OREGON DEPARTMENT OF AGRICULTURE

Upper Mainstem and South Fork John Day River Agricultural Water Quality Management Area Plan

April 2025

Developed by the

Oregon Department of Agriculture

and the

Upper Mainstem and South Fork John Day Local Advisory Committee

with support from the

Grant Soil and Water Conservation District

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Acronyms and Terms

Ag Water Quality Program – Agricultural Water Quality Program
Area Plan – Agricultural Water Quality Management Area Plan
Area Rules – Agricultural Water Quality Management Area Rules
CAFO – Confined Animal Feeding Operation
CTWS – Confederated Tribes of Warm Springs
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
ODFW – Oregon Department of Fish and Wildlife
OWEB – Oregon Watershed Enhancement Board
OWRI – Oregon Watershed Restoration Inventory
PSP – Pesticide Stewardship Partnership
SIA – Strategic Implementation Area
SWCD – Soil and Water Conservation District
TMDL – Total Maximum Daily Load
US EPA – United States Environmental Protection Agency

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Foreword

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

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

Required Elements of Area Plans

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

Plan Content

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

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

Chapter 3: Implementation Strategies. Describes activities to make and track progress towards the goals of the Area Plan. Presents goals, measurable objectives, strategic initiatives, proposed activities, and monitoring efforts.

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

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Chapter 1: Agricultural Water Quality Program

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

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

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

Each Area Plan is accompanied by Area Rules that describe local agricultural water quality regulatory requirements. ODA will exercise its regulatory authority for the prevention and control of water pollution from agricultural activities under the Ag Water Quality Program's general regulations (OAR 603-090-0000 to 603-090-0120) and under the Area Rules for this Management Area (OAR 603-095-2000). 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

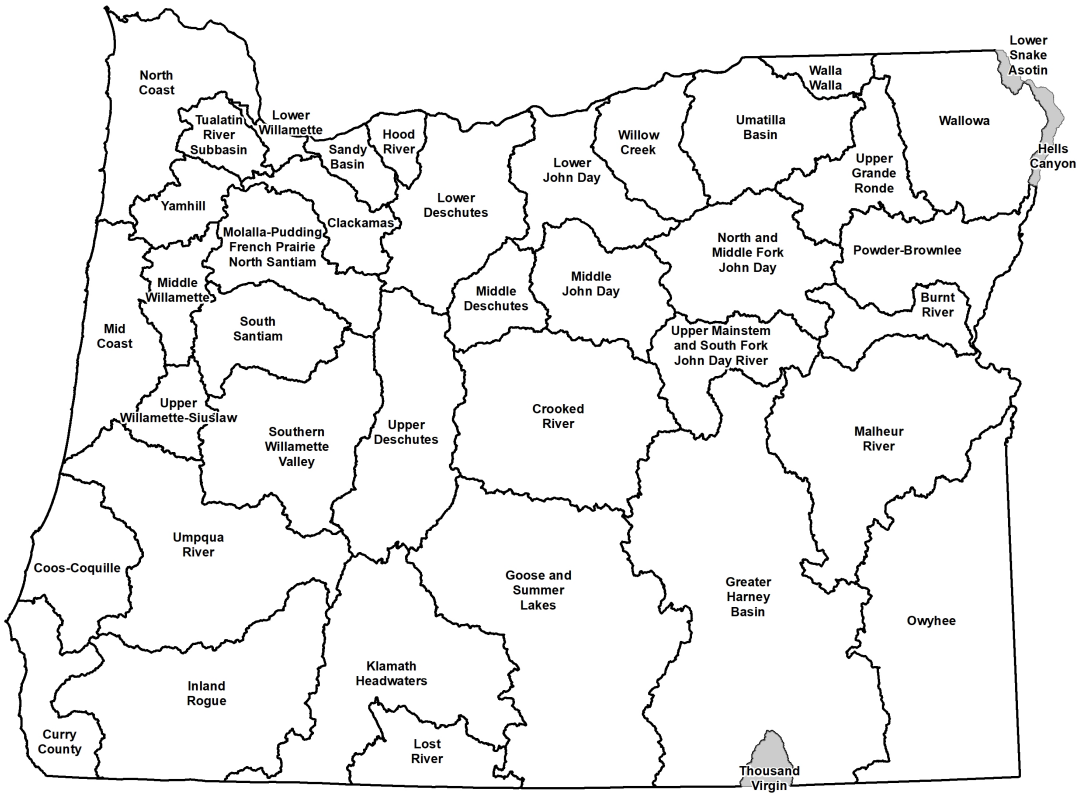
In 1993, the Oregon Legislature passed the Agricultural Water Quality Management Act directing ODA to develop plans to prevent and control water pollution from agricultural activities and soil erosion and achieve water quality standards and to adopt rules as necessary (ORS 568.900 through ORS 568.933). 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.

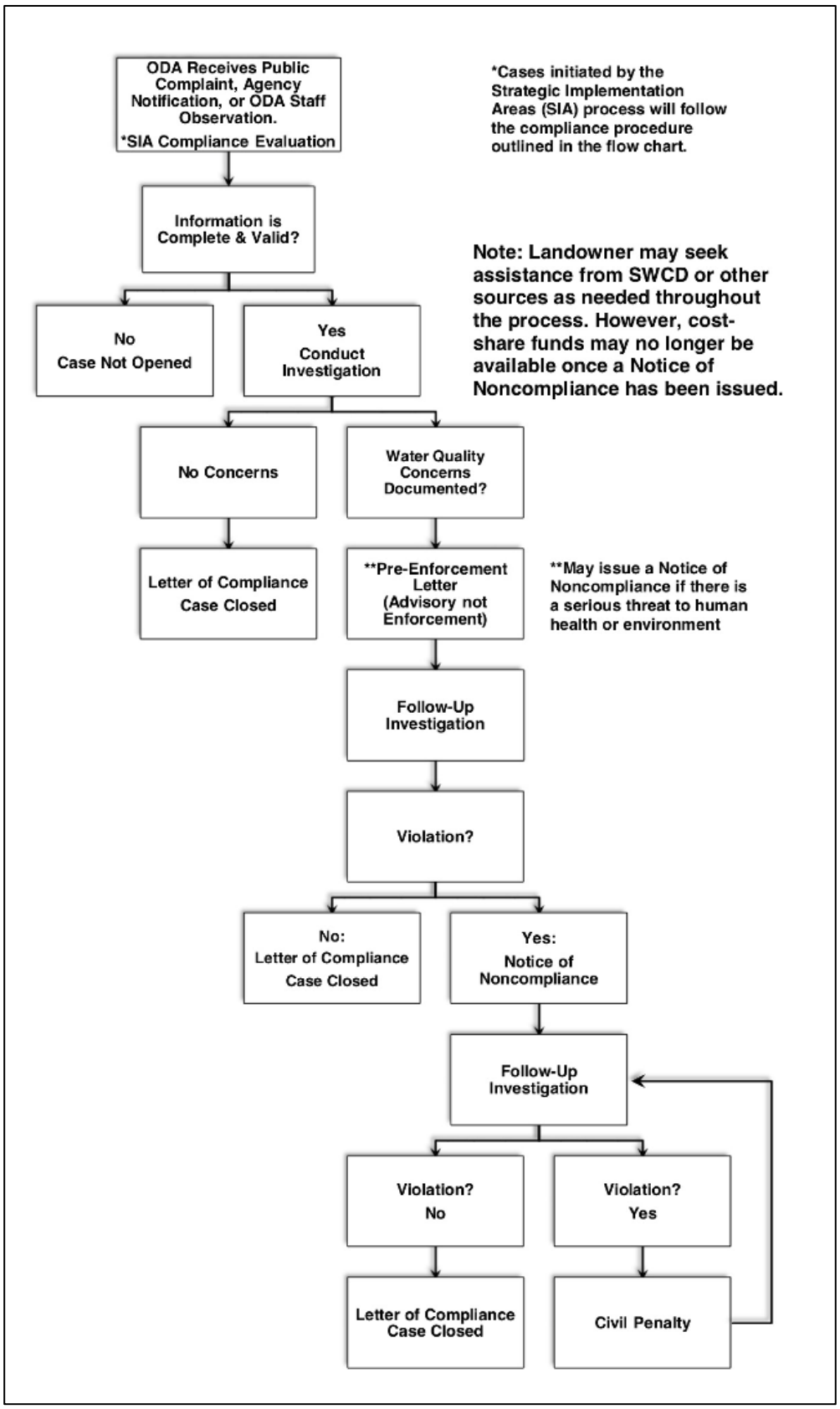
1.3.1.1 ODA Compliance Process

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, 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.

DEQ has issued TMDLs for a portion of these waterbodies that identify pollutant reductions needed to meet Oregon's water quality standards. The associated water quality management plans identify responsible entities and document management strategies needed to meet pollutant reduction targets.

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. Water bodies are categorized as achieving water quality standards when data show the standards have been consistently attained.

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. The agricultural sector is responsible for helping achieve the pollution limit by achieving the load allocation assigned to agriculture specifically, or to nonpoint sources in general, depending on how the TMDL was written.

As part of the TMDL issuance process, DEQ identifies Designated Management Agencies and Responsible Persons, which are parties responsible for submitting TMDL implementation plans. For the agricultural sector, ODA is the Local Management Agency, and the local Area Plans are recognized as the implementation plan for 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 canary grass, 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 2023 (www.oregon.gov/oda/shared/Documents/Publications/NaturalResources/WaterQualityGoalsMOA.pdf).

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

1.6.2 Other Partners

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

1.7 Measuring Progress

Agricultural landowners have been implementing effective conservation projects and management activities throughout Oregon to improve water quality for many years. However, it has been challenging for ODA, SWCDs, and LACs to measure progress toward improved water quality. ODA is working with SWCDs, LACs, and other partners to develop and implement

strategies that will produce measurable outcomes. ODA is also working with partners to develop monitoring methods to document progress.

1.7.1 Measurable Objectives

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

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

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

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

The measurable objective(s) and associated milestone(s) within the Management Area are in Chapter 3.1 and progress toward achieving the measurable objective(s) and milestone(s) is summarized in Chapter 4.1.

1.7.2 Land Conditions and Water Quality

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

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

- Landowners can see land conditions and may 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.

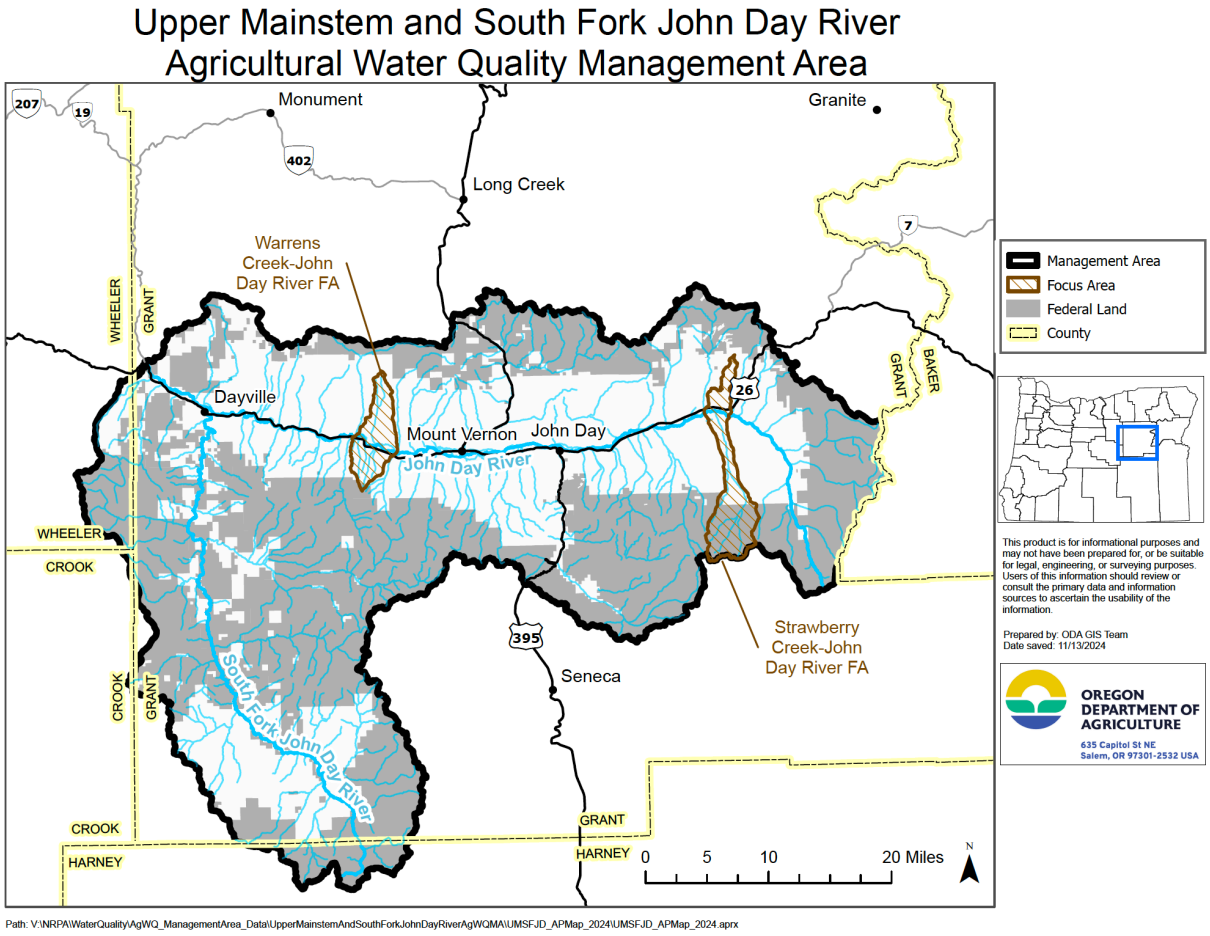
Water quality monitoring efforts in this Management Area are described in Chapter 3, and the data are summarized in Chapter 4.

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 Upper Mainstem and South Fork John Day River Management Area includes the areas that drain into the Upper Mainstem and the South Fork of the John Day River upstream from Picture Gorge (RM 205). The physical boundaries of the Management Area are shown on the map below. The operational boundaries of this Area Plan include all agricultural and rural lands in Oregon that contribute to the Upper Mainstem and the South Fork of the John Day River and tributaries that drain directly to the Columbia River except federally managed land, and lands subject to the Oregon Forest Practices Act.

Figure 2 Upper Mainstem and South Fork John Day River Management Area



2.1 Local Roles

2.1.1 Local Advisory Committee

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

Table 2.1.1 Current LAC members

Name	Geographic Representation	Description
Joanne Keerins (Chair)	Izee	Rancher, Grant SWCD board, South Fork John Day WC board, original LAC member
Stephan Charette	Management Area	ODFW fisheries biologist
Ted Clausen	Dayville	Rancher, Grant SWCD associate board member, original LAC member
Roger O. Ediger	Mt. Vernon	Rancher, Grant SWCD board, original LAC member
Phil St. Clair	Izee	Rancher, Grant SWCD board, South Fork John Day WC board, original LAC member
Mark Webb	Mt. Vernon	Small rural landowner, former Grant County judge, Executive Director of Blue Mountains Forest Partners, OWEB board member, Oregon Environmental Quality Commission member
Stefan Kelly	Management Area	Confederated Tribes of the Warm Springs John Day Watershed Restoration Coordinator
Didgette McCracken	Management Area	Grant SWCD associate board member, rancher, Grant OSU extension
Vacant		
Vacant		
Vacant		
Vacant		

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 implementing the Ag Water Quality Program within designated Management Areas. For this Management Area, Grant SWCD serves as the LMA. This SWCD also played a key role in the development of the Area Plan and Area Rules.

The LMA implements 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 2002.
Since approval, the LAC has met biennially to review the Area Plan and Area Rules. The biennial review process includes an assessment of progress toward achieving the goals and objectives in the Area Plan.

2.3 Geographical and Physical Setting

2.3.1 Upper Mainstem John Day Subbasin

The Upper Mainstem Subbasin lies almost entirely within Grant County, covering approximately 1,070 square miles upstream of Picture Gorge. The mainstem John Day River flows westward from the Blue Mountains through more than 75 miles of irrigated stream bottoms and benchlands before reaching Picture Gorge. Lower-elevation agricultural areas transition to rangeland and forested areas at higher elevations. Most headwater regions are managed by the Malheur and Ochoco National Forests, located in the Aldrich, Ochoco, and Strawberry mountains. The subbasin features naturally occurring lakes, hot springs, and mineral springs, with elevations ranging from about 2,230 feet at Picture Gorge to more than 9,000 feet in the Strawberry Range. Its diverse landscape includes mountains, rugged hills, plateaus dissected by streams, alluvial basins, and valleys. Coniferous forests and meadows dominate above 4,000 feet, while grasses, sagebrush, and juniper trees characterize the plant community below this elevation.

The Upper Mainstem Subbasin, located between Dayville and Prairie City, holds the largest population concentration in the John Day River Basin. Residents of Mt. Vernon, John Day, Canyon City, and Prairie City make up about 52 percent of Grant County's population. According to the 2020 U.S. Census, Grant County had a population of 7,240, a 3 percent decline from the 2010 estimate of 7,465. The subbasin is also home to much of the John Day River Basin's industry.

The Upper Mainstem Subbasin lies within the ceded lands of the Confederated Tribes of the Warm Springs Reservation of Oregon (Warm Springs Tribes). Through treaty, the Warm Springs Tribes ceded much of their traditional homeland, including vast areas of the John Day Basin, to the United States while retaining rights to use unclaimed land and its resources. Historically and presently, the area serves as a vital resource for ceremonies, hunting, livestock pasturing, fishing, and plant gathering, supporting both subsistence and commercial needs. These resources remain essential to the Warm Springs Tribes' economy, reinforcing their active role in resource management within the subbasin.

The Warm Springs Tribes have also acquired land managed as conservation areas for fish and wildlife habitat protection and enhancement, as well as for agriculture and traditional uses. Alongside the Oregon Department of Fish and Wildlife (ODFW), the Warm Springs Tribes share co-management responsibilities for the subbasin's fish and wildlife programs.

Local economic activity in Grant County is heavily influenced by federal land management decisions, as approximately 60 percent of the county's land is publicly managed. Of the 1.7 million acres of federal land in the county, the United States Forest Service (USFS) oversees about 90 percent, while the Bureau of Land Management (BLM) manages the remainder. The National Forest accounts for 80 percent of the county's commercial forestland, offering

significant forage resources for domestic livestock and wildlife, as well as abundant recreational opportunities.

Ranching is the primary agricultural activity in the area, with approximately 260,000 acres of forestland used for summer grazing. Additionally, around 25,000 acres are irrigated for grass and alfalfa hay production. Logging also plays a vital role in the local economy. Between 2014 and 2023, the Malheur National Forest sold a total of 228 million board feet (MMBF) of timber. Annual timber sales have generally increased during this period, ranging from 9 MMBF to a peak of 34 MMBF, largely driven by a 10-year stewardship contract initiated in 2013.

2.3.1.1 Climate, Land Ownership, Land Cover and Uses, Special Use Designated Areas, and Resources

Climate

The climate in Grant County is semi-arid. Average annual precipitation ranges from 10 to 14 inches in the river valley at Dayville (elevation 2,300 feet) to 40 to 44 inches at the pass near the headwaters of the John Day River (elevation 5,899 feet). Frost-free periods vary by location, with Dayville experiencing 80 to 172 consecutive frost-free days annually. In John Day (elevation 3,085 feet), the frost-free period ranges from 71 to 162 days, while Prairie City (elevation 3,710 feet) has 64 to 154 frost-free days annually.

Land Ownership

The federal government is the largest land manager in the subbasin. The BLM oversees primarily low-elevation grass and juniper rangelands, while the USFS manages higher-elevation conifer forests and juniper-grass rangelands. Private lands are generally concentrated at lower elevations along streams and at intermediate upland elevations, which are predominantly rangelands.

The Oregon Department of State Lands, the Oregon Department of Forestry (ODF), ODFW manage scattered parcels throughout the subbasin. A significant portion of ODFW's Phillip W. Schneider Wildlife Area is located above Dayville along the South Fork of the John Day River. Additionally, the Strawberry Mountain Wilderness Area, a federally designated special management area, lies south of John Day and Prairie City.

Land Cover and Land Uses

Land cover in the Upper Mainstem Subbasin is primarily composed of rangeland and forest. Most forested headwater areas are managed by federal agencies, while private rangeland dominates below the tree line. Upland soils, outside the relatively flat alluvial valley floor, have medium to high erosion potential and medium to high sediment yield.

Approximately 38 percent of the subbasin consists of rangeland and pastureland. Local ranchers depend on forestland for summer grazing, with nearly 260,000 acres of forestland utilized for this purpose. Forested areas cover about 56 percent of the subbasin.

Table 2.3.1.1 Upper Mainstem Subbasin Landcover

Type	Acres
Range and pastureland	262,000
Forestland (grazed)	258,000
Forestland (not grazed)	131,400
Cropland	26,300
Other	14,000
	691,700

Source: Oregon Department of Agriculture Small Watershed Reconnaissance Study, 1984

Irrigated cropland is primarily located in the valley, concentrated on alluvial fans and floodplains along the mainstem and its tributaries. These areas represent the highest concentration of irrigated acreage within the entire John Day Basin.

Special Use Designated Areas

There are three special use designated areas within the subbasin: the Strawberry Mountain Wilderness Area, the Cedar Grove Botanical Area, and the Canyon Creek Natural Area.

Resources

The economy of the Upper Mainstem Subbasin is heavily reliant on natural resources. The primary private-sector industries include forest products, ranching, and retail trade. In addition, federal, state, and local governments serve as significant employers in the area.

Agriculture

Ranching is the dominant agricultural activity in the subbasin, complemented by both irrigated and nonirrigated cropland. Approximately 25,000 acres of irrigated cropland account for about 95 percent of the cropped area. The primary crops grown are grass hay and alfalfa. According to the Natural Resources Conservation Service (NRCS), production values on arable valley soils range from 5.0 to 6.5 tons per acre for alfalfa and 1.5 to 2.5 tons per acre for native grass hay. Additionally, an acre of irrigated pasture can produce 6 to 15 animal unit months (AUMs) of forage. These estimates assume the use of standard management practices and sufficient water availability throughout the irrigation season. In contrast, nonirrigated land yields significantly lower production.

Forest Resources

The forests of Grant County consist almost entirely of softwoods, with small strands of hardwoods found along river valleys. A belt of western juniper acts as a transition zone between the forest and adjacent grasslands. Ponderosa pine is the predominant species, often forming pure stands at lower elevations, and accounts for 59 percent of the timber species in the region.

Timber harvests can significantly influence watershed health and water quality. In 1958, Grant County's total log production was 240 million board feet (MMBF), measured using the Scribner Decimal C Rule. Over the preceding decade, annual log output averaged 225 MMBF, ranging from a low of 154 MMBF in 1949 to a high of 285 MMBF in 1956. During this period, approximately 90 percent of the saw-timber volume came from federally managed lands, amounting to 12,185 MMBF Scribner. Private ownership accounted for an estimated 1,352 MMBF Scribner of saw-timber volume. Despite this, privately owned forestlands in Grant County contributed more than half of the county's log production between 1949 and 1958.

Gross standing timber volume on the Malheur National Forest was reported at 11,641 MMBF in 1959 (according to “Forest Statistics for Grant County, Oregon - Forest Survey Report 137,” November 1960). By 1994, this volume had increased slightly to 11,917 MMBF. However, timber sales from the Malheur National Forest saw a significant reduction by 2000, with annual volumes dropping to 13.5 MMBF (as noted in “Malheur National Forest Information Derived from Historical Sources and Reports” by William L. McArthur, USDA Forest Service Silviculturist).

The total forested land within the Malheur National Forest has increased by approximately 8 percent since the 1930s. This growth is attributed to the encroachment of ponderosa pine, juniper, and other conifer species into meadows, riparian zones, and shrublands, as well as land acquisitions by the Forest Service. (Source: “Malheur National Forest Information Derived from Historical Sources and Reports" by William L. McArthur, USDA Forest Service Silvaculturalist).

Wildland Fires

Wildfires can affect watershed health and water quality. Large wildfires have been common occurrences on the Malheur National Forest and documented from 1910 to current. For perspective, between 2007 and 2016 a total of 1,136 wildfires occurred in the Malheur National Forest. All these fires burned with a mix of severity ranging from very high severity to mixed and low severity effects that would be considered beneficial landscape effects to the soil and vegetation.

The year 2024 was the largest wildfire season on record for the John Day basin with seven major wildfires burning a total of 603,307 acres and 265,199 acres on private land. The UMSF management area had two major wildfires, the Rail Ridge and Falls, burning a total of 164,566 acres, which was 15.2 percent of the management area. Most of the wildfires were in the South Fork, primarily on Forest Service and BLM land.

Minerals and Energy

The Upper Mainstem Subbasin has a rich and varied mining heritage. The subbasin has produced gold, precious metals, and industrial minerals. Besides large amounts of gold, 27,000 tons of chromite ore were mined from the rock outcrops along the north slope of the Strawberry Range. Gold dredges were a major impact to the floodplains of the management area. It is estimated that the dredges moved more than 10,400,000 cubic yards of soil and rock, dredging 9 feet deep more than 716 acres in 9 miles of the John Day River and 2 miles of Canyon Creek (from above John Day to just below Mount Vernon on the river and up to about the high school on Canyon Creek). It is estimated that approximately one-third of the area was dredged near Prairie City and on Dixie Creek. According to *Gold and Silver in Oregon,* Brooks and Ramp (1968), dredging took place just below Prairie City from 1930–1936 and on Dixie Creek from 1938–1941.

Dredge tailing piles are still visible along the John Day River and tributaries, and many more acres have been leveled and reclaimed for other uses. Evidence of early hydraulic mining can still be seen in the region known as the Humbolt Diggings. Significant miles of ditches were hand-dug subsequent to the strikes of 1862 to provide water to support mining operations. The federal government has reserved the mineral rights on some of the property in the Upper Mainstem.

Prairie Wood Products in Prairie City has constructed a biomass-fired cogeneration facility on its mill site. This facility will use 70,000 bone dry tons per year of mill residue to generate 7.5 megawatts of energy per hour. The mill is expected to use about 120 gallons per minute (GPM)

of water in the process of generating energy. In February 1986, Prairie Wood Products applied for the right to pump 300 GPM of groundwater from two deep wells. The facility was shut down in 2014 and was scheduled to reopen in September 2024.

The Upper Mainstem contains several low-temperature geothermal energy resources. They are Mt. Vernon Hot Springs (120°F), Limekiln Hot Springs (70°F), Blue Mountain Hot Springs (136°F), Thompson Hot Springs (88°F) on Indian Creek, and Joaquin Miller Hot Springs (J Bar L) (118°F).

Fisheries and Wildlife Resources

The John Day River Subbasin supports anadromous runs of wild spring Chinook salmon and Endangered Species Act (ESA)-listed threatened summer steelhead. Summer steelhead are widely distributed throughout the subbasin. The John Day River summer steelhead major population group (MPG) is one of four MPGs within the Middle Columbia River Steelhead Distinct Population Segment (Mid-C Steelhead DPS) and the only MPG located entirely within Oregon. Additionally, anadromous Pacific lamprey (classified as “Oregon-sensitive”) are found throughout the basin.

Other focal native fish species include ESA-listed threatened bull trout, westslope cutthroat trout, and interior redband trout (resident Oncorhynchus mykiss). The basin is home to an estimated 27 fish species, 17 of which are native. Smallmouth bass, an introduced warmwater game fish, also contribute to a significant and economically important fishery in the lower John Day River. Current fish management policies emphasize maintaining native fish stocks and addressing factors that threaten their genetic integrity.

Native fish populations in the John Day Basin face significant challenges, including habitat loss, irrigation diversions, migration barriers, elevated water temperatures, and low streamflow. In the upper mainstem of the John Day River, the replacement of many gravity irrigation diversions has significantly improved fish passage, allowing greater access to the upper watershed. Despite these advancements, high water temperatures and reduced streamflow continue to severely restrict the distribution and productivity of cold-water fish species.

The riparian and upland habitats in the Management Area support a diverse range of terrestrial wildlife, including mule deer, elk, small mammals, migratory birds, reptiles, and amphibians. Mule deer are considered a key indicator of upland ecosystem health and are a management priority for ODFW through its Oregon Mule Deer Initiative, with a particular focus on the Murderers Creek Unit.

Recreation and Tourism

Recreational use can affect watershed health and water quality. The Upper Mainstem Subbasin contains most of the urban development and industry in the John Day drainage. This area offers a variety of recreational opportunities. The Strawberry Mountain Wilderness provides numerous recreational experiences, such as camping, hiking, fishing, horseback riding, and sightseeing.

Malheur National Forest campgrounds are in the subbasin. Steelhead and trout fishing account for approximately 4,200 angler-days per year along the river. Many other trout fishing opportunities are available in tributary streams and area lakes. Hunting for deer, bear, and elk is the single largest recreational pursuit in the basin and peaks during the fall months.

Water Resources
According to 2022 US Geological Survey data, the average discharge of the John Day River at McDonald Ferry station was 2,048 cubic feet per second (cfs) over the period from 1906 to 2022. However, the recent 10-year average discharge decreased to 1,764 cfs for the period from 2013 to 2022 (https://waterdata.usgs.gov/or/nwis/inventory/?site_no=14048000&agency_cd=USGS).

The annual average discharge at Picture Gorge is 346,000 acre-feet, representing 22.8 percent of the basin's total yield. Major tributaries contributing to the upper John Day River flow, as recorded at the Picture Gorge gauge, include the South Fork John Day River, Beech Creek, Canyon Creek, Strawberry Creek, and Dixie Creek. Of these, the South Fork John Day River alone contributes approximately 100,000 acre-feet annually, or 6.6 percent of the basin's yield Source: *Stream Restoration Program for the Upper Mainstem of the John Day River*, March 1992

Discharge in the upper John Day River varies seasonally, with peak flows typically occurring between March and early June. The lowest flows are recorded from July through September, during which instream water rights are often unmet in August and September. As of 2024, gauged streams within the Management Area include Strawberry Creek, the Upper Mainstem John Day River, Canyon Creek, the South Fork John Day River, Murderer's Creek, and Deer Creek.

The Upper Mainstem Subbasin contains most of the Management Areas natural lakes: Strawberry Lake, Little Strawberry Lake, Magone Lake, Slide Lake, and Little Slide Lake.

Water Use and Control
Irrigation is the dominant water use in the Upper Mainstem Subbasin. Although there are rights to divert more than 900 cfs of water for irrigation, it appears that the quantity actually used is less. According to the estimates of irrigated crop acreage, irrigation water requirements are about 100 cfs through the irrigation season. There are more than 80 ditches diverting water from the mainstem John Day River ("John Day River Basin Report," State of Oregon Water Resources Department, November 1986). Most irrigation diversions on anadromous fish streams are screened to protect against fish entering the ditches (ODFW). Four ditch companies operate in the subbasin.

The Upper Mainstem Subbasin is the drainage area (approx. 1,070 sq. mi.) above Picture Gorge, excluding the South Fork watershed. The 80 noted ditches directly divert out of the Mainstem John Day River and would be distributed from Picture Gorge to where the river enters the National Forest above Prairie City. Most of the tributaries to the Upper Mainstem John Day River are also used for irrigation through ditch diversions.

In the upper portion of the subbasin, most water is delivered using historical flood irrigation practices. Flood irrigation is economical for meadow hay and pastures but is much less efficient when compared to sprinkler irrigation. Irrigation ditch returns, which flow back into the river or stream source, can degrade water quality by adding sediment and nutrients. Below Mt. Vernon, there has been more interest in sprinkler irrigation systems to apply water on higher value crops such as alfalfa.

Water Use Restrictions
Minimum Streamflows: In 1985, the Water Resources Commission established six minimum instreamflow water rights to protect flow in the Upper Mainstem Subbasin. These minimum

instream flows are regulated the same as irrigation water rights, according to priority. The priority date for all six is November 3, 1983.

On the upper mainstem John Day River, instream rights cover the river reach from Rail Creek to Picture Gorge, 70 miles. Instream rights are also for a few upper mainstem tributaries Canyon Creek, Beech Creek, and Cottonwood Creek.

Hydroelectric Standards: Administrative rules governing hydroelectric application generally prohibit development of hydroelectric projects on the Mainstem John Day River.

2.3.2 South Fork John Day Subbasin

Flowing north from the Ochoco and Aldrich mountains, the South Fork John Day River drains an area of approximately 607 square miles and enters the mainstem John Day River at Dayville. Subbasin elevation ranges between about 2,300 feet to 7,400 feet above sea level. The South Fork Subbasin is located mostly in Grant County and is the driest and most sparsely populated area of the John Day Subbasins.

Dayville is the only incorporated city in the subbasin. There are three major transportation routes in the subbasin: Highway 26 in the extreme northern part of the subbasin; a road that parallels the South Fork John Day River from Dayville to the headwaters; and a federal aid secondary highway that connects Prineville with Highway 395 and crosses the southern portion of the basin.

A little more than one-half of the area is in forest with the remainder in range and pasture, of which 3,800 acres are irrigated. Nearly all the forested areas are grazed and are federally managed by the Malheur National Forest (74,618 acres). About 20 percent of the South Fork Subbasin is in private ownership and of this about 37,800 acres are used for grazing.

2.3.2.1 Climate, Land Ownership, Land Cover and Uses, Special Use Designated Areas, and Resources

Climate

The climate is semi-arid with precipitation ranging from 10 to 20 inches per year. Precipitation at Dayville averages about 13 inches per year. Most of the precipitation occurs between November and June with peak accumulations in May. The annual average temperature at Dayville is 52 °F. The coldest average monthly temperature (26 °F) occurs in December and the warmest (92°F) are shared between July and August. Subbasin elevation ranges between about 2,300 feet to 7,400 feet above sea level.

Land Ownership

The federal government manages most of the land in the subbasin. Private lands tend to be concentrated at lower elevations along streams and at intermediate upland elevations. The ODFW Phillip W. Schneider Wildlife Management Area accounts for most of the state lands in the South Fork drainage.

Land Cover and Uses

The subbasin is primarily characterized by two major land cover types: coniferous forest and rangeland. Agricultural areas are sparse and generally found near streams on loamy soils. The forested regions are predominantly composed of ponderosa pine and lodgepole pine, with western larch and fir species more common at higher elevations. While some forestland is privately owned, the majority is managed by the Malheur and Ochoco National Forests.

Table 2.3.2.1 South Fork Subbasin Landcover

Type	Acres
Forestland (grazed)	216,300
Forestland (not grazed)	0
Cropland	5,200
Range/pasturelands	164,800
Other	3,300
	389,600

The subbasin contains little urban land. Dayville, the only city within the area, had a population of 130 according to the 2020 census. The community of Izee spans a 27-mile stretch and includes approximately 12 families who live near the upper South Fork, close to the intersection of the Post-Paulina Highway and the Dayville-Hines Road. Settlement across the rest of the subbasin is minimal, with ranching serving as the primary economic activity.

The South Fork Subbasin is notable for its unique wildlife, vegetation, and geological features. The 26,000-acre Phillip W. Schneider Wildlife Management Area, owned and managed by ODFW, is a significant feature of the subbasin. Additionally, the 143,000-acre Murderers Creek Wild Horse Joint Management Area encompasses parts of the Phillip W. Schneider Wildlife Management Area (26,000 acres), USFS land (73,615 acres), BLM land (34,954 acres), and privately owned land. This area is jointly managed by the two federal agencies and is located 35 miles southwest of John Day. Wild horses share the range with a variety of native wildlife, including mule deer, elk, antelope, bighorn sheep, bear, cougar, and numerous other species.

According to Gerald Dixon from Region 6 of the U.S. Forest Service, a 2024 survey and statistical analysis estimated the Murderers Creek wild horse population at approximately 650. The Rail Ridge Fire, which began on September 2, 2024, burned more than 58,000 acres within the Joint Management Area (JMA), significantly reducing essential forage areas relied upon by wild horses and other wildlife. Due to the limited remaining forage, particularly in lower elevations critical for winter grazing, the managing agencies plan to temporarily gather and hold approximately 400 wild horses to support recovery efforts. Moving forward from 2024, herd levels in the JMA are expected to be maintained between 50 and 140 adult horses.

Special Use Designated Areas

Wild and Scenic River Reaches

The South Fork John Day River, designated as an Oregon Wild and Scenic Waterway, extends from approximately river mile (RM) 5, south of Dayville, at the northern boundary of the Phillip W. Schneider Wildlife Management Area, upstream to County Road 63 at RM 35 near the confluence of Pine Creek. Under Oregon law, this segment is classified as Recreational and overlaps with the National Wild and Scenic River designation.

The Federal Wild and Scenic River designation applies to the river stretch from Smokey Creek (RM 6), south of Dayville, upstream to the Malheur National Forest boundary at RM 52. This designation aims to protect the river's outstanding natural, cultural, and recreational features, ensuring it remains free flowing for the enjoyment of current and future generations.

Resources

Agriculture
Cropping is practiced on only a very small amount of the subbasin land area near Dayville and Izee. Irrigated agriculture, primarily pasture and hay production, composes more than half the agricultural acreage, with the remainder devoted to nonirrigated hay, pasture, and grain production. All irrigation water is derived from surface sources.

Forest Resources
Most of the forestlands in the subbasin are managed by the Malheur and Ochoco national forests. According to the draft environmental statement for the South Fork Planning Unit (Malheur National Forest, 1976), there are nearly 170,000 acres of commercial forest within the Unit. The unit's forestlands are used for range and have been since about 1900. The national forest currently permits annual cattle grazing between June 1 and October 15.

Wildland Fires
For wildland fires description, see Chapter 2.3.1.1 Resources, Wildland Fires.

Minerals and Energy
Mining activity has been minimal on the South Fork.

Fisheries and Wildlife Resources
For fisheries and wildlife, see Chapter 2.3.1.1 Resources, Fisheries and Wildlife Resources.

Recreation and Tourism
The South Fork Subbasin has experienced relatively little recreational development. However, recreation and tourism can impact watershed health and water quality. The area features three national forest campgrounds and the Black Canyon Wilderness, offering opportunities for hiking, camping, hunting, horseback riding, sightseeing, and fishing. Deer and elk hunting generate the most recreation user-days in the subbasin, peaking during the fall. Trout fishing is another popular activity, with activity levels highest in June and early fall.

Water Resources
Surface Water: The South Fork John Day River originates in the Ochoco and Aldrich mountains, with a gentle gradient averaging 47 feet per mile over its 60-mile course. Key tributaries below Izee Falls include Murderers Creek, Black Canyon Creek, and Deer Creek, while significant tributaries above the falls include Sunflower, Flat, Pine, Lewis, Corral, and Indian Creeks.

The South Fork near Dayville was intermittently gauged between 1910 and 1930, from 1951 to 1956, and continuously since 1986. The estimated average annual discharge at the river's mouth is 100,000 acre-feet. Streamflow gauging stations are also located on the Upper South Fork near Izee, Murderers Creek, and Deer Creek. These stations were operational from 1994 to 1996 and resumed recording in 1998 to the present.

Subbasin discharge is highest during the winter months, peaking in late April due to snowmelt runoff, and lowest in September. During the low-flow period from July to October, demands for irrigation, fisheries, and water quality are at their greatest.

Groundwater: The subbasin's geology primarily consists of basalt and complex pre-Tertiary rock. Limited well data exist for the area, so estimates of groundwater storage are unavailable. However, significant amounts of groundwater are likely stored in the basalt. Springs are relatively common, as indicated by topographic maps.

Water Use and Control

Water Rights: Currently, water rights in the subbasin total approximately 105 cubic feet per second (cfs) for all uses. Out-of-stream water usage is dominated by irrigation, accounting for 95 percent of the appropriated volume, while most of the remaining portion supports municipal use by the City of Dayville.

An estimated 6,000 acre-feet of water is required annually to support crops in the subbasin, with approximately 17 cfs needed from May through September. There are 141 water rights authorizing a total diversion rate of 99.4 cfs to irrigate roughly 4,400 acres. In the northern subbasin, irrigation primarily supports pasture and hay fields, with an equal split between sprinkler and flood irrigation methods. In the Izee area, flood irrigation is predominant. Most domestic water supplies are sourced from shallow wells. The upper portion of the South Fork drainage holds the only domestic surface water right in the subbasin, making domestic water use a relatively minor consumptive activity.

The City of Dayville has rights to divert 5.05 cfs from Conner Creek, a tributary entering the South Fork approximately 2 miles above its mouth, as well as from the South Fork John Day River. The city's water system is supplied by springs with a flow rate of 23 gallons per minute (0.05 cfs). In 1985, the city applied for an additional 0.3 cfs from the subbasin to enhance its water system. Storage rights in the Subbasin total around 45 acre-feet, primarily for small stock-watering impoundments. There are no industrial, mining, or hydropower water rights in the subbasin.

Groundwater use in the subbasin is minimal and largely for domestic purposes. The area's geologic formations yield water slowly, limiting availability for large-scale use. However, groundwater supplies are generally adequate for domestic needs. A single non-domestic well is located about three-quarters of a mile upstream from the river's mouth.

Water Use Restrictions

Reservations: Guyon Springs, a tributary of Conner Creek that flows into the South Fork, was reserved by order of the state engineer in 1932 for municipal use by the City of Dayville.

Minimum Perennial Streamflows: In 1983, the Water Resources Commission adopted a minimum streamflow for the South Fork, from the confluence with Black Canyon Creek to its mouth, at the request of ODFW and DEQ. Municipal, storage, domestic, and livestock uses are exempt from this minimum flow requirement.

Storage: The subbasin has a large amount of unappropriated winter and spring streamflow, which could be applied to beneficial use if it could be stored for release during the summer and fall. Studies conducted by the Bureau of Reclamation and the Corps of Engineers have identified many potential storage sites in the subbasin. None of the sites were found feasible based on the fishery criteria used by the agencies at the time of the studies.

Streamflows: The seasonal distribution of stream discharge is a problem in the South Fork just as it is throughout the John Day Basin. Late-season low streamflows are common and affect water quality and fisheries resources. Peak runoff carries high amounts of sediment that have adverse effects on water quality and fish habitat. Extreme high flow events, such as occurred in 1964, can alter stream structure.

2.3.3 Additional Influences on Water Quality within the Management Area

Human Impacts on Watershed Conditions

Over the past 130 years, human activities have significantly contributed to the degradation of watershed conditions. Many of these issues can be traced to state or federal programs, or extension staff initiatives, that implemented practices based on the "best agricultural or watershed health science" available at the time. Today, landowners and resource managers acknowledge these historical impacts and are actively addressing them through ongoing conservation efforts and improved land stewardship practices.

Grazing

Historical records suggest that the numbers of domestic grazing animals in Grant County have fluctuated significantly since settlement. Animal Unit Months (AUMs) have been used as a comparative measure due to changes in the relative numbers of livestock species over time. However, precise data on certain populations, such as the large numbers of free-roaming horses once associated with the Army Remount program, remain unverifiable. Many of these horses continued to roam the county for years after the remount program declined and ended around 1940. Comprehensive annual livestock inventories have not been located and may not exist. The following information has been compiled from available sources to provide a general sense of historic livestock numbers in Grant County.

Table 2.3.3 Historic livestock numbers in Grant County

Year	Sheep	Cattle	Horses/Mules	AUMs
1895 (1)	119,926	18,013	9,299	53,622
1965(2)	6,500	59,700	2,500	64,125
2001(2)	400	54,000	2,500	57,205
2009(3)	600	37,000	-	37,120
2013(2)	300	56,500	2,500	-
2024(4)	-	33,000	-	-

(1) Grant County News 1895 as reported in the History of Baker, Grant, Malheur and Harney County.
(2) OSU Extension Reports
(3) Oregon Department of Agriculture, 2010 Agripedia
(4) Oregon Department of Agriculture, 2024 Oregon Annual Statistical Bulletin

Stream Channel Treatment

From 1943 to 1951, intensive stream channel treatment projects were conducted in the region. During this time, 270,433 linear feet (51.22 miles) of stream channel was treated on 214 farms. The county agent reported, "These changes should help materially, as the channels were both deepened, widened, and straightened to enable them to handle the water." An estimated 254,853 cubic yards of material was moved to achieve the desired five-to-one slope on all treated banks.

The Soil Conservation Service and Agricultural Conservation Association were instrumental in driving these efforts, with Agriculture Adjustment Act payments playing a significant role in educating farmers on erosion control methods. Additionally, 90,361 linear feet of stream bank

was treated with riprap on the same 214 farms, underscoring the extensive scope of these conservation activities.

Drainage Projects

Between 1943 and 1951, annual reports document the drainage of 3,159 acres across 134 farms. A total of 254,825 linear feet of ditches were either blasted or excavated using draglines, with 25,875 linear feet of these ditches tiled. These efforts were undertaken to enhance crop production. According to the county agent, on four properties, “the production of hay has been doubled without any additional practices being established.” (Oregon State College Extension Service Annual Report, December 1, 1950 – November 30, 1951).

Juniper Expansion

Biological evidence suggests that western juniper has been present in eastern Oregon for at least 4,000 to 7,000 years. Historically, juniper was confined to “tough” sites — areas with shallow soils, fractured bedrock, or insufficient fuel to sustain fire. Natural wildfires and intentional burns set by Native Americans played a significant role in maintaining open landscapes. Seedlings, saplings, and trees under 40 years old are particularly vulnerable to fire. However, the crowns of mature juniper trees often suppress the growth of grasses and other vegetation beneath them, reducing the availability of fuel to carry fire into the canopy.

The wet climatic conditions between the mid-1800s and 1916, coupled with the introduction of livestock and the diminished role of fire, are believed to have contributed to the post-settlement expansion of juniper across the West.

If unmanaged, juniper will continue to spread, leading to the development of juniper woodlands with minimal understory. This lack of understory vegetation exacerbates erosion, promotes off-site sediment deposition, and reduces forage availability for both livestock and wildlife. Furthermore, juniper negatively impacts the hydrological cycle, intercepting up to 41 percent of total annual precipitation.

Logging Practices

Until the 1980s, federal timber sales often mandated the removal of woody debris from stream channels within the sale area. This practice, combined with the construction of numerous logging roads along streams and additional upland skid trails, significantly influenced runoff patterns and contributed to increased soil erosion. The Oregon Forest Practices Act (FPA), enacted in 1971, was introduced to guide logging practices on private land and address such environmental impacts.

Flood Damage

“The largest known floods were the winter rain floods that occurred in December 1964 and January 1965.” (US Army Corps of Engineers, December 1969). On December 24, the peak stage at the McDonald Ferry gauging station exceeded the historic peak recorded in 1894. The floods caused significant damage, resulting in losses to residences, utilities, industries, roads, bridges, and emergency services.

Flood control efforts under emergency and continuing authorities were undertaken along various reaches of the John Day River to restore the river to its natural channel and provide limited flood protection. Following the 1964-65 floods, channel clearing was performed at 147 locations, costing approximately $240,000. According to the Army Corps of Engineers' emergency flood control work map, most of this work was concentrated upstream of Kimberly on the Mainstem John Day River. Additional levee restoration work was carried out in March 1971 in the areas of

John Day and just upstream of Mt. Vernon (John Day River Basin: A Comprehensive Water Resources Investigation, U.S. Army Corps of Engineers, Walla Walla, WA, April 1972).

2.4 Agricultural Water Quality

2.4.1 Water Quality Issues

Stream pollution is closely tied to land use. In the John Day Basin, 45 percent of the land is forested, and more than 50 percent is in agricultural use. Other uses include urban, rural residential, parkland, and industrial. The TMDL planning applies to all land uses that contribute pollution to the basin's streams and rivers. The John Day Basin TMDL, that includes this Management Area, was approved in 2010. This Area Plan serves as the implementation plan for agriculture's load allocation and may be revised to address the load allocations as they are implemented.

2.4.1.1 Beneficial Uses

Water in the John Day Basin is to be managed to protect the recognized beneficial uses. Of the beneficial uses of water in the John Day River Basin, the most sensitive use is spawning and rearing of cold-water fisheries.

Designated beneficial uses in the John Day Basin include public and private domestic water supply, industrial water supply, irrigation, livestock watering, fish and aquatic life, wildlife and hunting, fishing, boating, water contact recreation, and aesthetic quality (OAR 340-41-0170, Table 170A) (www.oregon.gov/deq/wq/Pages/WQ-Standards-Uses.aspx).

Although individual sources or activities may not severely impact water quality, their cumulative effects, combined with impacts from other land uses and activities, contribute to the impairment of beneficial uses of the John Day River and its tributaries.

2.4.1.2 Water Quality Parameters of Concern

There are several water quality concerns for agriculture listed in the 2022 Integrated Report (https://www.oregon.gov/deq/wq/Pages/epaApprovedIR.aspx).

The following discussion of water quality parameters of concern addresses the standards established for the protection of beneficial uses listed in OAR 340-41-0170.

Temperature
According to the 2022 Integrated Report, water temperature is the most widespread concern in the basin. Stream heating can result from various factors, including excess solar radiation, reduced groundwater interaction, and diminished instream flow. These issues may arise from both natural disturbances and human-related stream modifications such as vegetation disturbance, irrigation withdrawal, and channel straightening. Elevated water temperatures negatively impact the survival of aquatic species. The purpose of temperature criteria is to protect designated temperature-sensitive beneficial uses, including specific salmonid life cycle stages in the state's waters.

For nonpoint sources of stream heating, such as vegetation disturbance and stream channel alteration attributed to agriculture and rural lands, the temperature TMDL establishes thermal

goals aimed at achieving more natural stream temperature patterns. The TMDL recovery targets include restoring natural shade-producing vegetation along all streams in the plan area and addressing stressors that hinder the attainment of natural vegetative and channel geometry conditions. In some areas, shade-producing riparian vegetation may not be suitable due to local site conditions. Site-specific determinations will be made by the Oregon Department of Agriculture.

Bacteria

Bacteria levels, particularly *Escherichia coli* (*E. coli*) can pose a threat to the health of water contact recreation users and domestic water supplies. Potential sources of these bacteria include animal manure and septic systems.

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

As an alternative to estimating the load allocation directly, the bacteria TMDL establishes a surrogate measure expressed in a phased bacteria level reduction until the numeric standard above is achieved. An interim percent load reduction of 69 percent is suggested as an initial target for implementation, with a prioritization on the Upper Mainstem of the John Day River. If the numeric standard is not achieved after reaching this target, an 83 percent reduction would then be pursued.

Dissolved Oxygen

Low levels of dissolved oxygen can harm fish and other aquatic life. The availability of nutrients, warm temperatures, and light stimulate aquatic plant and algae growth that reduces the oxygen content of water when these plants die and decay. Domestic and wildlife feces and other organic wastes break down and remove oxygen from water.

The dissolved oxygen TMDL targets the DEQ standard (OAR 340-041-0016(3)) for water bodies identified as providing cool-water aquatic life habitats.

The standard states*, "For waters identified by DEQ as providing cool-water aquatic life, the dissolved oxygen may not be less than 6.5 mg/l as an absolute minimum."*

The dissolved oxygen TMDL establishes that implementation of the temperature TMDL will sufficiently address the dissolved oxygen impairment identified in the plan area.

Biocriteria

Biocriteria refer to the support of plants and animals which live at least part of their life cycle in water. Factors that affect biocriteria are stream disturbances, excessive heat inputs, and excessive sediment.

The standard states, "*Waters of the state shall be of sufficient quality to support aquatic species without detrimental changes in the resident biological communities (OAR 340-41-0011)."*

The biocriteria TMDL establishes that biological impairment is addressed through the temperature TMDL. While stressors other than temperature are identified as causes of biological impairment in the Basin, they are addressed directly or indirectly through the temperature TMDL implementation measures.

2.4.1.3 TMDLs and Agricultural Load Allocations

Table 2.4.1.3: Pollutants with Approved TMDLs and Load Allocations for the Management Area
Bacteria: Applies to all waterbodies in the John Day Subbasin with emphasis placed on the upper John Day River. **Load Allocation:** 83 percent reduction of *E. coli* organisms entering streams via runoff and direct deposition. **TMDL:** John Day River Basin TMDL and Water Quality Management Plan (EPA; approved 2010) • For more information: http://www.oregon.gov/deq/FilterDocs/jdTMDLwqmp.pdf
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). **Load Allocation Surrogate:** Effective shade, the percent of potential daily solar radiation flux that is blocked by vegetation and topography. Channel morphology and instream flow are additional surrogates due to their importance in moderating temperature. **TMDL:** John Day Basin TMDL and Water Quality Management Plan (EPA; approved 2010) • For more information: http://www.oregon.gov/deq/FilterDocs/jdTMDLwqmp.pdf
Dissolved Oxygen: Addresses summer dissolved oxygen concerns. **Load Allocation:** Dissolved oxygen standards are expected to be met through Temperature TMDL load allocations **TMDL:** John Day River Basin TMDL and Water Quality Management Plan (EPA: approved 2010) • For more information: http://www.oregon.gov/deq/FilterDocs/jdTMDLwqmp.pdf
Biocriteria: Addresses biocriteria. **Load Allocation:** Biocriteria standards are expected to be met through Temperature TMDL load allocations **TMDL:** John Day River Basin TMDL and Water Quality Management Plan (EPA: approved 2010) • For more information: http://www.oregon.gov/deq/FilterDocs/jdTMDLwqmp.pdf

2.4.1.4 Drinking Water

The Oregon Department of Environmental Quality (DEQ) provides drinking water assessments for each Management Area ahead of the Oregon Department of Agriculture's (ODA) biennial reviews. The full report is accessible at DEQ's Nonpoint Source Implementation webpage: https://www.oregon.gov/deq/wq/programs/Pages/Nonpoint-Implementation.aspx. In January 2025, DEQ submitted a drinking water assessment for the Upper Mainstem and South Fork John Day River Agricultural Water Quality Management Area. Below is a summary of the report.

The Management Area includes eight public water systems serving approximately 4,480 people, relying on groundwater and surface water sources. Over the past decade, six systems reported

alerts for total coliform bacteria exceeding the Maximum Contaminant Level Goal (MCLG), with one system noting *E. coli* contamination in 2019. Although there were no nitrate violations in public systems within the past five years, a private well reported nitrate levels exceeding 5 mg/L. DEQ emphasizes implementing Source Water Protection Practices to reduce contamination risks and improve water resiliency. Resources like the Groundwater and Surface Water Resource Guides are available to support water quality management efforts. (https://www.oregon.gov/deq/FilterDocs/gwresguide.pdf) (https://www.oregon.gov/deq/FilterDocs/SurfaceWaterResourceGuide.pdf)

Land use in the Upper Mainstem and South Fork John Day River Agricultural Water Quality Management Area consists primarily of private rural lands and federal property managed by the United States Forest Service. DEQ encourages ODA to adopt measurable objectives for strategies that protect drinking water source areas. Proactive steps, such as pollutant reduction tools and soil assessments, are critical to safeguarding drinking water. Additional guidance and resources are available through DEQ's Drinking Water Protection Program. (https://www.oregon.gov/deq/wq/dwp/Pages/dwpcontacts.aspx)

2.4.2 Sources of Impairment

Probable sources of pollution in the John Day Basin include erosion from agricultural, rural, and forest lands; streambank erosion; and runoff and erosion from roads, urban areas, and agricultural operations. Both natural and human-caused erosion contribute to these issues. Pollutants are transported to surface water or groundwater through rainfall, snowmelt, irrigation, urban runoff, and seepage. A significant cause of water quality impairment is increased heat input, primarily due to the removal of shade-providing vegetation, along with changes to seasonal flows, channel shape, and floodplain functions.

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

2.5 Regulatory and Voluntary Measures

2.5.1 Area Rules

A landowner or operator's responsibility under the Area Plan is to implement measures that prevent or control the sources of water pollution associated with agricultural and rural lands and activities. Criteria developed in this Plan do not apply to conditions resulting from unusual weather events, or other exceptional circumstances. The LAC encourages ODA to consider 'random acts of God' during rainfall events when waters of the state could potentially cause pollutants to enter creeks. Landowners should not be held accountable for these events.

All landowners or operators are encouraged to evaluate conditions on their lands that may be addressed by the following Prevention and Control Measures. Where current conditions are not consistent with the adopted Area Rules, efforts should begin immediately to ensure compliance with the relevant Prevention and Control Measure. The Area Rules will be reconsidered as part of the biennial review of this Plan. Prevention and control measures deemed to prevent degradation or cause improvement toward water quality standards will be retained while measures failing to protect water quality will be altered or deleted.

Upper Mainstem and South Fork John Day River
OAR 603-095-2040

Limitations
(1) Limitations. All landowners or operators conducting activities on agricultural lands are provided the following exemptions from the requirements of OAR 603-095-2040(2)–(6) (Prevention and Control Measures).
(a) A landowner or operator shall be responsible for water quality caused only by conditions on land managed by the landowner or operator.
(b) Criteria do not apply to conditions resulting from unusual weather events or other circumstances not within the reasonable control of the landowner or operator. 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.

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

Livestock Management
(3) Livestock Management: By January 1, 2006, livestock areas shall be managed to control direct discharge of pollutants.

Uplands Management
(4) Uplands Management: By January 1, 2006, within the vegetative growth capability of the site, private land and access route management must foster sufficient vegetation to protect water quality by providing infiltration, filtering of sediment and animal wastes, and stabilization of soil.

Streamside Management
(5) Streamside Management: By January 1, 2006, management of streamside areas must allow the establishment, growth and active recruitment of vegetation, consistent with the vegetative growth capability of the site, for protection of water quality by filtering sediment, stabilizing streambanks, and providing shade.

Irrigation Management
(6) Irrigation Management: By January 1, 2006, irrigation must be done in a manner that limits the amount of pollutants entering waters of the state.

2.5.2 Voluntary Measures

2.5.2.1 Nutrients and Manure Management

Agricultural and rural land management activities shall be conducted in a manner which prevents or controls the placement, delivery, or sloughing of wastes into waters of the state. All applicable statutes and rules (ORS 468B.025) shall be followed concerning placement of wastes likely to escape or be carried into waters of the state. The same shall apply to discharge of wastes if the discharge reduces the quality of the waters of the state. Water discharge permits are required by law for point sources of pollution.

2.5.2.2 Riparian/Streamside Area Management

A landowner's responsibility under this Area Plan is to implement measures that prevent and control water pollution from agricultural activities. Areas near water bodies are especially important to water quality and are sensitive to management activities because of the natural ecological functions they perform such as water infiltration and storage, moderation of temperature and sediment capture. Streamside and riparian systems provide the connection between the water held in the uplands and the water that is released into the stream. The condition of this area influences the quality of the water in the stream.

Streamside area management addresses the water quality parameters of concern identified in the 303(d) list: temperature, dissolved oxygen, biocriteria, and bacteria. Streamside vegetation influences water temperature through shade, stream width to depth ratio, groundwater recharge and discharge, and other hydrological factors. Streamside vegetation filters out sediment and manure, thereby improving fish and invertebrate habitat by reducing bacteria, increasing dissolved oxygen, and increasing biological diversity. The streamside area is defined as the area near the stream where management practices can most directly influence the conditions of the water. This area usually varies, depending on the slope, soil type, stream size, and morphology.

Water is the distinguishing characteristic of a streamside area, but soil, vegetation, and landform are also important components. In a healthy streamside area, the four components are interdependent.
Healthy streamside areas provide several important ecological functions. These include:

- Controlling erosion by dissipation of stream energy associated with high flows.
- Building streambanks and floodplains by capturing suspended sediment and bedload.
- Facilitating flood-water retention and groundwater recharge.
- Developing root masses that stabilize streambanks.
- Developing diverse channel characteristics providing pool depth, cover, and variations in water velocity necessary for fish production.
- Supporting biodiversity.
- Providing shading of the water and recruitment of large woody debris for aquatic habitat.

Indicators of a healthy streamside area include:

- Maintenance or recruitment of desired riparian vegetation.
- Streambank integrity protected through 25-year flood events.

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

- Expansion of riparian area.
- Reduction in actively eroding streambank length beyond that expected of a dynamic stream system.
- Vegetation community composition changes reflecting an upward trend in streamside area condition. (Increases in grass-sedge-rush, shrubs, and litter with decreases in weedy forbs and bare ground.)
- Improvement (decrease) of width-to-depth ratio of channel.
- Increase in shade.
- Stubble height of grasses and leader growth of shrubs and trees sufficient to maintain vigorous plant growth.

Streamside management planning should target a properly functioning streamside area. When crop establishment or re-establishment occurs near streamside areas during the growing season, seedbed preparation should be timed to minimize exposure to erosive forces. An adequate vegetative buffer or equally effective erosion control practice should be provided during the winter months. Noxious weeds should be controlled to prevent the spread of the weeds or to eradicate the population, when possible, in accordance with the Grant County Weed District noxious weed program. Roads along streamside areas and stream crossings should be kept to a minimum and be installed and maintained to minimize sediment delivery to the stream and not impede fish passage. Streamside grazing should be managed to prevent degradation of water quality or negative impact to the stability of streambanks. Streamside grazing management should include an ongoing consideration of the degree of grazing use that will maintain or develop the desired vegetative cover.

Prevention of degraded streamside areas should always be a planning goal. Landowner(s) should implement management systems on those streamside areas to establish and/or maintain streamside vegetation, vegetative buffers, filter strips, sediment retention structure, or equally effective water pollution control practices. If any activity degrades a vegetative buffer, the landowner should replant or restore the disturbed area to an adequate cover. Grazing management should allow for recovery of plants and leave adequate vegetation to ensure streambank stability, reduce sediment or other pollutants from entering the stream, and provide streamside shading consistent with the vegetative capability of the site.

Grant County government has recognized, as a part of the comprehensive land use planning process, the value of riparian management along rivers, streams, and springs. The natural features provided by riparian areas have extensive economic, social, and environmental benefits to the county residents. It has developed a policy to conserve riparian areas while recognizing that certain activities may be in conflict with the overall goals of protecting streamside areas. The goals of this Area Plan are generally consistent with the natural resource elements of the Grant County Comprehensive Land Use Plan regarding water quality and riparian vegetation.

2.5.2.3 Soil Erosion Prevention and Control

Effective management practices for controlling soil erosion and sediment delivery:

- Conservation tillage (crop residue management) – reduced tillage, minimum tillage, direct seeding, modified conventional tillage, reservoir tillage, sub-soiling, or deep chiseling,
- Nutrient management – soil testing and fertilizer placement,
- Cover crops – perennial or annual,
- Contour farming practices – strip cropping, divided slopes, terraces (level and gradient), cross-slope tillage,
- Crop rotations,
- Early or double seeding in critical areas,
- Vegetative buffer strips – filter strips, grassed waterways, field borders, contour buffer strips,
- Irrigation scheduling – soil moisture monitoring and application rate monitoring,
- Prescribed burning,
- Weed control,
- Road design and maintenance,
- Sediment retention basins and runoff control structures,

- Reforestation,
- Tree thinning – commercial and pre-commercial,
- Streambank protection.

2.5.2.4 Livestock Management

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

Grazing near streams should be managed to prevent negative impacts to streambank stability, allow for recovery of plants, and leave adequate vegetative cover to ensure protection of riparian functions including shade and habitat. 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.

A permit is required for certain livestock confinement areas, defined as annual feeding operations, or concentrated animal feeding operations, under rules currently being drafted, which are consistent with the federal rules.

2.5.2.5 Uplands Management

Landowners and operators shall manage their resources in an attempt to prevent and control water pollution from upland soil erosion and runoff of pollutants. This includes agricultural and rural lands that may not be near water bodies but have the potential to contribute to water quality degradation through runoff of sediment or animal wastes. To implement proper management practices to ensure an area is healthy or functioning properly, the capability and potential of a site must be understood. Capability is the highest ecological status a site can attain given political, social, and economic constraints. Potential is the highest ecological status a site can attain given no political, social, or economic constraints and is often referred to as the “potential natural community.” Examples of constraints would include local ordinances, location of roads or homes, and the costs of management changes.

Uplands areas are the rangelands, forestlands and croplands, upslope from the streamside areas to the ridge tops. With a protective cover of crops, grass, shrubs or trees, consistent with site capability, these areas will capture, store, and safely release precipitation and runoff thereby reducing the potential of erosion of the soil or delivery of soil or pollutants to the receiving stream or other body of water. Proper management of upland vegetation considers physical conditions and provides for livestock production, controls soil erosion, protects fish and wildlife habitat, and reduces transport of soil and nutrients to the stream. 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 including periodic disturbances.

Healthy upland areas provide several important ecological functions. They are:

- 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 and sediment.
- 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, diversity, and recruitment.
- 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 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. Recommendations for management practices to protect water quality can be obtained from sources listed in the Implementation Strategies Chapter of this Area Plan.

Proper application of cropland management systems can control sheet and rill erosion and gully erosion. Average annual sheet and rill erosion rates can be estimated using the Revised Universal Soil Loss Equation (RUSLE) over a cropping rotation with supporting data from the NRCS Field Office Technical Guide and/or similar data from other credible sources.

Range and pasture management should include a grazing management system that maintains sufficient vegetative cover to prevent runoff of sediment and animal wastes. This should include a consideration of intensity, frequency, duration, and season of grazing. Noxious weeds should be controlled according to current county and state weed laws.

Land access routes can be constructed and maintained to limit runoff of sediment into waters of the state. Roads used for activities subject to the Oregon FPA are regulated by FPA rules. Non-crop areas must be managed to control runoff of sediment and animal wastes into waters of the state.

2.5.2.6 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 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/livestock 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 primarily conducted through flooding or sprinkler systems. Water is typically drawn from surface sources, such as streams or ponds, as well as from groundwater. These withdrawals can affect stream flows and, consequently, impact water quality. To minimize adverse effects on stream flows, water withdrawals should comply with legal water rights and consider surface water characteristics and diversion methods. Effective irrigation depends on applying water at the right time and in the right amount, tailored to crop needs. This can be achieved by monitoring soil moisture levels, using crop water use budgets, or employing other tracking tools to optimize application.

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.

Chapter 3: Implementation Strategies

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

Vision: Maintain and/or improve the water quality of the streams located in the Upper Mainstem and South Fork John Day River Management Area.

Mission: Maintain the economic viability of the agricultural industry and individual landowners, while pursuing water quality improvement through maintenance, restoration, education, and monitoring in the Upper Mainstem and South Fork John Day River Management Area.

Goal: Prevent and control water pollution from agricultural activities and soil erosion to achieve applicable water quality standards, while respecting private property rights.

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

This Area Plan has an adaptive management strategy. Periodically, the ODA, LAC, and SWCD will review this Plan and revise it to ensure that it is achieving the mission and goals. Monitoring will play a key role in this strategy. A good monitoring program will help determine agriculture's role as it relates to water quality concerns in the Upper Mainstem and South Fork Subbasins. The LAC met in 2018 to discuss monitoring and supports the SWCDs efforts to monitor riparian vegetation with remote sensing.

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

- Sufficient site-capable vegetation is established along streams to stabilize streambanks, filter overland flow, and moderate solar heating,
- Crop lands are consistently covered throughout the year with production crops, crop residues, or cover crops,
- Pastures have minimal bare ground,
- Irrigation runoff does not deliver sediment, nutrients, or chemicals to streams,
- 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 collaborating with SWCDs and LACs across Oregon to establish long-term measurable objectives to achieve desired water quality conditions. Currently, no measurable objectives exist for this Management Area.

Pollutant of concern:
Heat, Bacteria

Strategy:
Ensure adequate riparian vegetation for filtration of pollutants, stream shading, and streambank stability consistent with site capability.

Water Quality Criteria:
Temperature, Dissolved Oxygen, and Bacteria

- The temperature TMDL applies to all perennial and intermittent streams in the John Day Basin stream network.
- The bacteria TMDL load allocations apply to streams and sources throughout the upper and lower John Day Subbasins.

Data:
Riparian fence exclosure analysis of the Management Area provided by Grant SWCD.

3.1.1.1 Measurable Objective #1:
By 2026, assess the extent of publicly funded, completed riparian fence enclosures and riparian revegetation projects.
Assessment Method:
Once the evaluation of completed riparian fence enclosures and riparian revegetation projects are finished, the district will evaluate changes in riparian plant growth at key projects.
Milestones: • By 2026, conduct completed riparian fence enclosures and riparian revegetation projects assessment. • By 2027, complete evaluation of riparian plant growth within key projects from the assessment. • By 2027, conduct outreach to agriculture landowners in need of riparian enhancement projects. • By 2027, work with conservation partners to develop program(s) that enhance riparian vegetation.

3.1.2 Focus Areas and Other Coordinated Efforts in Small Watersheds

At present, there are no designated Focus Areas within this Management Area.

3.1.2.1 Warrens Creek Focus Area

Information regarding the Agricultural Water Quality Management Plan was mailed to landowners in the Warrens Creek Focus Area; recipients were either already aware or did not contact the district regarding concerns. The Focus Area has been closed due to lack of landowner participation.

3.1.2.2 Strawberry Creek Focus Area

Information regarding Agricultural Water Quality Management Plan was mailed to the landowners within the Strawberry Creek Focus Area; recipients were either already aware or did

not contact the SWCD regarding concerns. The Focus Area has been closed due to lack of landowner participation.

3.1.3 Strategic Implementation Areas (SIA)

Currently, there are currently 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 goals and objectives of the Area Plan (Table 3.2).

Table 3.2 Planned Activities for 2025-2030 throughout the Management Area by Grant SWCD, South Fork John Day Watershed Council, and NRCS

Activity	6-year Target	Description
Landowner Engagement		
# events that actively engage landowners (workshops, demonstrations, tours)	20	Natural Resource Fairs, site tours, radio ads, newspaper ads.
# landowners participating in active events	300	
Technical Assistance (TA)		
# landowners provided with TA (via phone/walk-in/email/booth/site visit)	200	Technical assistance in the form of site visits, information handouts, restoration guidance.
# site visits	300	Site visits for technical assistance; initial applications; Conservation Reserve Enhancement Program (CREP) certifications; Oregon Watershed Enhancement Board (OWEB) grants and Regional Conservation Partnership Program (RCPP).
# conservation plans written*	70	Funded Natural Resources Conservation Service (NRCS) and Farm Service Agency (FSA) contracts
On-the-ground Project Funding		
# funding applications submitted	200	Through various NRCS programs. RCPP, OWEB, Oregon Water Resources Department, U.S. Partners for Fish and Wildlife. Juniper removal, riparian fence.
* 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 water quality in the Management Area as part of its ambient monitoring network.

3.3.2 Land Conditions

There is no additional land condition monitoring.

Chapter 4: Progress and Adaptive Management

Chapter 4 describes progress toward achieving Area Plan goals and measurable objectives by summarizing accomplishments and monitoring results. 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. See Chapter 3.1 for background and assessment methods.

4.1.1 Management Area

Table 4.1.1 Management Area Results

Measurable Objective: By 2026, assess the extent of publicly funded, completed riparian fence enclosures and riparian revegetation projects.
Assessment Method: Once the evaluation of completed riparian fence enclosures and riparian revegetation projects are finished, the district will evaluate changes in riparian plant growth at key projects.
Milestones: • By 2026, conduct completed riparian fence enclosures and riparian revegetation projects assessment. • By 2027, complete evaluation of riparian plant growth within key projects from the assessment. • By, 2027 conduct outreach to agriculture landowners in need of riparian enhancement projects. • By, 2027 work with conservation partners to develop program(s) that enhance riparian vegetation.
Assessment results: Assessment results will be presented during the next biennial review.

4.1.2 Focus Areas and Other Focused Efforts in Small Watersheds

There are no Focus Areas in this Management Area.

4.1.3 Strategic Implementation Areas

There are currently 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 are no GWMAs 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 goals and objectives of the Area Plan.

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

Table 4.2a Activities conducted in 2019-2024 throughout the Management Area by Grant SWCD, South Fork John Day Watershed Council, and NRCS

Activity	6-year results	Description
Landowner Engagement		
# events that actively engage landowners (workshops, demonstrations, tours)	38	Grant County Natural Resource Fair 2022; Izee landowner contractor tour 2021; stakeholder survey; radio ads; and newspaper ads. The pandemic made it challenging to hold landowner engagement events.
# landowners participating in active events	435	25 at Natural Resource Fair; 20 at Izee tour; South Fork John Day Watershed Council is tracking call-backs and mail received; Belshaw Creek Project; juniper removal; riparian fence.
Technical Assistance (TA)		
# landowners provided with TA (via phone/walk-in/email/booth/site visit) *	342	Various soils, seeding recommendation requests; technical assistance in the form of site visits, information handouts, restoration guidance.
# site visits	624	Technical assistance; initial applications; Conservation Reserve Enhancement Program (CREP) certifications; Oregon Watershed Enhancement Board (OWEB) Stakeholder Engagement grant and Regional Conservation Partnership Program (RCPP) is providing funding for many site visits; juniper removal; erosion; Belshaw Creek; and Canyon Creek.
# conservation plans written**	128	Funded Natural Resources Conservation Service (NRCS) and Farm Service Agency (FSA) contracts.
On-the-ground Project Funding		
# funding applications submitted	349	Through various NRCS programs. RCPP, OWEB, Oregon Water Resources Department, U.S. Partners for Fish and Wildlife. Juniper removal, riparian fence, Belshaw Creek.
# funding applications awarded	173	Through various NRCS programs. Juniper removal, riparian fence.

* 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 1997-2023 (OWRI data include most, but not all projects, implemented in the Management Area.)

Landowners	OWEB	DEQ	NRCS*	BPA	CTWSR	ODFW	All other sources**
$1,603,331	$3,691,057	0	$179,143	$3,102,455	$2,280,001	$2,245,000	$1,899,921
							TOTAL 15,000,908

Acronyms: OWEB (Oregon Watershed Enhancement Board); DEQ (Oregon Department of Environmental Quality); NRCS (Natural Resources Conservation Service); BPA (Bonneville Power Administration); CTWSR (Confederated Tribes of the Warm Springs Reservation); ODFW (Oregon Department of Fish and Wildlife)
* 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 1997-2023 (OWRI data include most, but not all projects, implemented in the Management Area.)

Activity Type*	Miles	Acres	Count**	Activity Description
Upland		17,236		
Road	0		0	
Streamside Vegetation	70	1029		
Wetland		0		
Instream Habitat	17			
Instream Flow	24		cfs	
Fish Passage	1,274		88	
TOTAL	**1,384**	**18,264**	**88**	

* 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 dissolved oxygen, *E. coli*, pH, total phosphorus, temperature, and total suspended solids in the Management Area. (DEQ. 2022. Oregon Water Quality Status and Trends Report; https://www.oregon.gov/deq/wq/programs/Pages/wqstatustrends.aspx).

Data are from DEQ, US EPA, and USGS databases for 2001 through 2020. DEQ determined status for stations in five-year periods and trends for stations with at least eight years of data collected at the same time of year.

The following locations have sufficient data to calculate recent status and trends and are most likely to help characterize agricultural water quality (Table 4.3.1).

Table 4.3.1 Attainment of water quality standards from DEQ. 2022 Oregon Water Quality Status and Trends Report

Site Description	Parameter					
	E. coli	pH	Dissolved Oxygen	Temp.	Total Phosphorus (mg/L)	Total Suspended Solids (mg/L)
	Status and Trend					
South Fork JDR at Dayville 11020-ORDEQ	Yes	Yes	Yes↑	N/A	0.03;0.11	6;39
JDR upstream of Dayville 11479-ORDEQ	No↓	Yes	Yes↑	N/A	0.07;0.12	9:36
JDR at Clyde Holliday State Park 31990-ORDEQ	Yes	Yes	Yes	N/A	0.08;0.1	6.5;14
Canyon Creek at John Day City Park 31987-ORDEQ	N/A	Yes	Yes	N/A	0.03;0.05	3;4
Black Canyon Creek 26936-ORDEQ	N/A	Yes	Yes	N/A	0.03;0.04	1.5;4

[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
→Steady
–– No significant trend

Dissolved oxygen and pH trends are steady or improving.

E. coli has very few sites where it has been monitored. Where it has been monitored, the results are mixed.

Temperature is generally too high and on a degrading trend; there are exceptions, mainly in the upper stream reaches.

Very little phosphorous and sedimentation (total suspended solids) has been monitored in the area.

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 April 8, 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
Department of Environmental Quality (DEQ): Water quality monitoring • Temperature: Out of 47 total sites, 10 are attaining the standard, 13 are not attaining (24 unassessed). Of the six sites with sufficient data for trend analysis, five are improving, and one has no trend. • Bacteria: Out of 10 sites, two are attaining the standard, one is not attaining (seven unassessed). Two sites had sufficient data for trend analysis, with one degrading, and 1 one no trend. • Dissolved oxygen: Out of 30 sites, five are attaining the standard (25 unassessed). Dissolved oxygen levels are looking good throughout the area. Grant SWCD • Fox Creek Focus Area is seeing good tree growth within the riparian enclosures, which are constructed of livestock hog panels that are effectively keeping elk and beaver out. • Helicopter and utility terrain vehicle grass reseeding following wildfires is showing positive results as the landscape is beginning to green up. • The SWCD plans to advertise the availability of the utility terrain vehicle starting in August. • An Area Plan measurable objective has been established to track riparian vegetation growth. • Oregon Department of Fish and Wildlife and the SWCD are also collaborating on riparian habitat program fencing projects to support ongoing restoration efforts. South Fork John Day Watershed Council • One spring development, 2 miles of aquatic habitat work, 14.5 acres of riparian fence, 900 acres of seeding. Regional Conservation Partnership Program (RCPP) work on livestock water, juniper removal, streambank stabilization, etc. Water quality monitoring across ownerships. Outreach and education. Developing a five-year work plan for RCPP continuation. • Landowners are doing a lot on their own. • The LAC is pleased with the measurable objective the SWCD added to the plan.
Impediments
• DEQ monitoring data in the area lacks sufficient temperature measurements. There's concern about data quality, particularly regarding the cold-water influences of the upper mainstem, which are not meeting standards. This should inform the TMDL about what temperature targets are realistically achievable. • The agricultural community is being held responsible for rising stream temperatures, yet most of the monitoring occurs on federal land. There is concern that federal land managers may not be fully contributing to water quality goals. If water is already warm when it leaves federal land, it's assumed to continue warming as it passes through private agricultural lands. Shade doesn't cool water but slows down the rate of warming. • There are ongoing questions about whether cattle are the primary source of bacteria contamination. • Since 1995, LAC members Joanne Keerins and Phil St. Clair have planted more than 10,000 trees along the upper South Fork. However, most have not survived due to wildlife damage from beaver, elk, and deer activity combined with only 42 nonconsecutive frost-free days each year. There is uncertainty about whether the required shade targets can be met under these conditions and at what point efforts to meet shade goals can stop. • Some landowners will not work with conservation agencies. Building trust with landowners will be difficult, especially as more is being asked of them. However, establishing tiered expectations could ease concerns. The last monitoring effort contributed to the 303(d) listing, which adds to the sensitivity. • The Dry Pine flow station may no longer be collecting data and should be checked. • Flooding and channelization/diking work by the U.S. Army Corps of Engineers in the 1960s caused significant damage. Only recently have streams and riparian systems begun to recover.

Recommended Modifications and Adaptive Management

- ODA and DEQ need to collaborate more effectively to pinpoint specific problem areas through reasonable, targeted monitoring. Once issues are clearly identified, solutions can be developed.
- Stronger language is needed for baseline to define clear goals and expectations. A well-defined path forward should replace vague language and add specifics. This includes adding levels (more than just a standard), and setting tiered benchmarks ranging from minimum to maximum. Include measurable steps in between, so DEQ can evaluate and track progress effectively.
- Landowners want recognition for stewardship work they're already doing, as well as a clear status process.
- Increased funding is needed to support consistent, robust, and reasonable monitoring efforts.
- Annual meetings could help review and discuss measurable objectives.
- A fresh start in monitoring is recommended, including open conversations with landowners and partners to build trust and align on priorities.
- DEQ and ODA need to reassess their regulatory approach to ensure its effective in achieving water quality goals. Bringing OWEB into the conversation could help align focused funding.
- ODA must clearly define expectations and desired outcomes. Monitoring is foundational, and decisions shouldn't be made without knowing whether a problem exists or where it lies. More clearly defined and realistic standards could serve as a productive conversation starter with landowners.

Table 4.4b Number of ODA compliance activities in 2019-2024

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							