OREGON DEPARTMENT OF AGRICULTURE

Umatilla Agricultural Water Quality Management Area Plan

February 2024

Developed by the

Oregon Department of Agriculture

and the

Umatilla Local Advisory Committee

with support from the

Umatilla County Soil and Water Conservation District

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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
BOR – Bureau of Reclamation
CAFO – Confined Animal Feeding Operation
CTUIR – Confederated Tribes of the Umatilla Indian Reservation
CWA – Clean Water Act
DEQ – Oregon Department of Environmental Quality
GWMA – Groundwater Management Area
HUC – Hydrologic Unit Code
LAC – Local Advisory Committee
LMA – Local Management Agency (Umatilla SWCD and Morrow SWCD)
LUBGWMA – Lower Umatilla Basin Groundwater Management Area
Management Area – Agricultural Water Quality Management Area
NRCS – Natural Resources Conservation Service
OAR – Oregon Administrative Rules
ODA – Oregon Department of Agriculture
ORS – Oregon Revised Statute
OWEB – Oregon Watershed Enhancement Board
OWRI – Oregon Watershed Restoration Inventory
PSP – Pesticide Stewardship Partnership
SIA – Strategic Implementation Area
SWCD – Soil and Water Conservation District
TMDL – Total Maximum Daily Load
US EPA – United States Environmental Protection Agency

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Foreword

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

The Area Plan is neither regulatory nor enforceable (Oregon Revised Statute (ORS) 568.912(1)). 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. Describes activities to make and track progress towards the goals of the Area Plan. Presents goals, measurable objectives, strategic initiatives, proposed activities, and monitoring efforts.

Chapter 4: Progress and Adaptive Management. Describes progress toward achieving Area Plan goals and measurable objectives by summarizing accomplishments and monitoring results.

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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 603-095-0300). 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).

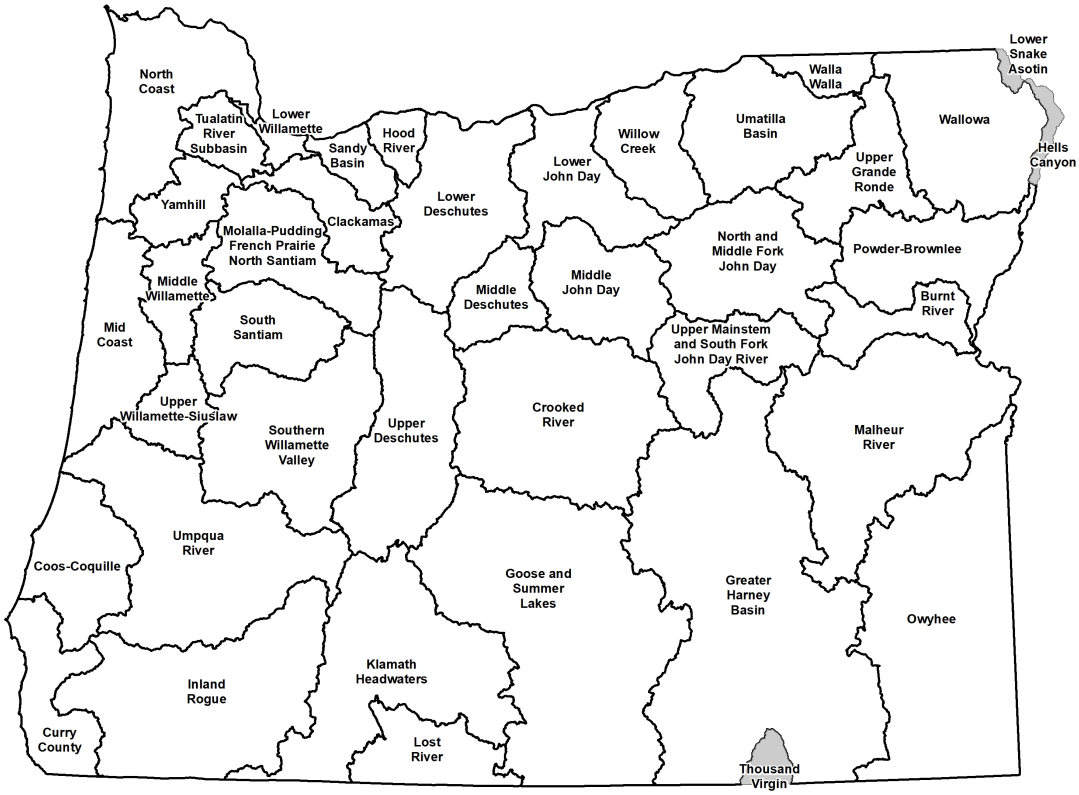
1.2 History of the Ag Water Quality Program

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 achieve water quality standards and to adopt rules as necessary (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). The Area Plan and Area Rules were developed and subsequently revised pursuant to these statutes.

Between 1997 and 2004, ODA worked with LACs and SWCDs to develop Area Plans and Area Rules in 38 watershed-based Management Areas across Oregon (Figure 1.2). 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.

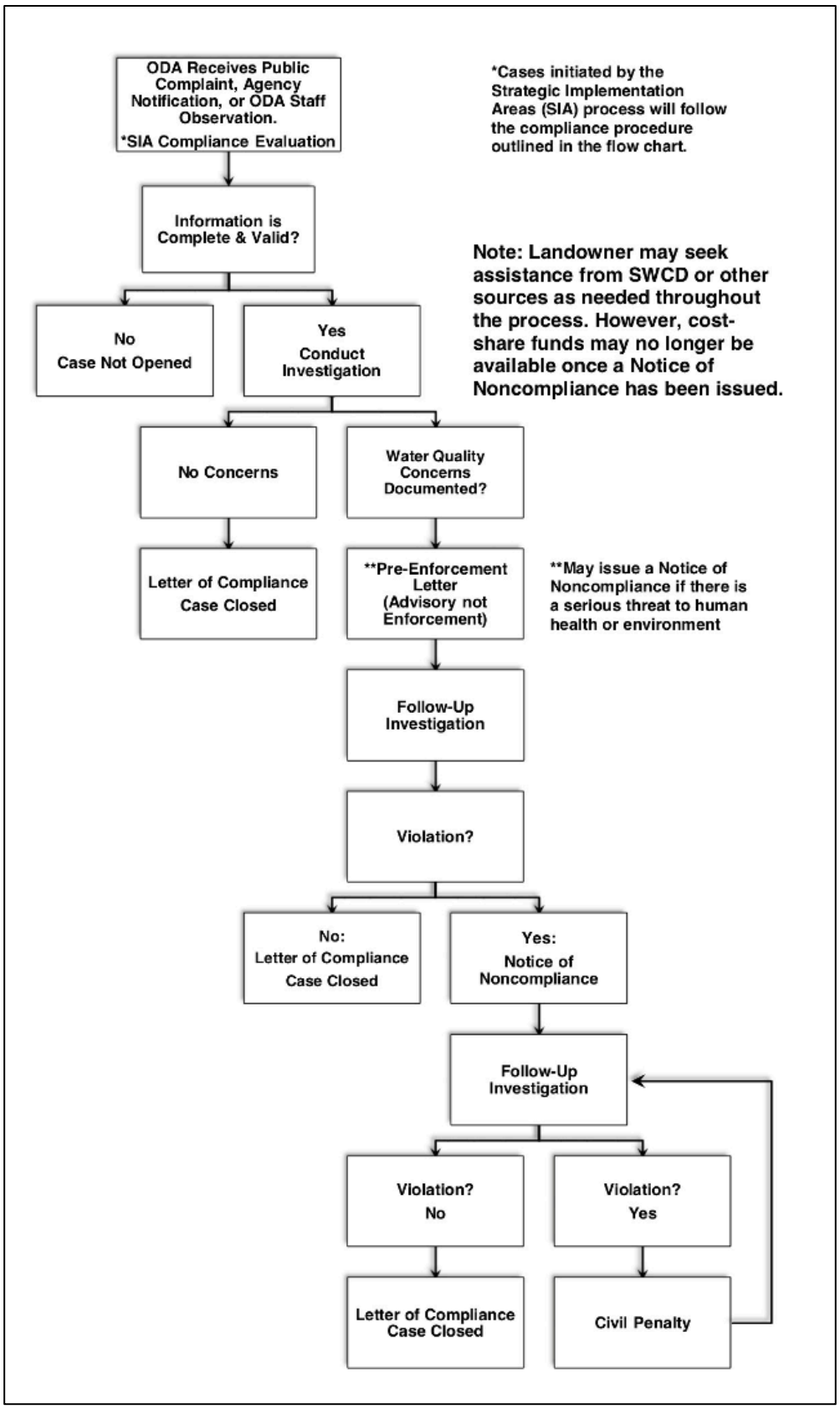
1.3.1.1 ODA Compliance Process

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 1.3.1.1 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 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,
- Wildfires and other natural disasters,
- 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

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

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 2.4.1.1.

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, 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 2.4.

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 "impaired" 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 permits. Nonpoint sources (agriculture, forestry, and urban) are assigned a load allocation to achieve.

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 2.4.1.

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 sets of Area Rules.

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. (Note that the beneficial effects on water quality vary based on factors such as soil type and ecoregion.) 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.

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/conservation-basics/natural-resource-concerns/soil.

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.

Any GWMA in this Management Area is described in Chapter 2.4.1.5. Any Measurable Objectives for the GWMA will be described in Chapter 3.1.5.

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, and 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 to expand efforts to improve water quality in Oregon related to pesticide use. This team facilitates and coordinates activities such as monitoring, analysis and interpretation of data, effective response measures, and management solutions. The team relies on monitoring data from the Pesticide 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.

Any PSPs in this Management Area are described in Chapter 3.1.4.

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 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 National Pollutant Discharge Elimination System permits for point sources, the CWA Section 319 grant program, the Source Water Protection Program (in partnership with the Oregon Health Authority), 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 2023 (https://www.oregon.gov/oda/shared/Documents/Publications/NaturalResources/WaterQualityGoalsMOA.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 NRCS and United States Department of Agriculture 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 effective conservation projects and management activities throughout Oregon to improve water quality for many years. However, it has been challenging for ODA, SWCDs, and LACs to measure progress 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 (Chapter 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 3.1 and progress toward achieving the measurable objective(s) and milestone(s) is summarized in Chapter 4.1.

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.

Any Focus Areas in this Management Area are described in Chapter 3.1.2. SWCDs will also continue to provide outreach and technical assistance to the entire Management Area.

Strategic Implementation Areas

Strategic Implementation Areas (SIAs) are small watersheds selected by ODA, in 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 3.1.3.

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 Agricultural Water Quality Monitoring

In addition to monitoring land 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 more than 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, chlorophyll a, specific conductance, dissolved oxygen, 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.

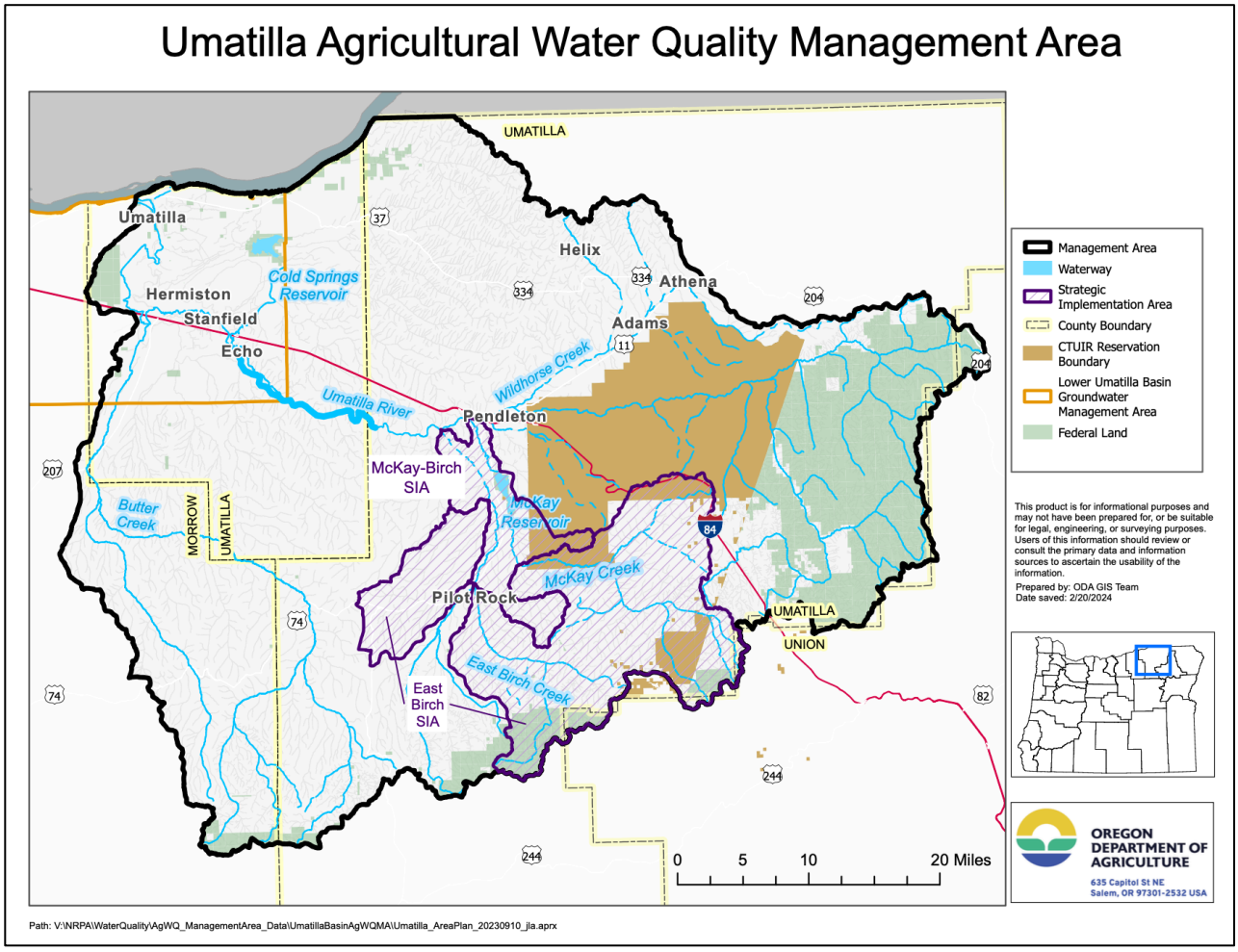
Water quality monitoring efforts in this Management Area are described in Chapter 3, and the data are summarized in Chapter 4.

Chapter 2: Local Background

Chapter 2 provides the local geographic, water quality, and agricultural context for the Umatilla Management Area. It also describes the water quality issues, Area Rules, and potential practices to address water quality issues.

The Umatilla Management Area consists of the drainage area of the Umatilla River from the headwaters to the confluence with the Columbia River. The operational boundaries of this Area Plan include all agricultural and rural lands in Oregon that contribute to the Umatilla River and its tributaries and that drain directly to the Columbia River except federally managed land, lands which make up the reservation of the Confederated Tribes of the Umatilla, and lands subject to the Oregon Forest Practices Act.

Figure 2 Umatilla Management Area



2.1 Local Roles

2.1.1 Local Advisory Committee

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	Description
Tom Straughan (Chair)	Birch Creek	Dryland crops, cattle, Umatilla SWCD board
Chris Williams	Athena	Dryland, irrigated crops
Karl Jensen	Butter Creek	Cattle
Marty King	Management Area	Confederated Tribes of the Umatilla Indian Reservation, water quality coordinator
Colin Hemphill	Pilot Rock	Dryland crops, cattle, Umatilla SWCD board
Jake Madison	Echo	Irrigated, dryland crops, LUBGWMA
Ray Qin	Hermiston	OSU Extension

2.1.2 Local Management Agency

SWCDs implement Area Plans through OWEB capacity grants, with details negotiated between ODA and each SWCD. The resulting scopes of work define the SWCDs as the LMAs for implementation of the Agricultural Water Quality Program in specific management areas. The LMAs for the Umatilla Management Area are Umatilla County SWCD and Morrow SWCD. These SWCDs were also involved in development of the Umatilla Area Plan and Area Rules.

The LMAs implement the Area Plan by conducting 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 approved the initial Umatilla Area Plan and Area Rules in 1999.

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

The Umatilla Management Area is a 2,545-square-mile area encompassing most of Umatilla County and a portion of Morrow County in northeast Oregon. The Umatilla River originates in the Blue Mountains and flows generally westward across the Columbia Plateau approximately 100 miles and discharges into the Columbia River at the town of Umatilla. The basin has a continental climate with a winter precipitation pattern. Precipitation varies from 8-10 inches per year along the Columbia River to as high as 45 inches per year in the higher elevations of the

Blue Mountains. Peak flows normally occur in the spring with high elevation snowmelt and diminish throughout the summer to their low points in August or September. In McKay Creek, summer flows are augmented with releases from McKay Reservoir for irrigation and fisheries. Elevations range from 270 feet at the Columbia River to above 6,000 feet at the highest peaks of the Blue Mountains. A thick sequence of lava flows, known as the Columbia River Basalt Group, underlies nearly all of the basin. Regional uplifting formed the Blue Mountains along the south and east borders of the basin. The basalt bedrock is covered with younger sedimentary deposits from glacial and river origins. Alluvium is common in the valleys and floodplains. A layer of loess, windblown silt, and fine sand, of various depths, covers the land surface of much of the Management Area.

2.3.1 Land Use, Water Use, Fish Resources

2.3.1.1 Land Use

The first inhabitants of the basin were Native Americans. The Confederated Tribes of the Umatilla Indian Reservation (CTUIR) homeland once encompassed 6.4 million acres in northeast Oregon and southeast Washington. As a result of the 1855 treaty with the United States government and subsequent federal legislation, the present-day reservation of the CTUIR, a union of the Cayuse, Umatilla, and Walla Walla tribes, consists of more than 170,000 acres, which lies mostly within the Umatilla Management Area. The ownership of reservation land is currently 29,890.5 acres of tribal trust; 63,607.6 acres in individual allotments;58,984 acres of fee land; and 17,636.8 acres of tribal fee land. The CTUIR reserved its sovereign authority and reserved rights to harvest fish, wildlife, and other natural resources in its traditional homeland.

Agricultural land, both dryland and irrigated, comprises about 42 percent of the Umatilla Basin, rangeland and range-forest transition areas account for another 42 percent, and the remaining portion of the Umatilla Basin is approximately 13 percent forest and 3 percent urban and developed areas. Historically, early settlers arrived (1843-1880) to mountains covered with forests and native grasses covering the plateau lands. These early settlers pursued an agrarian lifestyle, primarily raising livestock with limited crop production. Heavy livestock grazing during the last half of the 1800s and early part of the 20th century, along with expanding cultivation, modified much of this native vegetation. Less desirable, drought-tolerant species moved in, converting thousands of acres of perennial native grasses to annual grasses. Intensive tillage began during the 1880s to 1910s, converting large amounts of native grassland to dry cropland.

Mechanization and government policy (World War II horse slaughter) reduced the number of horses and the need for large areas of pasture and hay production by the late 1940s or early 1950s. Irrigation water rights date to the 1860s for flood irrigating in creek valleys. Several U.S. Bureau of Reclamation projects, beginning shortly after the turn of the century, developed arid areas in the lower Umatilla Basin. Since the advent of modern irrigation systems, thousands of acres of land in the lower Umatilla Basin have been developed for crop production.

Nearly 80 percent of the Umatilla Management Area, mostly agricultural and rangeland, is in private ownership. The federal government owns about 9 percent, and the Umatilla Indian Reservation includes about 11 percent of the Umatilla Management Area. The present population of Umatilla County is approximately 80,000 with about 60 percent in urban areas. Growth is expected to add 10,000 people in the next 10 years in the lower Umatilla Basin.

Records from 1900 indicate there were 223,000 sheep, 19,500 cattle, and 20,000 horses in the

Umatilla County. The 2017 USDA national agricultural statistics indicate there were 6,999 sheep, 56,413 cattle, and 2,492 horses in Umatilla County, and a total of 406,088 acres were used to produce crops in 2017.

Economically, the Umatilla Management Area is regarded as one of the state's major agricultural centers. In 2017, Umatilla County ranked first in the state in the categories of grains, oilseeds, dry beans, and dry peas, with sales of more than $103.9 million, and sales of more than $111.3 million in vegetables, melons, potatoes, and sweet potatoes. Wheat and other grains are the major commodities followed by cattle and potatoes. Hay and vegetables are also large contributors with vineyards, canola, and other alternative crops emerging as new commodities. Currently, 10 percent to 15 percent of the cropland has been retired from crop production, enrolled in Conservation Reserve Program (CRP), and seeded to grass, shrubs, and trees. The timber industry has declined dramatically in recent years primarily due to harvest reductions on national forest lands. Food processing, mainly located in the lower Umatilla Basin, has continued to expand.

2.3.1.2 Water Use

The average discharge of the Umatilla River at Yoakum (River Mile (RM) 37) is about 495,000 acre-feet (AF) per year. The gaged yield at Umatilla (RM 2) is about 336,000 AF per year. The difference is primarily due to withdrawals for irrigation and other purposes. The Umatilla River was adjudicated in 1916. The court decree defined rights for water use as: irrigation, municipal, domestic, stock, power, and industrial. The irrigation season was defined as March 1 to November 1. Above Pendleton (RM 55), surface water rights for all purposes total about 17.6 cubic feet per second (cfs). The entire Umatilla River drainage has surface water rights totaling 1,954.8 cfs (out-of-stream uses equals 1,813.5 cfs).

Two major reservoirs store water in the Umatilla Basin: McKay Reservoir has a design capacity of 73,800 AF and Cold Springs Reservoir has a design capacity of 38,000 AF. Both reservoirs are primarily for irrigation but provide wildlife, recreational, and flood control benefits as well. Many other sites have been studied for storage, but none have been developed due to economic reasons.

Six major irrigation diversions within the Federal Umatilla Reclamation project are located in the lower 32 miles of the mainstem Umatilla River. Large quantities of water are diverted and at times dewater entire reaches of the river during summer and fall months. Return flows to the river are an important factor in availability of water in the lower reaches. A cooperative program between the Bureau of Reclamation, irrigators, and CTUIR provides releases from McKay Reservoir for critical fish passage.

The Umatilla Basin Project began construction in the late 1980s. It is designed to deliver water from the Columbia River to the Umatilla Basin irrigation systems, permitting Umatilla River water, which was formerly diverted or stored for irrigation use, to remain in the Umatilla River to improve flows for salmon and steelhead production. In addition, the project improved fish passage facilities and provided protective screens to the major irrigation diversions.

Extensive development of the basalt groundwater resource, largely for irrigation, began in the mid 1960s. Estimates of annual groundwater use and annual groundwater recharge to the basalts indicates that the available groundwater supply was being significantly overdrawn. The Oregon Water Resources Department (OWRD) documented declines in many wells and interference between wells. Critical Groundwater Areas have been established in the Ordnance,

Butter Creek, and Stage Gulch areas. These orders control the amount of water pumped from wells in those areas and limits the development of new wells.

The appropriation and use of groundwater in the Umatilla Basin require a permit issued by OWRD, with the exception of statutorily exempt groundwater uses (see definition in OAR 690-507-0010(6) e.g., stock watering, domestic wells, and watering lawns not over one-half acre in size). OWRD "classifies" the type of beneficial uses that may file for a permit in a given subbasin. For example, the groundwater resources of the Butter Creek, Stage Gulch, and Ordnance Critical Ground Water Areas and the Ella Butte Study Area are closed to issuance of new permits. However, the only classified uses allowed are statutorily exempt groundwater uses. Outside of these closed areas, the classifications allowed are broader. For example, in the Columbia-Umatilla Plateau Subbasin, the classified uses that could file for a permit are: statutorily exempt ground water uses, irrigation, municipal, industrial, power development, low temperature geothermal, mining, fish life, wildlife, recreation, pollution abatement, and artificial groundwater recharge. For cities that have an OWRD approved conservation plan, and which have municipal wells in the basalt aquifer, the uses classified are municipal, group domestic, and statutorily exempt groundwater uses only. It is possible other uses may be permitted on a case-by-case basis subject to certain criteria. To determine what uses are classified in a certain subbasin, it is advisable to contact the local OWRD office in Pendleton.

2.3.1.3 Fish Resources

The Umatilla River Subbasin supports a variety of anadromous and resident fish, both cold water and warm water species. The historical abundance of the basin's anadromous fish resources, including fall and spring Chinook, coho and steelhead, has been greatly diminished. The bull trout and summer steelhead are listed as a threatened species under the federal Endangered Species Act (ESA). Recovery efforts have resulted in the restoration of Chinook and Coho salmon runs in the Basin.

The Umatilla River Subbasin is home to three indigenous species of fish that qualify as Sensitive, Threatened, or Endangered under either the federal ESA or Oregon's Sensitive Species Rule (OAR 635, Division 100).

Table 2.3.1.3 Umatilla River Sensitive, Threatened, or Endangered Fish Species

Species	ESA Status	Oregon Sensitive Species Status
Bull Trout	Threatened	Sensitive-Critical
Middle Columbia River Steelhead	Threatened	Sensitive-Critical
Middle Columbia River Chinook Salmon	Not Listed	Sensitive

2.4 Agricultural Water Quality

2.4.1 Water Quality Issues

2.4.1.1 Beneficial Uses

Multiple beneficial uses in the Umatilla Management Area require clean water, including drinking water, recreational activities, aquatic life, and agriculture (www.oregon.gov/deq/wq/Pages/WQ-Standards-Uses.aspx).

Beneficial uses in the Umatilla Management Area include public and private water supply, irrigation, industrial, livestock watering, salmonid fish rearing and spawning, resident fish and aquatic life, wildlife and hunting, boating, fishing, water contact recreation, hydropower, and aesthetics (OAR 340-041-0310, Table 310A).

While there may not be severe impacts on water quality from a single source or activity, the combined effects from all sources contribute, along with impacts from other land uses and activities, to the impairment of beneficial uses of the Umatilla River water.

2.4.1.2 Water Quality Parameters of Concern

Groundwater

Nitrate
Nitrate in the groundwater is the major water quality parameter of concern in the lower Umatilla Basin due to the documented contamination of drinking water in domestic wells. This has been identified by DEQ with the designation of the Lower Umatilla Basin Groundwater Management Area in 1990.

Surface Water

According to the 2022 Integrated Report, there are several water quality parameters of concern for agriculture (https://www.oregon.gov/deq/wq/Pages/epaApprovedIR.aspx), listed below.

Nutrients
Nutrients can occur naturally in streams and rivers, but elevated concentrations are often the result of pollution due to human activities. Phosphorus and nitrates have been nationally identified as the most important nutrients to prevent from reaching surface water bodies and groundwater. Nitrate is the primary form in surface water and groundwater because it readily dissolves in water and is easily transported. Studies conducted by the U.S. Geological Survey (USGS) National Water Quality-Assessment (NAWQA) Program estimate that about 90 percent of nitrogen and 75 percent of phosphorus originates from nonpoint sources; the remaining percentages are from point sources.

Excess nutrients can promote the growth of algae, which can reduce beneficial uses of the stream. Biological processes (such as algal production) in surface waters are controlled by the availability of temperature, light, and nutrients. Abundant algae cause wide fluctuations in pH and dissolved oxygen, impacting aquatic life. Nuisance algae and plant growth impair aesthetics and can cause odor problems.

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

The temperature standard (OAR 340-041-0028) provides numeric and narrative temperature criteria. Maps and tables provided in OAR 340-041-0310 specify where and when the criteria apply. Biologically based numeric criteria, 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.

Determining whether the stream temperature is above or below the temperature standard is based on the average of the maximum daily water temperatures for the stream's warmest, consecutive seven-day period during the year. Water temperature measurements must be taken with continuous recording temperature sensors in well-mixed and representative stream locations.

A one-time measurement above the standard is not a violation of the standard. When stream flow is exceptionally low or air temperature is exceptionally high, the temperature criterion is waived. (An example is when the flow is less than the expected 10-year low flow or the air temperature is above the 90th percentile of a seven-day average.)

Several river/stream segments in the Umatilla Basin have been declared "water quality limited" by the Department of Environmental Quality (DEQ) under Section 303(d) of the CWA. Water quality standards violations occur for temperature, pH, bacteria, nutrients (ammonia and nitrate), turbidity, aquatic weeds/algae, sedimentation, dissolved oxygen, iron, and manganese. Of these, temperature, flow, ammonia, algae, and bacteria are primarily summer concerns. Data collected during the past few years indicate that temperature, sediment, pH, and nutrients are interrelated and together lead to conditions that impair beneficial use of the water. Temperature is the most common listing and one of the easiest to quantify as well as the most difficult to affect. Further monitoring and data evaluation will be done to support effective solutions and track progress and will be the basis for future refinement of this Area Plan.

Sediment

Sediment includes fine silt and organic particles suspended in the water column, settled particles, and larger gravel and boulders that move at high flows. Sediment movement and deposition is a natural occurrence, but high levels of sediment can degrade fish habitat by filling pools, creating a wider and shallower channel, and covering spawning gravels. Suspended sediment or turbidity in the water can cause physical damage to fish and other aquatic life, modify behavior, and increase temperature by absorbing incoming sunlight. Sediment comes from erosion on range, forestland and croplands, erosion from streambanks and streambeds, and runoff from roads and developed areas. Nutrients, pesticides, and toxic substances can also be attached to sediment particles.

Mercury

Primary sources in the Management Area include atmospheric deposition from global sources, land management activities and natural conditions that result in runoff or sediment erosion that can transport mercury to streams, and point sources (wastewater, stormwater, and industrial discharges). Mercury is tightly bound to organic matter in soils, and has accumulated over long periods of time, resulting in legacy concentrations in soil. Mercury is toxic to humans and aquatic life at high concentrations and can accumulate via the food chain in fish that humans

consume. The chronic aquatic life water quality criterion for mercury is 0.012 µg/l for freshwater (OAR 340-041-8033).

pH and Dissolved Oxygen
Extremes in water pH and low levels of dissolved oxygen can harm fish and other aquatic life. Both conditions can be caused by the availability of nutrients, warm temperatures, and light, all of which stimulate aquatic plant or algae growth. Excessive aquatic plant growth can increase water pH, which may harm fish. The death and subsequent decomposition of aquatic plants can deplete the water of dissolved oxygen resulting in the death of fish and other aquatic animals as well. These conditions are usually aggravated by low stream flow. For waters identified as providing cold-water aquatic life, the dissolved oxygen shall not fall below 8.0 mg/l unless environmental conditions (barometric pressure, altitude, and temperature) preclude attainment (OAR 340-041-0016). The water quality standard for pH (hydrogen ion concentrations) values range from 6.5 to 9.0 (OAR 340-041-0315).

Bacteria
Bacteria counts are used to determine the safety for human contact, recreation, and domestic water supplies. High levels of *E. coli* bacteria can cause severe gastric illness and even death. Potential sources of bacteria include animal manure and septic systems. Streams may be listed as violating this criterion during the summer period (the highest use period for water contact recreation), or for the fall-winter-spring period. The DEQ standard sets a maximum level allowable over a 90-day period (126 *E. coli* per 100mL), as well as a single sample maximum of 406 *E. coli* organisms per 100 ml. (OAR 340-041-0009).

Biological Criteria
Biological criteria refer to the support of plants and animals that live at least part of the life cycle in water. Factors that affect biological criteria are stream disturbances, excessive heat inputs, and excessive sediment. The biologic condition is assessed through sampling of streambed insects and fish counting.

Waters of the state shall be of sufficient quality to support aquatic species without detrimental changes in the resident biological communities (OAR 340-041-0011).

Aquatic Weeds and Algae
Both rooted aquatic plants and algae are a natural part of stream systems. They grow by taking in nutrients from the water column and sunlight. When water temperatures are warm enough and sufficient nutrients are present, excessive growth can occur; this can be a problem for both aquatic life and recreational beneficial uses. Excessive growth can affect aquatic life in several ways. During sunlight hours, plants and algae remove carbon dioxide from the water column as part of photosynthesis. With excessive growth, this can result in increased pH (alkaline conditions). During the night, plant growth removes oxygen from water and releases carbon dioxide, resulting in both low pH (acidic conditions) and low dissolved oxygen. In addition, when algae die and decompose, they remove oxygen from the surrounding water. Low dissolved oxygen can lead to decreased fish habitat and even fish kills. Additionally, low dissolved oxygen levels can lead to changes in water chemistry that allow mercury to be more able to enter the food chain. Algal blooms also often create odors and coloration that are objectionable to recreational users.

Harmful algal blooms (HABs) occur when excessive amounts of the naturally occurring blue-green algae, cyanobacteria, reach levels that create toxins that can be dangerous to animals and humans.

Cyanobacterial blooms cause taste and odor problems, decreased aesthetics, depleted dissolved oxygen, and harmful toxins. Physical factors that contribute to the creation of HABs include the availability of light, meteorological conditions, alteration of water flow, vertical mixing, and temperature. Chemical factors include pH changes, nutrient loading (principally in various forms of nitrogen and phosphorus), and trace metals.

2.4.1.3 TMDLs and Agricultural Load Allocations

DEQ, Umatilla Basin Watershed Council (UBWC), and CTUIR, formed a core partnership to lead the development of a TMDL for the Umatilla Basin. Numerous local, state, and federal natural resource agencies in the Umatilla Basin provided technical and financial assistance in the data collection and evaluation of data used in the TMDL. A citizen stakeholder committee provided balanced and diversified local input into the TMDL development process. TMDLs for the Umatilla Basin were approved by the EPA in May 2001 and apply to various land uses: agriculture, transportation, urban, and forestry. A copy of the Umatilla Subbasin TMDL can be found at https://www.oregon.gov/deq/wq/tmdls/pages/tmdls-umatilla-basin.aspx.

The TMDL set maximum limits on the amount of pollutants allowed to enter in the Umatilla River Subbasin's waters. This "loading capacity" is calculated to achieve water quality standards.

The "Load Allocation" is the allocated portion of the allowable pollutant assigned to the various land uses in the Management Area. DEQ has requested the appropriate designated management agency in the Management Area develop pollution control plans and programs designed to achieve the load allocations. OARs 340-041 and 340-042 require management plans and set the water quality standards.

Table 2.4.1.3: Pollutants with Approved TMDLs and Load Allocations for the Management Area

Temperature, Sediment, Nitrate, Bacteria: Applies to Umatilla Basin HUC4 including Umatilla, Pendleton, and Athena.

Load Allocation:

- Temperature: reduce solar loading, increase effective shade (all Umatilla Basin perennial streams)
- Sediment: upland and streambank percent erosion reductions, TSS (max 80mg/l) (all Umatilla Basin perennial streams)
- Nitrate: Ag allocation varies by stream (lb./day) and flow (CFS), instream target 10mg/l (Wildhorse Creek watershed – Spring Hollow Creek and Sand Hollow Creek)
- Bacteria: Ag allocation varies by stream (organisms), target < 406 organisms (Butter Creek; canyons and gulches near Yoakum; Stage Gulch; Birch Creek; McKay Creek; Tutuilla Creek; Wildhorse Creek; and the Umatilla River from Pendleton to mouth)

Surrogate:

- Temperature: percent effective shade
- Sediment: TSS, percent upland erosion, percent erosion index sediment
- Nitrate: instream flow (lbs./day)
- Bacteria: E.coli organisms entering streams per runoff

Current TMDL: Umatilla River Basin TMDL, (DEQ; approved 2001).

TMDL Revisions: No revisions

- For more information: https://www.oregon.gov/deq/FilterDocs/umatmdl.pdf

2.4.1.4 Drinking Water

DEQ summarizes drinking water issues in each Management Area prior to biennial reviews. DEQ's full report is available at: https://www.oregon.gov/deq/wq/programs/Pages/Nonpoint-Implementation.aspx.

There are 57 public water systems using groundwater wells in the plan area serving approximately 56,843 people. Within the management area, 19 public water systems have had alerts in the past 10 years and eight of these have exceeded the maximum contaminant level (MCL) for nitrate. The drinking water standard for nitrates is 10 mg/L. These contaminants are often related to animal and cropland agriculture. The locations of nitrate contamination of private domestic wells and public drinking water sources is near to agricultural land use such as alfalfa and irrigated crops. The Domestic Well Testing Act database (real estate testing data) from 1989-2018 indicates 70 significant detections of nitrate (≥ 7 mg/L) in private wells out of 522 total wells included in the database for this area. Of those private wells, 37 had nitrate concentrations of ≥ 10 mg/L. A majority of the private wells with high nitrate are located within the LUBGWMA.

E. coli bacteria alerts for public water systems are generated by the Oregon Health Authority when detected in sample results. Within the management area, 12 public water systems have had recent alerts for detections of *E. coli*. Several of the water systems have had recent alerts for total coliform and no violations.

DEQ recommends ODA work with the SWCD to implement best management practices (BMPs) in and around private domestic and public drinking water wells to reduce high nitrate levels.

DEQ also recommends public water systems utilize source water protection practices to prevent potential contamination and increase resiliency.

ODA and the Morrow SWCD are currently in the process of inventorying large and small livestock operations including acreage, irrigation, and drainage paths within the LUBGWMA. In addition, ODA and the Morrow SWCD will inventory crop and sprinkler systems, including crop type observed, irrigation method/type, cover crop (if any), and rotation crop (if known). This will assist in nutrient utilization analysis in the area, as well as the development of irrigation and nutrient best management practices. Results will be presented at the next biennial review.

2.4.1.5 Groundwater Management Area

The Lower Umatilla Basin Groundwater Management Area (LUBGWMA) includes parts of northern Morrow and Umatilla counties. DEQ designated it a GWMA in 1990 because of high levels of nitrate in the groundwater. It is one of three GWMAs in Oregon. See more about GWMAs in Oregon Revised Statute 468B.175 to 468B.188.

The LUBGWMA Committee is tasked with developing long-term plans to reduce nitrate levels in the area. The committee is appointed by DEQ and includes local residents, businesses, and organizations, as well as county, city, and tribal government representatives. The committee is locally led and state supported. Per statute, ODA is responsible for developing portions of the plans that address farming practices. Find more information about the committee, including its Second Action Plan, at https://lubgwma.org.

2.4.2 Sources of Impairment

2.4.2.1 Groundwater Sources

Irrigated agriculture, pastures, and CAFOs are the relevant potential sources of groundwater nitrogen pollution. The major sources of groundwater pollution from agricultural activities are manure, wastewater, fertilizers, and mineralization of organic matter. Applied nitrogen from various sources to the soil that is not utilized by plant growth remains in the soil and can be leached to groundwater if sufficient water is available to move it through the soil profile.

LUBGWMA

A 2011 report completed by DEQ, ODA, and OSU Extension titled *Estimation of Nitrogen Sources, Nitrogen Applied, And Nitrogen Leached to Groundwater in the Lower Umatilla Basin Groundwater Management Area* concluded the sources of nitrate identified in the LUBGWMA Action Plan contribute significantly different amounts of nitrogen leaching to groundwater, and can be classified into three tiers:

Tier One: Irrigated Agriculture (81.6% of total nitrogen);

Tier Two: Pastures (8.1% of total nitrogen), food processors (4.6% of total nitrogen), and on-site septic systems (3.9% of total nitrogen);

Tier Three: Lawns (0.9% of total nitrogen), CAFO waste applied to dry land crops (0.7% of total nitrogen), vegetable gardens (0.3% of total nitrogen), and the Depot Washout Lagoon (0.09% of total nitrogen).

EPA has contracted a current study (2023) to detail nitrogen loading in the area, including sources and application.

2.4.2.2 Surface Water Sources

Nonpoint sources of pollution in the Umatilla Management Area include eroding agricultural, range, and forest lands; eroding streambanks; runoff and erosion from roads and urban areas; runoff from livestock and other agricultural operations; and septic systems. Re-routing of runoff via road building, construction, and land surfacing such as parking areas can lead to excessive erosion or pollutant transport.

Pollutants from nonpoint sources are carried to the surface water through the action of rainfall, snowmelt, irrigation and urban runoff, and seepage. A major nonpoint source of water quality impairment is heat input, which has increased due to vegetation removal, seasonal flow reduction, changes in channel shape, and alteration to the floodplain. Channelization alters gradient, width/depth ratio, and sinuosity, causing sediment and temperature increases.

2.5 Regulatory and Voluntary Measures

2.5.1 Area Rules

All landowners or operators conducting activities on lands in agricultural use must be in compliance with the Area Rules. A landowner is responsible for only those conditions caused by activities conducted on land managed by the landowner or occupier. Conditions resulting from

unusual weather events or other circumstances not within the reasonable control of the landowner or operator are considered when making compliance decisions. An example of reasonable control of the landowner means that technically sound and economically feasible measures are available to address conditions described in prevention and control measures. ODA may allow temporary exceptions when a specific integrated pest management plan is in place to deal with certain weed or pest problems. The Area Rules will be applied with consideration of agronomic and economic impacts.

Umatilla (1999, revised 2006)
603-095-0340 Prevention and Control Measures

(1) All landowners or operators conducting activities on lands in agricultural use must be in compliance with the following rules. A landowner is responsible for only those conditions caused by activities conducted on land managed by the landowner or operator. Rules will be applied with consideration of agronomic and economic impacts.

(a) These rules do not apply to conditions resulting from unusual weather events or other exceptional circumstances.

(b) Temporary exceptions to the rules are allowed when a specific integrated pest management plan is in place to deal with certain weed, insect or disease problems.

(c) Implementation of these rules will begin upon adoption and will be fully implemented by January 1, 2008.

(2) Waste Management: Effective on rule adoption, no person subject to these rules shall violate any provision of ORS 468B.025 or ORS 468B.050 (see Chapter 1.4.4).

(3) Soil Erosion and Sediment Control: Landowners must control upland soil erosion using technically sound and economically feasible methods.

(a) Landowners must control active channel (gully) erosion to protect against sediment delivery to streams.

(b) On croplands, a landowner may demonstrate intent to comply with this rule by:

(A) Operating consistent with a Soil and Water Conservation District (SWCD)-approved conservation plan that meets Resource Management Systems (RMS) quality criteria for soil and water resources; or

(B) Operating in accordance with an SWCD-approved plan for Highly Erodible Lands (HEL) developed for the purpose of complying with the current US Department of Agriculture (USDA) farm program legislation; and farming non-HEL cropland in a manner that meets the requirements of an approved USDA HEL compliance plan for similar cropland soils in the county; or

(C) Farming such that the predicted sheet and rill erosion rate does not exceed 5 tons/acre/year, as estimated by the Revised Universal Soil Loss Equation (RUSLE); or

(D) Constructing and maintaining terraces, sediment basins, or other structures sufficient to keep eroding soil out of streams.

(c) On rangelands**,** a landowner may demonstrate intent to comply with this rule by:

(A) Operating consistent with a Soil and Water Conservation District (SWCD)-approved conservation plan that meets Resource Management Systems (RMS) quality criteria for soil and water resources, or

(B) Maintaining sufficient live vegetation cover and plant litter to capture precipitation, slow the movement of water, increase infiltration, and reduce excessive movement of soil off the site; or

(C) Minimizing visible signs of erosion, such as pedestal or rill formation and areas of sediment accumulation.

(d) Private roads that traverse rural lands or roads used for agricultural activities must be constructed and maintained such that road surfaces, fill and associated structures are designed and maintained to limit contributing sediment to waters of the state. All roads on agricultural lands not subject to the Oregon Forest Practices Act (OFPA) are subject to this regulation. Homesteads and other non-crop areas must be laid out and managed in a manner that controls soil erosion and prevents delivery of sediments to the stream. Stream crossings, with or without culverts or bridges, must be kept to a minimum, must be installed and maintained to prevent sediment delivery to the stream and not impede fish passage as provided by ORS 498.268. Agricultural lands must be managed to prevent runoff of sediment to public road drainage systems.

(4) Stream-side Area Management:

(a) Agricultural land management activity must not cause streambank instability.

(b) Agricultural land management near streams must include establishment and maintenance of riparian vegetation, vegetative buffers, filter strips, sediment retention structures, or equally effective water pollution control practices, placed so as to prevent sediment, thermal and other pollution of waters of the state.

(c) When establishment or reestablishment of crops occurs near waters of the state during the growing season (March through October), cropping and management systems must be employed that prevent erosion. An adequate vegetative buffer or equally effective erosion control practice must be provided during the winter months (November through March).

(5) Livestock Management:

(a) Pastures and rangeland must be managed to prevent sediment, nutrient and bacterial contributions to waters of the state. Adequate vegetative buffers or filter strips must be installed and maintained, and vegetative cover must be maintained or restored after use as needed to control contaminated runoff or weed infestations. Where appropriate, waste management systems must be installed to collect, store, and utilize animal wastes.

(b) Barnyards, feedlots, drylots, confinement and non-pasture areas, and other livestock facilities located near waters of the state must employ an adequate runoff control system, or an equally effective pollution control practice. Where necessary to prevent waste delivery, waste management systems must be installed to collect, store, and utilize animal wastes.

(c) Grazing must be done in a manner that does not degrade waters of the state or negatively impact the stability of streambanks. Grazing management systems must be applied that allow for recovery of plants and leave adequate vegetative cover to ensure streambank stability, reduce sediments entering the stream, and provide stream-side shading consistent with site capability. The grazing management system must maintain or develop the desired vegetative cover.

(6) Irrigation Management:

(a) Irrigation systems must be designed and operated to prevent runoff of potential contaminants. Irrigation scheduling must consider such factors as soil conditions, crop, climate and topography.

(b) Overland return flows from irrigation must be managed to prevent the delivery of pollution, including water temperature increases, to waters of the state.

(7) Nutrient and Farm Chemical Management:

(a) Crop nutrient applications, including manure, sludge and commercial fertilizers, must be done at a time and in a manner that does not pollute waters of the state.
(b) Nutrients and farm chemicals must be stored in a location and condition that makes them unlikely to be carried into the waters of the state by any means.

(8) Channel and Drain Management: Whenever major construction, re-construction or maintenance occurs in ditches and water channels, exclusive of perennial and intermittent streams, they must be designed and maintained with a capacity to handle a greater than normal runoff event with a minimum likelihood of bank erosion or erosion impacts on nearby land areas.

2.5.2 Voluntary Measures

Voluntary efforts are the focus of ODA, Umatilla SWCD, Morrow SWCD, and the LAC. However, if a particular landowner refuses to correct a verified adverse condition on his or her property 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, this Area Plan and its associated administrative rules describe prohibited conditions.

Readers should note that this Area Plan is only a guidance document; by itself it is not regulatory. However, it does refer to administrative rules that set enforceable requirements for landowners. To help distinguish between this Area Plan and its associated rules, all rule language is provided in Chapter 2.5.1 and is separate from this section.

This Area Plan encourages farmers and ranchers to manage their land to control conditions that have been identified as contributing to undesirable water quality using adaptive management techniques.

2.5.2.1 Waste Management

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

Wastes include excess soil, manure, fertilizers, and other substances.

Indicators of noncompliance include but is not limited to:

- Runoff flowing through areas of high livestock usage and carrying wastes into waters of the state,
- Livestock waste accumulated in drainage ditches or areas of flooding,
- Fecal coliform (*E. coli*) counts that exceed state water quality standards.
- Applying excess nutrients (including fertilizers, manure, and other additives) above amounts that crops can uptake.

2.5.2.2 Soil Erosion and Sediment Control

A landowner or operator's responsibility under this Area Plan is to implement measures that prevent and control water pollution from upland agricultural activities and soil erosion. This includes agricultural, rural lands, and road management that may not be in close proximity to waterbodies but have the potential to contribute to water quality degradation by runoff of sediment and wastes.

Upland areas include rangelands, forests, and croplands upslope from the riparian areas. These areas extend to the ridge tops of watersheds. With a protective cover of crops and crop residue, grass (herbs), shrubs or trees, consistent with site capability, these areas will capture, store, and safely release precipitation thereby reducing the potential of excessive soil erosion or delivery of soil or pollutants to the receiving stream or other body of water. Vegetation is dependent on physical characteristics including soil, geology, landform, water, and other climate factors. Proper management of upland vegetation considers physical and biological conditions, controls soil erosion, and minimizes transport of soil and nutrients to the stream. Upland management also considers livestock production and, at the same time, should consider forest health and protection of fish and wildlife habitat. Healthy uplands maintain productivity over time and are resilient to stresses caused by variations in physical conditions such as climatic changes.

Healthy upland areas provide several important ecological functions. These include:

- Capture, storage, and safe release of precipitation,
- Provide for plant health and diversity that support habitat (cover and forage) for wildlife and livestock,
- Filtration of sediment,
- Filtration of polluted runoff,
- Provide for plant growth that increases root mass that utilizes nutrients and stabilizes soil against erosion. Indicators of these conditions include:
    - Recruitment of beneficial plant species,
    - Groundcover to limit runoff of nutrients and sediment,
    - Cropland cover that is sufficient to limit movement of nutrients and sediment,
    - Roads and related structures designed, constructed, and maintained to limit sediment delivery to streams.

Factors to evaluate upland area condition may include:

- Vegetation utilization through stubble height measurements,
- Plant species composition to measure plant health and diversity,
- Groundcover (live plants, standing plant litter, and ground litter) as a measure of potential erosion,
- Evidence of overland flow (pattern and quantity),
- Site productivity (domestic livestock and wildlife carrying capacity),
- Soil erosion potential through prediction models available through NRCS.

Noxious weeds present a challenge to establishing upland and streamside vegetation. These weeds can harm water quality in many ways. Some examples are:

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

Public roads and rights of way should be managed to reduce the impact of runoff onto agriculture lands and into waterways. This includes practices, similar to agricultural practices, such as: grass seeding of rights of way; rock placement in borrow ditches; sediment basins; proper culvert placement; and weed control. Similarly, agricultural lands must be managed to reduce the impacts of runoff onto public rights of way.

While the Revised Universal Soil Loss Equation (RUSLE2) is used as a means of assessing likely reductions in in-field soil erosion, because it has not been validated as a siltation

prediction tool, it should not be used as a standard means of predicting siltation problems in adjoining waterways. It is presumed that if a landowner adopts practices that prevent and control soil erosion that a significant reduction in stream sedimentation from agricultural activities will result. A landowner may develop and adopt alternative means of reducing stream sedimentation, but the burden of demonstrating effectiveness of the alternative system rests on the landowner.

2.5.2.3 Streamside Area Management

A landowner or operator's responsibility under this Area Plan is to implement measures that prevent and control water pollution from agricultural activities. Areas near waterbodies are especially important to water quality and sensitive to management activities.

The streamside area is defined as the area near the stream where management practices can most directly influence the conditions of the water. This area usually ranges from 10 feet to 100 feet from the water, depending on the slope, soil type, stream size, and morphology.

The riparian area, as defined in OAR 690-400-0010(14), is a zone of transition from an aquatic to a terrestrial system, dependent upon surface or subsurface water, that reveals through the zone's existing or potential soil-vegetation complex the influence of such surface or subsurface water. A riparian area may be located adjacent to a lake, reservoir, estuary, pothole, spring, bog, wet meadow, muskeg, slough, or ephemeral, intermittent, or perennial stream.

Water is the distinguishing characteristic of riparian areas, but soil, vegetation, and landform also exert strong influence on these systems. In a healthy riparian ecosystem, these four components interact to produce a wide variety of conditions.

Healthy riparian and streamside areas provide several important ecological functions. These include:

- Dissipation of stream energy associated with high flows and thus influencing the transport of sediment,
- Capture of suspended sediment and bedload that builds streambanks and develops floodplain function,
- Retention of floodwater and recharging groundwater,
- Stabilization of streambanks through plant root mass,
- Development of diverse channel characteristics providing pool depth, cover, and variations in water velocity necessary for fish production,
- Support of biodiversity,
- Shade for moderation of solar heat input,
- Recruitment of large woody debris for aquatic habitat.

Indicators to determine improvement of this condition include:

- Ongoing, natural recruitment of desirable riparian or upland plant species,
- Management activities maintain at least 50 percent of each year's growth of woody vegetation – both trees and shrubs,
- Management activities minimize the degradation of established native vegetation,
- Maintenance of established beneficial vegetation,
- Maintenance or recruitment of woody vegetation – both trees and shrubs,
- Streambank integrity capable of withstanding 25-year flood events.

Factors used to evaluate improvement of the streamside area condition could include:

- Expansion of riparian area as evidenced by development of riparian vegetation and plant vigor,
- Reduction in actively eroding streambank length beyond that expected of a dynamic stream system,
- Community composition changes reflecting an upward trend in riparian condition (increases in grass-sedge-rush, shrubs, and litter and decreases in bare ground),
- Plant community composition reflecting an upward trend as indicated by decreases in noxious plant species,
- Stream channel characteristics show upward trend consistent with landscape position (i.e. a decrease of width-to-depth ratio of the channel),
- Shade patterns consistent with site capability,
- Stubble height of herbaceous species and leader growth of shrubs and trees.

2.5.2.4 Livestock Management

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

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

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

Factors used to evaluate effectiveness of management may include:

- Safe diversion of runoff,
- Protection of clean water sources,
- Off-stream watering systems,
- Lot maintenance; smoothing, mounding, seeding,
- Structural measures i.e.; filter strips, catch basins, berms,
- Waste collection, storage and application methods,
- Plant community is neither dominated by invasive annual plant species nor by overgrowth of native woody species,
- Plant cover (plants plus plant litter) is adequate to protect site,
- Distribution and amount of bare ground does not exceed what is expected for site,
- Livestock utilization patterns do not exhibit excessive sustained use in key areas,
- Plant vigor levels and regeneration are sufficient to protect long-term site integrity.

2.5.2.5 Irrigation Management

A landowner or operator's responsibility under this Area Plan is to implement measures that prevent and control water pollution from irrigation, this includes pollution to groundwater and surface water. Diversion of water for irrigation or other uses and the return of that water to the surface or groundwater are activities that have potential for contributing to water quality problems.

Irrigated lands are lands either riparian, floodplain, or upland upon which water is applied for the purpose of growing crops. Diversion of water from a water body to be applied on land for the purpose of growing crops is a recognized beneficial use of water. Irrigation water use is regulated by the OWRD in the form of water rights, which specify the rate, duty, and season that water can be applied to a particular parcel of land. Refer to OWRD Rules (OAR 690 and ORS 536 through 543) for more details.

Irrigation in this basin is done by flooding, drip, or sprinkler application. Water usually is diverted from surface sources (stream or pond) and from groundwater sources. Water withdrawals influence stream flows and thus, indirectly affect water quality. Over-irrigating can leach agricultural chemicals (including nitrate) to groundwater, directly affecting water quality. Subject to legal water rights, water withdrawals (dependent on surface water characteristics and method of diversion) should be made in a manner to minimize the adverse impacts on stream flows. The efficacy of irrigation water application is generally enhanced by assuring the quantity and timing of application based on the needs of the crop, as determined by soil moisture levels, crop water use budgets or other monitoring tools. Irrigation water, if not managed, will carry valuable fertilizers and nutrients past the root zone to where it is not available for beneficial use and will eventually be carried down into groundwater. This is in violation of ORS 468B, described in Chapter 1.4.4.

Area soils within the LUBGWMA are mostly sands and fine sands with low moisture holding capacities, therefore, there is generally a small buffer between proper irrigation quantities/rates and irrigation which will push nutrients to the groundwater. There are areas within the Management Area that have sandy loam soils with a higher soil moisture holding capacity; it is important that irrigation and nutrient management plans include soil specifics.

Especially within the LUBGWMA, flood irrigation should not be utilized as a method of irrigation. Near the irrigation source, flood irrigation in this type of soil will quickly leach nutrients beyond the root zone and add to the contaminated groundwater in the area.

All irrigators within the region should have an irrigation management plan to match irrigation application quantities, rates to the crop, soil type, and environmental demands. A companion nutrient management plan should match fertilizer and nutrient applications to agronomic demand.

Irrigation management aims at increasing food production and contributes to economic development through improvements in performance, productivity, and sustainability of irrigated agriculture and irrigation systems.

An irrigation management plan should consist of:

- Soil types and map
- Crop types, acreage, schedules, and critical moisture period
- Irrigation system types, efficiencies

- Estimated water use (evapotranspiration-ET) and peak ET, weekly
- Irrigation rate, frequency and total, weekly

Characteristics of an irrigation system that has minimal effect on water quality include:

- Operation based on an irrigation and nutrient management plan,
- Delivery of water efficiently to the land within legal water rights,
- Minimal overland return flows,
- Return flow routing that provides for settling, filtering, and infiltration,
- Minimal effect on stability of streambanks and minimal soil erosion,
- Scheduling of water application appropriate to the site including consideration of soil conditions, crop needs, climate, and topography,
- Installation and management of diversion structures that control erosion and sediment delivery and protect the stability of streambanks,
- Diversions that are adequately screened and which provide for fish passage. (Refer to ORS 498.268 for screening requirements),
- Sediment is captured from irrigation runoff before it enters rivers and streams.

2.5.2.6 Nutrient and Farm Chemical Management

Crop nutrient applications, including manure, sludge, commercial fertilizer, and other added nutrient inputs, should always be done at a time and in a manner that reduces the possibility of runoff into any nearby stream or waterway as well as leaching to groundwater. Fertilizers should be applied according to a nutrient management plan.

A nutrient management plan should consist of:

- Soil and water tests
- Fertilizer type and storage
- N, P, and K fertilizer concentrations
- Field map
- Application equipment and method
- Crop N utilization, by month
- N, P, K application, by month

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

Concentrated potential contaminants (CPCs) are substances managed on a property that may or may not be toxic or dangerous but need special consideration when storage locations are chosen. Typical farm and ranch CPCs include, but are not limited to manure; compost; fuel, lubricants and other motor vehicle chemicals; insecticides, herbicides, and other farm chemicals; fertilizer; used truck and tractor batteries; solvents; garbage; and cleaning products. Fertilizers, pesticides, and other chemicals that have been applied to the land are not considered concentrated after application.

Safe storage of all CPCs is encouraged, including consideration of major factors which might make any site potentially threatening to surface and/or groundwater. Management practices for

spill prevention and control must be implemented.

Pesticides must be used in accordance with label requirements. Pesticide handling and application practices should be adopted that limit off-target pesticide transport and maximize the amount of applied pesticide material retained on the property.

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

2.5.2.7 Channel and Drain Management

Ditches and water channels should be designed and maintained with a capacity to handle above normal flows with a minimum likelihood of bank erosion and negative erosion impacts on nearby land areas. Water storage, transfer, and recirculation facilities must be constructed and maintained so that the infiltration of agricultural chemicals and nutrients to groundwater is reasonably controlled.

Instream activities other than routine maintenance of diversion or other agricultural structures are regulated and permitted by the Division of State Lands.

Chapter 3: Implementation Strategies

Chapter 3 describes efforts to make and track progress toward the goals of the Umatilla Area Plan. It presents the goals, measurable objectives, strategic initiatives, proposed activities, and monitoring efforts.

Goal

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

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

- Prevent runoff and leaching of agricultural wastes,
- Control soil erosion on uplands to acceptable rates,
- Provide adequate riparian vegetation for stream bank stability and stream shading consistent with site capability,
- Limit Nitrate groundwater contamination in irrigated agriculture by promoting irrigation and fertilizer management plans and education.

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.
6. Irrigation and nutrient application are done according to irrigation and nutrient management plans that account for soil, environmental, and crop demand to minimize leaching of groundwater.

LAC Mission

Seek to achieve water quality standards appropriate to the Umatilla Management Area through development and implementation of this Area Plan.

3.1 Measurable Objectives and Strategic Initiatives

Measurable objectives allow the Agricultural 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 4.1.

3.1.1 Management Area

ODA is working with SWCDs and LACs throughout Oregon toward establishing long-term measurable objectives to achieve desired conditions. Currently, ODA and the Umatilla SWCD are using the SIA program to show progress in this Management Area. These are described

below. The SWCD's goal is to complete an SIA every three years until the entire Management Area has been assessed.

3.1.1.1 Measurable Objective #1

Prevent runoff of agricultural wastes

Livestock operations along streams are evaluated for likelihood of pollution from bacteria and sediment. The assessment method consists of looking for likely sources (manure piles and heavy use areas) during a field survey.

Measurable Objective
By June 30, 2050, fewer than 5% of livestock operations in the Management Area are likely to pollute surface water.
Milestone
By 2030, complete an inventory of livestock operations that are likely to pollute surface water from bacteria and sediment.

3.1.1.2 Measurable Objective #2

Control soil erosion on uplands to acceptable rates

Uplands will be evaluated for erosion potential. ODA and the SWCD will develop an assessment method that will track soil loss on uplands.

Measurable Objective
By 2030, ODA and the SWCD will develop an assessment method that will establish a baseline and track erosion potential on uplands. Objective will be updated during the next biennial review when the assessment is completed showing baseline data.

3.1.1.3 Measurable Objective #3

Provide adequate riparian vegetation for stream bank stability and stream shading consistent with site capability

Riparian vegetation will be evaluated on perennial stream reaches 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 compared to what could be provided by site capable vegetation.

Measurable Objective
By June 30, 2050, 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).
Milestone
By 2030, complete a riparian vegetation assessment of perennial streams to identify whether adequate vegetation is present to prevent and control water pollution, based on the site's ability to grow vegetation (site capability).

3.1.2 Focus Areas and Other Coordinated Efforts in Small Watersheds

There are currently no focused efforts in small watersheds in this Management Area.

3.1.3 Strategic Implementation Areas (SIA)

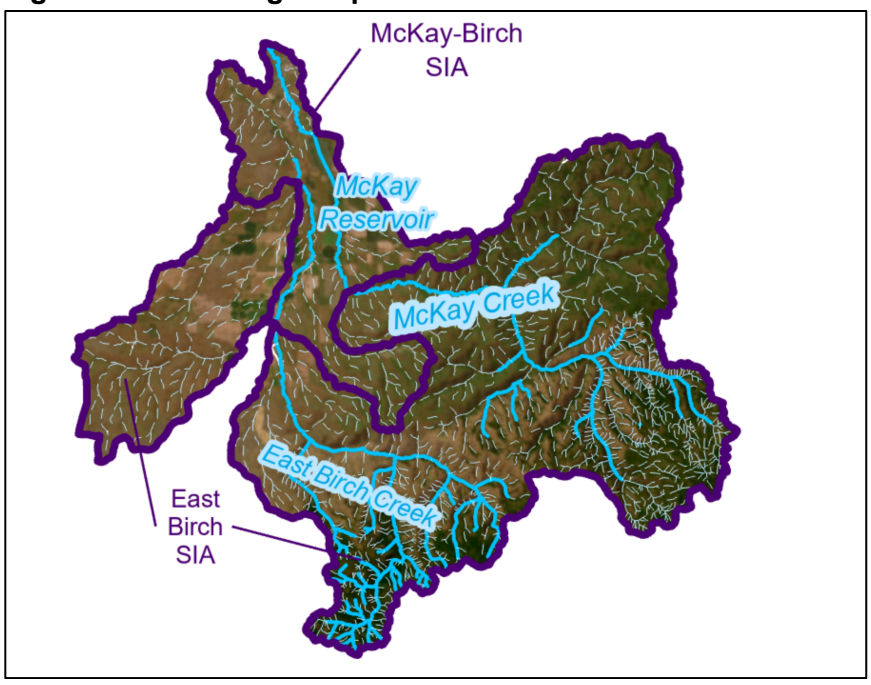
ODA's Strategic Implementation Areas (SIA) initiative is a process through ODA to ensure compliance with Oregon's Agricultural Water Quality Area Rules (Area Rules) by working with landowners where water quality concerns persist.

SIA Compliance Evaluation Method:
ODA evaluated all agricultural tax lots within the SIAs to identify opportunities to improve water quality and ensure compliance with Area Rules. The evaluation considered the condition of streamside vegetation, areas of bare ground, and potential livestock impacts (including manure management). The process involved both a remote evaluation and field verification from publicly accessible areas.

Opportunity levels:

- **Likely in Compliance (LC):** ODA identified no likely agricultural water quality regulatory concerns, and the goals of the Area Plan are likely being achieved.
- **Restoration Opportunity (RO):** ODA identified no likely agricultural water quality regulatory concerns, but there is likely some opportunity for improvement through voluntary measures to reach the goals of the Area Plan.
- **Compliance Opportunity (CO):** ODA identified that agricultural activities may impair water quality or evaluation was inconclusive. There also may be an opportunity for improvement through voluntary measures to reach the goals of the Area Plan.
- **Potential Violation (PV):** During the Field Evaluation, ODA observed a potential violation of the Area Rules. There also may be an opportunity for improvement through voluntary measures to reach the goals of the Area Plan.

Figure 3.1.3 Strategic Implementation Areas in the Umatilla Management Area



3.1.3.1 McKay Birch SIA (2017)

The McKay Birch SIA includes Birch Creek, McKay Creek, and Stewart Creek. All of these streams drain into the Umatilla River located in Umatilla County. These streams have a common problem, which is poor water quality; temperature, bacteria, and pH are the major concerns present within each of the streams. Biological criteria, iron, and lead are also water quality concerns but are limited to available data.

Measurable Objective
By February 21, 2022, all 6 tax lots identified as a Potential Violation or Compliance Opportunity will be improved to Restoration Opportunity or Likely in Compliance.

Monitoring Objective
Monitor water quality in the McKay Birch SIA which includes streams in Birch Creek, Stewart Creek, and McKay Creek to develop a baseline of data and to see if any changes were taking place over time. Sample types and locations were selected for spring irrigation-focused issues on Birch Creek and Stewart Creek, and winter livestock issues on McKay Creek.

Assessment Method/Sampling Plan
• Two sampling sites on McKay Creek, both above the dam (RM 137 - RM 138) testing for *E. coli*, nitrogen, TKN, phosphorus, and TSS. Sample timeframe: November to March. • Four sampling sites on Birch Creek (RM 132 - RM 135) and one on Stewart Creek (RM 136) testing for nitrogen, TKN, phosphorus, and TSS. Sample timeframe: Between March to June.

McKay Birch SIA monitoring results are described in Chapter 4.

3.1.3.2 East Birch SIA (2021)

The East Birch SIA includes East Birch Creek and McKay Creek. These streams drain into the Umatilla River located in Umatilla County. These streams have a common problem, which is poor water quality; temperature, sediment, and pollutants are the major concerns present within each of the streams.

Measurable Objective
By February 21, 2026, all 8 tax lots identified as a Potential Violation or Compliance Opportunity will be improved to Restoration Opportunity or Likely in Compliance.

Monitoring Objective
The monitoring objective is to collect baseline temperature data for four years to provide an accurate picture of current riparian health.

Assessment Method/Sampling Plan
Starting in 2024, the Umatilla SWCD will monitor water temperature in the East Birch SIA. Monitoring will occur on East Birch Creek, McKay Creek, and North Fork McKay Creek utilizing existing CTUIR temperature loggers with additional HOBO loggers to bolster collection of a baseline dataset. The sampling will occur to determine if collecting baseline data for four years will create an accurate picture of current riparian health. Monitoring will begin in 2024 and results will be reported during the next biennial review.

3.1.4 Pesticide Stewardship Partnerships (PSP)

The Pesticide Stewardship Partnership (PSP) Program is a voluntary program that relies on local partnerships to monitor pesticide levels in waterways and enact solutions to protect water quality while managing pests and maintaining crop yield. Local efforts include implementing projects based on technical assistance, outreach, and education. The PSP works as a feedback loop with the water quality sampling data continuously being used to evaluate pesticides of concern, the effectiveness of education and collaborative projects on an annual basis. There are currently no PSPs in this Management Area.

3.1.5 Groundwater Management Area

The Lower Umatilla Basin Groundwater Management Area (LUBGWMA) includes parts of northern Morrow and Umatilla counties. DEQ designated it a GWMA in 1990 because of high levels of nitrate in the groundwater.

3.1.5.1 Measurable Objective #1

Inventory non-permitted livestock operations within the LUBGWMA.

Assessment Method: By 2026, the Umatilla SWCD and Morrow SWCD through ODA funds, will complete an inventory of large and small livestock operations including acreage, irrigation, and drainage paths within the LUBGWMA. The method consists of inventorying large and small livestock operations; inventorying irrigation types; and inventorying manure storage and location to irrigation drains.

These results will help the LAC develop future measurable objectives and milestones at the 2026 biennial review. Measurable objectives include:

Measurable Objective
By June 30, 2025, the Umatilla SWCD and Morrow SWCD will complete an inventory of large and small livestock operations including acreage, irrigation, and drainage paths within the LUBGWMA.

3.1.1.2 Measurable Objective #2

Inventory crop and sprinkler systems within the LUBGWMA

Assessment Method: The Umatilla SWCD and Morrow SWCD will complete an inventory of crop and sprinkler systems in the LUBGWMA including crop type observed, irrigation method/type, cover crop (if any), and rotation crop (if known).

These results will help the development of best management practices (BMPs) for the area. BMPs are methods designed to minimize adverse environmental effects of farming practices while maintaining agricultural production. Soil properties and crop needs will determine the correct amounts of nutrients to apply and the timing of application as well as the application method. Adoption of BMPs can help to avoid excessive levels of nutrients in the system that can become harmful when lost to the surrounding environment. In addition, these results will help the LAC develop future measurable objectives and milestones at the 2026 biennial review. Measurable objectives include:

Measurable Objective
By June 30, 2025, the Umatilla SWCD and Morrow SWCD will complete an inventory of crop and sprinkler systems in the LUBGWMA including crop type observed, irrigation method/type, cover crop (if any), and rotation crop (if known).

3.2 Proposed Activities

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

Table 3.2 Planned Activities for 2024-2027 throughout the Management Area by the Umatilla SWCD and Morrow SWCD

Activity	4-year Target	Description
Landowner Engagement		
# events that actively engage landowners (workshops, demonstrations, tours)	20	Riparian bank protection workshops
# landowners participating in active events	400	
Technical Assistance (TA)		
# landowners provided with TA (via phone/walk-in/email/booth/site visit)	400	TA includes information provided or assistance with funding
# site visits	200	Help with current projects and technical services
# conservation plans written*	20	Riparian plantings and grazing plans
# Irrigation management plans	10	Irrigation management plans via ODA, OSU, NRCS, or other. Management plan development will be accelerated once BMPs are developed (likely by June 30, 2025).
# Nutrient management plans	10	Nutrient management plans via ODA, OSU, NRCS, or other. Management plan development will be accelerated once BMPs are developed (likely by June 30, 2025).
On-the-ground Project Funding		
# funding applications submitted	30	Riparian fencing and bank stabilizations
* Definition: any written management plan to address agricultural water quality concerns, such as: nutrients, soil health, grazing, irrigation, and streamside vegetation. Can include farm and ranch plans (including small acreages) and NRCS-certified plans. Excludes projects with weak connection to agricultural water quality.		

3.3 Additional Agricultural Water Quality and Land Condition Monitoring

The progress and success of implementation efforts will be assessed through determination of changes in land management systems and the measurement of water quality improvement over time. Monitoring activities are integral components of the Area Plan.

3.3.1 Water Quality

DEQ monitors surface water quality in the Management Area as part of its ambient monitoring network. DEQ also monitors a groundwater well network within the LUBGWMA to track nitrate trends over time.

3.3.2 Land Conditions

There is no additional land condition monitoring.

Chapter 4: Progress and Adaptive Management

Chapter 4 describes progress toward achieving Area Plan goals and measurable objectives by summarizing accomplishments and monitoring results.

4.1 Measurable Objectives and Strategic Initiatives

The following tables provide the assessment results and progress toward measurable objectives and milestones in the past five years (January 2019 - December 2023). See Chapter 3.1 for background and assessment methods.

4.1.1 Management Area

Progress on Measurable Objectives will be reported at the 2026 Biennial Review.

Table 4.1.1.1 Management Area Results: Prevent runoff of agricultural wastes

Measurable Objective
By June 30, 2050, fewer than 5% of livestock operations in the Management Area are likely to pollute surface water.
Milestones
By 2030, complete an inventory of livestock operations that are likely to pollute surface water from bacteria and sediment.
Activities and Accomplishments
Livestock operations that are likely to pollute surface water were identified and addressed in the McKay Birch, and East Birch SIAs. **McKay Birch SIA** (HUC# 170701030408, 170701030608, 170701030609): 6 tax lots were identified as Compliance Opportunities for riparian and bare ground. As of June 26, 2020, all 6 tax lots were improved. **East Birch SIA** (HUC# 170701030607, 170701030605, 170701030603, 170701030601, 170701030602, 170701030403, 170701030406, 170701030407, 170701030405, 170701030404, 170701030402, 170701030401): 2 tax lots were identified as Potential Violations and 6 tax lots were identified as Compliance Opportunities for bare ground and manure. As of December 1, 2023, 4 tax lots have been improved.
Adaptive Management
To be completed during 2026 biennial review. • Due to limited ODA and SWCD capacity, baseline assessment data hasn't been collected for the entire management area. • Target date was extended due to limited capacity and resources to complete the assessment.

Table 4.1.1.2 Management Area Results: Control soil erosion on uplands to acceptable rates

Measurable Objective
By June 30, 2030, ODA and the SWCD will develop an assessment method that will track erosion potential on uplands. Objective will be updated during the next biennial review when the assessment is completed showing baseline data.
Milestones
N/A
Activities and Accomplishments
To be completed during 2026 biennial review.
Adaptive Management
To be completed during 2026 biennial review.

Table 4.1.1.3 Management Ara Results: Provide adequate riparian vegetation for stream bank stability and stream shading consistent with site capability

Measurable Objective
By June 30, 2050, 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).
Milestones
By June 30, 2030, complete a riparian vegetation assessment of perennial streams to identify whether adequate vegetation is present to prevent and control water pollution, based on the site's ability to grow vegetation (site capability).
Activities and Accomplishments
To be completed during 2026 biennial review.
Adaptive Management
• Due to limited ODA and SWCD capacity, baseline assessment data has not been collected for the management area. • The target date was extended because due to limited capacity and resources to complete the assessment.

4.1.2 Focus Areas and Other Focused Efforts in Small Watersheds

There are currently no focused efforts in small watersheds in this Management Area.

4.1.3 Strategic Implementation Areas

Table 4.1.3.1 2017 McKay Birch SIA

Evaluation Results		
As of February 21, 2018, 6 tax lots were identified as either a Potential Violation or a Compliance Opportunity. PV = 0, CO = 6, RO = 29, LC = 552		
Measurable Objective		
As of February 21, 2022, all 6 tax lots identified as a Potential Violation or a Compliance Opportunity will be improved to Restoration Opportunity or Likely in Compliance.		
Post Evaluation		
As of June 26, 2020, all 6 tax lots identified as a Potential Violation or a Compliance Opportunity were improved to Restoration Opportunity or Likely in Compliance. PV = 0, CO = 0, RO = 35 , LC = 552. The measurable objective was achieved.		
Adaptive Management Discussion		
To be completed during the biennial review. • The SIA is closed, and work is completed. • ODA and partners met their measurable objective.		
Monitoring Activities		
Water quality was monitored in streams in Lower Birch Creek, Stewart Creek, and Lower McKay Creek to develop a baseline of data and to see if any changes were taking place over time.		
Activity	**Accomplishment**	**Description**
ODA		
# acres evaluated	36,630	
# stream miles evaluated	103	
# landowners at Open House	25	
# landowners receiving outreach materials	193	
SWCD and Conservation Partners		
# landowners provided with technical assistance	50	
# site visits	17	

# conservation plans written	4	
SIA and Project Funding		
# funding applications submitted	10	
# funding applications awarded	5	

Table 4.1.3.2 2021 East Birch SIA

Evaluation Results		
As of November 16, 2021, 8 tax lots were identified as either a Potential Violation or a Compliance Opportunity. PV = 2, CO = 6, RO = 8, LC = 654		
Measurable Objective		
By November 16, 2025, all 8 tax lots identified as a Potential Violation or a Compliance Opportunity will be improved to Restoration Opportunity or Likely in Compliance.		
Current Status		
As of December 1, 2023, 4 tax lots identified as a Potential Violation or a Compliance Opportunity have been improved to Restoration Opportunity or Likely in Compliance.		
Adaptive Management Discussion		
The SIA is open and work is continuing. An adaptive management discussion will occur during the biennial review.		
Monitoring Activities		
Monitoring is expected to start in spring/summer 2024.		
Activity	**Accomplishment**	**Description**
ODA		
# acres evaluated	169,507	
# stream miles evaluated	632	
# landowners at Open House	17	
# landowners receiving outreach materials	583	
SWCD and Conservation Partners		
# landowners provided with technical assistance	5	3 potential violations and 2 compliance opportunities.
# site visits	4	3 potential violations and 1 compliance opportunity.
# conservation plans written		
SIA and Project Funding		
# funding applications submitted	1	$125,000 OWEB Grant for TA and monitoring.
# funding applications awarded	1	$125,000 OWEB Grant for TA and monitoring.

4.1.4 Pesticide Stewardship Partnerships

There are no PSPs in this Management Area.

4.1.5 Groundwater Management Area

The measurable objective for the LUBGWMA is listed in Chapter 3, and was recently added during the 2024 biennial review. Results from this measurable objective will be reported in 2026.

There has been extensive discussion regarding the LUBGWMA, agricultural management plans within the LUBGWMA, and obtaining verifiable nutrient leaching data within the LUBGWMA.

Table 4.1.5.1 Groundwater Management Area Results: Inventory non-permitted livestock operations within the LUBGWMA

Measurable Objective
By June 30, 2025, the Umatilla SWCD and Morrow SWCD will complete an inventory of large and small livestock operations including acreage, irrigation, and drainage paths within the LUBGWMA.
Activities and Accomplishments
The Morrow SWCD received an ODA Agricultural Water Quality Support Grant to complete the inventory. The database and data input forms are being developed and the Morrow and Umatilla SWCDs will begin the inventory in May 2024.
Adaptive Management
To be completed during 2026 biennial review.

Table 4.1.5.2 Groundwater Management Area Results: Inventory crop and sprinkler systems within the LUBGWMA

Measurable Objective
By June 30, 2025, the Umatilla SWCD and Morrow SWCD will complete an inventory of crop and sprinkler systems in the LUBGWMA including crop type observed, irrigation method/type, cover crop (if any), and rotation crop (if known).
Activities and Accomplishments
The Morrow SWCD received an ODA Agricultural Water Quality Support Grant to complete the inventory. The database and data input forms are being developed and the Morrow and Umatilla SWCDs will begin the inventory in May of 2024.
Adaptive Management
To be completed during 2026 biennial review.

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. The four-year results for activities conducted in 2020-2023 are provided in Table 4.2a below.

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

Table 4.2a Activities conducted in 2020-2023 by the Umatilla SWCD and Morrow SWCD

Activity	4-year results	Description
Community and Landowner Engagement		
# active events that target landowners/ managers (workshops, demonstrations, tours)	7	Covid-19 restrictions limited active events. Tour for water quality stream erosion projects, providing water quality educational information.
# landowners/managers participating in active events	264	
Technical Assistance (TA)		
# landowners/managers provided with TA (via phone/walk-in/email/site visit	352	TA includes information provided or assistance with funding.
# site visits	131	Assist with current projects and technical services.
# conservation plans written*	2	Riparian plantings and grazing plans.
On-the-ground Project Funding		
# funding applications submitted	8	Riparian fencing and bank stabilizations.

# funding applications awarded	4	Livestock exclusion grant, grant for the Umatilla County Bank Restoration and River Resiliency Guidebook.

* 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. OWRI results are provided annually in January after a year of proofing and GIS management.

Table 4.2b Implementation funding (cash and in-kind) for projects on agricultural lands reported 1997-2020 (OWRI data include most, but not all projects, implemented in the Management Area.)

Landowners	OWEB	DEQ	NRCS*	CTUIR	BPA	All other sources**	TOTAL
$2,538,399	$3,793,753	$26,817	$41,480	$407,534	$4,062,172	$2,512,894	$13,383,049

* This table may not include all NRCS funding due to privacy concerns.
**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 1997-2020 (OWRI data include most, but not all projects, implemented in the Management Area.)

Activity Type*	Miles	Acres	Count**	Activity Description
Upland		51,370		Grazing management, no-till agriculture, irrigation system improvements, and upland spraying.
Road	0		7	Bridge crossing.
Streamside Vegetation	20	470		Riparian plantings, riparian spraying, riparian fencing, bank stabilization
Wetland		216		Wetland vegetation planted and wetland treated for non-native and noxious plant species.
Instream Habitat	11			Large wood placement.
Instream Flow	0		0 cfs	Anchored habitat structures placed, flow deflector installed, mainstream channel modified/created, weir installed.
Fish Passage	99		8	Dam removal, diversion modifications.
TOTAL	**130**	**52,056**		

* This table may not include all NRCS projects due to privacy concerns.
** # hardened crossings, culverts, etc.

4.3 Additional Agricultural Water Quality and Land Condition Monitoring

4.3.1 Water Quality

4.3.1.1 DEQ Monitoring

For this biennial review, DEQ reviewed data from 58 ambient monitoring stations, of which four had sufficient data for this status and trends analysis (*Umatilla AgWQ Management Area: DEQ's Water Quality Status and Trends Analysis for the Oregon Department of Agriculture's Biennial Review of Agricultural Area Rules and Plan.* 60pp. 2018). Water quality at the McKay Creek site is driven primarily by McKay Reservoir six miles upstream.

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

Table 4.3.1.1 Agricultural Water Quality Concerns: Surface Water

Site Description	Parameter					
	E. coli	pH	Dissolved Oxygen	Temperature	Total Phosphorus (mg/L)	Total Suspended Solids (mg/L)
	Attainment Status and Trend				median; maximum[1]	median; maximum[2]
Umatilla River at Yoakum Bridge - 10404	Yes↓	Yes↓	Yes↓	N/A	0.075; 0.37	159; 217 (No↓)
Umatilla River at Highway 11 - 10406	N/A	Unassessed	Yes↑	N/A	0.03; 0.2 (→)	90; 90 (No→)
Umatilla River at Westland Road - 11489	Yes↓	Yes↓	Yes↓	N/A	0.08; 0.51	251; 504 (No↓)
McKay Creek at Kirk Road - 12005	No	Yes↓	Yes↑	N/A	0.07; 0.25	N/A

[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 total suspended solids in this Management Area
↑ Statistically significant improving trend
↓ Statistically significant degrading trend

E. coli: Values are generally low, however the trend line for Umatilla River at Yoakum Bridge and Umatilla at Westland Road have been noticeably degrading.

pH: The three stations that were assessed for pH had exceedances; the exceedances are becoming fewer, but still contribute to a degrading trend. Continued efforts in the area will begin to reverse this downward trend.

Dissolved oxygen: The dissolved oxygen standard is complex, and DEQ has several criteria that apply to this Management Area including 8 mg/L (cold water beneficial use) or 6.5 mg/L (cool water use) that apply year-round, except for 11 mg/L during the salmonid spawning seasons. Warm water holds less oxygen. Dissolved oxygen has been noticeably declining in the Umatilla River at Yoakum Bridge and Umatilla River at Westland Road sites and is improving slightly at both the McKay Creek at Kirk Road site and Umatilla River at Highway 11 site.

Total phosphorus: levels are high in McKay Creek at Kirk Road and in all 3 Umatilla River sites as shown in the table with medians nearing, and extremes much greater than ODA's general stream limit of 0.08.

TSS: Levels generally meet the TMDL location, except at Yoakum Bridge where values are about 100 times those at the other locations. Higher levels appear to occur during spring runoff or during heavy rainfall events. The last exceedances occurred during the February 2020 floods.

4.3.1.2 SIA Monitoring

McKay Birch SIA

The Umatilla SWCD sampled major streams within the McKay Birch SIA area to develop a baseline of data, and to see if any change was taking place. Two sampling sites were located on McKay Creek above the dam. They were both tested for *E. coli*, nitrogen, Total Kjeldahl Nitrogen (TKN), total phosphorous, and total suspended solids (TSS) by the Bureau of Reclamation (BOR). Four sampling sites are on Birch Creek and one on Stewart Creek, and all sites were tested for nitrogen, TKN, total phosphorous, and TSS by the BOR.

For this biennial review, the Umatilla SWCD reviewed the data provided by the BOR for the seven monitoring sites and calculated the averages in table 4.3.1.2 below.

Table 4.3.1.2 Agricultural Water Quality Concerns

Site ID	Site Description	*E. coli* (ct/100mL)	Nitrogen (mg/L)	TKN (mg/L)	Total Phosphorus (mg/L)	Total Suspended Solids (mg/L)
UMA137	**McKay Creek**	Avg. 27.22	Avg. 0.088	Avg. 0.246	Avg. 0.063	Avg. 9.11
UMA138	**McKay Creek**	Avg. 25.89	Avg. 0.074	Avg. 0.246	Avg. 0.060	Avg. 7.06
UMA132	**Birch Creek**	-	Avg. 0.439	Avg. 0.415	Avg. 0.164	Avg. 71.38
UMA133	**Birch Creek**	-	Avg. 0.475	Avg. 0.493	Avg. 0.289	Avg. 147.54
UMA134	**Birch Creek**	-	Avg. 0.534	Avg. 0.378	Avg. 0.177	Avg. 63.33
UMA135	**Birch Creek**	-	Avg. 0.312	Avg. 0.369	Avg. 0.151	Avg. 44.92
UMA136	**Stewart Creek****	-	Avg. 2.34	Avg. 0.432	Avg. 0.156	Avg. 21.58

** High nitrogen levels were observed. However, it was determined that agriculture is not contributing to high nitrogen levels because the results did not change when livestock were removed (three winter livestock operations that only have livestock from December to March). Mud swallows were observed on the bridge upstream of the sampling site, so the sampling location was moved 100 yards upstream and the levels went down. It is also possible that septic systems close to the creek are contributing (eight houses with septic systems within 100 yards from the creek).

McKay Creek: Overall, McKay Creek averages around 25 ct/100mL of *E. coli* and there always seems to be a spike during flooding events. Nitrogen, TKN, and total phosphorus are all holding steady without much change. However, there is slightly higher nitrogen at the downstream site. TSS is much better than sites on Birch Creek and is below the TMDL.

Birch /Stewart Creek: Overall, Birch Creek maintains consistent averages for nitrogen, TKN, and phosphorus. Stewart Creek, however, shows very high levels of nitrogen. Birch Creek's largest water quality concern is highly eroded banks and therefore consistent levels of high TSS. Generally, the trends increase proceeding farther downstream on Birch Creek.

East Birch SIA

Starting in 2024, the Umatilla SWCD will monitor water temperature in the East Birch SIA, and reporting will occur during the next biennial review.

4.3.2 Land Condition

There is no additional land condition monitoring.

4.4 Biennial Reviews and Adaptive Management

ODA, the LAC, the LMA, and other partners met on February 21, 2024, 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

Progress
Outreach and Education: • Watershed field days (fourth grade through high school). Also, outdoor school with natural resource focus. • Streambank stabilization presentations to landowners. • Ag water quality high school presentations. Grant Writing: • Worked on grants for livestock water development, fencing off waterways, off-stream water, replanting with native vegetation, and bank stabilization. Technical Assistance: • Created a bank restoration guidebook that includes pre-engineered bank restoration options for landowners. • Site visits for landowners needing help solving a water quality or agricultural issue (livestock water development, fencing off waterways, off-stream water, replanting with native vegetation, and bank stabilization). • Because of the recent flood events, landowners are working with SWCD to move to off-stream watering because on-stream watering is no longer possible. • 26 drone flights (invasive weed scouting, erosion mapping, terrain mapping, etc.). • SIAs o Monitored seven sites on within the McKay Birch SIA from 2019-2022. o A sampling plan was developed for temperature monitoring in the East Birch SIA.
Impediments
• Management Area-wide assessments were not completed for this biennial review due to staff time and resources needed for the LUBGWMA. • OWEB grant requirements have become more stringent over time. Every year they require more information to make a project competitive. Therefore, the Umatilla County SWCD is having to submit proposals several years in a row to get awarded. • OWEB cultural resource requirement will double the costs of small grant projects. • Capacity is especially challenging as a one-person district.

- Conservation plans from NRCS don't make it to Umatilla SWCD and conservation data is not being shared due to privacy concerns.
- The LAC voiced concerns over regularly changing assessment methods in the Area Plan.
- Flood events in 2019 and 2020 impacted landowners who were historically in compliance with the riparian rule.
- Weeds are a growing problem since the 2019 and 2020 floods. Issue with weeds being used as a cover crop, especially on parcels not in active production.
- Stream temperature within Umatilla River continues to exceed standards. The 2019 and 2020 floods likely had an impact on the trend.

Recommended Modifications and Adaptive Management

- Recommendation to add Washington State University as a player within Planned Activities for 2024-2027, they are acting in partnership with Oregon State University in the Umatilla Basin.
- Work with NRCS to see if it's possible to collaborate on Management Area-wide measurable objectives.
- Umatilla SWCD to connect with DEQ on water quality monitoring data to compare pre-flooding and post-flooding data.
- Recommendation for DEQ to consider alternative sites for temperature monitoring in the Umatilla management area.
- Relationship building and outreach is needed for Spanish-speaking landowners in the LUBGWMA; currently there is almost zero connection to these landowners.
- Reinvigoration of Tiichám Conservation District may be the vehicle to work with private landowners within reservation. Recommendation to reach out to the Tiichám Conservation District to see if there is potential for collaboration.

Table 4.4b Number of ODA compliance activities 1/1/2019 through 12/31/2023

Location	Cases		Site Visits	Agency Actions				
				Letter of Compliance		Pre-Enforcement Notification	Notice of Noncompliance	Civil Penalty
	New	Closed		Already in compliance	Brought into compliance			
Outside SIAs	1	0	0	0	0	0	0	0
Within SIAs	2	3	4	2	1	0	0	0