Lower John Day Agricultural Water Quality Management Area Plan

March 2019

Developed by the
Oregon Department of Agriculture
Lower John Day Local Advisory Committee

With support from the
Gilliam County Soil and Water Conservation District
Sherman County Soil and Water Conservation District

Oregon Department of Agriculture
Water Quality Program
635 Capitol St. NE
Salem, OR 97301
Phone: (503) 986-4700

Gilliam SWCD
PO Box 106
Condon, OR 97823
(541) 384-2672

Sherman Co. SWCD
PO Box 405
Moro, OR 97039
(541) 565-3216

oda.direct/AgWQPlans
Table of Contents

Acronyms and Terms Used in this Document.......................................................... i

Foreword.................................................................................................................. iii

Required Elements of Area Plans.......................................................................... iii

Plan Content............................................................................................................... iii

Chapter 1: Agricultural Water Quality Management Program Purpose and
Background .................................................................................................................. 1
  1.1 Purpose of Agricultural Water Quality Management Program and Applicability of
Area Plans .................................................................................................................. 1
  1.2 History of the Ag Water Quality Program ............................................................ 1
  1.3 Roles and Responsibilities .................................................................................. 2
    1.3.1 Oregon Department of Agriculture ............................................................... 2
    1.3.2 Local Management Agency ........................................................................... 5
    1.3.3 Local Advisory Committee .......................................................................... 5
    1.3.4 Agricultural Landowners .............................................................................. 5
    1.3.5 Public Participation ....................................................................................... 6
  1.4 Agricultural Water Quality .................................................................................. 6
    1.4.1 Point and Nonpoint Sources of Water Pollution .............................................. 6
    1.4.2 Beneficial Uses and Parameters of Concern ................................................... 6
    1.4.3 Impaired Waterbodies and Total Maximum Daily Loads (TMDLs) .................. 7
    1.4.4 Oregon Water Pollution Control Law – ORS 468B.025 and ORS 468B.050 ....... 7
    1.4.5 Streamside Vegetation and Agricultural Water Quality ............................... 8
  1.5 Other Water Quality Programs .......................................................................... 9
    1.5.1 Confined Animal Feeding Operation Program ............................................... 9
    1.5.2 Groundwater Management Areas ................................................................ 10
    1.5.3 The Oregon Plan for Salmon and Watersheds ............................................. 10
    1.5.4 Pesticide Management and Stewardship ......................................................... 10
    1.5.5 Drinking Water Source Protection ................................................................. 11
  1.6 Partner Agencies and Organizations .................................................................. 11
    1.6.1 Oregon Department of Environmental Quality .............................................. 11
    1.6.2 Other Partners ............................................................................................ 11
  1.7 Measuring Progress ......................................................................................... 11
    1.7.1 Measurable Objectives .................................................................................. 12
    1.7.2 Land Conditions and Water Quality ............................................................. 12
    1.7.3 Focused Implementation in Small Geographic Areas .................................... 13
  1.8 Monitoring, Evaluation, and Adaptive Management ........................................... 13
    1.8.1 Agricultural Water Quality Monitoring ......................................................... 13
    1.8.2 Statewide Aerial Photo Monitoring of Streamside Vegetation ....................... 14
    1.8.3 Biennial Reviews and Adaptive Management ................................................ 14

Chapter 2: Local Background .................................................................................. 15
  2.1 Local Roles and Responsibilities ........................................................................ 15
    2.1.1 Local Advisory Committee .......................................................................... 15
    2.1.2 Local Management Agency .......................................................................... 16
  2.2 Area Plan and Rules: Development and History ............................................... 16
  2.3 Geographical and Physical Setting .................................................................... 16
    2.3.1 Location, Description and Land Use ............................................................... 16
Chapter 2: \(2.3.2\) Climate ..................................................................................................................17
\(2.3.3\) Hydrology ..............................................................................................................18
\(2.3.4\) Topography/Geology ..........................................................................................18
\(2.3.5\) Vegetation ............................................................................................................19
\(2.3.6\) Fish and Wildlife Resources ................................................................................19
\(2.4\) Agricultural Water Quality ......................................................................................19
\(2.4.1\) Water Quality Issues ............................................................................................19
\(2.4.2\) Basin TMDLs and Agricultural Load Allocations ................................................21
\(2.4.3\) Sources of Impairment .........................................................................................21
\(2.4.4\) Drinking Water .....................................................................................................22
\(2.5\) Voluntary and Regulatory Measures .......................................................................22
\(2.5.1\) Waste Management ............................................................................................23
\(2.5.2\) Upland Management ...........................................................................................23
\(2.5.3\) Riparian and Streamside Area Management .........................................................25
\(2.5.4\) Livestock Management .......................................................................................27
\(2.5.5\) Irrigation Management .......................................................................................27
\(2.5.6\) Water Quality Management Practices ..................................................................28

Chapter 3: \(3.1\) Strategic Initiatives .......................................................................................29
\(3.1.1\) Measurable Objectives .........................................................................................29
\(3.1.2\) Focus Area(s) .......................................................................................................31
\(3.1.3\) Strategic Implementation Area ............................................................................32
\(3.2\) Strategies and Activities .........................................................................................32
\(3.2.1\) Education and Outreach ......................................................................................32
\(3.2.2\) Conservation Planning and Conservation Activities ...........................................33
\(3.2.3\) Technical & Financial Assistance ........................................................................34
\(3.3\) Monitoring and Evaluation .....................................................................................35

Chapter 4: \(4.1\) Progress Toward Measurable Objectives ....................................................37
\(4.1.1\) Management Area ...............................................................................................37
\(4.1.2\) Focus Area ...........................................................................................................38
\(4.1.3\) Strategic Implementation Area ............................................................................39
\(4.2\) Activities and Accomplishments ............................................................................39
\(4.3\) Monitoring—Status and Trends ..............................................................................41
\(4.3.1\) Water Quality .......................................................................................................41
\(4.4\) Biennial Reviews and Adaptive Management .........................................................43

APPENDIX A: Effective Water Quality Management Practices .........................................45
APPENDIX B: References Used In The Development Of The Area Plan ............................47
Acronyms and Terms Used in this Document

Ag Water Quality Program – Agricultural Water Quality Management Program
Area Plan – Agricultural Water Quality Management Area Plan
Area Rules – Agricultural Water Quality Management Area Rules
CAFO – Confined Animal Feeding Operation
CNPCP – Coastal Nonpoint Pollution Control Program
CWA – Clean Water Act
CZARA – Coastal Zone Act Reauthorization Amendments
DEQ – Oregon Department of Environmental Quality
DMA – Designated Management Agency
GWMA – Groundwater Management Area
HABs – Harmful Algal Blooms
LAC – Local Advisory Committee
LMA – Local Management Agency
Management Area – Agricultural Water Quality Management Area
MOA – Memorandum of Agreement
NPDES – National Pollution Discharge Elimination System
NRCS – Natural Resources Conservation Service
OAR – Oregon Administrative Rules
ODA – Oregon Department of Agriculture
ODF – Oregon Department of Forestry
OHA – Oregon Health Authority
ORS – Oregon Revised Statute
OWEB – Oregon Watershed Enhancement Board
PMP – Pesticides Management Plan
PSP – Pesticides Stewardship Partnership
RCA – Required Corrective Action
SIA – Strategic Implementation Area
SWCD – Soil and Water Conservation District
TMDL – Total Maximum Daily Load
USDA – United States Department of Agriculture
US EPA – United States Environmental Protection Agency
WPCF – Water Pollution Control Facility
WQPMT – Water Quality Pesticides Management Team
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)). It references associated Agricultural Water Quality Management Area Rules (Area Rules), which are Oregon Administrative Rules (OARs) 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 state and federal law (OAR 603-090-0030(1)). At a minimum, an Area Plan must:

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

Plan Content

Chapter 1: Agricultural Water Quality Management Program Purpose and Background. The purpose is to have consistent and accurate information about the 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 available practices to address water quality issues.

Chapter 3: Local Goals, Objectives, and Implementation Strategies. Presents goal(s), measurable objectives, and timelines, along with strategies to achieve these goal(s) and objectives.

Chapter 4: Local Implementation, Monitoring, and Adaptive Management. ODA and the Local Advisory Committee (LAC) will work with knowledgeable sources to summarize land condition and water quality status and trends to assess progress toward the goals and objectives in Chapter 3.
Chapter 1: Agricultural Water Quality Management Program

Purpose and Background

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

As part of Oregon’s Agricultural Water Quality Management Program (Ag Water Quality Program), the Area Plan guides landowners and partners such as Soil and Water Conservation Districts (SWCDs) in addressing water quality issues due 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 LAC, with support and input from the SWCD and the Oregon Department of Environmental Quality (DEQ). The public was invited to participate in the original development and approval of the Area Plans and is invited to participate in the biennial review process. The Area Plan is implemented using a combination of outreach, conservation and management activities, compliance with Area Rules developed to implement the Area Plan, 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 603-095-2940). The Ag Water Quality Program’s general rules guide the Ag Water Quality Program, and the Area Rules for the Management Area are the regulations that landowners are required to follow. Landowners will be encouraged through outreach and education to implement conservation 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 properties grazing a few animals or raising crops,
- Agricultural lands that lay idle or on which management has been deferred,
- Agricultural activities in urban areas,
- Agricultural activities on land subject to the Forest Practices Act (ORS 527.610).

Water quality on federal lands in Oregon is regulated by DEQ and on Tribal Trust lands 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; to achieve water quality standards; and to adopt rules as necessary (ORS 568.900 through ORS 568.933). Senate Bill 502 was passed 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). 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: Map of 38 Agricultural Water Quality Management Areas**

1.3 **Roles and Responsibilities**

1.3.1 **Oregon Department of Agriculture**

The Oregon Department of Agriculture 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 carry out a water quality management plan for the prevention and control of water pollution from agricultural activities and soil erosion. State and federal laws drive the establishment of a Ag Water Quality Management Plan, which include:

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

The Oregon Department of Agriculture has the legal authority to develop and implement Area Plans and Area Rules for the prevention and control of water pollution from agricultural activities and soil erosion, where such plans are required by state or federal law (ORS 568.909 and ORS 568.912). ODA 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. 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. The ODA will use enforcement where appropriate and necessary to gain compliance with Area Rules. Figure 2 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 the condition through required corrective actions (RCAs) 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 RCAs, ODA may assess civil penalties for continued violation of the 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.
Figure 2: Compliance Flow Chart

[Flowchart image showing the process of ODA receiving complaints, evaluating complaints, conducting investigations, determining violations, and taking appropriate actions such as issuing letters of compliance or notices of noncompliance, with options for civil penalties.

NOTE: Provider may seek assistance from SWCD or other sources as needed throughout the process. However, cost-share funds are no longer available once a Notice of Noncompliance has been issued.

* May issue a Notice of Noncompliance if there is a serious threat to human health or environment.

* Pre-Enforcement Letter

Is an Advisory or Warning
Not an Enforcement Action

Letter of Compliance
Close Case

Notice of Noncompliance

Follow-Up Investigation

Follow-Up Investigation

Letter of Compliance
Close Case

Notice of Noncompliance

Follow-Up Investigation

Civil Penalty

Violated?
1.3.2 Local Management Agency
A Local Management Agency (LMA) is an organization that ODA designated to assist with the implementation of an Area Plan (OAR 603-090-0010). The Oregon Legislature’s intent is for SWCDs to 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 agreement between ODA and each SWCD. Each SWCD implements the Area Plan by providing outreach and technical assistance to landowners. SWCDs also work with ODA and the LAC to establish implementation priorities, evaluate progress toward meeting Area Plan goals and objectives, and revise the Area Plan and 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 as many as 12 members to assist with the development and subsequent biennial reviews of the local Area Plan and Area Rules. The LAC serves in an advisory role to the director of ODA and to the Board of Agriculture. LACs are composed primarily of agricultural landowners in the Management Area and must reflect a balance of affected persons.

The LAC may meet as frequently as necessary to carry out their responsibilities, which include but are not limited to:
- Participate in the development and ongoing revisions of the Area Plan,
- Participate in the development and revisions of the Area Rules,
- Recommend strategies necessary to achieve the goals and objectives in the Area Plan,
- Participate in biennial reviews 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. Each landowner in the Management Area is required to comply with the Area Rules. In addition, landowners need to select and implement a suite of measures to protect water quality. The actions of each landowner will collectively contribute toward achievement of the water quality standards.

Technical and financial assistance is available to landowners who want to work with SWCDs (or other local partners) to achieve land conditions that contribute to good water quality. Landowners also may 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 do not result from agricultural activities, such as:
- Conditions resulting from unusual weather events,
- Hot springs, glacial melt water, extreme or unforeseen weather events, and climate change,
- Septic systems and other sources of human waste,
- Public roadways, culverts, roadside ditches and shoulders,
- Dams, dam removal, hydroelectric plants, and non-agricultural impoundments,
- Housing and other development in agricultural areas,
- 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 Plans 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 Plans and Area Rules, as needed, to address comments received. The director of ODA adopted the Area Plans and Area Rules in consultation with the Board of Agriculture.

The Oregon Department of Agriculture, LACs, and SWCDs conduct biennial reviews of the Area Plans and Area Rules. Partners, stakeholders, and the general public are invited to participate in the process. Any future revisions to the Area Rules will include a formal public comment period and a formal public hearing.

1.4 Agricultural Water Quality
The CWA directs states to designate beneficial uses related to water quality for every waterbody, 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. Significant point sources are required to obtain permits that specify their pollutant limits. Agricultural operations regulated as point sources include permitted Confined Animal Feeding Operations (CAFOs), and many are regulated under ODA’s CAFO Program. Pesticide applications in, over, or within three feet of water also are regulated as point sources. Irrigation water flows from agricultural fields may be at a defined outlet but they do not currently require a permit.

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

Many waterbodies throughout Oregon do not meet state water quality standards. Many of these waterbodies have established water quality management plans that document needed pollutant reductions. The most common water quality concerns related to agricultural activities are temperature, bacteria, biological criteria, sediment and turbidity, phosphorous, algae, pH, dissolved oxygen, harmful algal blooms (HABs), nitrates, pesticides, and mercury. These parameters vary by Management Area and are summarized in Chapter 2.
1.4.3 Impaired Waterbodies and Total Maximum Daily Loads (TMDLs)

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

A TMDL includes an assessment of water quality data and current conditions and describes a plan to achieve conditions so that waterbodies will meet water quality standards. TMDLs specify the daily amount of pollution a waterbody can receive and still meet water quality standards. In the TMDL, point sources are allocated pollution limits as “waste load allocations” that are then incorporated in NPDES waste discharge permits, while a “load allocation” is attributed to nonpoint sources (agriculture, forestry, and urban). 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.

Total Maximum Daily Loads generally apply to an entire basin or Subbasin, not just to an individual waterbody on the 303(d) list. Waterbodies will be listed as achieving water quality standards when data show the standards have been attained.

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

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

1.4.4 Oregon Water Pollution Control Law – ORS 468B.025 and ORS 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 of the Area Rules.

ORS 468B.025 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:

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

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

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

1.4.5 Streamside Vegetation and Agricultural Water Quality
Across Oregon, the Ag Water Quality Program emphasizes streamside vegetation protection and enhancement to prevent and control water pollution from agriculture activities and to prevent and control soil erosion. Streamside vegetation can provide three primary water quality functions: shade for cool stream temperatures, 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.

Additional reasons for the Ag Water Quality Program’s emphasis on streamside vegetation include:
- Streamside vegetation improves water quality related to multiple pollutants, including: temperature (heat), sediment, bacteria, nutrients, toxics, and pesticides.
- Streamside vegetation provides fish and wildlife habitat.
- Landowners can improve streamside vegetation in ways that are compatible with their operation. Streamside conditions may be improved without the removal of the agricultural activity, such as with managed grazing.
- Streamside vegetation condition is measurable and can be used to track progress in achieving desired site conditions.

Site-Capable Vegetation
The Ag Water Quality Program uses the concept of “site-capable vegetation” to describe the vegetation that agricultural streams can provide to protect water quality. Site-capable vegetation is the vegetation that can be expected to grow at a particular site, given natural site factors (e.g., elevation, soils, climate,
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 flowing through agricultural lands. The Area Rules for each Management Area require that agricultural activities 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 for narrow streams. For example, shrubs and grass may provide shade, protect streambanks, and filter pollutants. However, on larger streams, mature site-capable vegetation is needed to provide the water quality functions.

In many cases, invasive, non-native plants, such as introduced varieties of blackberry and reed canarygrass, grow in streamside areas. This type of vegetation has established throughout much of Oregon due to historic and human influences and may provide some of the water quality functions of site-capable vegetation. ODA’s statutory authority does not require the removal of invasive, non-native plants, however, ODA recognizes removal as a good conservation activity and encourages landowners to remove these plants. Voluntary programs through SWCDs and watershed councils provide technical assistance and financial incentives for weed control and restoration projects. In addition, the Oregon State Weed Board identifies invasive plants that can negatively impact watersheds. Public and private landowners are responsible for eliminating or intensively controlling noxious weeds as may be provided by state and local law enacted for that purpose. For further information, visit www.oregon.gov/ODA/programs/weeds.

1.5 Other Water Quality Programs

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

1.5.1 Confined Animal Feeding Operation Program
The Oregon Department of Agriculture is the lead state agency for the CAFO Program. The CAFO Program was developed to ensure that operators do not contaminate ground or surface water with animal manure or process wastewater. Since the early 1980s, CAFOs in Oregon have been registered to a general Water Pollution Control Facility (WPCF) permit designed to protect water quality. A properly maintained CAFO must implement a site-specific suite of structural and management practices to protect ground or surface water. To assure continued protection of ground and surface water, the 2001 Oregon State Legislature directed ODA to convert the CAFO Program from a WPCF permit program to a federal National Pollutant Discharge Elimination System (NPDES) program. Oregon Department of Agriculture and DEQ jointly issue the NPDES CAFO Permit, which complies with all CWA requirements for CAFOs. In 2015, ODA and DEQ jointly issued a WPCF general CAFO Permit as an alternative for CAFOs that are not subject to the federal NPDES CAFO permit requirements. Currently, ODA can register CAFOs to either the WPCF or NPDES CAFO permit.

Either of the Oregon CAFO 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. You can view the CAFO program site at http://www.oregon.gov/ODA/programs/NaturalResources/Pages/CAFO.aspx
1.5.2 **Groundwater Management Areas**

Groundwater Management Areas are designated by DEQ where groundwater has elevated contaminant concentrations resulting, at least in part, from nonpoint sources. After the GWMA is declared, a local groundwater management committee comprised of affected and interested parties is formed. The committee works with and advises the state agencies that are required to develop an action plan that will reduce groundwater contamination in the area.

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

1.5.3 **The Oregon Plan for Salmon and Watersheds**

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

1.5.4 **Pesticide Management and Stewardship**

The ODA Pesticides Program holds the primary responsibility for registering pesticides and regulating their use in Oregon under the Federal Insecticide Fungicide Rodenticide Act. ODA’s Pesticide Program administers regulations relating to pesticide sales, use, and distribution, including pesticide operator and applicator licensing as well as proper application of pesticides, pesticide labeling, and registration.

In 2007, the interagency Water Quality Pesticide Management Team (WQPMT) was formed to expand efforts to improve water quality in Oregon related to pesticide use. The WQPMT includes representation from ODA, ODF, DEQ, and Oregon Health Authority (OHA). The WQPMT facilitates and coordinates activities such as monitoring, analysis and interpretation of data, effective response measures, and management solutions. The WQPMT relies on monitoring data from the Pesticides Stewardship Partnership (PSP) program and other monitoring programs to assess the possible impact of pesticides on Oregon’s water quality. Pesticide detections in Oregon’s streams can be addressed through multiple programs and partners, including the PSP program.

Through the PSP, state agencies and local partners work together to monitor pesticides in streams and to improve water quality (https://www.oregon.gov/deq/wq/programs/Pages/Pesticide.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.

Oregon Department of Agriculture 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 resources.
1.5.5 Drinking Water Source Protection

Oregon implements its drinking water protection program through a partnership between DEQ and OHA. The program provides individuals and communities with information on how to protect the quality of Oregon’s drinking water. The DEQ and OHA encourage preventive management strategies to ensure that all public drinking water resources are kept safe from current and future contamination. For more information see: [https://www.oregon.gov/deq/wq/programs/Pages/dwp.aspx](https://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 Oregon to implement the federal CWA in our state. DEQ is the lead state agency with overall authority to implement the CWA in Oregon. DEQ coordinates with other state agencies, including ODA and ODF, to meet the requirements of the CWA. The DEQ sets water quality standards and develops TMDLs for impaired waterbodies, which ultimately are approved or disapproved by the EPA. In addition, DEQ develops and coordinates programs to address water quality including NPDES permits for point sources, the CWA Section 319 grant program, Source Water Protection, the CWA Section 401 Water Quality Certification, and GWMAs. DEQ also coordinates with ODA to help ensure successful implementation of Area Plans.

A Memorandum of Agreement (MOA) between DEQ and ODA recognizes that ODA is the state agency responsible for implementing the Ag Water Quality Program. ODA and DEQ updated the MOA in 2012.

The MOA includes the following commitments:

- ODA will develop and implement a monitoring strategy, as resources allow, in consultation with DEQ.
- ODA will evaluate the effectiveness of Area Plans and Area Rules in collaboration with DEQ.
  - ODA will determine the percentage of lands achieving compliance with Area Rules.
  - ODA will determine whether the target percentages of lands meeting the desired land conditions, as outlined in the goals and objectives of the Area Plans, are being achieved.
- ODA and DEQ will review and evaluate existing information to determine:
  - Whether additional data are needed to conduct an adequate evaluation.
  - Whether existing strategies have been effective in achieving the goals and objectives of the Area Plans.
  - Whether the rate of progress is adequate to achieve the goals of the Area Plans.

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

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

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 towards improved water quality. ODA is working with SWCDs, LACs, and other partners to develop and implement strategies that will produce measurable outcomes. ODA also is working with partners to develop monitoring methods to document progress.

1.7.1 Measurable Objectives
Measurable objectives allow the Ag Water Quality Program to better evaluate progress towards improved water quality. 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 needed to achieve the measurable objective.

The Oregon Department of Agriculture, LAC, and LMA will establish measurable objectives and associated milestones for each Area Plan. Many of these measurable objectives relate to land conditions and primarily are implemented through focused work in small geographic areas (section 1.7.3), with a long-term goal of developing measurable objectives and monitoring methods at the Management Area scale.

At each biennial review, ODA and its partners will evaluate progress toward the most recent milestone(s) and why they were or were not achieved. ODA, the LAC, and LMA will evaluate whether changes are needed to keep on track for achieving the measurable objective(s) and will revise strategies to address obstacles and challenges.

The measurable objectives and associated milestones for the Area Plan are in Chapter 3 and progress toward achieving the measurable objectives and milestones is summarized in Chapter 4.

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

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

- Landowners can see land conditions and have direct control over them,
- 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 resultant improvements in the water. Extensive monitoring of water quality is needed to evaluate progress, which is expensive and may fail to demonstrate improvements in the short term,
- Improved land conditions can be documented immediately, but there may be significant lag time before water quality improves or water quality impacts due to other sources,
- Reductions in water quality from agricultural activities are primarily through changes in land conditions and management activities.

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 less likely to document the short-term effects of changing land conditions on water quality parameters such as temperature, bacteria, nutrients, sediment, and pesticides.
1.7.3 Focused Implementation in Small Geographic Areas

Focus Areas
A Focus Area is a small watershed with water quality concerns associated with agriculture. Through the Focus Area process, the SWCD delivers systematic, concentrated outreach and technical assistance in a small geographic area. A key component of this approach 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 geographic areas and is supported by a large body of scientific research (e.g. Council for Agricultural Science and Technology, 2012. Assessing the Health of Streams in Agricultural Landscapes: The Impacts of Land Management Change on Water Quality. Special Publication No. 31. Ames, Iowa).

Systematic implementation in Focus Areas provides the following advantages:

- Measuring progress is easier in a small watershed than across an entire Management Area,
- Water quality improvement may be faster since small watersheds generally respond more rapidly,
- A proactive approach can address the most significant water quality concerns,
- Partners can coordinate and align technical and financial resources,
- Partners can coordinate and identify appropriate conservation practices and demonstrate their effectiveness,
- A higher density of projects allows neighbors to learn from neighbors,
- A higher density of projects leads to opportunities for increasing the connectivity of projects,
- Limited resources can be used more effectively and efficiently,
- Work in one Focus Area, followed by other Focus Areas, will eventually cover the entire Management Area.

Soil and Water Conservation Districts select a Focus Area in cooperation with ODA and other partners. The scale of the Focus Area matches the SWCD’s capacity to deliver concentrated outreach and technical assistance, and to complete (or initiate) projects. The current Focus Area for this Management Area is described in Chapter 3. The SWCD 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 cooperation 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. 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 Area Rules. Finally, ODA completes a post-assessment to document progress made in the watershed. Chapter 3 describes any SIAs in this Management Area.

1.8 Monitoring, Evaluation, and Adaptive Management

The Oregon Department of Agriculture, LAC, and LMA will assess the effectiveness of the Area Plan and Area Rules by evaluating the status and trends in agricultural land conditions and water quality (Chapter 4). This assessment will include an evaluation of progress toward measurable objectives. ODA will utilize other agencies’ and organizations’ local monitoring data when available. ODA, DEQ, SWCDs, and LACs will examine these results during the biennial review and will revise the goal(s), measurable objectives, and strategies in Chapter 3 as needed.

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

Other partners may have water quality data that is described in Chapter 3 and presented in Chapter 4.

1.8.2 Statewide Aerial Photo Monitoring of Streamside Vegetation
Starting in 2003, ODA began evaluating streamside vegetation conditions using aerial photos. Stream segments representing 10 to 15 percent of the agricultural lands in each Management Area were randomly selected for long-term aerial photo monitoring. Stream segments are generally 3-5 miles long. ODA evaluates streamside vegetation at specific points within 30-, 60-, and 90-foot bands along both sides of stream segments from the aerial photos and assigns each segment a score based on streamside vegetation. The score can range from 70 (all trees) to 0 (all bare ground). The same stream segments are re-photographed and re-scored every five years to evaluate changes in streamside vegetation conditions over time. Because site-capable vegetation varies across the state, there is no single “correct” streamside vegetation index score. The purpose of this monitoring is to measure positive or negative change for an individual reach.

1.8.3 Biennial Reviews and Adaptive Management
All Area Plans and Area Rules around the state undergo biennial reviews by ODA and the LAC. As part of each biennial review, ODA, DEQ, SWCDs, and the LAC discuss and evaluate the progress on implementation of the Area Plan and Area Rules. This evaluation includes discussion of enforcement actions, land condition and water quality monitoring, and outreach efforts over the past biennium. ODA and partners evaluate progress toward achieving measurable objectives, and revise implementation strategies as needed. The LAC submits a report to the Board of Agriculture and the director of ODA describing progress and impediments to implementation, and recommendations for modifications to the Area Plan or Area Plans necessary to achieve the goal of the Area Plan. ODA and partners will use the results of this evaluation to update the measurable objectives and implementation strategies in Chapter 3.
Chapter 2: Local Background

This Area Plan applies to agricultural activities on all non-federal agricultural, rural, and forest lands in the Lower John Day Management Area. This Management Area consists of 1) all lands drained by the John Day River and its tributaries downstream but not inclusive of the Butte Creek drainage and 2) all streams flowing into the Columbia River between the Lower Deschutes drainage and the Willow Creek drainage. It applies to lands in current agricultural use and those lying idle or on which management has been deferred. It also applies to agricultural operations within incorporated city boundaries.

Figure 3: Lower John Day Ag Water Quality Management Area

2.1 Local Roles and Responsibilities

2.1.1 Local Advisory Committee
This Area Plan was developed with the assistance of the LAC. The LAC was formed in 2002 to assist with the development of the Area Plan and regulations and with subsequent biennial reviews.
Table 1: Current LAC members are:

<table>
<thead>
<tr>
<th>Name</th>
<th>Location</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Walter Powell</td>
<td>Condon</td>
<td>Oregon Wheat Commission, Dryland crops</td>
</tr>
<tr>
<td>Tracy Fields</td>
<td>Moro</td>
<td>Dryland crops, cattle</td>
</tr>
<tr>
<td>Bob Martin, Chair</td>
<td>Moro</td>
<td>Dryland crops</td>
</tr>
<tr>
<td>Guy Weedman</td>
<td>Moro</td>
<td>Dryland crops, cattle</td>
</tr>
<tr>
<td>Marvin Thompson</td>
<td>Moro</td>
<td>Dryland crops</td>
</tr>
<tr>
<td>Brad Eakin</td>
<td>Grass Valley</td>
<td>Dryland crops</td>
</tr>
<tr>
<td>Corey Wade</td>
<td>Arlington</td>
<td>Dryland crops, cattle</td>
</tr>
<tr>
<td>Susie Anderson</td>
<td>Condon</td>
<td>Watershed Council, cattle</td>
</tr>
<tr>
<td>Rich Harper</td>
<td>Condon</td>
<td>SWCD, Dryland crops</td>
</tr>
</tbody>
</table>

2.1.2 Local Management Agency

The implementation of this Area Plan is accomplished through an Intergovernmental Grant Agreement between ODA and the Gilliam and Sherman County SWCDs. This Intergovernmental Grant Agreement defines the SWCDs as the Local Management Agencies for implementation of the Area Plan. The SWCDs were also involved in development of the Area Plan and Area Rules.

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

2.2 Area Plan and Rules: Development and History

The director of ODA approved the Area Plan and Area Rules in 2004.

Since approval, the LAC meets biennially to review the Area Plan and regulations. The review process included assessment of the progress of Area Plan implementation toward achievement of plan goals and objectives. In 2006, the LAC agreed to modify the Prevention and Control Measures - Upland Management section of the Area Plan to add a statement clarifying the relationship between the Soil Erosion and Sediment Control Rule (OAR 603-095-2940(3)) and the Waste Management Rule (OAR 603-095-2940(2)). In 2013, the Area Plan was updated to include information about the John Day Basin TMDL and load allocations for agriculture. The 2015 biennial review included development of measurable objectives and reformatting the Plan to a chapter format that makes all plans in the state formatted consistently.

2.3 Geographical and Physical Setting

2.3.1 Location, Description and Land Use

The Management Area is an interior plateau generally situated between the Blue Mountains to the east and the Cascades Mountain Range to the west in north central Oregon.

The John Day River is unique – it’s the second longest undammed river (500 river miles) in the continental United States, behind the Yellowstone River. It contains designations of Federal Wild and Scenic River and State Scenic River in some sections and hosts a diversity of fish and wildlife. Located in the southern section of the Columbia Plateau Ecological Province, the John Day River Basin is an 8,100 square mile drainage area, the fourth largest basin in the state. The flows originate in the Strawberry Mountains (elevation 9,000 ft.) and flow generally westward and then northward for approximately 284 miles, discharging into the Columbia River east of Rufus (200 ft.) at River Mile (RM) 217.
Major towns in the Management Area include Arlington, Condon, Grass Valley, and Moro. This area is not highly populated (0.9 – 2.2 people / square mile).

The Management Area contains 1,181,194 acres (1,845 square miles). Most of the land (1.07 million acres) is privately owned. Bureau of Land Management manages 88,566 acres (7.5 percent), mostly along the John Day River, while the U.S. Forest Service only manages 13,551 acres (1.1 percent) in the southeastern corner.

Today the economy is heavily-based on agriculture, tourism, and agriculture-related industries. The small population, isolation from major cities, and limited transportation facilities limit expansion of the economy. The timber industry (logging) is most important in the forested upper portions of the Management Area. Dryland production of grain crops is the major economic activity on the plateaus of the Management Area. Raising livestock is important throughout the Management Area, comprised mostly of cattle and sheep ranching and associated hay crops. Tourism and recreation are growing industries, constituting a significant sector of the economy and are inextricably tied to the production of natural resources. Hunting, fishing, boating, camping, wildlife observation, photography, hiking, swimming, and scenic viewing are among the most common recreational activities. Federal Wild and Scenic River segments and State Scenic Waterway designation have undoubtedly contributed to the rise in tourism and recreation. These river segments contain outstandingly remarkable values and provide opportunities for white water rafting, warm-water bass fishing, and wildlife viewing.

### 2.3.2 Climate

The climate ranges from sub-humid in the upper Management Area to semi-arid in the lower Management Area. The area has a continental climate, characterized by low winter and high summer temperatures, low average annual precipitation and dry summers. The low annual rainfall on the majority of the landscape is characteristic of the Intermountain Region, which receives most precipitation (70-80 percent) between November and March. Less than 10 percent of the annual precipitation falls as rain during July and August, usually from sporadic, but violent thunderstorms. The other events that produce substantial and damaging runoff in this area are heavy precipitation or rapid snowmelt on frozen soils. These events occur relatively infrequently and cannot be predicted. Annual rainfall varies from about 8-inches in the northeast portion of the Management Area to about 28-inches in the extreme southeast, higher elevation forested areas. Most of the agricultural areas receive between 10- and 14-inches of precipitation per year. Mean annual temperatures vary inversely with elevation. Mean annual temperature ranges from 38°F in the upper subbasin to 58°F in the lower basin. Throughout the Management Area, actual temperatures vary from sub-zero during the winter months to over 100°F during the summer. Inflows of moist Pacific air moderate extreme winter temperatures. The average frost-free period is 50 days in the upper basin and 200 days in the lower basin.
2.3.3 Hydrology
The John Day and Columbia rivers are the largest watercourses within the area. Most water in the Management Area is derived from the upper watersheds, primarily in the form of melting snow. The John Day is a free-flowing system with highly variable discharge from peak to low flows. Discharge usually peaks from March through June and seasonal low flows typically occur from August to October. The John Day River tends to experience floods in December and January when warm temperatures and high precipitation result in rain on snow events, which lead to extreme runoff. Average annual discharge of the John Day River into the Columbia River is approximately 1.5 million-acre feet (or 2,103 cfs), with a range of 1 million to 2.25 million-acre feet. Peak flow at the McDonald Ferry gauging station (RM21) is typically over 100 times greater than the lowest flows the same year. From year to year, peak flows can vary as much as 300 – 700 percent. Major tributaries of the Lower John Day in the Management Area include Rock Creek, Grass Valley Canyon, Pine Hollow, Thirty-mile Creek, Dry Creek, Blalock Canyon and Juniper Creek.

2.3.4 Topography/Geology
Rock assemblages within the Management Area include masses of oceanic crust, marine sediments, volcanic materials, ancient river and lake deposits, and recent river and landslide deposits. Major geologic events included volcanic eruptions, uplifting, faulting, and erosion. Volcanic activity in the form of lava flows, mudflows, and ash fall formed and stratified three key formations in the subbasin over the course
of approximately 37 to 54 million years – the Clarno Formation, the John Day Formation and the Columbia River Basalt Group. The Columbia River Basalt Group, a less erodible formation, resulted from a series of flood basalt 12 to 19 million years ago. The Columbia River Basalt is the dominant rock at elevations below 4,000 feet. Igneous rocks are exposed in the higher reaches of the subbasin, while the lower basin exposures are primarily extrusive rocks, ash, and wind-blown loess. After volcanic activity ceased (10 million years ago), erosion and faulting continued to alter the landscape.

2.3.5 Vegetation
The present plant communities differ from the original flora as a result of intensive grazing, fire suppression, and introduction of exotic plants. Native bunch grasses have been largely replaced by western juniper, sagebrush, and exotic plants (e.g. cheatgrass). Land cover is predominantly rangeland and cropland. Agriculture is the primary private sector economic activity. The primary agricultural products in the Management Area are small grain and beef cattle production. The maximum allowable acreage (25% of total cropland) has been enrolled in the Conservation Reserve Program (CRP), removed from crop production and planted to perennial grasses.

Classifiable plant communities (ecological sites) are categorized into four basic divisions, according to the topographic position which they occupy: riparian, terrace, upland, and forest-woodland. Grass, shrub, and juniper communities dominate the valleys; ponderosa pine, lodgepole pine, Douglas fir, and white fir communities dominate higher elevations. Soil diversity also contributes to the variety of vegetation types. Exotic plants (noxious weeds) and uncontrolled growth of some native species (e.g. juniper) is a growing problem within the region. The single greatest threat to native rangeland biodiversity and recovery of less than healthy watersheds is the rapidly expanding invasion of noxious weeds. Although many weeds occupy lands in the Management Area, those causing most concern are diffuse, spotted, and Russian knapweeds; Dalmation toadflax; yellow starthistle; Scotch thistle; purple loosestrife; rush skeletonweed; leafy spurge; poison hemlock; Russian thistle; Canada thistle and medusahead rye.

2.3.6 Fish and Wildlife Resources
Historically, the John Day River was one of the most significant anadromous fish producing rivers in the Columbia River basin. Today, the John Day continues to support some of the most diverse native and non-native fish assemblages and healthiest populations of anadromous fish. It is estimated that there are 27 species of fish, including 17 native species, found in the John Day Basin. The relative health of these populations has been largely attributed to the absence of any large dams, limited releases of hatchery fish and the presence of quality habitat in headwater areas. The John Day Basin supports wild runs of spring and fall Chinook salmon, summer steelhead, and Pacific lamprey; resident populations of westslope cutthroat, interior redband, and bull trout also exist.

A variety of wildlife species, including large and small mammals, waterfowl, passerines, raptors, reptiles, and amphibians, are associated with riverine, wetland, and upland habitats. Many wildlife species reside in the shrub-steppe habitat.

Certain populations of wildlife species are being managed by federal and state wildlife managers, including big game, fur bearer, upland birds, and waterfowl species. Many raptors inhabit the Subbasin as well.

2.4 Agricultural Water Quality

2.4.1 Water Quality Issues
Beneficial Uses
Beneficial uses in the Management Area include public and private water supply, irrigation, industrial, livestock watering, anadromous fish passage, salmonid fish rearing and spawning, resident fish and
aquatic life, wildlife and hunting, boating, fishing, water contact recreation, and aesthetics (OAR 340-41-602, Table 10). Of the beneficial uses of water, the most sensitive use for most waters and parameters of concern is spawning and rearing of cold-water fisheries.

**WQ Parameters and 303(d) list**

The DEQ has identified several water quality concerns in the Management Area, including high temperature, sedimentation, bacteria levels, low oxygen concentrations and impaired biological conditions. The Lower John Day is listed for high summer water temperatures, sedimentation, copper, and biological criteria. The following discussion of stream temperature addresses the CWA requirements for standards to be established for the most sensitive beneficial use.

**Stream Temperature**

Elevated water temperature is the most widespread concern in the basin. The causes of stream heating are excess solar radiation, decreased groundwater interaction and instream flow reduction. These can result from natural disturbances and human-related stream modifications such as vegetation disturbance, irrigation withdrawal and channel straightening. Excessive water temperatures affect the survival of aquatic species. The purpose of the temperature criteria to protect designated temperature-sensitive beneficial uses, including specific salmonid life cycle.

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

A one-time measurement above the standard is not a violation of the standard. When stream flow is exceptionally low or air temperature is exceptionally high, the temperature criterion are waived (an example is when the flow is less than the expected ten-year low flow or the air temperature is above the 90th percentile of a seven-day average). *(Questions and Answers About DEQ’s Temperature Standards.)*

For nonpoint sources of stream heating (e.g. vegetation disturbance, stream channel alteration) attributed to agriculture and rural lands, the temperature TMDL establishes thermal goals for on-the-ground conditions that would lead to more natural stream temperature patterns. The TMDL recovery targets call for natural shade-producing vegetation along all streams in the Management Area and the removal of stressors that are impeding that attainment of a natural vegetative and channel geometry conditions. In certain areas, shade producing riparian vegetation may not be appropriate due to local site conditions. Site-specific determinations will be made by ODA.

Vegetation affects all of these factors and humans have, depending on the site, some degree of direct influence on vegetation. Riparian vegetation can help narrow and deepen stream channels, which protects water from heating by exposing less stream surface area to the surrounding environment.

Healthy vegetation in both the uplands and in the riparian area will capture, store, and safely release water later in the season. Releasing water later in the summer will reduce temperatures in two ways. The first way is that a higher volume of water requires more energy to heat it. Secondly, infusion of groundwater, usually between 45°F and 55°F, can help hold down stream temperatures.

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

Given the general trend that streams are cool at the headwaters and temperatures gradually increase as the water progresses to the mouth, attempts to reduce the rate of heating should focus on the small streams high in the watersheds. Humans have much more influence on these types of streams than on larger rivers. It is important to note that the small streams human management can affect represent the majority of stream miles in this and other watersheds. This is not to say that reaches lower in the system should be ignored. The climate and topography also have a profound influence on stream temperatures. Because eastern Oregon’s summer climate is hot and dry, water temperatures are naturally high and flows are low late in the summer.

Clearly, developing healthy, functioning riparian plant communities and stabilizing stream banks will improve critical aquatic and riparian habitat. However, because of the natural factors listed above and the technical and biological challenges (e.g. site capability, and beaver, deer, and rodent damage) of developing riparian vegetation it is unlikely that portions of most stream segments will meet the temperature criteria. But the numerical criteria are only part of the temperature standard. The standard itself focuses on limiting human-caused warming of surface waters to the extent it is feasible. Industries, agencies, cities and other groups including agriculture are required to write and implement a basin-wide management plan, such as this Area Plan, that describes how these sources will attempt to control stream temperatures if a stream in the basin exceeds the temperature criterion.

Table 2: Waterbodies with Approved TMDLs

<table>
<thead>
<tr>
<th>Category 4</th>
<th>Waterbody</th>
<th>Segment - River Mile</th>
<th>Parameter</th>
<th>Season</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Brown Creek</td>
<td>0 – 9.5</td>
<td>Temperature</td>
<td>Year Round</td>
</tr>
<tr>
<td></td>
<td>Grass Valley Canyon</td>
<td>0 – 39.8</td>
<td>Temperature</td>
<td>Summer</td>
</tr>
<tr>
<td></td>
<td>Hay Creek</td>
<td>0 – 24.8</td>
<td>Temperature</td>
<td>Year Round</td>
</tr>
<tr>
<td></td>
<td>John Day River</td>
<td>0.4 -182</td>
<td>Temperature</td>
<td>Year Round</td>
</tr>
<tr>
<td></td>
<td>Rock Creek</td>
<td>0 – 79.2</td>
<td>Temperature</td>
<td>Year Round</td>
</tr>
<tr>
<td></td>
<td>Stahl Canyon</td>
<td>0 - 5.7</td>
<td>Temperature</td>
<td>Summer</td>
</tr>
<tr>
<td></td>
<td>Thirty Mile Creek</td>
<td>0 – 39.4</td>
<td>Temperature</td>
<td>Year Round</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Category 5</th>
<th>Waterbody</th>
<th>Segment - River Mile</th>
<th>Parameter</th>
<th>Season</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Brown Creek</td>
<td>0 – 9.4</td>
<td>Biological Criteria</td>
<td>Year Round</td>
</tr>
<tr>
<td></td>
<td>Brown Creek</td>
<td>0 – 9.4</td>
<td>Sedimentation</td>
<td>Year Round</td>
</tr>
<tr>
<td></td>
<td>John Day River</td>
<td>0 – 154.6</td>
<td>Copper</td>
<td>Year Round</td>
</tr>
<tr>
<td></td>
<td>John Day River</td>
<td>0 – 278.3</td>
<td>Biological Criteria</td>
<td>Year Round</td>
</tr>
<tr>
<td></td>
<td>Rock Creek</td>
<td>0 – 79.2</td>
<td>Biological Criteria</td>
<td>Year Round</td>
</tr>
<tr>
<td></td>
<td>Rock Creek</td>
<td>0 – 79.2</td>
<td>Sedimentation</td>
<td>Year Round</td>
</tr>
</tbody>
</table>

2.4.2 Basin TMDLs and Agricultural Load Allocations
The John Day Basin TMDL, includes this Management Area, was approved in 2010. This Area Plan serves as the implementation plan for agriculture’s load allocation in the Management Area and may be revised to address the load allocations as they are implemented. A copy of the John Day TMDL can be found at [https://www.oregon.gov/deq/wq/tmdls/Pages/TMDLs-Basin-John-Day.aspx](https://www.oregon.gov/deq/wq/tmdls/Pages/TMDLs-Basin-John-Day.aspx).

2.4.3 Sources of Impairment
Nonpoint source pollution is pollution emanating from landscape scale sources and cannot be traced to a single point. Probable nonpoint sources of pollution in the John Day River watershed include eroding
agricultural and forest lands, eroding streambanks, runoff and erosion from roads and urban areas, and runoff from livestock and other agricultural operations. Pollutants from nonpoint sources are carried to the surface water or groundwater through the action of rainfall, snowmelt, irrigation and urban runoff, and seepage.

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.

2.4.4 Drinking Water
There are 12 public water systems using groundwater wells in the plan area serving approximately 2,600 people. All public water systems in the management area have recent alerts for total coliform and/or E. coli with the exception of Sherman County School and the Sherman County Fairgrounds. Nitrate alerts or exceedances exist for Moro (5mg/L) and Sherman County School (up to 10mg/L, 6-8mg/L recently); both of these PWSs are on the west side of the WQMA. The drinking water standard for nitrates is 10 mg/L. These contaminants are often related to animal and cropland agriculture; fecal bacteria are present throughout the Management Area. All of the public groundwater systems have agricultural land uses (irrigated crops, pasture and/or livestock) within their source areas, although intensity of use varies. Real Estate Testing data for 1989-2015 indicates no significant detections of nitrate (>7mg/L) in private wells; however, only four wells are included in the database for this area.

DEQ recommends ODA and the SWCDs include a task in the plan to further evaluate agricultural land uses in the area near City of Moro and Sherman County School, as these show nitrate contamination. Implementation of best management practices in this area may reduce the potential for agricultural sources to impact drinking water sources.

At this time, the LAC has decided not to further evaluate drinking water sources in the Management Area. However, the Sherman SWCD will highlight ways to test drinking water in their quarterly newsletter.

2.5 Voluntary and Regulatory Measures
This Area Plan provides farmers, ranchers, and other agricultural land users in the Management Area a tool to achieve the following conditions on the land they occupy and manage:

- Soil erosion on uplands not exceeding acceptable rates,
- Elimination of placement, delivery, or sloughing of wastes into streams,
- Riparian vegetation for bank stability, filtration of overland flows and stream shading consistent with vegetative site capability.

The intent of this Area Plan is not to tell anyone how to farm, ranch, or otherwise utilize natural resources. However, SWCD personnel along with the Natural Resources Conservation Service (NRCS) in local offices help farmers, ranchers, and other agricultural land users implement recommendations in this Area Plan. For detailed information, please refer to the “Prevention and Control Measures” section. Each farmer, rancher, or other agricultural land user is expected to observe their property to ensure that undesirable conditions do not exist or that conditions are beginning to improve. If problems are encountered in meeting the goals of this Area Plan, land managers are encouraged to seek assistance as they will be required to bring the land they own or operate on into compliance with these goals.

A landowner or operator’s responsibility under this Area Plan is to implement measures that prevent and control the sources of water pollution associated with agricultural and rural lands and activities. A landowner or operator is not responsible for conditions caused by other landowners or for circumstances not within their reasonable control including unusual weather events. Reasonable control means that the
landowner or operator is using technically sound and economically feasible measures to address conditions that can result in water pollution.

603-095-2940

Prevention and Control Measures

(1) Limitations: All landowners or operators conducting activities on agricultural lands are provided the following exemptions from the requirements of OAR 603-095-2940 (2), (3), and (4).

(a) A landowner or operator shall be responsible for water quality resulting from conditions caused by the management of the landowner or operator.

(b) These rules 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 are used to address conditions described in Prevention and Control Measures.

(c) The Department may allow temporary exceptions when a specific integrated pest management plan is in place to deal with certain weed or pest problems.

(d) The capability of a site is the highest ecological status a site can attain given political, social, or economic constraints.

The sections that follow describe more detailed information related to potential agricultural water quality concerns, provides definitions of commonly used terms, provides dates when rules are effective and provides some exemptions to the rules.

To implement proper management practices and ensure an area is healthy or functioning properly, the capability and potential of a site must be understood. Site capability is the highest ecological status a site can attain considering political, social, or economic constraints. These constraints are often referred to as limiting factors. Site 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.”

2.5.1 Waste Management

Landowners must prevent the introduction of waste materials into nearby bodies of water.

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

Refer to Section 1.4.4, for text and definitions of applicable statutes.

2.5.2 Upland Management

Landowners must implement measures to control water pollution from agricultural activities and soil erosion. This includes agricultural and rural lands that may not be in close proximity to waterbodies but have the potential to degrade water quality degradation.

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

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

- Capture, storage, and beneficial release of precipitation,
- Provide for plant health and diversity that support habitat (cover and forage) for wildlife and (livestock,
- Filtration of sediment,
- Filtration of polluted runoff,
- Provide for plant growth that increases root mass that utilizes nutrients and stabilizes soil against erosion.)

Indicators of these conditions include:

- Recruitment of beneficial plant species,
- Groundcover to limit runoff of nutrients and sediment,
- Cropland cover that is sufficient to limit movement of nutrients and sediment,
- Roads and related structures designed, constructed and maintained to limit sediment delivery to streams,
- Noxious weed and insect pest populations contained (see state weed laws and county weed (regulations to determine weed species that must be controlled).

Factors to evaluate upland area condition may include:

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

Location and management of roads can significantly impact upland and riparian conditions. Weed infestations and runoff causing erosion are common problems associated with roads. Farm roads are considered as part of the agricultural operation and must be managed to control erosion. Agricultural lands must be managed to reduce the impacts of runoff onto public rights of way. (}

This Area Plan does not prescribe specific practices to landowners for management of upland areas to reduce runoff of sediment and other wastes. Site specific recommendations for management to protect water quality, including grazing management systems, desirable vegetation types and road construction and maintenance, can be obtained from sources listed in Chapter 3.

The Soil Erosion and Sediment Control Rule (OAR 603-095-2940(3)), minimizes sediment at its source by controlling erosion on-site and recognizes an established system of conservation plans and farming practices that is likely to provide compliance with the Waste Management Rule (OAR 603-095-2940(2)). Most landowners or operators exercising control of soil erosion in compliance with the “soil erosion” rule would avoid discharging sufficient sediment into a stream to cause violation of the “waste management” rule. However, if monitoring demonstrates a water quality problem, then existing conservation plans may need to be modified to assure protection of beneficial uses.

In addition to complying with this rule, landowners should be aware that the waste rule requires them to prevent pollution from sediment delivery to streams. While an NRCS-approved farm plan may show compliance with the erosion rule, farming in accordance with the plan may still result in pollution in violation of rule #3 (OAR 603-095-2940(3)). If ODA determines during a compliance investigation that a
landowner’s farm plan is not adequate to comply with the waste rule, ODA will work with the SWCD, NRCS and the landowner to modify the plan to comply with the waste rule.

(3) Soil Erosion and Sediment Control: By January 1, 2008, landowners must control upland soil erosion using technically sound and economically feasible methods.

(a) On croplands, a landowner may demonstrate compliance with this rule by:
(A) operating consistent with a Soil and Water Conservation District (SWCD) approved conservation plan that meets Resource Management Systems (RMS) quality criteria for soil and water resources; or
(B) operating in accordance with an SWCD-approved plan for Highly Erodible Lands (HEL) developed for the purpose of complying with the current US Department of Agriculture (USDA) farm program legislation; and farming non-HEL cropland in a manner that meets the requirements of an approved USDA HEL compliance plan for similar cropland soils in the county; or
(C) farming such that the predicted sheet and rill erosion rate does not exceed 5 tons/acre/year, as estimated by the Revised Universal Soil Loss Equation (RUSLE); or
(D) constructing and maintaining terraces, sediment basins, or other structures sufficient to keep eroding soil out of streams.

(b) On rangelands, a landowner may demonstrate compliance with this rule by:
(A) operating consistent with a Soil and Water Conservation District (SWCD) approved conservation plan that meets Resource Management Systems (RMS) quality criteria for soil and water resources, or
(B) maintaining sufficient live vegetation cover and plant litter, consistent with site capability, to capture precipitation, slow the movement of water, increase infiltration, and reduce excessive movement of soil off the site; or
(C) minimizing visible signs of erosion, such as pedestal or rill formation and areas of sediment accumulation.

(c) Landowners must control active gully erosion to protect against sediment delivery to streams. 'Active Gully Erosion' means gullies or channels that at the largest dimension have a cross sectional area of at least one square foot and that occur at the same location for two or more consecutive years of cropping or grazing.

2.5.3 Riparian and Streamside Area Management
Landowners must implement measures that seek to control water pollution from agricultural activities. Areas near waterbodies are especially important to water quality and sensitive to management activities.

The riparian area, as defined in OAR 141-110-0020(28), is a zone of transition from an aquatic to a terrestrial system, dependent upon surface or subsurface water, that reveals through the zone's existing or potential soil-vegetation complex the influence of such surface or subsurface water. A riparian area may be located adjacent to a lake, reservoir, estuary, pothole, spring, bog, wet meadow, muskeg, slough, or ephemeral, intermittent or perennial stream.

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

Water is the distinguishing characteristic of riparian areas but soil, vegetation, and landform also exert strong influence on these systems. In a healthy riparian ecosystem, these four components interact to produce a wide variety of conditions.
Healthy riparian areas provide several important ecological functions. These include:

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

Indicators to determine improvement of this condition include:

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

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

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

Riparian area management addresses the water quality parameters of concern identified in the 303(d) list. Streamside vegetation influences water temperature through shade, stream width-to-depth ratio, groundwater recharge and discharge, and other hydrological factors. Sediment reductions improve fish and invertebrate habitat. Healthy riparian condition improves biological criteria and habitat by reducing stream disturbances, preventing excessive heat and contaminant inputs, and adding to stream habitat complexity.

Management may directly influence healthy riparian areas. Specific recommendations for management to protect water quality, including buffer width, vegetation types, and grazing timing, can be obtained from several sources listed in the Implementation Strategies section of this Area Plan.

(4) Streamside Management: By January 1, 2008, management must allow the establishment and
improvement, over time, of riparian vegetation for streambank stability, filtering sediment and shading, consistent with site capability.

2.5.4 Livestock Management

Landowners must water pollution from livestock operations. Livestock production is a common agricultural activity in the Management Area. Careful management of grazing, feeding, and handling areas is critical to the success of livestock operations and can improve water quality by limiting runoff of sediment and animal wastes. 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. (Factors used to evaluate effectiveness of management may include:

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

2.5.5 Irrigation Management

Landonwers must control water pollution from irrigation. Diversion of water for irrigation or other uses and the return of excess water to the stream are activities that have potential for contributing to water quality problems. (Irrigated lands are lands upon which water is applied to grow crops. Irrigation water use is regulated by the Oregon Water Resources Department (OWRD) in the form of water rights, which specify the rate and amount of water that can be applied to a particular parcel of land (OAR 690 – Division 250 and ORS 536 through 543).

Irrigation is done by either flooding or sprinklers. Water usually is diverted from a surface source (stream or pond) but may also be from groundwater sources. Water withdrawals can reduce stream flows and thus, indirectly reduce water quality. There may be some positive benefits occurring from flood irrigation - including flow augmentation as water returns back to the stream, cooling and filtering of water through underground percolation, and the recharge of shallow wells and springs due to the connectivity of surface water to groundwater. Irrigation water may be used more than once as it returns to the stream and is available for instream uses or by other irrigators. (Characteristics of an irrigation system that has minimal effect on water quality include:

- 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 screened and which provide for fish passage. Refer to ORS 498.268 for screen requirements,
• Sediment is captured from irrigation runoff before it enters rivers and streams.

2.5.6 Water Quality Management Practices
Effective agricultural management practices for pollution control, are those management practices and structural measures that are determined to be the most effective, practical means of controlling and preventing pollution from agricultural activities.

Appropriate management practices for individual farms may vary with the specific cropping, topographical, environmental, and economic conditions existing at a given site. Due to these variables, it is difficult to recommend any uniform set of management practices to improve water quality relative to agricultural practices.

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

A detailed listing of a number of specific practices and management measures which can be employed to control or reduce the risk of agricultural pollution are contained in other documents such as the Field Office Technical Guide (FOTG), available for reference at the local NRCS office. Refer to Attachment A for examples of effective management practices for controlling water pollution.
Chapter 3: Strategic Initiatives

Purpose
The purpose of this Area Plan is to establish a framework to minimize agriculture’s impact on water quality within the Lower John Day Management Area. The Area Plan establishes procedures to identify and control factors that contribute to pollution originating on agricultural and rural lands. It also describes a program designed to achieve the goals of this Area Plan.

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

To achieve the Area Plan purpose and goal, the following water quality related objectives are established:

- **Control soil erosion on uplands to acceptable rates.**
  
  Intent: While all soil lost from fields through erosion may not necessarily enter streams due to distance from stream or practices such as sediment basins, the reduction in such erosion will reduce the likelihood that soil will enter streams.

- **Control pollution caused by the introduction of or discharge of wastes into waters of the state.**
  
  Intent: This ensures that high nutrient concentrations, pathogens associated with high animal density areas, high sediment concentrations in run-off, or other potential pollutants are not readily transported to streams and groundwater. It is also consistent with existing state statutes.

- **Provide riparian vegetation for streambank stability and stream shading.**
  
  Intent: The purpose of this objective is to provide for streambank stability and stream shading, consistent with site capability, not to restore riparian areas to their pre-settlement conditions or to address wetland areas away from streams. Because most of these changes take time and may require planning and implementation of management changes, landowners should take current actions necessary to achieve the desired conditions.

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

3.1.1 Management Area

1) **Control pollution caused by the introduction of or discharge of wastes into waters of the state.**

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

2) **Control soil erosion on uplands to acceptable rates.**

   Uplands were evaluated for erosion potential. NRCS used RUSLE2 to estimate erosion rates, based on average slopes, rainfall, soil types, and cropping practices. Soil loss was estimated at 10-year intervals between 1975 and 2015. These estimations are modeled based upon best-known information and technology at the time of study. The information is an approximation, based on assumptions and averages and should be used accordingly.
3) Provide riparian vegetation for streambank stability and stream shading.

Perennial stream reaches were evaluated for vegetative water quality function (shading, bank stability, and filtration of potential pollutants in overland flows).

Current streamside vegetation was categorized based on the degree to which it is likely to prevent and control water pollution, based on the site’s ability to grow vegetation, based on current constraints such as roads (“site capability”). The key water quality functions provided by plants are: shade, bank stability, and filtration of pollutants in overland flows. Because these functions are usually difficult to determine remotely, this method uses the surrogates of: canopy cover and ground cover.

SWCDs used a combination of the most recent aerial photography, ground truthing, and local knowledge to describe and map site capable vegetation communities and to classify existing vegetation.

This method obviously has limitations related to accuracy of the estimates. However, it can provide a useful approximation of the degree to which streamside vegetation is protecting water quality and it identifies areas that need improvement.

A. Methodology

1. Identify perennial stream reaches on agricultural lands

2. Identify site-capable plant communities

<table>
<thead>
<tr>
<th>Community Name</th>
<th>Indicator Species</th>
<th>% canopy cover over stream</th>
<th>% ground cover</th>
<th>Where</th>
<th>% of assessed streams in county</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open Riparian Shrub</td>
<td>Mostly willows and other shrubs with some alder/cottonwood</td>
<td>≤ 80</td>
<td>≤ 80</td>
<td>Sherman Co: Lower elevation / lower rainfall / small streams</td>
<td>100</td>
</tr>
<tr>
<td>Riparian Tree</td>
<td>White alder, black cottonwood, black hawthorn, western juniper</td>
<td>75</td>
<td>n/a</td>
<td>Gilliam Co.: Lower elevation / higher rainfall</td>
<td>25</td>
</tr>
<tr>
<td>Riparian Shrub</td>
<td>Coyote willow, red osier dogwood, wild rose, blue elderberry, Wyoming big sagebrush</td>
<td>50</td>
<td>n/a</td>
<td>Gilliam Co.: deeper soils / lower rainfall</td>
<td>64</td>
</tr>
<tr>
<td>Riparian Grass</td>
<td>Wheatgrass, Idaho fescue, thickspike wheatgrass, downy brome, reed canary grass</td>
<td>5</td>
<td>n/a</td>
<td>Gilliam Co.: shallow soils / lower rainfall</td>
<td>10</td>
</tr>
<tr>
<td>Riparian Forest</td>
<td>Ponderosa pine, Douglasfir, western juniper</td>
<td>65</td>
<td>n/a</td>
<td>Gilliam Co.: higher elevation / higher rainfall</td>
<td>1</td>
</tr>
</tbody>
</table>

SWCD staff determined classifications based on the table below. Sherman SWCD evaluated both ground and canopy cover; Gilliam SWCD just canopy cover due to the large number of streams they needed to assess. Both SWCDs created GIS maps with the results for their own use.
3.1.2 Focus Area(s)

2015-2019 - Lower Grass Valley Canyon Focus Area – Sherman SWCD

The Lower Grass Valley Canyon Watershed is nearly 30,000 acres in size. The Focus Area is one entire 6th field HUC (170702041305). Land use within the watershed consists of approximately 75 percent farmable ground and 25 percent of rangeland. The main crop grown is dryland wheat but some areas allow for hay production. There are 39 landowners within the Lower Grass Valley Canyon Watershed which will allow for multiple opportunities for outreach and getting projects on the ground.

2015-2019 Assessment Method for Lower Grass Valley Canyon

1. Aerial photos are used to map the waterways and do a broad classification from I-IV.
2. The mapped classifications are ground-truthed by stopping at all roads and public access points along mapped waterways to visually assess the ground and canopy cover along the waterway.

The following classes were used to classify and record conditions:

Table 3: Determining classes based on surrogates (compared to that provided by site capability)

<table>
<thead>
<tr>
<th>WQ functions provided by riparian veg, to the extent allowed by site capability</th>
<th>How to determine classes?</th>
<th>% of that provided by site capability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class I = Fully provided</td>
<td>Both of the following met</td>
<td>&gt;75%</td>
</tr>
<tr>
<td>Class II = Partially provided, not impaired by agricultural activities</td>
<td>At least one of the following met</td>
<td>&gt;50%</td>
</tr>
<tr>
<td>Class III = Likely not provided due to agricultural activities</td>
<td>At least one of the following met</td>
<td>&lt;50%</td>
</tr>
<tr>
<td>Class IIIx = Likely not provided due to weeds</td>
<td>At least one of the following met</td>
<td>&lt;50%</td>
</tr>
</tbody>
</table>

The following classes were used to classify and record conditions:

Table 4. Streamside condition classifications in the Lower Grass Valley Canyon Focus Area.

<table>
<thead>
<tr>
<th>Class I</th>
<th>Class II</th>
<th>Class III</th>
<th>Class IV (non-ag)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vegetation on agricultural lands likely sufficient to moderate solar heating, stabilize streambanks, and filter out pollutants consistent with site capability (&gt;75% canopy cover and &gt;75 ground cover of that provided by site capable vegetation).</td>
<td>Agricultural activities allowing plant growth, but vegetation likely insufficient to moderate solar heating, stabilize streambanks, or filter out pollutants consistent with site capability (&gt;50% ground or canopy cover of that provided by site capable vegetation).</td>
<td>Agricultural activities likely not allowing vegetation to moderate solar heating, stabilize streambanks, or filter out pollutants consistent with site capability (ag activities result in &lt;50% canopy or ground cover of that provided by site capable vegetation). This category also includes lands dominated by invasive species.</td>
<td>Non-agricultural land, e.g. roads, rural residential, forest land.</td>
</tr>
</tbody>
</table>

2015-2019 – Middle Rock Creek – Gilliam SWCD:

The Juniper Canyon-Rock Creek Focus Area encompasses 35,867 acres in the middle section of Rock Creek in Gilliam County. The Focus Area is the 6th field HUC number 170702041204. This section of Rock Creek includes some of the most intensive irrigated agriculture in the County as well as substantial livestock production and dry-land wheat farms. Approximately 30 landowners, mostly large with a few small hobby farms, make up the nearly 100 percent private ownership of this section of the watershed. Forty acres of BLM ground combined with State Highway 19 and the Rock Creek County Road make up the small portion of public ownership in the Focus Area. In the Focus Area, there are 25 miles of perennial streams and 50 miles of intermittent and ephemeral streams. Land use is approximately 95 percent agriculture, five percent rural residential.

Assessment Method for Middle Rock Creek
The Districts use ODA’s Streamside Vegetation Assessment (SVA) Tool to assess streamside conditions. The SVA is used throughout the state by many districts, which provides a consistent way to assess progress at various scales. Using GIS remote imagery, vegetation types within a 35-foot assessment area are mapped. Outreach and project implementation follow the initial assessment. Post-project assessments can be done periodically to gauge whether streamside vegetation is providing additional benefits.

For a description of assessment results, see Chapter 4.

3.1.3 Strategic Implementation Area
In 2018, ODA selected Thirtymile Watershed in Gilliam County as a SIA. ODA completed compliance evaluations related to agricultural activities and potential concerns related to surface and ground water. The evaluation considered the condition of streamside vegetation, bare ground, and potential livestock impacts (including manure piles). The process involved both a remote evaluation and field verification from publicly accessible areas.

Categories for evaluation include:
- **Limited Opportunity for Improvement:** ODA identified that there are likely no regulatory concerns, but there may be opportunity for improvement (uplift) to reach the ecological goals of the Area Plan.
- **Opportunity for Improvement:** ODA identified that agricultural activities may be impairing water quality, or evaluation was inconclusive using remote and field verifications.
- **Potential Violation:** ODA identified during the remote evaluation and verified during the field evaluation from a publicly accessible location, that a potential violation of the Area Plan Rules exists.

3.2 Strategies and Activities
To achieve clean water, an effective strategy must increase awareness of the problem and the range of potential solutions, motivate appropriate voluntary action, and provide for technical and financial assistance to plan and implement effective conservation practices. The Sherman County and Gilliam SWCDs through annual work plans and Memorandum of Agreement with ODA will use the following strategies, at the local level, in cooperation with landowners and other agencies and organizations.

The following strategies will apply for public participation in implementation and review of the Area Plan. ODA and the SWCDs intend to encourage participation in this water quality improvement program by:
- Providing educational programs to raise public awareness and understanding of water quality issues and solutions,
- Providing incentives for the development and implementation of voluntary water quality plans,
- Offering technical assistance for the development and implementation of effective agricultural management practices for pollution control,
- Developing a monitoring program to identify current and potential water quality problems,
- Following up on any water quality complaints and provide assistance in solving identified problems.

3.2.1 Education and Outreach
**Strategy 1:** Create a high level of awareness and an understanding of water quality issues among the agricultural community and rural public in a manner that minimizes conflict and encourages cooperative efforts through education and technical assistance activities.
As resources allow, the SWCDs, watershed councils, and OSU Extension Service (Extension), in partnership with other agencies and local organizations, will develop educational programs to improve the awareness and understanding of water quality and quantity issues. The objective of the educational programs is to promote the programs in a manner that reduces conflict and encourages cooperative efforts through education and technical assistance activities by:

- Incorporating implementation of the Area Plan as a priority element in the Sherman County and Gilliam County Soil and Water Conservation Districts’ annual work plans and long-range plans with support from partner organizations,
- Showcase successful practices and systems and conduct annual tours for landowners and media,
- Inform landowners of the Area Plan and Rules and encourage landowners to make such changes as may be needed,
- Recognize successful projects and practices through appropriate media and newsletters,
- Promote cooperative on-the-ground projects to solve critical problems identified by landowners and in cooperation with partner organizations,
- Conduct educational outreach to promote public awareness of water quality issues,
- Coordinate the review of information and education materials with agencies or organizations as appropriate.

### 3.2.2 Conservation Planning and Conservation Activities

**Strategy 2:** Encourage active participation by the agricultural community and rural public in the process of solving our water quality problems.

- Encourage development of individual conservation plans by assisting landowners with plans that address water quality and with the implementation of conservation practices adopted in those plans.
- Promote the continued development, evaluation, and adoption of practices and technologies that enhance water quality in an efficient, effective, economic manner, by reviewing research and development needs with agriculture assistance agencies and consultants.

Landowners and operators have flexibility in choosing management approaches and practices to address water quality issues on their lands. They may implement management systems on their own without a plan or may develop a plan that suits the needs of their operation. The local management agencies recommend that voluntary water quality plans be developed to assist the landowners and operators to assess the conditions on their lands, identify problems or potential problems on their land and to describe measures and resources needed to address those problems.

Voluntary water quality plans describe the management systems and schedule of conservation practices that the landowner will use to conserve soil, water, and related plant and animal resources on all or part of a farm or ranch unit. Voluntary water quality plans may be developed by landowners or operators, consultants, or technicians available through the SWCD or NRCS. An effective individual water quality plan will outline specific measures necessary to prevent or control water pollution and soil erosion from agricultural activities and to address the “Prevention and Control Measures” outlined in this AgWQM Area Plan.

Farm planning assistance is available from these and other sources:

- **Technical Assistance**
  - NRCS – planning, design, implementation
  - SWCD – planning, design, implementation, grant-writing
  - Watershed councils –planning, implementation, grant-writing
- **Workbooks and Publications**
Voluntary Conservation on Your Land, NRCS/Oregon Association of Conservation Districts (OACD)

Oregon Small Acreages Conservation Toolbox, NRCS/OACD

WEST Program Workbook, Oregon Cattleman’s Assoc. (OCA)/OSU

Ranch Water Quality Planning Workbook, Oregon State University (OSU) Extension

The Oregon Plan Toolbox, Oregon Watershed Enhancement Board (OWEB)

**Programs**

- Farm*A*Syst Program, OSU Extension
- Stream*A*Syst Program, OSU Extension
- Home*A*Syst Program, OSU Extension

This Area Plan recognizes that planning for water quality is only part of a successful plan for overall management of agricultural and rural land and that other, broader objectives must also be considered in total farm or resource management planning. Sustaining agricultural production capacity for future generations is one of those broader objectives. Conserving water and soil resources will help achieve that.

The Gilliam and Sherman County SWCDs have a long history of providing assistance to farmers and ranchers in implementing practices for the protection and conservation of natural resources. The Gilliam SWCD was created on November 4, 1946, and the Sherman County SWCD was created on April 21, 1950, under ORS 568.210–800. The SWCD boundaries are consistent with the respective county boundaries.

The SWCD and the NRCS have traditionally assisted landowners and operators with conservation planning and practice implementation utilizing many of the U.S. Department of Agriculture (USDA) conservation cost-share programs. When working with operators, the SWCD and NRCS staff follow a nine-step planning process, which helps the landowners identify their conservation objectives, and leads to development of a conservation plan that outlines various alternatives that may be used to address identified natural resource concerns. Staff works with the operators on their land to conduct resource inventories and surveys, and help lay out and oversee the installation of conservation measures on their land. The NRCS and SWCD develop specific conservation measures to control erosion, improve wildlife habitat, and reduce sedimentation.

### 3.2.3 Technical & Financial Assistance

**Strategy 3:** Work to improve the quality of water in the Management Area through planning and implementation of technically sound and economically feasible conservation practices that contribute to meeting Area Plan objectives.

- Limit soil erosion and pollution caused by agricultural activities, as close to the source as possible, by achieving soil erosion targets and sediment control.
- Show progress in reduction of pollution from agricultural and rural lands through periodic surveys of stream reaches and associated lands. Methods will be selected as targets become better understood and quantified.
- Implement successful practices for streambank stabilization, reduction in high summer water temperatures, and restoration and enhancement of wetlands and riparian areas, while avoiding adverse fish habitat modification.
- Implement conservation practices to improve irrigation water use and conveyance efficiency to reduce the impact of seasonal flow modifications on streams resulting from water withdrawals and to reduce the potential of polluted return flows.
- Identify priorities for pollution source identification and determining areas for implementing restoration activities including reasonable timelines for management strategies targeting TMDL attainment.
It is not the intent of this Area Plan to impose a financial hardship on any individual. It is the responsibility of the landowner or operator to request technical and/or financial assistance and to develop a reasonable timeframe for addressing potential water quality problems.

As resources allow, the Sherman County and Gilliam County SWCDs, NRCS, area watershed councils, and other natural resource agency staff are available to assist landowners in evaluating effective practices for reducing runoff and soil erosion on their farms, where it exists, and incorporating these practices into voluntary individual water quality plans. Personnel in these offices can also design and assist with implementation of practices, and assist in identifying sources of cost-sharing funds for the construction and/or use of some of these practices.

**Strategy 4:** Encourage adequate funding and administration of the program to achieve Area Plan goals and objectives.

- Promote incentive and cost-share programs to assist with implementation of Area Plans and related practices, by annually identifying water quality funding needs with agencies providing cost-share and technical assistance to agricultural operations.
- Implement systematic, long range planning, focusing on coordinated efforts on full-scale, watershed-based approaches.
- Identify needs, develop projects, actively seek funding, and ensure successful implementation of funded projects.

Technical and cost-sharing assistance for installation of certain management practices may be available through current USDA conservation programs such as Environmental Quality Incentive Program (EQIP), Conservation Reserve Enhancement Program (CREP), Conservation Reserve Program (CRP), EPA’s non-point source implementation grants (Section 319), or state programs such as OWEB, the Riparian Tax Incentive Program, and the Wildlife Habitat Conservation and Management Program. Other agencies may also be available to provide technical assistance or financial assistance to private landowners.

### 3.3 Monitoring and Evaluation

DEQ monitors two sites in the Management Area as part of their ambient monitoring network (John Day River at Hwy 206 and Rock Creek at the mouth).

DEQ retrieved data from DEQ, EPA, and USGS databases for January 1, 2000 to October 1, 2018 for the Management Area. DEQ determined status for stations with data from 2016 through 2018 and trends for stations with at least eight years of data. Their report is summarized in Chapter 4 and can be found at [http://www.oregon.gov/deq/wq/programs/Pages/wqstatustrends.aspx](http://www.oregon.gov/deq/wq/programs/Pages/wqstatustrends.aspx). The report will be updated for future biennial reviews.

For a description of monitoring and evaluation results, see Chapter 4.
Chapter 4: Implementation, Monitoring, and Adaptive Management

4.1 Progress Toward Measurable Objectives
Management Area-Wide Measurable Objectives will be updated during the 2021 Biennial Review.

4.1.1 Management Area
1) Control pollution caused by the introduction of, or discharge of wastes into waters of the state.  
2017: Ten livestock operations were identified likely to pollute perennial streams.

Current Status:
- Ten livestock operations were identified likely to pollute perennial streams.
  - By June 30, 2022, reduce the number to 50% through voluntary efforts, assuming funding is available.
  - By June 30, 2037, reduce the number to 0% through voluntary efforts, assuming funding is available.

The SWCDs will contact landowners to offer technical assistance to the livestock operations that were identified as likely polluting surface water.

2) Control soil erosion on uplands to acceptable rates
During 2015, the average erosion rate on tilled cropland was approximately two tons of soil per acre per year. In addition, the total erosion for the year was approximately 693,000 tons. Erosion in 2015 was 79 percent less than in 1975 when an estimated 3.3 million tons of soil was lost (approximately 10 tons per acre per year).

Due to uncertainty of Farm Bill and other funding, measurable objectives were not developed at this time. However, the goal is to keep soil loss below soil loss tolerance (either two or five tons per acre per year, depending on soil type). The LAC will revisit this measurable objective during the 2021 Biennial Review.

The SWCDs will continue to provide technical assistance to landowners to continue to keep soil loss below soil loss tolerance.

3) Provide riparian vegetation for streambank stability and stream shading.
SWCD staff calculated the percentages of stream miles in each category for their respective counties and provided these to ODA.

Current status of vegetation along perennial streams is:

<table>
<thead>
<tr>
<th>Class</th>
<th>Sherman Co.</th>
<th>Gilliam Co.</th>
<th>Total</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class I:</td>
<td>102.38</td>
<td>234.5</td>
<td>336.9</td>
<td>64</td>
</tr>
<tr>
<td>Class II:</td>
<td>22.41</td>
<td>143.1</td>
<td>165.5</td>
<td>31</td>
</tr>
<tr>
<td>Class III:</td>
<td>1.06</td>
<td>19.8</td>
<td>20.9</td>
<td>4</td>
</tr>
<tr>
<td>Class IIIx:</td>
<td>6.35</td>
<td>-</td>
<td>6.35</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>132.20</td>
<td>397.4</td>
<td>529.65</td>
<td>100</td>
</tr>
</tbody>
</table>
The next target is:

By June 30, 2027, assuming funding is available, 75% of perennial streams in agricultural areas will have streamside vegetation that likely provides the full suite of water quality functions the site is capable of (i.e., shade, bank stability, filtration of overland flow).

4.1.2  Focus Area

Lower Grass Valley Canyon (Sherman SWCD) – Assessment Results 2015-2019:

Table 6: Class I, II, III, IV Results in stream miles

<table>
<thead>
<tr>
<th>Class</th>
<th>2015: Pre-Assessment</th>
<th>2017: Interim-Assessment</th>
<th>2019: Post-Assessment</th>
<th>Reason for Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>14.90 miles</td>
<td>14.90 miles</td>
<td>TBD</td>
<td></td>
</tr>
<tr>
<td>II</td>
<td>.44 miles</td>
<td>.44 miles</td>
<td>TBD</td>
<td></td>
</tr>
<tr>
<td>III</td>
<td>0</td>
<td>0</td>
<td>TBD</td>
<td></td>
</tr>
<tr>
<td>IV (Not Ag)</td>
<td>2.49 Miles</td>
<td>2.49 Miles</td>
<td>TBD</td>
<td></td>
</tr>
<tr>
<td>Total (I-IV)</td>
<td>17.84 Miles</td>
<td>17.84 Miles</td>
<td>17.84 Miles</td>
<td></td>
</tr>
<tr>
<td>Total Ag Area Assessed (= Total minus “Not Ag”)</td>
<td>15.34 miles</td>
<td>15.34 miles</td>
<td>15.34 miles</td>
<td></td>
</tr>
</tbody>
</table>

Currently, the SWCD is implementing restoration projects with funding from an OWEB Large Grant. The restoration projects include new and rebuilt cropland terraces and WASCB’s (water and sediment control basins), spring developments and guzzlers for wildlife and livestock off-channel watering and range seeding. In addition, the SWCD has recently completed two years of weed surveying and have applied for a weed control grant through Oregon Weed Board. 2019 results will be reported during the 2021 Biennial Review.

Milestone: By 2019, increase Class I [97%] by 1%
2015 Conditions: Class I = 97%

Middle Rock Creek (Gilliam SWCD) – Assessment Results 2015-2019:

Table 7: Streamside Vegetation Assessment (SVA) Results – In Acres

<table>
<thead>
<tr>
<th>SVA Map Category (Alphabetical)</th>
<th>2015: Pre-Assessment</th>
<th>2017: Interim-Assessment</th>
<th>2019: Post-Assessment</th>
<th>Change Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ag Infrastructure</td>
<td>2.26</td>
<td>2.26</td>
<td>TBD</td>
<td></td>
</tr>
<tr>
<td>Bare</td>
<td>6.76</td>
<td>6.76</td>
<td>TBD</td>
<td></td>
</tr>
<tr>
<td>Bare Ag</td>
<td>7.26</td>
<td>7.26</td>
<td>TBD</td>
<td></td>
</tr>
<tr>
<td>Grass</td>
<td>16.19</td>
<td>16.19</td>
<td>TBD</td>
<td></td>
</tr>
<tr>
<td>Grass Ag</td>
<td>22.14</td>
<td>22.14</td>
<td>TBD</td>
<td></td>
</tr>
<tr>
<td>Not Ag</td>
<td>0.02</td>
<td>0.02</td>
<td>TBD</td>
<td></td>
</tr>
<tr>
<td>Shrub</td>
<td>37.80</td>
<td>37.80</td>
<td>TBD</td>
<td></td>
</tr>
<tr>
<td>Shrub Ag</td>
<td>0.34</td>
<td>0.34</td>
<td>TBD</td>
<td></td>
</tr>
<tr>
<td>Tree</td>
<td>33.00</td>
<td>33.00</td>
<td>TBD</td>
<td></td>
</tr>
<tr>
<td>Tree Ag</td>
<td>0.00</td>
<td>0.00</td>
<td>TBD</td>
<td></td>
</tr>
<tr>
<td>Water</td>
<td>46.27</td>
<td>46.27</td>
<td>TBD</td>
<td></td>
</tr>
<tr>
<td>TOTAL ACRES</td>
<td>172.06</td>
<td>172.06</td>
<td>172.6</td>
<td></td>
</tr>
</tbody>
</table>

Currently, the SWCD working is on two projects in the Focus Area. The first is Rock Creek Summer Streamflow. This technical assistance application for planning will survey 34.5 miles of Rock Creek, the first fish-bearing tributary on the lower John Day River. Summer flows, water quantity, temperature, summer steelhead abundance, and riparian habitat, including large woody debris, riparian cross-sections,
vegetation extent and shade in the wetted reaches, will be inventoried and mapped. The data collected will
guide the direction of planned future flow and habitat restoration efforts in Rock Creek as well as
identifying sites for future long-term monitoring. The second is the Hewes Diversion; the project is
located in Gilliam County 16 miles north of Condon in the Lower Rock Creek Watershed. The project is
on Rock Creek approximately 20 miles upstream from the confluence with the John Day River. During
high flows, steelhead enter the abandoned Hewes diversion dam and become trapped as flows recede
resulting in threatened species fatalities. Additionally, high flows strike the concrete structure and careen
into the eastern streambank introducing large amounts of sediment into the system. Rock Creek is an
important lower basin steelhead spawning and rearing stream in the Lower John Day. This project
proposes to completely remove the concrete diversion structure; enhance side channel habitat by placing
large wood structures, boulder clusters and regrade the disturbed channel to natural stream form. Banks
will be sloped back, seeded and planted. Project partners include Gilliam County SWCD, Oregon
Department of Fish and Wildlife, Waste Management, the Confederated Tribes of the Warm Springs, and
two local Gilliam County landowners. The 2019 results will be reported during the 2021 Biennial
Review.

Milestone: By 2019, decrease Ag Infrastructure [2.26 acres] and Bare Ag [7.26 acres] by 5 acres
2015 Conditions: Ag Infrastructure [2.26 acres] + Bare Ag [7.26 acres] = 9.52 acres

4.1.3 Strategic Implementation Area

Thirtymile Creek (2018)
Pre and Post Compliance Evaluation Results:

<table>
<thead>
<tr>
<th>Evaluation Categories</th>
<th>Pre-evaluation</th>
<th>Post-evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Limited Opportunity for Improvement</td>
<td>= 338 parcels</td>
<td>TBD</td>
</tr>
<tr>
<td>Opportunity for Improvement</td>
<td>= 12 parcels</td>
<td>TBD</td>
</tr>
<tr>
<td>Potential Violation</td>
<td>= 2 parcels</td>
<td>TBD</td>
</tr>
<tr>
<td>Total</td>
<td>= 352 parcels</td>
<td>352 parcels</td>
</tr>
</tbody>
</table>

ODA is currently working with Gilliam County SWCD to develop an Outreach and Monitoring Strategy.

4.2 Activities and Accomplishments

Many conservation activities and implementation monitoring tracks have been implemented to benefit
water quality. The SWCD and NRCS track activities that have been implemented through quarterly
reports to ODA and through a NRCS database, respectively. Projects that have received funding from the
OWEB are tracked in OWEB’s restoration database. In addition, partner agencies can submit reports of
projects and activities in the Management Area that improve water quality.
Table 8: Outreach and Education:

<table>
<thead>
<tr>
<th>Gilliam SWCD</th>
<th>Sherman County SWCD</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Public Outreach: Quarterly Newsletter, informational booth at Gilliam County Fair.</td>
<td>• Quarterly Newsletters</td>
</tr>
<tr>
<td>• Student Education: 5 in-school presentations with stream demonstration table, Plant identification field trip to Cottonwood Canyon State Park, 12 presentations at Tri-County Outdoor School.</td>
<td>• 1,500 Sherman County Residents and Landowner Contacts</td>
</tr>
<tr>
<td>• Project Tours: Rock Creek, Lonerock Creek, Thirtymile Creek, and Hay Canyon.</td>
<td>• 18 producer events</td>
</tr>
<tr>
<td>• Annual Meeting</td>
<td>• 6 other public information activites/events</td>
</tr>
<tr>
<td>• Place-Based Planning Meetings</td>
<td>• 13 education events with K-6th grade, including Outdoor School, 4-H Camp, STEP</td>
</tr>
<tr>
<td>• NRCS Annual Workgroup Meeting</td>
<td>• Annual Fair Display</td>
</tr>
<tr>
<td>• NRCS CRP Meeting</td>
<td>• Annual Meeting</td>
</tr>
</tbody>
</table>

Table 9: Planning and Projects:

<table>
<thead>
<tr>
<th>Gilliam SWCD</th>
<th>Sherman County SWCD</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Promoting, Planning, and Implementing CREP Program – 22 landowners, 30 miles of stream, 715 acres</td>
<td>• Promoting, Planning and Implementing CREP Program – 55 contracts equalling 4,115 acres</td>
</tr>
<tr>
<td>• Design, Apply for Large Grant Funding for Olex Diversion</td>
<td>• 8 OWEB small grants</td>
</tr>
<tr>
<td>• Design, Apply for Large Grant Funding for Harper Diversion</td>
<td>o 4 spring developments</td>
</tr>
<tr>
<td>• Design, Apply for Large Grant Funding for Hewes Diversion</td>
<td>o 3 WASCB</td>
</tr>
<tr>
<td>• Design and Apply for Large Grant Funding for Scott and Hay Canyon Wildfire Restoration Weed Control and Reseeding</td>
<td>o 3,185 feet pasture cross fence</td>
</tr>
<tr>
<td>• Design and Apply for Large Grant Funding for Hughes Diversion (Focus Area)</td>
<td>o 27,180 feet terrace</td>
</tr>
<tr>
<td>• Design and Apply for NACD Farm Bill Support</td>
<td>• OWEB Large grants</td>
</tr>
<tr>
<td>• OWRD PBP</td>
<td>o 18,168 feet terrace</td>
</tr>
<tr>
<td>• Thirtymile Weeds</td>
<td>o 14 WASCB’s</td>
</tr>
<tr>
<td>• Ferry Canyon Weeds</td>
<td>o 2,218 acres direct seed</td>
</tr>
<tr>
<td>• Rock Creek Summer Streamflow (Focus Area)</td>
<td>o 9,370 acres surveyed for noxious weeds (private property)</td>
</tr>
<tr>
<td>• CBASS</td>
<td>o 23 acres noxious weed treatment</td>
</tr>
<tr>
<td>• RCPPP Stakeholder</td>
<td>• CCS</td>
</tr>
<tr>
<td>• Ferry Canyon Fire Restoration</td>
<td>o 12 haul roads for erosion control</td>
</tr>
<tr>
<td></td>
<td>o 61,130 feet terrace</td>
</tr>
</tbody>
</table>

Table 10: Monitoring:

<table>
<thead>
<tr>
<th>Gilliam SWCD</th>
<th>Sherman County SWCD</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Thirtymile Creek Steelhead Monitoring</td>
<td>• Two-year project monitoring of all project sites funded through OWEB small &amp; large grants</td>
</tr>
<tr>
<td>• ODA Temperature Monitoring</td>
<td></td>
</tr>
<tr>
<td>• CREP Monitoring (OWEB)</td>
<td></td>
</tr>
<tr>
<td>• Rock Creek Summer Streamflow</td>
<td></td>
</tr>
<tr>
<td>• Two-year monitoring of all project sites</td>
<td></td>
</tr>
</tbody>
</table>
Table 11: Funding and Grants:

<table>
<thead>
<tr>
<th>Gilliam SWCD</th>
<th>Sherman County SWCD</th>
</tr>
</thead>
<tbody>
<tr>
<td>BPA Riparian Program - $50,117</td>
<td>• OWEB – 216-8100 CREP TA - $39,083</td>
</tr>
<tr>
<td>OWEB – 216-8100 CREP Technical Assistance - $82,426</td>
<td>• OWEB – 218-6003 Lower GV Canyon Upland Restoration - $9,668 (to date)</td>
</tr>
<tr>
<td>OWRD – Lower John Day Integrated Water Resource Place Based Planning - $190,000</td>
<td>• OWEB – 215-6039 Holmes Upland Erosion Control - $11,253</td>
</tr>
<tr>
<td>Gilliam County – SWCD Program Support - $100,000</td>
<td>• OWEB – 217-6064 Lower GV Weed Mngt - $40,460</td>
</tr>
<tr>
<td>CTWSRRO – Lower Basin Program Support - $100,000</td>
<td>• OWEB Small Grant – Lower John Day - $36,704</td>
</tr>
<tr>
<td>DEQ 319 UAV Protocol - $26,235</td>
<td>• Sherman Co. SWCD – County Cost Share - $39,393</td>
</tr>
<tr>
<td>Ferry Canyon Weeds - $42,026</td>
<td></td>
</tr>
<tr>
<td>Thirtymile Weeds - $45,420</td>
<td></td>
</tr>
<tr>
<td>RCPP Stakeholder - $46,734</td>
<td></td>
</tr>
<tr>
<td>CBASS - $72,546</td>
<td></td>
</tr>
<tr>
<td>Scott Canyon/Hay Canyon Fire restoration - $27,423</td>
<td></td>
</tr>
<tr>
<td>Lonerock Effectiveness Monitoring - $75,224</td>
<td></td>
</tr>
<tr>
<td>Rock Creek Streamflow - $27,692</td>
<td></td>
</tr>
<tr>
<td>NACD Farm Bill Support - $54,265</td>
<td></td>
</tr>
<tr>
<td>Ferry Canyon Fire Restoration - $15,000</td>
<td></td>
</tr>
<tr>
<td>John Day Basin Partnership FIP Development – $17,631</td>
<td></td>
</tr>
</tbody>
</table>

4.3 Monitoring—Status and Trends

4.3.1 Water Quality

DEQ

For this biennial review, DEQ reviewed data from 20 monitoring stations, of which two had sufficient data for this status and trends analysis (DEQ. Lower John Day AgWQ Management Area: DEQ’s Water Quality Status and Trends Analysis for the Oregon Department of Agriculture’s Biennial Review of Agricultural Area Rules and Plan. 33pp. 2018). This report is incomplete because it does not include data collected by volunteer monitors. DEQ expects to include these data in their next report.

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

Table 12: Main Agricultural Water Quality Concerns

<table>
<thead>
<tr>
<th>Site ID</th>
<th>Site Description</th>
<th>E. coli (mpn/100mL)</th>
<th>pH</th>
<th>Dissolved Oxygen (mg/L)</th>
<th>Total Phosphorus2 (mg/L)</th>
<th>Total Suspended Solids3 (mg/L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>11386</td>
<td>John Day R @ Hwy 206</td>
<td>1/108</td>
<td>5/1224</td>
<td>0/115</td>
<td>0.03; 113</td>
<td>4; 1054</td>
</tr>
<tr>
<td>36787</td>
<td>Rock Ck @ mouth</td>
<td>0/41↑</td>
<td>0/444↑</td>
<td>0/444↓</td>
<td>0.08; 44</td>
<td>2; 37</td>
</tr>
</tbody>
</table>

1 N = total # of observations
2 DEQ has no benchmark for total phosphorus in this Management Area;
   ODA benchmark for potential water quality concerns = 0.08 mg/L
   DEQ has no benchmark for TSS in this Management Area

Statistically significant seasonal patterns

↑ Statistically significant improving trend
↓ Statistically significant degrading trend
Few concerns were identified in this analysis. *E. coli* and pH are improving in Rock Creek. Dissolved oxygen is decreasing in Rock Creek, but the lowest value is still about 1.5 mg/L above the criterion.

The biggest concern is that half the total phosphorus values in Rock Creek exceed the ODA benchmark. Highest phosphorus values coincide with the highest suspended sediment values at both locations, so phosphorus likely enters the streams via soil erosion. However, phosphorus values are higher and sediment is lower in Rock Creek than in the John Day River, so some of this phosphorus may be entering Rock Creek from organic sources such as manure or fertilizer. We speculate this because the geologic sources of phosphorus (concentrations in soil) are likely to be similar in both areas, undisturbed and natural areas tend to be low in stream phosphorus, and Rock Creek has a predominance of range and ranch use.

### 4.3.2 Land Conditions

Five streams were assessed in this basin. Riparian index scores for these streams had a narrow range with the highest being 39 for Juniper Creek and the lowest at 30.40 for Rosebush Creek. Tree coverage was highest for Juniper with one band reaching 40 percent. Tree coverage was essentially zero on Rosebush Creek. Juniper also had the highest percent of bare land, due to rock outcrops. Bare land coverage on Juniper ranged from 5 to 19 percent, but there was no bare/agriculture. Bare/agriculture land was greatest on Lone Rock Creek with one band reaching 5 percent.

Streams in this basin had some interesting qualitative features:

- **Juniper Creek**: had a stable channel throughout the area assessed. Most of stream is bounded on west side by lava flow. Part of the stream reach is in a slot canyon. One part of the stream makes a nearly right-angle turn, though there was no indication of any human influence on the channel configuration.
- **Lone Rock Creek**: Mostly stable, few areas of bank erosion.
- **Rock Creek**: Upper reach shows many unvegetated point and mid-stream bars, indicating an excessive sediment load. Uppermost section has recent riparian plantings. Lower reach partially channelized but stable.
- **Rosebush**: Mostly a channelized, narrow stream. It has multiple small impoundments. Mostly stable channel.
- **Thirtymile Creek**: Large numbers of cattle visible on upper reach, but channel is stable throughout. Appears that a large amount of sediment from rock avalanches and other upland erosion has affected the stream.

#### Table 13: Streams Assessed

<table>
<thead>
<tr>
<th>Stream</th>
<th>2007 Score</th>
<th>2012 Score</th>
<th>Notable Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Juniper Creek</td>
<td>39.01</td>
<td>38.57</td>
<td></td>
</tr>
<tr>
<td>Lone Rock Creek</td>
<td>38.94</td>
<td>39.05</td>
<td></td>
</tr>
<tr>
<td>Rock Creek</td>
<td>33.41</td>
<td>34.01</td>
<td></td>
</tr>
<tr>
<td>Rosebush Creek</td>
<td>30.40</td>
<td>30.39</td>
<td></td>
</tr>
<tr>
<td>Thirtymile Creek</td>
<td>31.49</td>
<td>32.74</td>
<td>+4%</td>
</tr>
</tbody>
</table>

Thirtymile Creek was the only stream in this basin that had an appreciable change in RIS. The 4 percent increase was due to the cumulative impact of small increases in shrub and grass cover, with a reduction in grass agriculture. ODA will not repeat this study and it will not be reported in the next plan version.
4.4 Biennial Reviews and Adaptive Management

The March 21, 2019, biennial review consisted mostly of a discussion of Focus Areas, Management Area Wide Measurable Objectives and the DEQ monitoring trend and status report.

Compliance Cases: There were no compliance cases in the Management Area since the last Biennial Review.

Recommendations from the LAC:

- Staff turnover with the LMAs has reduced the amount of ag water quality projects being implemented in the Management Area.
- Lack of personnel to continue farming.
- The LAC feels that a lot of great work has been done to reduce soil erosion from crop fields from where farming practices were 30 years ago.
APPENDIX A: Effective Water Quality Management Practices

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, fertilizer timing and placement
- Cover crops – perennial or annual
- Contour farming practices - strip cropping, divided slopes, terraces (level/gradient), contour 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

Effective management practices for prevention and control of impacts from livestock
- Grazing management or scheduling based on intensity, duration, frequency, and season of use; pasture rotation including resting and deferrals
- Vegetation management - grass seeding, weed control, controlled burning
- Fencing – including temporary, cross, and exclosures
- Watering facilities - spring development, water gaps, off-stream water
- Salt and mineral distribution
- Waste management systems - waste collection, storage, and utilization; facilities operation and maintenance
- Safe diversion of runoff
- Protection of clean water sources
- Lot maintenance - smoothing, mounding, seeding, filter strips, catch basins, berms

Effective management practices for prevention and control of impacts to streamside areas
- Critical area planting
- Vegetative buffer strips - Continuous CRP, CREP, riparian buffers, riparian forest buffers
- Livestock management - seasonal grazing, fencing - exclusion, temporary
- Water developments - off-stream watering, water gaps, spring developments
- Conservation tillage practices
- Weed control
- Nutrient and chemical application scheduling
- Road, culvert, bridge, and crossing maintenance
- Wildlife management

Effective management practices for prevention and control of impacts from irrigation
- Irrigation scheduling based on crop needs, soil type, climate, topography, infiltration rates
- Irrigation system efficiency and uniformity monitoring
- Diversion maintenance - push-up dam management, fish screens
- Return flow management
- Flow measuring devices
- Backflow devices
- Cover crops
APPENDIX B: References Used In The Development Of The Area Plan

Field Office Technical Guide, NRCS
John Day Basin Report, Oregon Water Resources Department, 1986
John Day River Basin Total Daily Maximum Load (TMDL) and Water Quality management Plan (WQMP), DEQ, Nov. 2010
John Day Subbasin Summary, prepared for the Northwest Power Planning Council, 2001
Oregon Administrative Rules, Chapter 340, Division 41, DEQ, March 1996
Oregon Administrative Rules, Chapter 603, Divisions 90 and 95, ODA
Oregon Revised Statutes, 468B
Oregon Revised Statutes, 561.191
Oregon Revised Statutes, 568.900 through 568.933
Oregon Small Acreages Conservation Toolbox, NRCS /OACD, 2016
Pollution Limits and Water Quality Plan for the John Day River Basin, DEQ. Nov. 2010
Riparian Area Management; Process for Assessing Proper Functioning Condition, BLM, 2015
The Ecological Provinces of Oregon, Oregon Agricultural Experiment Station, May 1998
The Oregon Plan Toolbox, OWEB
WEST Program Workbook, Oregon Cattleman’s Association, 1998