OREGON DEPARTMENT OF AGRICULTURE

Middle John Day Agricultural Water Quality Management Area Plan

May 2025

Developed by the

Oregon Department of Agriculture

and the

Middle John Day Local Advisory Committee

with support from the

Wheeler Soil and Water Conservation District

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Table of Contents

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Acronyms and Terms

Ag Water Quality Program – Agricultural Water Quality Program
Area Plan – Agricultural Water Quality Management Area Plan
Area Rules – Agricultural Water Quality Management Area Rules
CAFO – Confined Animal Feeding Operation
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
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
USDA – United States Department of Agriculture
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 goal, 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 603-095-2500). 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).

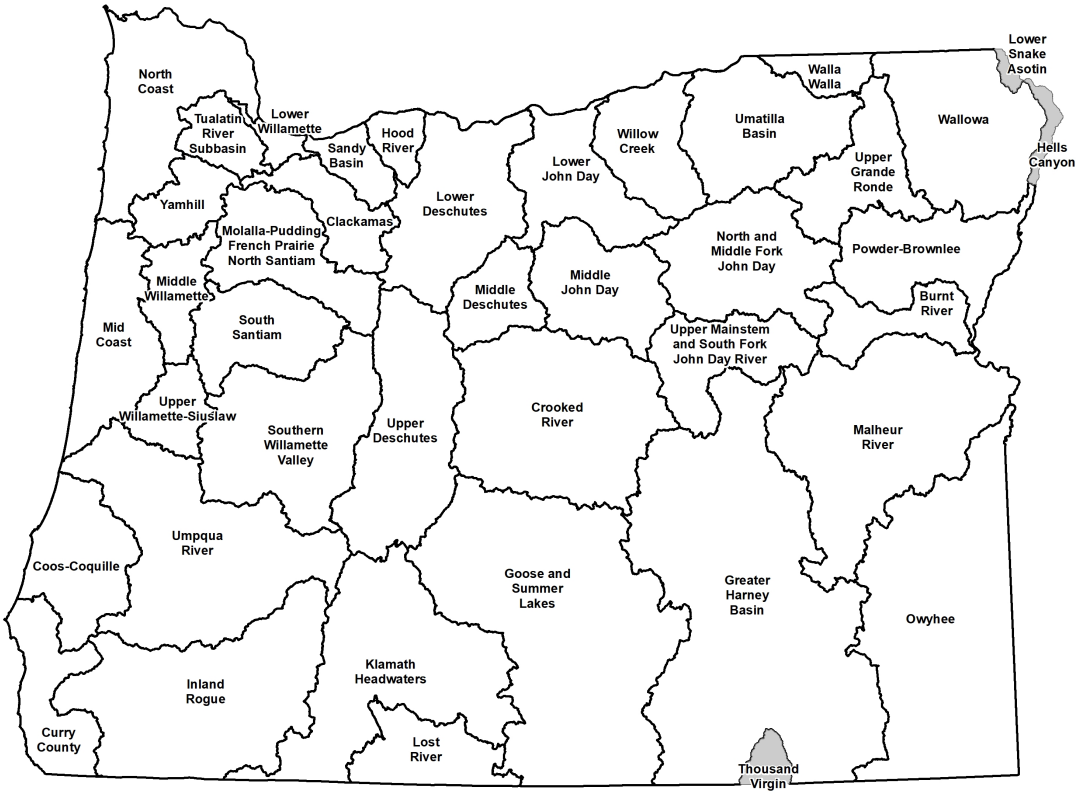
1.2 History of the Ag Water Quality Program

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.

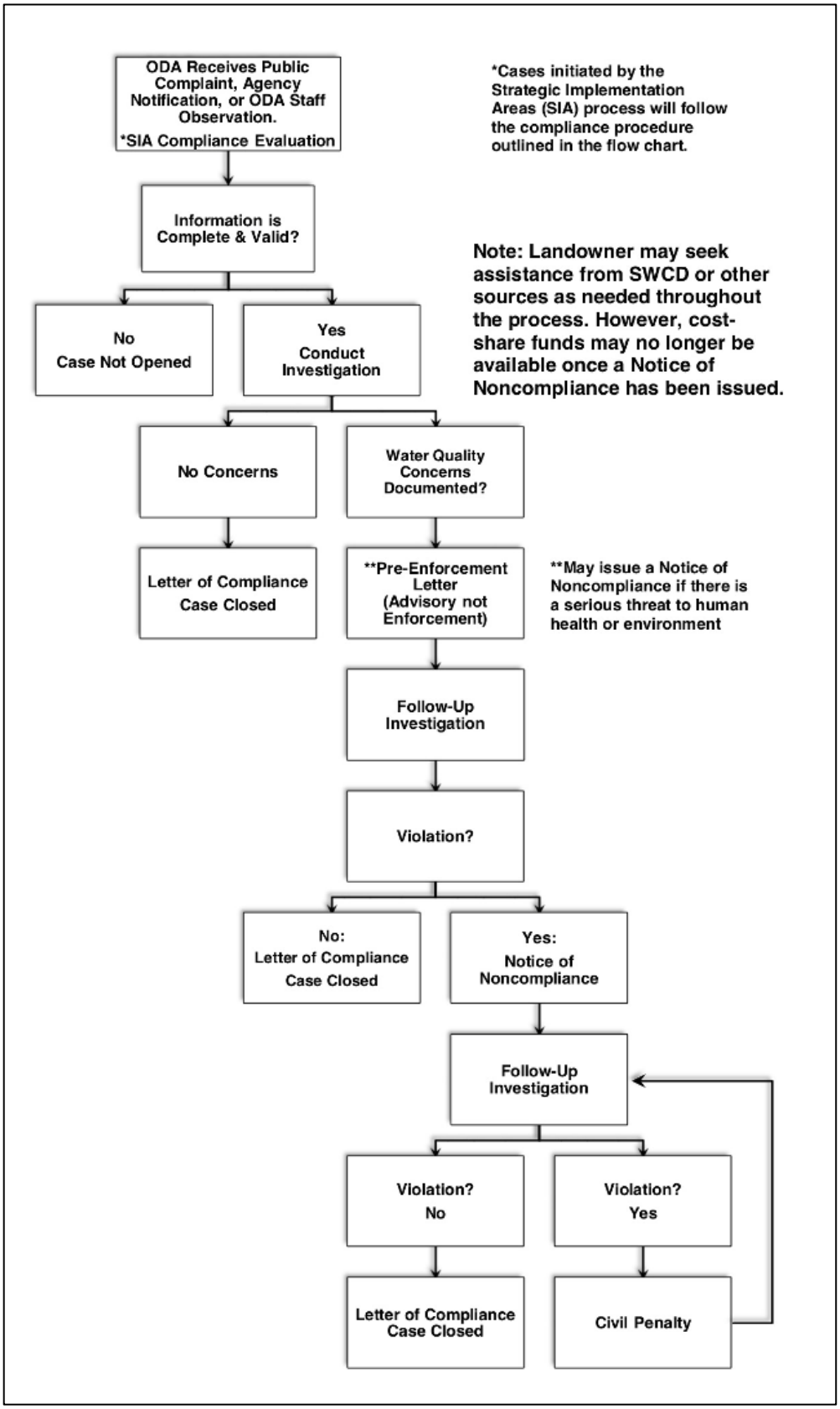
1.3.1.1 ODA Compliance Process

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 1.3.1.1).

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 and turbidity, phosphorous, nitrates, algae, pH, dissolved oxygen, harmful algal blooms, pesticides, and mercury. Water quality impairments vary across the state; they are summarized for this Management Area in Chapter 2.4.

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/wps/portal/nrcs/detail/or/soils/health.

1.5 Other Water Quality Programs

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

1.5.1 Confined Animal Feeding Operation Program

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

1.5.2 Groundwater Management Areas

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

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

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 2018 (http://www.oregon.gov/ODA/shared/Documents/Publications/NaturalResources/DEQODAmoa.pdf).

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

1.6.2 Other Partners

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

1.7 Measuring Progress

Agricultural landowners have been implementing 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.

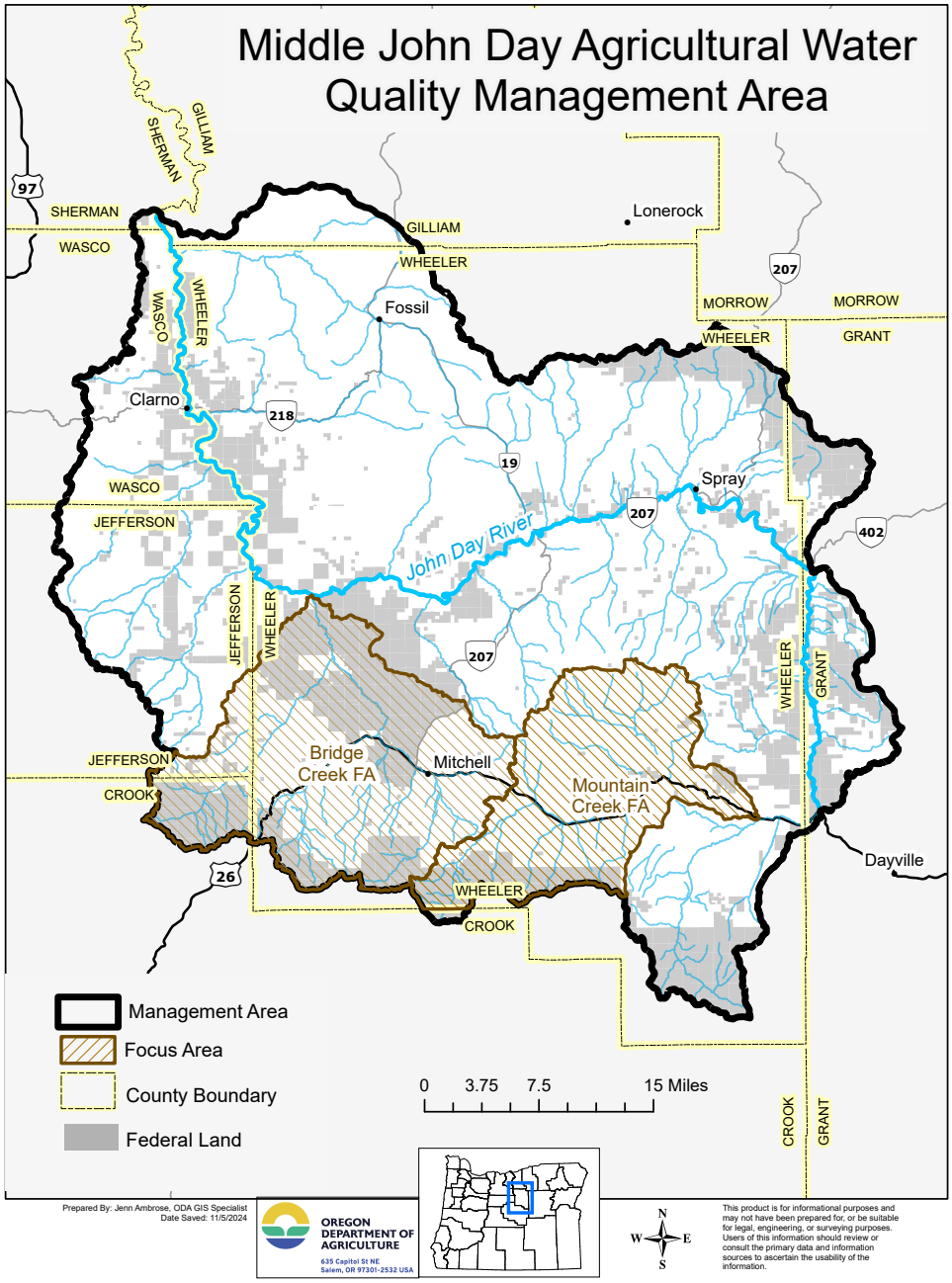
Water quality monitoring efforts in this Management Area are described in Chapter 3, and the data are summarized in Chapter 4.

Chapter 2: Local Background

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

The Management Area includes parts of Wheeler, Grant, Gilliam, Jefferson, Wasco, and Crook SWCDs. The cities of Fossil, Mitchell, and Spray are the incorporated cities in the subbasin.

Figure 2 Middle John Day 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 Current LAC members

Name	Geographic Representation	Description
John Aaron	Heppner	Timber
Jim Driscoll	Kimberly	Cattle, hay
Jean Hill	Kimberly	Cattle
Jeremiah Holmes	Spray	Hay, cattle
Bryce Logan	Fossil	Livestock and wildlife
Adam Temple	Twickenham	Hay
Jim Bob Collins	Mountain Creek	Cattle, hay, SWCD Board Chair
Roberta Vandehey	Winlock, West Alder Creek	Timber and cropland

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 Ag Water Quality Program in specific Management Areas. The lead LMA for this Management Area is Wheeler SWCD, and the other LMAs are Jefferson, Wasco, Gilliam and Monument SWCDs. These SWCDs were also involved in development of the 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 Area Plan and Area Rules in 2003.

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 John Day River Basin is an 8,100 square mile drainage area, the fourth largest basin in the state. The flows originate in the Blue Mountains and flow generally westward and then northward for approximately 284 miles, discharging into the Columbia River east of Rufus, at River Mile (RM) 218. The John Day River is one of the longest undammed rivers in the United States. The climate is continental, characterized by low winter and high summer temperatures, low average annual precipitation and dry summers. Precipitation ranges from 10 to 12 inches at low elevations and up to 30 inches in the mountains. Most precipitation falls between November and March. Less than 10 percent of the annual precipitation falls as rain during July and August, usually from sporadic thunderstorms. Throughout the subbasin, actual temperatures vary from subzero during winter months to more than 100°F during the summer. Inflows of moist Pacific

air moderate extreme winter temperatures. The average frost-free period is 50 days in the upper basin and 200 days in the lower basin.

The Middle John Day Management Area contains 1,894 square miles or 1,212,160 acres. It includes a 110-mile reach of the John Day River from the Gilliam-Wheeler county line (RM 95) to the upstream end of Picture Gorge (RM 205). The elevation ranges from 1,300 feet near Clarno to more than 6,000 feet in the Ochoco Mountains. The climate varies from semi-arid to relatively moist at higher elevations. The average annual temperature at Mitchell is 49^{o} F, with the average low of 33^{o} F and average high of 68^{o} F.

2.3.1 Geology, Land Cover and Land Use, Land Ownership, Special Uses, Water Resources, Water Use, Fisheries and Wildlife Resources, and Agriculture

Geology

The Middle John Day River is underlain by basalt and andesite lava flows that cap several thousand feet of weakly structured mudstones, clayey sediments, and other soft rocks composed of volcanic debris. The effect of relatively brittle lava flow rocks perched on easily erodible sediments results in the classic landslide terrain that comprises the region. Examples of acre and mountain-size tilted slump blocks with perched basalt flows are common (e.g., Sheep Rock) and represent the aggressive nature of mass-wasting processes that are continually taking place. The result of these processes has produced the dramatic incised terrain of the Middle John Day: up to 3,500 feet of downcutting of the wide, uplifted central Oregon plateau.

Sediment loading of the Middle John Day River and various tributaries is of concern to the LAC. It is recognized that sudden weather events, such as summer flash floods (water spouts), coupled with the region's geological setting, are responsible for the creation of the valley. Periodic, often isolated, weather events cause severe sedimentation in the drainage systems, including nonsettleable clayey sediment. Single events can release thousands of cubic yards of sediment and scour the steep wall canyons. These are naturally occurring events to which the ecosystem is adjusted. Sediment loading from man-made developments, including ranch roads, cropland, and building sites, tend to be insignificant in comparison.

Land Cover and Land Use

Range and shrublands cover 61 percent of the subbasin, forest covers 36 percent, and the remainder is urban, roads, open water, or barren. Western juniper has encroached into many areas and all areas, especially along transportation corridors, have increasing threats for noxious weeds. These invasive species replace the native vegetation with less desirable vegetation.

Nearly all the land is grazed and only 2 percent is used for farming activities such as pasture, hay, and small grains.

Land Ownership

The 1.2 million acres in the Management Area is 78 percent privately owned. The public owns 22 percent and is managed by the Bureau of Land Management (BLM), the U.S. Forest Service (USFS), the National Park Service (NPS), and the State of Oregon.

Special Uses

There are numerous special use areas designated in the Management Area. The John Day River is federally designated as wild and scenic from the mouth to Service Creek and state-designated as a Scenic Waterway from the mouth to Parrish Creek. The John Day Fossil Beds

National Monument includes three units (Clarno, Painted Hills, and Sheep Rock) managed by the NPS. The Bridge Creek Wilderness Area is located in Ochoco National Forest, and the BLM manages the Research Natural Area, one Wilderness Area (Spring Basin), and two Wilderness Study Areas (Sutton Mountain and Pat's Cabin).

The Management Area is within the ceded lands of the Confederated Tribes of the Warm Springs Reservation of Oregon (Tribes). The Tribes have reserved certain treaty rights to the use of the land and its resources, and this area is still used for ceremonial and subsistence purposes. The Tribes also manage the Pine Creek Conservation Area, a 34,000-acre wildlife habitat protection project near Clarno.

Water Resources

Peak flows in the John Day River occur from late March to early June and can account for as much as 70 percent of the annual discharge. Low flows occur from July through November. The Middle John Day Management Area is fairly dry. Flows are determined more by input from upper tributaries than by inputs from lower tributaries. Smaller streams are likely to stop flowing in the late summer and fall. Main tributaries are Bridge Creek and Butte Creek.

Outflow of the Management Area is not measured since there is no recording station at Clarno. The nearest gauge is at McDonalds Ferry, near the mouth of the John Day Basin. Major inflow from upstream subbasins is measured by gauges at Picture Gorge on the Upper Mainstem and at Monument on the North Fork. The gauge at Service Creek, which is roughly the midpoint of the Management Area, provides a good record of water production for the subbasin above that point. Flow data indicate that the subbasin above the gauge produces about 100,000 acre-feet of water per year, or roughly 120 acre-feet of water per square mile.

Water quality in the John Day River is generally satisfactory except during water flow extremes. Turbidity, erosion, and sedimentation problems occur during high flows, and higher temperatures occur with concurrent lower dissolved oxygen during low flows.

High water temperatures create the most serious threat to beneficial uses of the water. Tributaries have high temperatures in the summer. These tributaries carry high sediment loads during heavy rainstorms and snowmelt. Portions of the basin contain soils of the fossil formations. Stream turbidity increases during heavy rains because the very fine soils remain in suspension, resulting in higher sediment loads.

Water Use

More than 85 percent of the appropriated water volume is used for irrigation. Another 9 percent is for mining; all mining rights date from before 1940 and a majority are probably not used. There also are rights for about 4 cubic feet per second for municipal use, the majority for the town of Spray.

The Oregon Water Resources Department (OWRD) approves the in-stream water rights for fish protection to minimize the effects of pollution or maintain recreational uses. In-stream water rights have a priority date and are regulated in the same way as other water rights. An in-stream water right cannot affect a use with a senior priority date. In-stream water rights were established for the mainstem John Day River at Service Creek in 1962; lower Bridge Creek in 1983; and upper Bridge Creek, Rock Creek, and Bear Creek in 1990.

Fisheries and Wildlife Resources

The John Day River supports runs of wild anadromous ESA-listed summer steelhead and spring Chinook. Summer steelhead are the most widely dispersed salmonid in the John Day basin. The John Day River summer steelhead major population group (MPG) is one of four MPGs in the Middle Columbia River Steelhead Distinct Population Segment (Mid-C steelhead DPS) and the only MPG wholly within Oregon. The Lower John Day also supports fall Chinook salmon, and anadromous Pacific lamprey are present throughout the basin (CTWSRO, 2015). Other focal native fish species include ESA-listed bull trout, westslope cutthroat trout, and interior redband trout (resident *O. mykiss*). It is estimated that there are 27 species of fish, including 17 native species. Smallmouth bass, an introduced warmwater game fish, provide an economically important fishery in the lower John Day River. The current fish management policy is focused on maintaining native stocks of fish by preserving genetic integrity.

The riparian and upland habitats of the Management Area are used by a variety of terrestrial wildlife, including mule deer, elk, small mammals, migratory birds, reptiles, and amphibians. Mule deer is a good indicator of upland health.

Agriculture

Agriculture is the primary economic activity in the Management Area. Total gross sales for Wheeler County in 2022 were reported as $9,549,000. Cattle were by far the leading commodity ($8.1 million) and hay products coming in second. Hay and forage, field crops, recreation and fee hunting, and other livestock and animal products contribute to the agricultural economy.

2.4 Agricultural Water Quality

2.4.1 Water Quality Issues

2.4.1.1 Beneficial Uses

Beneficial uses in the Management Area include drinking water, recreational activities, aquatic life, and agriculture (www.oregon.gov/deq/wq/Pages/WQ-Standards-Uses.aspx). Of the beneficial uses, the most sensitive use for most waters and parameters of concern is spawning and rearing of cold-water fisheries.

2.4.1.2 Water Quality Parameters of Concern

The primary water quality concerns for agriculture in the 2022 Integrated Report are high temperature, sedimentation, biological criteria, and dissolved oxygen. (https://www.oregon.gov/deq/wq/Pages/epaApprovedIR.aspx).

Temperature

Water temperature is primarily a concern in the summer, 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.

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.

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 90-day geometric mean of 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 their 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).

2.4.1.3 TMDLs and Agricultural Load Allocations

The John Day Basin TMDL, which includes this Management Area, was approved in 2010. A copy of the John Day TMDL can be found at https://www.oregon.gov/deq/wq/tmdls/Pages/TMDLs-Basin-John-Day.aspx.

Table 2.4.1.3: John Day Basin TMDL and Load Allocations for this Management Area
Temperature: Applies to all waterbodies in the John Day Subbasin. **Load Allocation:** The daily sum of the natural background solar heat load, throughout the basin stream network, and the heat load corresponding to the additional 0.1ºC human use allowance (HUA). (Note: HUA accounts for all nonpoint sources collectively; agriculture's allocation is not separate.) **Load Allocation Surrogate:** Effective shade. **TMDL Revisions:** DEQ is under a court order to update and replace the John Day Basin temperature TMDLs to make them consistent with the current temperature standards. These TMDLs must be updated because they were based in part on the Natural Conditions Criterion, a section of the temperature standard that was subject to litigation and has since been disapproved by EPA. DEQ must issue the updated temperature TMDL in the John Day Basin by November 2027. (www.oregon.gov/deq/wq/tmdls/Pages/tmdlreplacement.aspx).
Dissolved Oxygen: Addresses summer dissolved oxygen concerns. **Load Allocation:** Dissolved oxygen standards are expected to be met through Temperature TMDL load allocations
Biocriteria: Addresses biocriteria. **Load Allocation:** Biocriteria standards are expected to be met through Temperature TMDL load allocation.
Bacteria: Applies to all waterbodies in the John Day Subbasin. (Note: Current data on bacteria does not present bacteria as an issue in the Middle John Day Management Area, but the data is limited. Additional monitoring is needed to determine whether bacteria is an issue in this Management Area.) **Load Allocation:** 83 percent reduction of *E. coli* organisms entering streams via runoff and direct deposition.

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 seven active public water systems using a combination of surface and groundwater sources in this Management Area serving approximately 1,244 people; additional public water systems serve another 310 people. Approximately 21 private surface drinking water rights and numerous private groundwater wells provide water for domestic use.

Drinking water contaminants of concern within this Management Area are total coliform, *E. coli*, nitrate, haloacetic acid (HAA5), trihalomethanes (TTHM), sodium, and fluoride. Of this list, only *E. coli* and nitrate are potentially sourced from agriculture. None of the public water systems had an alert for *E. coli* or nitrate in the past 10 years. There are 16 records of private well samples, of which one measured nitrate concentration ≥ 5 mg/L.

Nitrate and *E. coli* from sources such as fertilizers and septic systems can readily penetrate to aquifers used for drinking water when soil leaching potential is moderately high or high, and bacteria removal through soil filtration can be less effective in sandy soils. Unfortunately, most

of the soils in the Management Area have not been assessed. The areas that have been assessed mostly have soils with low or moderate nitrate leaching potential. Landowners should always properly manage manure and fertilizer to minimize leaching and runoff of nitrates and *E. coli* to surface and ground water.

2.4.2 Sources of Impairment

Both point and nonpoint sources contribute to water pollution. The accumulation of point and nonpoint source pollution results in water quality impairment. Point sources discharge pollutants into the water through a pipe or conveyance. In contrast, nonpoint source pollution is pollution emanating from landscape scale sources and typically cannot be tracked to a single point of discharge. Nonpoint sources of pollution in the area can include the effects of weather events causing runoff and erosion from agricultural and forest lands, leaching of pollutants to groundwater, eroding streambanks, and runoff from roads and urban areas. Pollutants from nonpoint sources can be carried to the surface water or groundwater through the actions of rainfall, snowmelt, irrigation, and leaching. Increased heat input due to vegetation removal, seasonal flow reduction, changes in channel shape, and floodplain alteration are major sources of water quality impairment. Channelization and bank instability may alter gradient, width/depth ratio, and sinuosity, thereby causing undesirable changes in sediment transport regime, erosional and depositional characteristics, and elevated temperature.

2.5 Regulatory and Voluntary Measures

A landowner's responsibility under this Area Plan is to implement measures that prevent and control the possible sources of water pollution that may be associated with agricultural and rural lands and activities. The sections that follow provide more detailed information related to potential agricultural water quality concerns. Criteria to determine measures to be implemented will consider agricultural and economic impacts.

2.5.1 Area Rules

OAR 603-095-2540 Prevention and Control Measures

(1) Limitations: All landowners or operators conducting activities on agricultural and rural lands are provided the following exemptions from the requirements of OAR 603-095-2540 (Prevention and Control Measures).
   (a) A landowner or operator shall be responsible for only those conditions caused by activities conducted on land managed by the landowner or operator.
   (b) Rules do not apply to conditions resulting from unusual weather events or other circumstances not within the reasonable control of the landowner or operator. Within the reasonable control of the landowner means that technically sound and economically feasible measures must be available to address conditions described in Prevention and Control Measures.
   (c) The Department may allow temporary exceptions when a specific integrated pest management plan is in place to deal with certain weed or pest problems.

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

(3) Effective January 1, 2008, riparian management must allow the establishment, growth, and active recruitment of vegetation consistent with the vegetative capability of the site, for protection of water quality by filtering sediment, stabilizing streambanks and providing shade.

(4) Effective January 1, 2008, irrigation must be done in a manner that limits the amount of pollutants entering waters of the state in the runoff from the irrigated area.
(5) Effective January 1, 2008, areas used to control livestock, with a demonstrated impact on water quality, will be managed to control runoff of sediment or animal waste.

2.5.2 Voluntary Measures

Uplands Management and Soil Erosion

Landowners and operators should manage their resources to prevent and control water pollution from upland soil erosion and runoff of pollutants. This includes agricultural and rural lands that may not be in close proximity to water bodies but have the potential to contribute to water quality degradation through runoff of sediment or animal wastes.

Upland areas are the range, forest, and croplands upslope from the riparian areas to the ridge tops. Vegetation on upland areas is dependent on physical characteristics including geology, landform, soils, water, and other climate factors. Healthy uplands maintain productivity over time and are resilient to stress caused by variations in physical conditions.

Healthy upland areas provide several important ecological functions, such as:

- Capture, store, and safely release precipitation in balance with climate and landform,
- Provide plant health and diversity that supports habitat (cover and forage) for wildlife and livestock,
- Filter sediment and thus reduce polluted runoff,
- Provide root masses that utilize nutrients and stabilize soil against erosion.

Indicators of healthy conditions may include:

- Ongoing recruitment of beneficial vegetation,
- Adequate groundcover to limit runoff of nutrients and sediment,
- Cropland condition sufficient to limit runoff of nutrients, sediment, and pesticides,
- Roads and related structures designed, constructed, and maintained to limit sediment delivery to streams,
- Noxious weeds controlled or contained.

Factors to evaluate upland area condition may include:

- Stubble height as a tool to measure plant utilization,
- Species composition to measure plant health and diversity,
- Groundcover (plants, litter) to measure potential for erosion,
- Presence of patterns of erosion caused by overland flows,
- Domestic livestock and/or wildlife carrying capacity,
- Soil loss prediction models available at local Natural Resources Conservation Service (NRCS) Field Office.

This Area Plan does not prescribe specific practices to landowners for management of upland areas to reduce runoff of sediment and other wastes. Site specific recommendations for management to protect water quality include grazing management systems, desirable vegetation types, and road construction and maintenance.

The following practices and many others may be considered in the development of a management system that is appropriate for prevention and control of pollution caused by agricultural activities on an individual parcel of land. Management practices and land management changes are most

effective when selected and installed as integral parts of a comprehensive resource management plan based on natural resource inventories and assessment of management practices. The result is a system using management practices and land management changes which are designed to be complementary, and when used in combination, are more technically sound than each practice separately.

Effective water quality management practices for soil erosion and sediment control:

- Range plantings of desirable perennial species,
- Livestock distribution systems:
    - Fencing
    - Water development
    - Salting
    - Herding
- Grazing management plans that balance available forage and utilization,
- Prescribed burning to control undesirable species and invigorate desirable species,
- Weed control to reduce plant competition,
- Thinning or removal of overstocked stands or trees and brush,
- Road design and maintenance to reduce runoff of sediment,
- Sediment retention basins and runoff control structures,
- Irrigation scheduling to maximize the efficient use of available water.

Riparian Area Management

Landowners and operators should manage their resources to prevent and control impacts to streams. Areas near waterbodies are especially important to water quality and sensitive to management activities because of the natural ecological functions they perform such as water infiltration, waste filtration, erosion control, water storage, and moderation of temperature.

The riparian area 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 areas provide several important ecological functions. These include:

- Dissipation of stream energy associated with high flows and thus influencing the transport of sediment,
- Capturing suspended sediment and bedload that builds streambanks and develops floodplain function,
- Retaining floodwater and recharging groundwater,
- Stabilizing streambanks through plant root mass,
- Developing diverse channel characteristics providing pool depth, cover, and variations in water velocity necessary for fish production,
- Supporting biodiversity,
- Shading for moderation of solar heat input,

- Recruitment of large woody debris for aquatic habitat.

Indicators to determine improvement of this condition include:

- Recruitment of desirable riparian plant species,
- 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 available to evaluate improvement of the riparian 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.

Effective water quality management practices for prevention and control of impacts to riparian areas:

- Critical area planting to stabilize erodible areas,
- Vegetative buffer strips to stabilize streambanks, filter sediment and wastes, and provide shade,
- Livestock management including riparian pastures, seasonal grazing, temporary or permanent fencing,
- Water developments including off-stream watering, water gaps and spring development,
- Weed control to reduce competition with desired species,
- Nutrient and chemical application scheduling to avoid drift or runoff,
- Road, culvert, bridge, and crossing maintenance.

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 waterbody 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 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. 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.

In general, flood irrigation utilizes 50 percent more water than a sprinkler system; an effort to increase the conversion from flood to sprinkler irrigation should be encouraged due to increased water temperatures and availability.

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,
- Efficient delivery of water 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,
- Appropriate scheduling of water application to the site including consideration of soil conditions, crop needs, climate and topography,
- Diversion structures that are installed and managed to control erosion and sediment delivery, and protect the stability of streambanks. If funding becomes available, temporary diversions, which must be reinstalled every year, should be replaced with suitable permanent diversions (i.e. pumping stations, infiltration galleries, dams).
- Diversions that are adequately for fish protection and provide for fish passage (refer to ORS 498.301).

Effective water quality management practices for prevention and control of impacts from irrigation:

- Irrigation scheduling based on crop needs, soil type, climate, topography, and infiltration rates,
- Irrigation system efficiency and uniformity monitoring,
- Diversion maintenance including push-up dam management, screens and fish passage,

- Return flow management to prevent pollution from entering streams,
- Backflow devices to prevent well contamination,
- Flow measuring devices to assure legal and efficient water usage,
- Cover crops to reduce soil erosion.

Livestock Management

This section applies to bacteria. Landowners or operators should manage their land to prevent and control water pollution from livestock enterprises. Management of areas used for grazing, feeding, and handling are critical to the success of livestock operations and has potential to affect water quality by the runoff of sediment and animal waste. Livestock management can be done in a manner that limits soil erosion and minimizes the delivery of sediment and animal wastes to nearby streams. A grazing management system should promote and maintain adequate vegetative cover, for protection of water quality, by consideration of intensity, frequency, duration, and season of grazing.

Managed grazing near streams should 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. Offstream 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.

Effective water quality management practices for prevention and control of impacts from livestock:

- Grazing management or scheduling based on intensity, duration, frequency and season of use,
- Pasture rotation including resting or deferred grazing,
- Vegetation management including grass seeding, weed control, clipping, fertilization, and controlled burning,
- Fencing to protect sensitive areas and aid in distribution,
- Watering facilities including spring developments, water gaps, off-stream water (may require water rights, refer to ORS 537.141),
- Salt and mineral placement to aid livestock distribution,
- Waste management systems for waste collection, storage, and utilization; facilities operation and maintenance,
- Routing clean water around confinement areas.

Chapter 3: Implementation Strategies

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

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

LAC Goal: Develop strategies that are practical and economically feasible in order to aid the prevention of water pollution from agricultural and rural activities and the control of water pollution if such problems exist.

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

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

3.1 Measurable Objectives and Strategic Initiatives

Measurable objectives allow the Ag Water Quality Program to evaluate progress toward meeting water quality standards and TMDL load allocations. Any measurable objectives are stated here. Progress is reported in Chapter 4.1.

3.1.1 Management Area

ODA is working with LMAs, LACs, landowners, and other conservation partners to achieve desired conditions on private agricultural lands that are protective of water quality. In this Management Area, practices addressing stream temperature are of high priority. Additionally, practices addressing soil erosion on private agricultural lands, particularly due to the recent large scale wildfire events, are also of high priority. The following practices have been chosen to establish long-term goals and to measure progress throughout the Management Area.

To moderate solar heat inputs (temperature), filter overland flow (sediment), and stabilize banks (sediment):

- Fencing along riparian areas for a streamside vegetation buffer (e.g. NRCS Practice Code 382),
- Planting shrubs and/or trees in riparian areas (e.g. NRCS Practice Code 391)

To prevent soil erosion:

- Seeding on disturbed (e.g. post-wildfire) lands (e.g. NRCS Practice Code 550)

Measurable Objectives, by December 2029 (contingent on funding):

- Install 32,520 feet of riparian buffer fencing,
- Plant 76.36 riparian acres of shrubs and/or trees, and

- Seed 295,350.82 acres of bare and/or disturbed private agricultural lands.

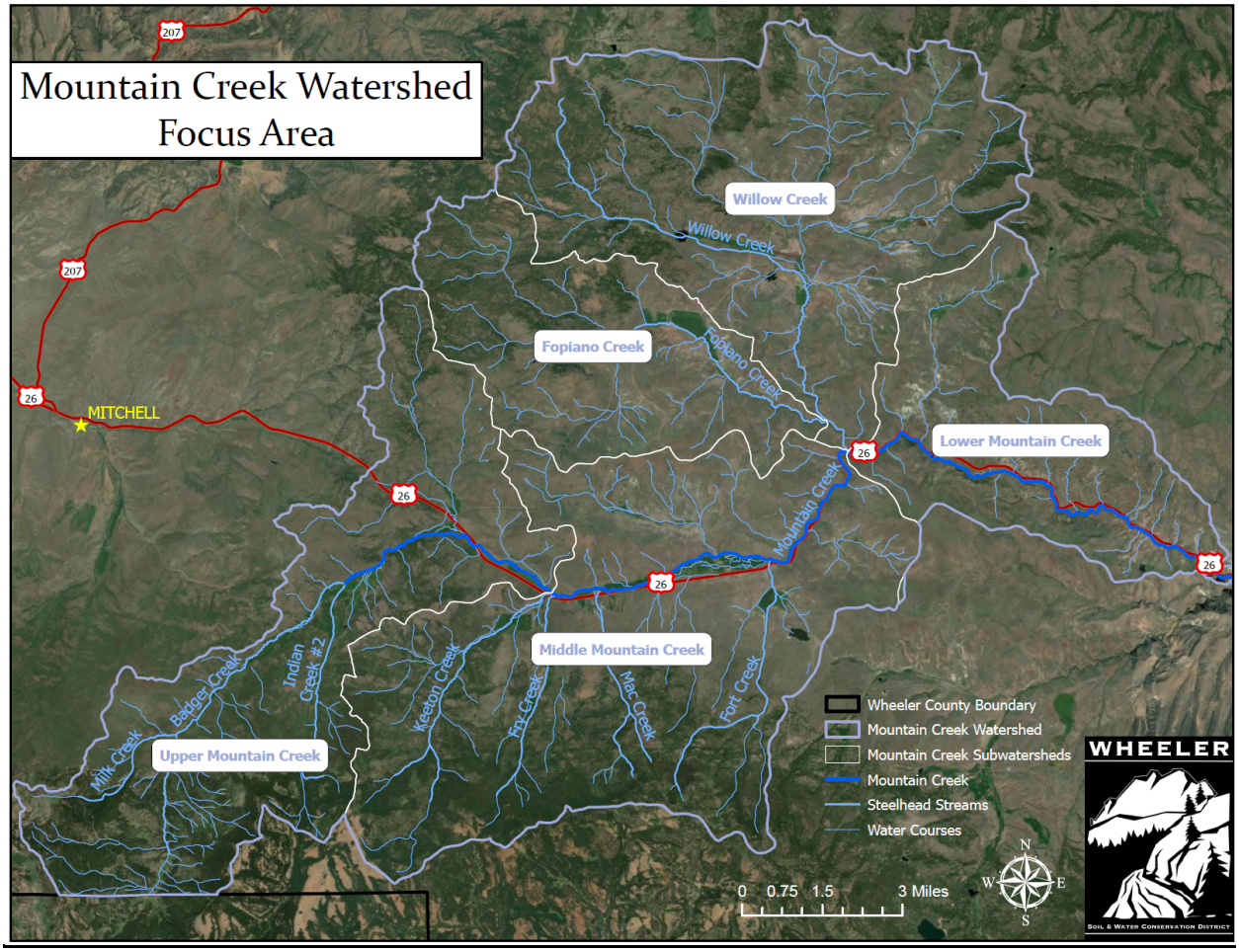
These goals will be reviewed at each biennial review and the strategies to accomplish these goals may be adjusted or adapted at biennial reviews as needed.

3.1.2 Focus Areas

Focus Areas are selected by SWCDs and all landowner participation in projects is voluntary. The Wheeler SWCD currently has two focus areas. The Wheeler SWCD is improving water quality in these focus areas by working with landowners to remove agricultural impacts to allow riparian buffer vegetation to establish and grow, reduce stream and overland sediment flows, increase stream shading, and improve upland forage.

3.1.2.1 Mountain Creek Focus Area

Mountain Creek Focus Area began in 2012 and is located east of the town of Mitchell along Highway 26 between Keyes Summit and the confluence of Mountain Creek into Rock Creek. It includes agricultural lands within the subwatersheds of Fopiano, Willow, Upper Mountain, Middle Mountain, and Lower Mountain Creeks. The focus area was determined by the 33.6 miles of surveyed stream channel on the mainstem of Mountain Creek in 2010.



Assessment Method:
The Wheeler SWCD conducted a survey on representative reaches of the streams using an "Intermediate Survey Level" as defined in the publication *Surveying Oregon's Streams "A Snapshot in Time."*[1] Percent shade is measured in degrees for both the left and right bank using an inclinometer; shade values are averaged for each unit. Percent active erosion was also measured during the field survey; each bank side was inspected for each unit for total active erosion.

In 2010, Wheeler SWCD conducted a reach evaluation of the 33.6 miles of mainstem that spanned 14 landowners. The purpose was to identify the severity of the limiting factors on a reach-by-reach basis and create an interactive GIS framework to improve the effectiveness of restoration work within the Mountain Creek Watershed. Nineteen out of 135 total "reaches" were selected as improvement reaches. These 19 reaches make up the four project reaches that are spread throughout the watershed and are representative of the system. A weighted average of the project reaches was calculated for the purpose of developing one measurable objective for shade and one for erosion.

2017 assessment results:
- Weighted average shade = 15.64%
- Weighted amount of erosion = 22.43%

Measurable Objective: By 2025,
- Increase weighted average shade to 29.00%.
- Decrease weighted average erosion to 10.00%

Milestone: Not applicable.

3.1.2.2 Bridge Creek Focus Area

Wheeler SWCD opened Bridge Creek Focus Area in 2023 (see map below). It is directly west of the Mountain Creek Focus Area and west of the town of Mitchell. It includes seven sub-watersheds with a total of 172,211 acres, of which approximately 34 percent is in agricultural use. Bridge Creek originates in the Ochoco Mountains and generally flows northwestwardly for approximately 28 miles before its confluence with the John Day River.

Assessment Method: Same method as Mountain Creek Focus Area. The assessment for this focus area is conducted on West Branch Bridge Creek, a direct tributary to Bridge Creek.

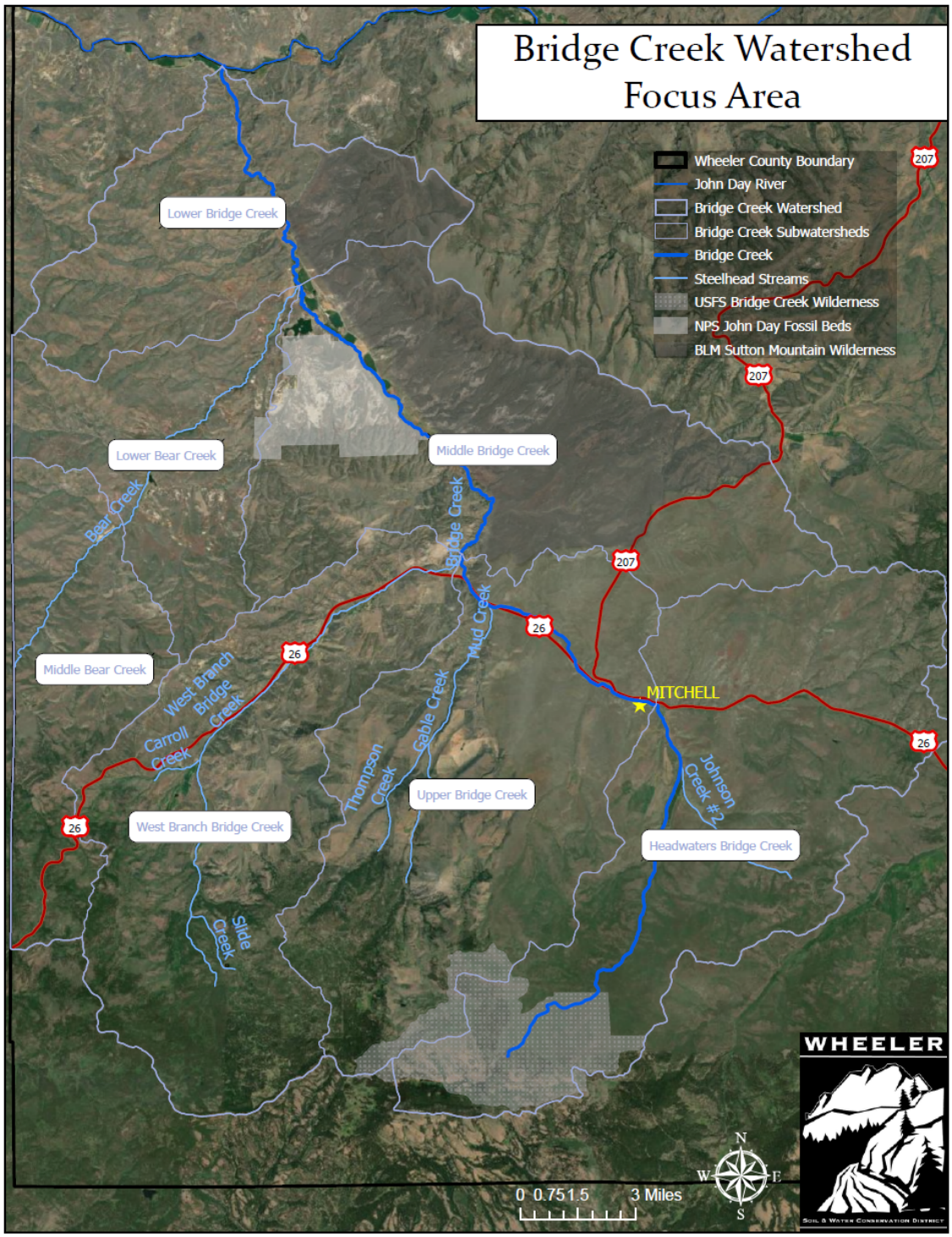
2023 assessment results:
- Weighted average shade = 35.62%
- Weighted amount of erosion = 8.68%

Measurable Objective: By 2035,
- Increase weighted average shade to 49.05%.
- Decrease weighted average erosion to 4.33%.

2023 Milestone: By 2026,

[1] Oregon Department of Fish and Wildlife. This publication is located on the web at: http://odfw.forestry.oregonstate.edu/freshwater/inventory/pdffiles/step.pdf.

- Increase weighted average shade to 38.55%.
- Decrease weighted average erosion to 7.40%.



3.1.3 Strategic Implementation Areas (SIA)

There are no SIAs in this Management Area.

3.1.4 Pesticide Stewardship Partnerships (PSP)

There are no PSPs in this Management Area.

3.1.5 Groundwater Management Area (GWMA)

There is no GWMA in this Management Area.

3.2 Proposed Activities

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

Table 3.2 Planned and Ongoing Activities for 2024 and 2025 throughout the Management Area by Wheeler SWCD and NRCS

Activity	Target*	Description
Landowner Engagement		
# events that actively engage landowners (workshops, demonstrations, tours)	12	NRCS Local Workgroup Meeting, Post Fire Meetings
# landowners participating in active events	2820	
Technical Assistance (TA)		
# landowners provided with TA (via phone/walk-in/email/booth/site visit)	1065	NRCS
# site visits	480	NRCS
# conservation plans written**	175	EQIP, IRA, RCPP, CSP
On-the-ground Project Funding		
# funding applications submitted	210	EQIP, IRA, RCPP, CSP

* Targets are for a 2-year period

** 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

3.3.1 Water Quality

DEQ monitors one site in the Management Area as part of their ambient monitoring network. Results of these additional monitoring activities are presented in Chapter 4.

3.3.2 Land Conditions

There is no additional agricultural land condition monitoring other than in the Focus Areas above.

Chapter 4: Progress and Adaptive Management

Chapter 4 describes progress toward achieving Area Plan goals and measurable objectives by summarizing accomplishments and monitoring results. Tracking activities is straightforward; monitoring water quality or land conditions takes more effort; relating changes in land conditions to changes in water quality is important but more challenging.

4.1 Measurable Objectives and Strategic Initiatives

The following tables provide the assessment results and progress toward measurable objectives and milestones in years 2018 through 2023. See Chapter 3.1 for background and assessment methods.

4.1.1 Management Area

Management Area-wide measurable objectives have not been developed.

4.1.2 Focus Areas

4.1.2.1 Mountain Creek Focus Area

Table 4.1.2.1 Mountain Creek Focus Area

Measurable Objective
By 2025 increase weighted average shade to 29.00% and decrease weighted average erosion to 10.00%.
Milestones
1. By 2019 increase weighted average shade to 15.93% and decrease weighted average erosion to 20.93%. 2. By 2021 increase weighted average shade to 21.65% and decrease weighted average erosion 16.94%.
Current Conditions
Progress Toward Measurable Objectives and Milestones The milestones for shade and erosion have been met and exceeded. This focus area is on track to achieve its measurable objective in 2025.
Assessment Results

	2015	**2017**	**2019**	**2021**
Shade Weighted Average	15.13	15.64	20.86	25.61
Erosion Weighted Average	25.98	22.43	17.48	13.16

Activities and Accomplishments (for January 2018 through December 2023)	
Community and Landowner Engagement	
# active events that target landowners/ operators	6
# landowners/operators participating in active events	71
Technical Assistance (TA)	
# landowners/operators provided with TA	224
# site visits	164
# conservation plans written	85
Ag Water Quality Practices Implemented in the Focus Area (Jan. 2018 through Dec. 2023)	

Brush Management	574.65	Acres

Herbaceous Weed control	16	Acres
Dam, Diversion	4	#
Fence	36541	Feet
Riparian Forest Buffer	27.65	Acres
Riparian Forest Buffer	50	#
Irrigation Pipeline	16	Feet
Livestock Pipeline	18587	Feet
Spring Development	13	Each
Stream Crossing	1	#
Structure for Water Control	4	#
Watering Facility	6000	Gallons
Watering Facility	3	#
Structure for Water Control	1	#

Adaptive Management Discussion

Landowners and the Wheeler SWCD were successful in improving the shade and erosion conditions. At the onset of this project, from 2010 through 2015, conditions were slow to improve. However, in the six-year period (2018 through 2023), shade and erosion milestones were met and exceeded. With conditions improving, the landowners and Wheeler SWCD are successfully working toward achieving the Focus Area measurable objective.

4.1.2.2 Bridge Creek Focus Area

Table 4.1.2.2 Bridge Creek Focus Area

Measurable Objective	
By 2035 increase weighted average shade to 49.05% and decrease weighted average erosion 4.35%.	
Milestones	
By 2026 increase weighted average shade to 38.55% and decrease weighted average erosion 17.40%.	
Current Conditions	
Progress Toward Measurable Objectives and Milestones Not applicable. The Wheeler SWCD has just begun work in this Focus Area. The pre-assessment was completed in 2023, and the next assessment is planned for 2026.	
Assessment Results: • Weighted average shade = 35.62% • Weighted amount of erosion = 8.68%	
Activities and Accomplishments (for calendar year 2023)	
Community and Landowner Engagement	
# active events that target landowners/ operators	0
# landowners/operators participating in active events	0
Technical Assistance (TA)	
# landowners/operators provided with TA	11
# site visits	4
# conservation plans written	1
Ag Water Quality Practices Implemented in the Focus Area	
Brush Management	48 acres
Comments: Active landowner engagement is planned for 2024.	
Adaptive Management Discussion	
Not applicable.	

4.1.3 Strategic Implementation Areas

There are no SIAs in this Management Area.

4.1.4 Pesticide Stewardship Partnerships

There are no PSPs in this Management Area.

4.1.5 Groundwater Management Area

There is no GWMA in this Management Area.

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.

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

Table 4.2a. Activities conducted in January 2018 through December 2023 throughout the Management Area by Wheeler SWCD, Mid John Day Watershed Council, and NRCS.

Activity	6-year results	Description
Landowner Engagement		
# events that actively engage landowners (workshops, demonstrations, tours)	18	
# landowners participating in active events	4,146	
Technical Assistance (TA)		
# landowners provided with TA (via phone/walk-in/email/booth/site visit)*	1,847	
# site visits	878	
# conservation plans written**	201	
On-the-ground Project Funding		
# funding applications submitted	201	
# funding applications awarded	259	

* Number reported likely double counts some landowners due to tracking methods.

** 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.

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 1997-2022 (OWRI data include most, but not all projects, implemented in the Management Area.)

Landowners	OWEB	DEQ	NRCS*	NOAA	ODFW	CTWS	All other sources**	TOTAL
1,908,478	6,303,083	390	706,677	1,650,537	1,401,130	3,358,264	1,626,355	$16,954,914

* 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 1997-2022 (OWRI data include most, but not all projects, implemented in the Management Area.)

Activity Type*	Miles	Acres	Count**	Activity Description
Upland		51,894		Juniper treatment, weed treatment, forest health improvement, range planting, cross fencing, stock water developments
Road	0		0	N/A
Streamside Veg	79	1,984		Fending, off-site water, and planting
Wetland		2		Off-site water, fending, and planting
Instream Habitat	10			Fencing, planting, streambank stabilization, BDAs to reconnect riparian/floodplain
Instream Flow	17		2 cfs	Instream water right transferred/leased
TOTAL	106	53,880		

* 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

DEQ analyzed data for *E. coli*, pH, dissolved oxygen, temperature, total phosphorus, and TSS in the John Day Basin (DEQ, 2022 Oregon Water Quality Status and Trends Report, 2011-2020, www.oregon.gov/deq/wq/programs/Pages/wqstatustrends.aspx). The main water quality concerns that may be related to agriculture are discussed below.

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]
John Day River Dayville - 11479	No↓	Yes	Yes↑	N/A	0.07; 0.12	9; 36
NF John Day at Kimberly - 11017	No↓	Yes	Yes	N/A	0.02; 0.12	3; 50
NF John Day Hwy 395 - 38510	Unassessed	Yes	Yes	N/A	0.02; 0.04	1; 2

[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

Dissolved Oxygen and pH are attaining water quality standards in the approximately 10 sites monitored.

E. coli was high (not attaining) in the John Day River at 3 locations in the span from Service Creek to Dayville.
Water temperature is predominantly not attaining water quality standards throughout the Management Area, which is the reason for the John Day Basin TMDL and the Revised Temperature TMDL coming to the area. There are many areas which do show an improving water temperature trend, but some are still declining.

4.3.2 Land Conditions

There is no additional land condition monitoring.

4.4 Biennial Reviews and Adaptive Management

ODA, the LAC, the LMA, and other partners met on May 7, 2025, 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
• Great progress has been made in Mountain Creek since it became a focal area for Wheeler SWCD in 2010. Not only are improvements of riparian vegetation visibly notable, this has also been documented through assessments that have been repeated at intervals since 2010. • Throughout the past decade, more than 200 beaver dam analogs (BDAs) have been installed along Bridge Creek. This passive restoration technique is dynamic. Even so, many BDAs remain and have significantly reduced sediment and improved engagement with the floodplain, which in turn has improved the growth and vigor of riparian vegetation. • Wildfire recovery grant funding is in place for 2025 season to begin assessing and prioritizing needed wildfire recovery work (e.g., reseeding disturbed private agricultural lands) due to vast acreages of wildfires that occurred within this Management Area (and others) in 2024.
Impediments
• There is funding and work for staff at Local Conservation Entities Capacity. LMAs are having challenges in finding qualitied staff, • Drought and wildfire across private agricultural lands has caused challenges and altered conservation and management plans. • The lack of a new farm bill and the pause on federal funding is impacting some farm bill programs (e.g., Conservation Reserve Enhancement Program (CREP). • Wildfires create an immediate need for local government entities, such as SWCDs, to respond and organize not just agricultural landowners, but the rural community in general. There also is a need for implementation of key wildfire recovery efforts that benefit most from immediate response (e.g., over seeding across wildfire disturbed lands to address sediment runoff into streams).
Recommended Modifications and Adaptive Management
• The LAC recommends additional monitoring efforts occur in the Management Area to better understand which watersheds have concerns and where the source is coming from. Sediment/turbidity is of specific interest. • It is recommended that additional monitoring of photo points and/or drones imagery occur over long periods of time (e.g., over 10, 15, and 20 years after project completion) because landscapes in eastern Oregon often take longer to respond to the benefits of implementing restoration or altering management practices. It can often take 10-20 years post-project implementation for benefits to be fully realized.

- Wildfire response and recovery funding that is quickly accessible is needed so that local conservation and local government entities can be more effective at responding to wildfires to effectively protect watershed health.

Table 4.4b Number of ODA compliance activities in 2018-2023

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 SIA	0	0	0	0	0	0	0	0
Within SIA	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A