	Copper*	Year Round	Toxic substances
Minam River	0 – 10.2	Sedimentation	Undefined	Resident fish/aquatic life; Salmonid rearing; salmonid spawning
Prairie Ck	0 – 12.5	Dissolved oxygen	Spring/summer	Spawning
Prairie Ck	0 – 12.5	Sedimentation	Undefined	Resident fish/aquatic life; Salmonid rearing; salmonid spawning
Spring Ck	0 – 4.5	Dissolved oxygen	Spring/summer	Spawning
Wallowa River	0 – 35.7	Dissolved oxygen	Jan 1 – June 15	Spawning
Wallowa River	0 – 50	pH	Summer	pH 6.5 to 9.0
Wallowa River	0 – 50	Sedimentation	Undefined	Resident fish/aquatic life; Salmonid rearing; salmonid spawning
Imnaha Subbasin				
Imnaha River	0 – 72.2	Biological Criteria	Year Round	Aquatic Life
* ***Added in 2012***				