North and Middle Fork John Day River Agricultural Water Quality Management Area Plan

Developed by the:

North and Middle Fork John Day River Local Advisory Committee

Oregon Department of Agriculture

With support from the:

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Acronyms and Terms Used in this Document

AF – Acre Feet
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
BLM – Bureau of Land Management
CAFO – Confined Animal Feeding Operation
cfs – cubic feet per second
CNPCP – Coastal Nonpoint Pollution Control Program
CRP – Conservation Reserve Program
CREP – Conservation Reserve Enhancement Program
CWA – Clean Water Act
CZARA – Coastal Zone Act Reauthorization Amendments
DEQ – Oregon Department of Environmental Quality
DOGAMI – Oregon Department of Geology and Mineral Industries
EQIP – Environmental Quality Incentive Program
ESA - Endangered Species Act
GWMA – Groundwater Management Area
HUC – Hydrologic Unit Code
LA – Load Allocation
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
OACD – Oregon Association of Conservation Districts
OAR – Oregon Administrative Rules
OCA – Oregon Cattleman's Association
ODA – Oregon Department of Agriculture
ODF – Oregon Department of Forestry
ODFW – Oregon Department of Fish and Wildlife
ORS – Oregon Revised Statute
OSU – Oregon State University
OWEB – Oregon Watershed Enhancement Board
PMP – Pesticides Management Plan
PSP – Pesticides Stewardship Partnership
Regulations – Agricultural Water Quality Management Area Regulations
RM – River Mile
RUSLE – Revised Universal Soil Loss Equation
SWCD – Soil and Water Conservation District
T – Soil Loss Tolerance Factor
TMDL – Total Maximum Daily Load
USDA – United States Department of Agriculture
USDI – United States Department of Interior
US EPA – United States Environmental Protection Agency
USFS – United States Forest Service
WQPMT – Water Quality Pesticides Management Team
WRD – Water Resources Department

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Foreword

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

Chapter 1 of the Area Plan was developed by Oregon Department of Agriculture. The Local Advisory Committee and the Local Management Agency discussed and offered input but did not develop or participate in the development of Chapter 1. ODA developed Chapter 1 to have consistent and accurate information about the Agricultural Water Quality Management Program statewide.

Chapters 2-4 of the Area Plan was developed by volunteer members of the North and Middle Forks John Day River AgWQM Area Local Advisory Committee (LAC) and the ODA, with assistance from the Monument Soil and Water Conservation District (SWCD). It represents the efforts of the LAC, ODA and the SWCD, in consultation with members of the community, to address water quality as it may be affected by conditions on agricultural and rural land in the planning area. It is the responsibility of the landowner to comply with the Rules in the Area Plan.

The Area Rules, to implement this Area Plan, were formally adopted by the Department in March 2002. The Area Plan was revised in 2011 to update the reference information, water quality standards and include Total Maximum Daily Load (TMDL) target information. The John Day River Basin TMDL was developed by the Oregon Department of Environmental Quality (DEQ) and approved by the federal Environmental Protection Agency (EPA) in December 2010 to fulfill requirements of the Clean Water Act (CWA) to develop pollution control targets and improvement plans for impaired waters within the plan area. In the North and Middle Fork John Day River Subbasins, TMDL targets have been established to address instream temperature. The TMDL focuses on temperature reduction measures.

The operational boundaries of this Area Plan include all private agricultural and rural land that drains into the North and Middle Forks of the John Day River and their tributaries. Federally managed land, and those activities subject to the Oregon Forest Practices Act, are exempted from this Area Plan but are subject to Water Quality Management Plans developed by their respective designated management agencies. This Area Plan applies to agricultural lands in current use and those laying idle or on which management has been deferred. This Area Plan applies also to rural lands not in agricultural use such as private roadways and rural residential properties.

The provisions of this Area Plan do not establish legal requirements or prohibitions, as described in Oregon Revised Statute (ORS) 568.912(1). The provisions of this Area Plan do not affect legal water rights established under the rules of the Water Resources Department (WRD).

The Oregon Department of Agriculture (ODA) will exercise its enforcement authority for the prevention and control of water pollution from agricultural activities under administrative rules for the North and Middle Forks John Day River AgWQM Area (Oregon Administrative Rules (OAR) 603-095-1000 through OAR 603-095-1060), and statewide enforcement procedures provided in OAR 603-090-0060 through OAR 603-090-0120.

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

This Area Plan will be used by the local management agencies for guiding their implementation, outreach, and assistance efforts and by landowners to enhance their awareness and understanding of water quality issues in continuing efforts to prevent and control water pollution.

Required Elements of Area Plans

603-095-1000 Purpose
(1) These rules have been developed to implement a water quality management area plan pursuant to authorities vested in the department through ORS 568.900- 568.933. The area plan is known as the North and Middle Forks John Day River Agricultural Water Quality Management Area Plan.
(2) The purpose of these rules is to outline requirements for landowners in the North and Middle Forks John Day River Management Area, for the prevention and control of water pollution from agricultural activities and soil erosion. Compliance with Division 95 rules is expected to aid in the achievement of applicable water quality standards in the North and Middle Forks John Day River subbasins.
(3) Failure to comply with any provisions of the North and Middle Forks John Day River Agricultural Water Quality Management Area Plan:
(a) Does not constitute a violation of OAR 603-090-0000 through 603-090-0120, or of OAR 603 095-0010 through OAR 603-095-1060;
(b) Is not intended by the department to be evidence of a violation of any federal, state, or local law by any person.
(4) Nothing in the North and Middle Forks John Day River Agricultural Water Quality Management Area Plan shall be used to interpret any requirement of OAR 603-095-1000 through OAR 603-095-1060.

Statutory Authority: ORS 561.190 – 561.191, and ORS 568.912
Statutes Implemented: ORS 568.900 - 568.933

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 (Oregon Administrative Rule (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 the Oregon Department of Agriculture (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 Agricultural Water Quality Management Program.

Chapter 2: Local Background. Provides the local geographic, water quality, and agricultural context for the Management Area. Describes the water quality issues, regulations (Area Rules), and available or beneficial practices to address water quality issues.

Chapter 3: Local Goals, Objectives, and Implementation Strategies. Chapter 3 presents goal(s), measurable objectives and timelines, and strategies to achieve the goal(s) and objectives.

Chapter 4: Local Implementation, Monitoring, and Adaptive Management. ODA and the Local Advisory Committee (LAC) will work with partners to summarize land condition and water quality status. Trends are summarized to assess progress toward the goals and objectives in Chapter 3.

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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), this Area Plan guides landowners and partners such as Soil and Water Conservation Districts (SWCDs) in addressing local agricultural water quality issues. The purpose of this Area Plan is to identify strategies to prevent and control water pollution from agricultural activities and soil erosion (ORS 568.909(2)) on agricultural and rural lands for the area within the boundaries of the Management Area (OAR 603-090-0000(3)) and to achieve and maintain water quality standards (ORS 561.191(2)). This Area Plan has been developed and revised by ODA, the LAC, with support and input from the SWCD and the Oregon Department of Environmental Quality (DEQ). Throughout the development and revision processes, the public was invited to participate. This included public comment at meetings and public hearings during the Area Plan approval process. This Area Plan is implemented using a combination of outreach and education, conservation and management activities, compliance, monitoring, evaluation, and adaptive management.

The provisions of this Area Plan do not establish legal requirements or prohibitions (ORS 568.912(1)). Each Area Plan is accompanied by OAR regulations 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 (OARs 603-090-0000 to 603-090-0120) and under the regulations for this Management Area (OARs 603-095-1040). The Ag Water Quality Program's general OARs guide the Ag Water Quality Program, and the OARs for the Management Area are the regulations that landowners must follow.

This Area Plan and its associated regulations apply to all agricultural activities on non-federal and non-Tribal Trust land within the Management Area, including:

- Large commercial farms and ranches
- Small 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).

1.2 History of the Ag Water Quality Program

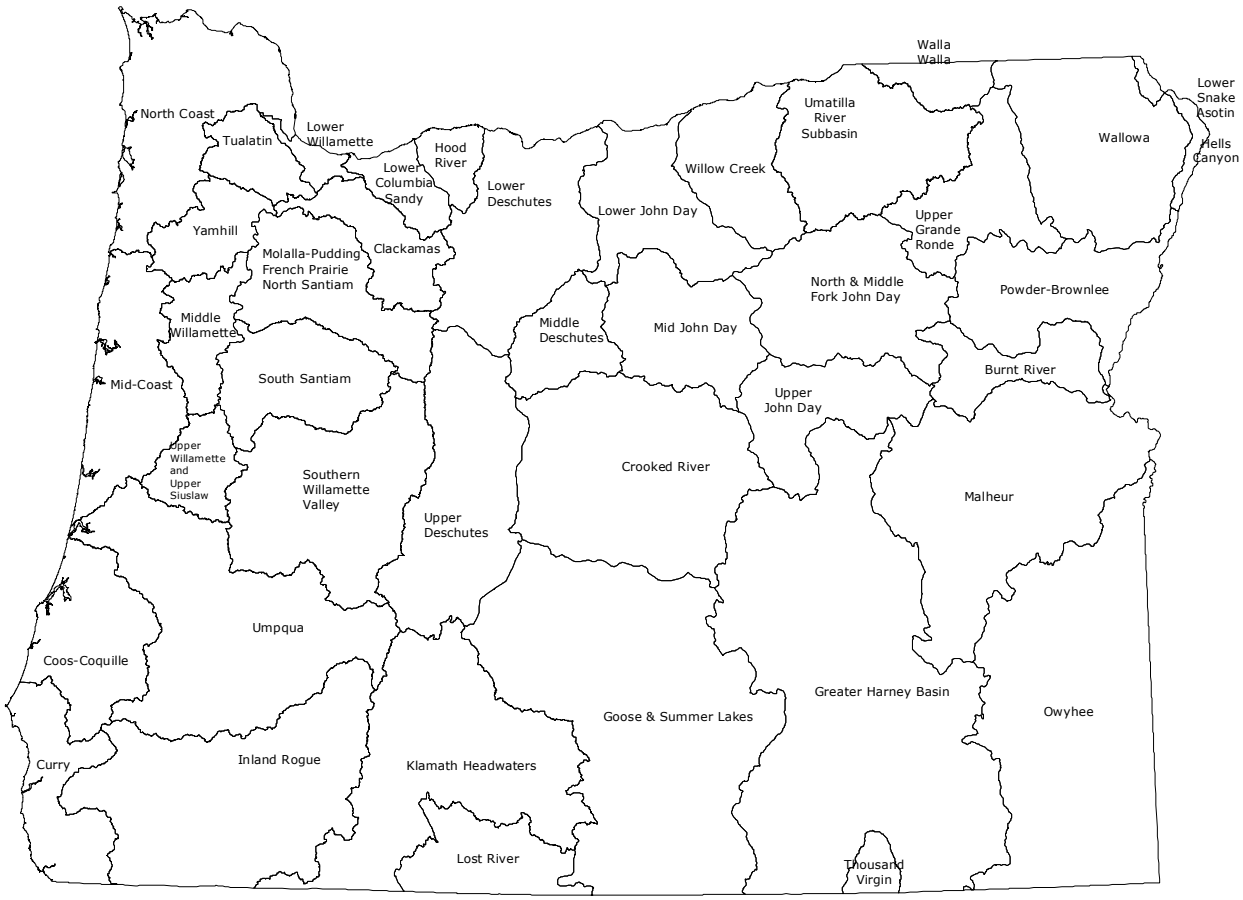
In 1993, the Oregon Legislature passed the Agricultural Water Quality Management Act, directing ODA to develop plans to prevent and control water pollution from agricultural activities and soil erosion, and to achieve water quality standards (ORS 568.900 through ORS 568.933). Senate Bill 502 was passed in 1995 to clarify that ODA regulates agriculture with respect to water quality (ORS 561.191). This Area Plan and its associated regulations were developed and subsequently revised pursuant to these statutes.

Between 1997 and 2004, ODA worked with LACs and SWCDs to develop Area Plans and associated regulations 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 regulations,

- Conducting biennial reviews of Area Plans and regulations,
- Monitoring, evaluation, and adaptive management,
- Developing partnerships with SWCDs, state, federal, and tribal agencies, 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 (ODA)

ODA is the agency responsible for implementing the Ag Water Quality Program (ORS 568.900 to 568.933, ORS 561.191, OAR 603-090, and OAR 603-095). The Ag Water Quality Program is intended to meet the needs and requirements related to agricultural water pollution, including:

- 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 a GWMA has been established and an Action Plan developed).

ODA has the legal authority to develop and implement Area Plans and associated regulations 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 will base Area Plans and regulations 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 associated regulations. ODA has responsibility for any actions related to enforcement or determination of noncompliance with regulations (OAR 603-090-0080 through OAR 603-090-0120). ORS 568.912(1) and ORS 568.912(2) give authority to ODA to adopt regulations that require landowners to perform actions necessary to prevent and control pollution from agricultural activities and soil erosion.

The emphasis of this Area Plan is on voluntary action by landowners or operators to control the factors effecting water quality in the Management Area. The regulations are outlined as a set of minimum standards that must be met on all agricultural or rural lands. Landowners and operators who fail to address these regulations may be subject to enforcement procedures, which are outlined below.

Enforcement Action—ODA will use enforcement mechanisms where appropriate and necessary to gain compliance with water quality regulations. Any enforcement action will be pursued only when reasonable attempts at voluntary solutions have failed. If a violation is documented, ODA may issue a pre-enforcement notification or an Order such as a Notice of Noncompliance. If a Notice of Noncompliance is issued, the landowner or operator will be directed by ODA to remedy the condition through required corrective actions under the provisions of the enforcement procedures outlined in OAR 603-090-060 through OAR 603-090-120. If a landowner does not implement the required corrective actions, civil penalties may be assessed for continued violation of the regulations. See the Compliance Flow Chart for a diagram of the compliance process. If and when other governmental policies, programs, or regulations conflict with this Area Plan or associated regulations, ODA will consult with the agency(ies) and attempt to resolve the conflict in a reasonable manner.

ODA will investigate complaints against landowners or operators who are alleged to be out of compliance with the Rules associated with this Area Plan. If the landowner is in non-compliance, ODA will consult with the landowner/operator and the SWCD to develop solutions and timelines. The authority and procedures for complaint investigation rests with the ODA under provisions of OAR 603-095-1060.

ODA will use enforcement mechanisms where appropriate and necessary to gain compliance with the prevention and control measures. Any enforcement action will be pursued only when reasonable attempts at voluntary solutions have failed. Landowners with chronic or egregious violations of Area Rules will be subject to enforcement action by ODA under authority provided in OAR 603-090-0060 through 603-090-0120.

Entry onto private property is authorized for the purpose of investigating lands within the Management Area to determine sources of pollution. ODA may investigate lands within the Management Area to determine those actions that may be required of landowners under the Area Rules and to determine whether the landowner is carrying out the required actions. ODA will not enter onto private lands without first seeking landowner consent.

Complaints and Investigations
(1) When the department receives notice of an alleged occurrence of agricultural pollution through a written complaint, its own observation, through notification by another agency, or by other means, the department may conduct an investigation. The department may, at its discretion, coordinate inspection activities with the appropriate Local Management Agency.

(2) Each notice of an apparent occurrence of agricultural pollution shall be evaluated in accordance with the criteria in ORS 568.900 through 568.933 or any rules adopted thereunder to determine whether an investigation is warranted.

(3) Any person allegedly being damaged or otherwise adversely affected by agricultural pollution or alleging any violation of ORS 568.900 through 568.933 or any rules adopted thereunder may file a complaint with the department.

(4) The department will evaluate or investigate a complaint filed by a person under section OAR 603-095-1060(3) if the complaint is in writing, signed and dated by the complainant and indicates the location and description of:
(a) The waters of the state allegedly being damaged or impacted; and
(b) The property allegedly being managed under conditions violating criteria described in ORS 568.900 through 568.933 or any rules adopted thereunder.

(5) As used in section OAR 603-095-1060(4), "person" does not include any local, state or federal agency.

(6) Notwithstanding OAR 603-095-1060(4), the department may investigate at any time any complaint if the department determines that the violation alleged in the complaint may present an immediate threat to the public health or safety.

(7) If the department determines that a violation of ORS 568.900 through 568.933 or any rules adopted thereunder has occurred, the landowner may be subject to the enforcement procedures of the department outlined in OAR 603-090-0060 through 603-090-0120.

Letter of Compliance
A Letter of Compliance tells the owner/operator that at the time of the inspector's site visit, the property was in compliance with all Area Rules and there were no conditions observed during the investigation, such as manure piles near drainages or heavily grazed areas, that are likely to cause a water quality problem in the near future.

Water Quality Advisory
A Water Quality Advisory means the owner/operator is in compliance because there were no violations of Area Rules documented at the time of the inspector's visit, but the conditions on the property have the potential to violate the Area Rules in the future. Examples: a riparian area is in poor condition, and if management changes are not made, conditions will not improve; there is manure in a corral that could be transported to surface water in a rain event; there is build up of sediment in a sediment basin.

A Water Quality Advisory letter includes a description of the conditions that have the potential to violate the Area Rules, the statute or rule that may be violated, consequences of future documented violations, and a schedule of recommended corrective actions. The letter may also refer the landowner to other sources of technical assistance, and summarize other issues discussed during the investigation. The

inspector will usually follow up to see if the changes effectively reduced the potential for a water quality problem.

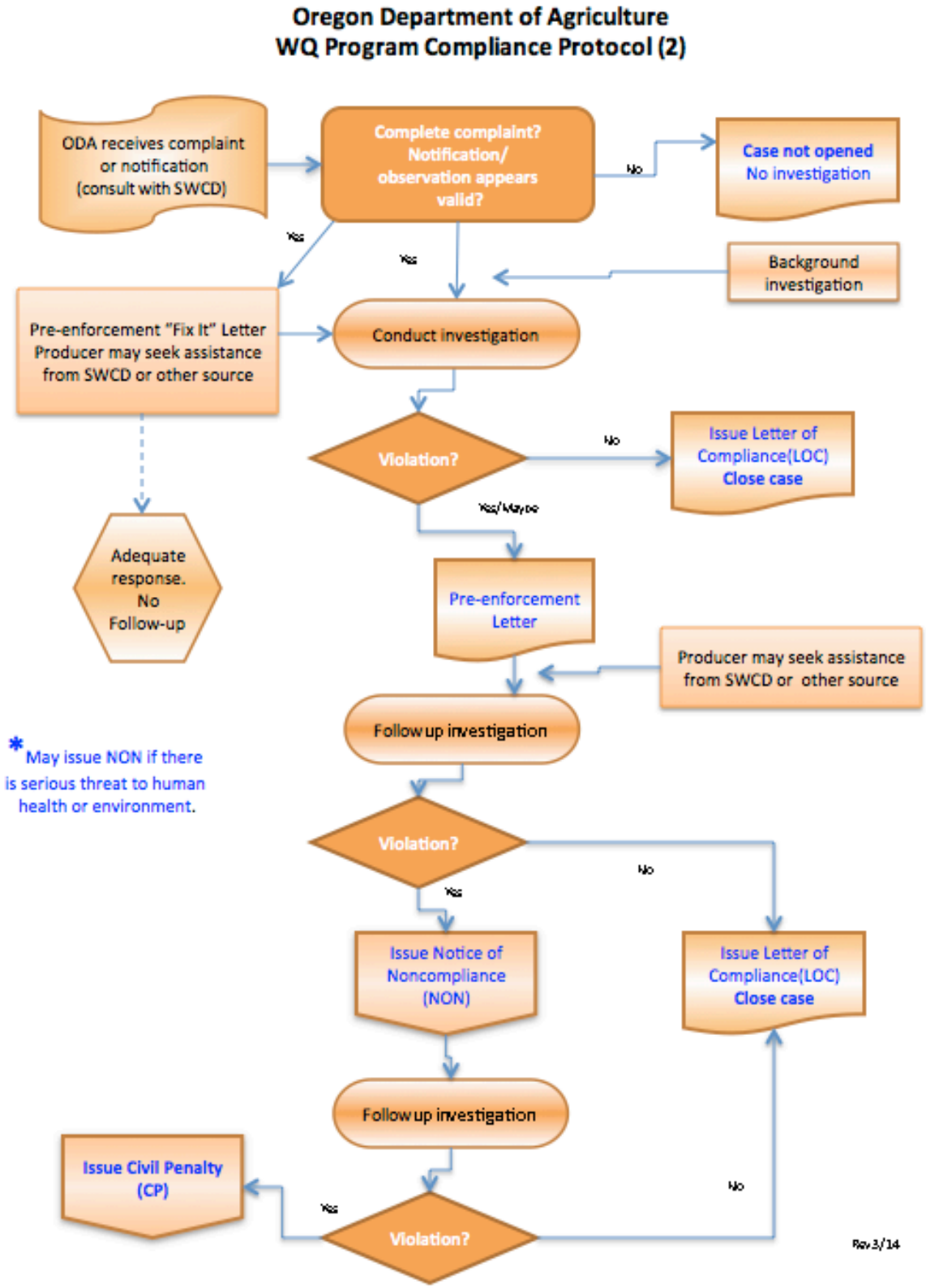
Letter of Warning
A Letter of Warning means the inspector found a violation of Area Rules during the investigation, but the pollution-causing activity was not egregious and was not done intentionally to cause water pollution. The Letter of Warning is an unofficial compliance action (not defined in Administrative Rule) that gives the landowner or operator at least one opportunity to correct the problem before he/she receives a Notice of Noncompliance. A Letter of Warning is not considered an enforcement action by the State.

A Letter of Warning includes a description of the conditions that violate the Area Rules, the statute or rule that is violated, consequences of future documented violations, and a schedule of recommended corrective actions. The letter may also refer the landowner to other sources of technical assistance, and summarize other issues discussed during the investigation. Although the landowner has the flexibility to choose the recommended actions or other practices best suited to correct the problem on the operation, the inspector will follow up to see if the violation has been addressed.

Notice of Noncompliance/Plan of Correction
A Notice of Noncompliance (NON) means the inspector found a violation of Area Rules during the investigation, and the violation was either (1) egregious or done to intentionally cause water pollution, or (2) a second violation after being issued a Letter of Warning. A Notice of Noncompliance includes a description of the conditions that violate the Area Rules, the statute or rule that is violated, consequences of current documented violations, and a schedule of required corrective actions. The letter may also refer the landowner to other sources of technical assistance, and summarize other issues discussed during the investigation. A Plan of Correction usually accompanies a NON if the corrective actions require more than 30 days and directs the landowner to take specific steps to correct the problem. An inspector will follow up to confirm the landowner completed the required corrective actions and effectively addressed the violation.

Civil Penalty
A Civil Penalty is a fee that is assessed to a landowner whose agricultural activities caused either a willful and intentional violation of Area Rules, or who repeatedly failed to take steps to correct a violation. Oregon Department of Agriculture's Division 90 rules include a matrix for calculating the value of civil penalties for the Water Quality Program.

Figure 2: Compliance Flow Chart



1.3.2 Local Management Agency

A Local Management Agency is an organization that ODA has designated to implement an Area Plan (OAR 603-090-0010). The legislative intent is for SWCDs to be Local Management Agencies 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 who voluntarily address natural resource concerns. Currently, all Local Management Agencies 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 associated regulations as needed.

1.3.3 Local Advisory Committee (LAC)

For each Management Area, the director of ODA appoints an LAC (OAR 603-090-0020) with up to 12 members, to assist with the development and subsequent biennial reviews of the local Area Plan and regulations. The LAC serves in an advisory role to the director of ODA and to the Board of Agriculture. LACs are composed primarily of 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 regulations,
- Recommend strategies necessary to achieve goals and objectives in the Area Plan,
- Participate in biennial reviews of the progress of implementation of the Area Plan and regulations,
- Submit written biennial reports to the Board of Agriculture and the ODA director.

1.3.4 Agriculture's Role

Each individual landowner or operator in the Management Area is required to comply with the regulations, which set minimum standards. However, the regulations alone are not enough. To achieve water quality standards, individual landowners also need to attain land conditions that achieve the goals and objectives of the voluntary Area Plan. Each landowner or operator is not individually responsible for achieving water quality standards, agricultural pollution limits, or the goals and objectives of the Area Plan. These are the responsibility of the agricultural community collectively.

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

Area regulations only address impacts that result from agricultural activities. A landowner is responsible for only those conditions caused by activities conducted on land managed by the landowner or occupier. Conditions resulting from unusual weather events or other circumstances not within the reasonable control of the landowner or operator are considered when making compliance decisions. Agricultural landowners may be responsible for some of the above impacts under other legal authorities.

Under the Area Plan and associated regulations, agricultural landowners and operators are not responsible for mitigating or addressing factors that do not result from agricultural activities, such as:

- 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.

1.3.5 Public Participation

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

ODA, LACs, and SWCDs conduct biennial reviews of the Area Plans and regulations. Partners, stakeholders, and the general public are invited to participate in the process. Any future revisions to the regulations will include a public comment period and a public hearing.

1.4 Agricultural Water Quality

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 pesticide applications in, over and within three feet of water. Many CAFOs are regulated under ODA's CAFO Program. Irrigation water discharges may be at a defined discharge point, but does not currently require a permit.

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

1.4.2 Beneficial Uses and Parameters of Concern

Beneficial uses of clean water 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 are usually fish and aquatic life, water contact recreation, and public and private domestic water supply. These uses are generally the first to be impaired as a water body is polluted, 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 contribute to the impairment of beneficial uses in the Management Area. Beneficial uses that have the potential to be impacted in this Management Area are summarized in Chapter 2.

Many water bodies throughout Oregon do not meet state water quality standards. These water bodies may or may not have established water quality management plans documenting needed 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, nitrates, pesticides, and mercury. These parameters vary by Management Area and are summarized in Chapter 2.

1.4.3 Impaired Water Bodies and Total Maximum Daily Loads (TMDLs)

Every two years, the DEQ is required by the federal CWA to assess water quality in Oregon. CWA 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. DEQ, in accordance with the CWA, is required to establish TMDLs for pollutants on the 303(d) list.

A TMDL includes an assessment of water quality data and current conditions and describes a plan to restore polluted waterways to conditions that meet water quality standards. TMDLs specify the daily amount of pollution that a water body can receive and still meet water quality standards. Through the TMDL, point sources are assigned pollution limits as "waste load allocations" in permits, while nonpoint sources (agriculture, forestry, and urban) are assigned pollution limits as "load allocations." TMDLs are legal orders issued by the DEQ, so parties assigned waste or load allocations are legally required to meet them. The agricultural sector is responsible for meeting the pollution limit (load allocation) assigned to agriculture specifically, or to nonpoint sources in general, as applicable.

TMDLs generally apply to an entire basin or subbasin, and not just to an individual water body on the 303(d) list. Once a TMDL is developed for a basin, the basin's impaired water bodies are removed from the 303(d) list, but they remain on the list of impaired water bodies. When data show that water quality standards have been achieved, water bodies will be identified on the list of water bodies that are attaining water quality standards. As part of the TMDL process, DEQ identifies the Designated Management Agency (DMA) or parties responsible for submitting TMDL implementation plans. TMDLs designate that the local Area Plan is the implementation plan for the agricultural component of the TMDLs that apply to this Management Area. Biennial reviews and revisions to the Area Plan and regulations must address agricultural or nonpoint source load allocations from TMDLs.

The list of impaired water bodies (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 Water Pollution Control Law – ORS 468B.025 and ORS 468B.050

Senate Bill 502 was passed in 1995, authorizing ODA as the state agency responsible for regulation of farming activities for the purpose of protecting water quality. A Department of Justice opinion dated July 10, 1996, states that "...ODA has the statutory responsibility for developing and implementing water quality programs and rules that directly regulate farming practices on exclusive farm use and agricultural lands." In addition, this opinion states, "The program or rule must be designed to achieve and maintain Environmental Quality Commission's water quality standards."

To implement Senate Bill 502, ODA incorporated ORS 468B into all of the Area Plans and associated regulations in the state. A Department of Justice opinion, dated September 12, 2000, clarifies that ORS 468B.025 applies to point and nonpoint source pollution.

ORS 468B.025 states that:

> "(1) ...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."

The aspects 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 (ORS 468B.005)

"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.

1.5 Other Water Quality Programs

1.5.1 Confined Animal Feeding Operation (CAFO)

ODA is the lead state agency for the CAFO Program. The CAFO Program was developed to ensure that operators and producers do not contaminate ground or surface water with animal manure. Since the early 1980s, CAFOs have been registered to a general Water Pollution Control Facility permit designed to protect water quality, while allowing the operators and producers to remain economically viable. A properly maintained CAFO does not pollute ground or surface water. To assure continued protection of ground and surface water, ODA was directed by the 2001 Oregon State Legislature to convert the CAFO Program from a Water Pollution Control Facility permit program to a federal National Pollutant Discharge Elimination System (NPDES) program. ODA and DEQ jointly issued a NPDES CAFO Permit in 2003 and 2009. The 2009 permit will expire in May 2014, and it is expected that a new permit will be issued at that time. The NPDES CAFO Permit is compliant with all CWA requirements for CAFOs; it does allow discharge in certain circumstances as long as the discharge does not violate Water Quality Standards.

Oregon NPDES CAFO Permits require the registrant to operate according to a site-specific, ODA approved, Animal Waste Management Plan that is incorporated into the NPDES CAFO Permit by reference. CAFO NPDES Permits protect both surface and ground water resources.

1.5.2 Drinking Water Source Protection

Oregon implements its drinking water protection program through a partnership between DEQ and the Oregon Health Authority. The program provides individuals and communities with information on how to protect the quality of Oregon's drinking water. DEQ and the Oregon Health Authority encourage community-based protection and preventive management strategies to ensure that all public drinking water resources are kept safe from future contamination. For more information see: www.deq.state.or.us/wq/dwp/dwp.htm. Agricultural activities are required to meet those water quality standards that contribute to safe drinking water.

1.5.3 Groundwater Management Areas (GWMAs)

Groundwater Management Areas are designated by DEQ when groundwater in an area has elevated contaminant concentrations resulting, at least in part, from nonpoint sources. Once the GWMA is declared, a local groundwater management committee comprised of affected and interested parties is formed. The committee then 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. These include the Lower Umatilla Basin GWMA, the Northern Malheur County GWMA, and the Southern Willamette Valley GWMA. Each GWMA has a voluntary Action Plan to reduce nitrate concentrations in groundwater. If after a scheduled evaluation point DEQ determines that the voluntary approach is not effective, then mandatory requirements may become necessary.

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, Oregon Department of Forestry, DEQ, and the Oregon Health Authority. 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 can be addressed through multiple programs and partners, including the PSP Program described above.

Through the PSP Program, state agencies and local partners work together to monitor pesticides in streams and to improve water quality (www.deq.state.or.us/wq/pesticide/pesticide.htm). DEQ, ODA, 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. There has been noteworthy progress since 2000 in reducing pesticide concentrations and detections.

ODA led the development and implementation of a Pesticides Management Plan (PMP) for the state of Oregon (www.oregon.gov/ODA/PEST/water_quality.shtml). 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. The PMP sets forth a process for preventing and responding to pesticide detections in Oregon's ground and surface water resources by managing the pesticides that are currently approved for use by the U.S. EPA and Oregon in both agricultural and non-agricultural settings.

1.5.5 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 salmon, because they have such 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 associated regulations throughout Oregon.

1.6 Partner Agencies and Organizations

1.6.1 Oregon Department of Environmental Quality (DEQ)

The U.S. EPA has delegated authority to DEQ under the CWA authority for protection of water quality in Oregon. In turn, DEQ is the lead state agency with overall authority to regulate for water quality in Oregon. DEQ coordinates with other state agencies, including ODA and Oregon Department of Forestry, to meet the needs of the CWA. DEQ sets water quality standards and develops TMDLs for impaired waterbodies. In addition, DEQ develops and coordinates programs to address water quality including National Pollution Discharge Elimination Permits (for point sources), 319 grant program, Source Water Protection, 401 Water Quality Certification, and GWMAs. DEQ also coordinates with ODA to help ensure successful implementation of Area Plans as part of its 319 program.

DEQ designated ODA as the Designated Management Agency for water pollution control activities on agricultural and rural lands in the state of Oregon to coordinate meeting agricultural TMDL load allocations. A Memorandum of Agreement (MOA) between DEQ and the ODA recognizes that ODA is the agency responsible for implementing the Ag Water Quality Program established under ORS 568.900 to ORS 568.933, ORS 561.191, and OAR Chapter 603, Divisions 90 and 95. The MOA between ODA and DEQ was updated in 2012 and describes how the agencies will work together to meet agricultural water quality requirements.

The MOA includes the following commitments:

- ODA will develop and implement a monitoring strategy, as resources allow, in consultation with DEQ,
- ODA will evaluate Area Plans and regulation effectiveness in collaboration with DEQ
    - ODA will determine the percentage of lands achieving compliance with Management Area regulations,
    - 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 with the objective of determining:
    - 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 Plan,
    - Whether the rate of progress is adequate to achieve the goals of the Area Plan.

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 its associated regulations. The petition must allege with reasonable specificity that the Area Plan or associated regulations are not adequate to achieve applicable state and federal water quality standards (ORS 568.930(3)(a)).

1.6.2 Other Partners

ODA and SWCDs work in close partnership with local, state, and federal agencies and organizations, including: DEQ (as indicated above), the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) and Farm Service Agency, watershed councils, Oregon State University Extension Service, 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 and operators have implemented 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 this progress. ODA is working with SWCDs, LACs, and our partners to develop and implement objectives and strategies that will produce measurable outcomes for agricultural water quality.

1.7.1 Measurable Objectives

Measurable objectives allow the Ag Water Quality Program to better evaluate progress toward meeting water quality standards and load allocations where TMDLs have been completed. Many of these measurable objectives relate to land condition and are mainly implemented through focused work in small geographic areas (section 1.7.3). The measurable objectives for this Area Plan are in Chapter 3, and progress toward achieving the objectives is summarized in Chapter 4.

At a minimum, the measurable objectives of the Ag Water Quality Program and this Area Plan are to:

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

1.7.2 Land Condition and Water Quality

Land conditions can serve as useful surrogates (indicators) for water quality parameters. For example, streamside vegetation is generally 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 nutrients, because many pesticides and nutrients 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.
- It requires extensive monitoring of water quality at an intensive temporal scale to evaluate progress; it is expensive and may fail to demonstrate short-term improvements.

- Improved land conditions can be documented immediately, but there may be a significant lag time or a need for more extensive implementation before water quality improves.
- Agricultural improvements in water pollution are primarily through improvements in land and management conditions.

Water quality monitoring data may help ODA and partners to measure progress or identify problem areas in implementing the Area Plan; although, as described above, it may be less likely to evaluate 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 significant water quality or land condition concerns that are associated with agriculture. ODA's intent in selecting Focus Areas is to deliver systematic, concentrated outreach and technical assistance in small geographic areas ("Focus Areas") through the SWCDs. A key component of this approach is measuring conditions before and after implementation to document the progress made with available resources. The focused implementation 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).

Systematic implementation in Focus Areas can provide 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 the appropriate source specific conservation practices and demonstrate the effectiveness of these conservation practices.
- A higher density of projects allows neighbors to learn from neighbors.
- A higher density of prioritized projects leads to greater connectivity of projects.
- Limited resources are used more effectively and efficiently.
- Work in one Focus Area, followed by other Focus Areas, will eventually cover the entire Management Area.

SWCDs choose a Focus Area in cooperation with ODA and other partners. In some cases, a Focus Area is selected because of efforts already underway or landowner relationships already established. The scale of the Focus Area matches the SWCD's capacity to deliver concentrated outreach and technical assistance, and to complete (or initiate) projects over a biennium. The current Focus Area for this Management Area is described in Chapter 3.

Working within a Focus Area is not intended to prevent implementation within the remainder of the Management Area. The remainder of the Management Area will continue to be addressed through general outreach and technical assistance.

Strategic Implementation Areas

Strategic Implementation Areas are small watersheds selected by ODA, in cooperation with partners, and after review of water quality and other available information. ODA leads the assessment of current conditions and the landowner outreach. Strategic Implementation Areas and Focus Areas are both tools to concentrate efforts in small geographic areas to achieve water quality standards. As with Focus Areas, SWCDs and partners work with landowners to improve conditions that may impact water quality.

However, Strategic Implementation Areas also have a compliance evaluation and assurance process that allows ODA to proactively gain compliance with Ag water quality regulations.

1.8 Implementation, Monitoring, Evaluation, and Adaptive Management

Implementation of the Area Plan and associated regulations will be assessed by evaluating the status and trends in agricultural land conditions. Measurable objectives will be assessed across the entire Management Area and within the Focus Area. ODA conducts land condition and water quality monitoring at the statewide level and will analyze this and other agencies' and organizations' local monitoring data. The results and findings will be summarized in Chapter 4 for each biennial review. ODA, DEQ, SWCDs, and LACs will examine these results during the biennial review and will revise the goal(s), objectives, and strategies in Chapter 3, as needed.

1.8.1 Statewide Aerial Photo Monitoring of Streamside Vegetation

Starting in 2003, ODA began evaluating streamside vegetation conditions using aerial photos acquired specifically for this purpose. ODA focuses on land condition monitoring efforts on streamside areas because these areas have such a broad influence over water quality. Stream segments representing 10 to 15 percent of the agricultural lands in each Management Area were randomly selected for monitoring. ODA examines streamside vegetation at specific points in 90-foot bands along the stream from the aerial photos and assigns each sample stream segment a score based on ground cover. 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 one correct riparian index score. The main point is to measure positive or negative change. The results are summarized in Chapter 4 of the Area Plan.

1.8.2 Agricultural Ambient Water Quality Monitoring Assessment

ODA currently evaluates water quality data from monitoring sites in DEQ's water quality database that reflects agricultural influence on water quality. These data are also published in the DEQ water quality database and evaluated at the statewide level to determine trends in water quality at agricultural sites statewide. Results from monitoring sites in the Management Area, along with local water quality monitoring data, are described in Chapter 4.

1.8.3 Biennial Reviews and Adaptive Management

The Area Plan and associated regulations 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 associated regulations. This evaluation includes enforcement actions, landscape and water quality monitoring, and outreach efforts over the past biennium across the Management Area and for the Focus Area. In addition, progress toward achieving agricultural load allocations may be documented (if a TMDL has been established). As a result of the biennial review, the LAC submits a report to the Board of Agriculture and the director of ODA. This report describes progress and impediments to implementation, and recommendations for modifications to the Area Plan or associated regulations necessary to achieve the purpose of the Area Plan. The results of this evaluation will be used to update the goal(s), measurable objectives, and strategies in Chapter 3.

This Area Plan and the associated Area Rules are subject to a two-year review process. During the biennial review, ODA, in cooperation with the Monument SWCD and the LAC will assess the progress of Area Plan implementation toward achievement of Area Plan goals and objectives. These assessments will include:

1. An accounting of the numbers and acreage of operations with Voluntary Water Quality Plans and the calculated amount of soil erosion and pollution prevented.
2. Identification of additional sources of sediment, heat inputs and other contributors to non-attainment of all applicable water quality standards.
3. An evaluation of available current water quality monitoring data.
4. An evaluation of outreach and education programs designed to provide public awareness and understanding of water quality issues.
5. A review of projects, demonstrations, and tours used to showcase successful management practices and systems.
6. An evaluation of the effectiveness of technical and financial assistance sources available to the agricultural community.
7. Review of load allocations (LA) and effectiveness of this plan in meeting LAs as described in the TMDL for the John Day River Basin.

Based on these assessments, the ODA, SWCD, LAC, and the State Board of Agriculture will consider making appropriate modifications to the Area Plan and Rules. Any future amendments to the Area Rules will be subject to public participation process as defined in Oregon law.

Chapter 2: Local Background

This is only intended as an example. For a more consistent look for our plans around the state, try to work with the LAC to use this outline and section titles. However, if current text is adequate, no changes are necessary.

2.1 Local Roles and Responsibilities

2.1.1 Local Advisory Committee (LAC)

This Area Plan was developed with the assistance of a LAC. The LAC was formed in 2002 to assist with the development of the Area Plan and regulations and with subsequent biennial reviews. Members are:

Name	Location	Description
Ron Burnette, Chair	Middle Fork John Day River, East of 395, North of County RD 20	Rancher, Landowner
Sharon Livingston, Vice-Chair	Long Creek, OR	Rancher, Landowner
Gary Adams		
Jack Cavender		
Jim Bahrenburg		
Rick Henslee	Long Creek, OR	Rancher, Landowner, North Fork John Day Watershed Council Board Member, Grant SWCD Director
La Velle Holmes	Middle Fork John Day River	
Dale Martin		
Allen Reilly		
Allen Gillette	John Day Basin	Fish Biologist
John Zakrajsek	Northern and Upper North Fork John Day	Local Representative
Jacki Groff	Monument, OR	Landowner, Monument SWCD Director.

2.1.2 Local Management Agency

The implementation of this Area Plan is accomplished through an Intergovernmental Agreement between ODA and the Monument SWCD. This Intergovernmental Agreement defines the SWCD as the Local Management Agency for implementation of the Area Plan. The SWCD was also involved in development of the Area Plan and associated regulations.

Monument SWCD is the Local Management Agency (LMA) designated by the Department for development and implementation of the AgWQM Area Plan and projects in the AgWQM Area. Grant and Umatilla County SWCDs will assume responsibility for the implementation of the Area Plan and related projects within those districts under agreement with the LMA. The North Fork John Day Watershed Council will assist the LMA in implementation and review of the Area Plan and related projects. Implementation priorities will be established on a periodic basis through annual work plans developed jointly by the SWCD and ODA with input from partner agencies.

The director of ODA appointed an LAC representing local agricultural producers, and owners, agencies, tribes, environmental organizations and the SWCD for the purpose of assisting with the development of this Area Plan and the associated OARs to implement core elements of the Area Plan.

The LMA and LAC will participate in biennial review of plan implementation progress. Any future amendments to the administrative rules will be subject to the public participation process outlined in Oregon law.

2.2 Area Plan and Regulations: Development and History

The director of ODA approved the Area Plan and regulations in March of 2002.

Since approval, the LAC met 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.

2.3 Geographical and Physical Setting

The John Day River Basin is an 8,100 square mile drainage area, the fourth largest basin in the state. The flows originate in the Blue Mountains and flow generally westward and then northward for approximately 284 miles, discharging into the Columbia River east of Rufus, at River Mile (RM) 218. The John Day River is one of the longest rivers without a dam in the United States. The climate is continental, characterized by low winter and high summer temperatures, low average annual precipitation and dry summers. Precipitation ranges from nine inches at the mouth to over 40 in the upper reaches.

The North Fork Subbasin is an area of 1,800 square miles that flows westward for over 100 miles, entering the John Day River mainstem at Kimberly (RM 184.2). The subbasin includes parts of Grant, Umatilla, Morrow, Union, and Wheeler counties. The elevation ranges from 1,830 feet at the mouth to over 8,300 feet in the Blue Mountains. The climate varies from semi-arid near the mouth to relatively moist at higher elevations. Precipitation ranges from slightly more than 13 inches at Monument to over 40 inches annually (mostly snow) at the higher elevations of the Blue Mountains.

The Middle Fork Subbasin, a tributary to the North Fork, drains 806 square miles and flows approximately 75 miles joining the North Fork at RM 32.2, above Monument. The subbasin is entirely in Grant County. The elevation ranges from 2,200 feet at the mouth to over 8,100 feet in the headwaters.

Most of the North and Middle Forks Subbasins are in the John Day Ecological Province, which consists of "extensive areas of steeply and intricately dissected hills interspersed with isolated buttes and extensive plateaus and large and small valleys. The hills are mainly geologically eroded ancient lacustrine materials; plateaus and buttes are capped with igneous or tuffaceous rock. Soils are directly related to these different geologic formations; they are the parent materials in which the soils have formed." The upper North Fork is in the Blue Mountain Province "typified by groups of rugged mountains, steep canyons and extensive plateaus divided by dendritic-pattern drainages. Basalt is the major bedrock underlying mountains and plateaus. Soils can be grouped according to natural vegetation." (*The Ecological Provinces of Oregon, 1998)*

2.3.1 Water Yield, Land Use, Land Ownership, Agriculture, Water Use, Fishery Resources

Water Yield
The North Fork, including the Middle Fork, yields about 60 percent of the annual discharge of the John Day River Basin. The flow comes mostly from melting snowpack with late summer flows from groundwater. Average annual discharge at Monument, measured since 1925, is 904,200 acre-feet (AF). Peak discharge occurs between March and early June and the lowest flows generally occur during July, August, and September. The Middle Fork contributes about 25 percent of the North Fork flow with average annual measured flow at Ritter of 168,464 AF and an average annual estimated discharge at the mouth of about 268,000 AF.

Land Use
Forest covers 73 percent of the land area; range and pasture 24 percent; cropland 2 percent; and other uses 1 percent. Ninety-five percent of the land is used for grazing. In 1985, about 40 percent of the cropland was irrigated. Mining claims form small private enclaves mostly within federally managed land.

Urban areas occupy only a small portion of the North and Middle Forks Subbasins. Long Creek, Monument, Ukiah, and Granite are the incorporated cities with a total population of 690.

Special management areas include: the North Fork John Day River Wilderness (122,000 acres), the federal Wild and Scenic River System (27.8 miles - Wild River, 10.5 miles - Scenic River, 15.8 miles - Recreational River), State Scenic Waterways (53 miles - Accessible Natural River, 3 miles - Recreational River, 11 miles - Natural River, 60 miles - Scenic River), US Forest Service (USFS) Greenhorn Mountains Scenic Area (29,285 acres) and Oregon Department of Fish and Wildlife (ODFW) Bridge Creek Wildlife Management Area (12,800 acres).

Significant mining has taken place in several areas of the basin. Gold was discovered in the Canyon City area in 1862, which led to further exploration and settlement in the area. Large deposits were found in the Susanville and Greenhorn areas of the North and Middle Forks Subbasins. Hydraulic mining was used to wash soil and gravel away to expose the gold ore.

Dredges were used in the streams to dig up the deposited gravel and sift out the gold. The Oregon Department of Geology and Mineral Industries (DOGAMI) estimates that at least 13 million cubic yards of material was handled on the North Fork-Granite Creek-Clear Creek system and 4.2 million cubic yards on the Middle Fork-Vincent Creek systems.

Land Ownership
Most of the land (65 percent) in the subbasin is owned by the public; managed by the USFS and US Department of Interior -Bureau of Land Management (BLM). The USFS lands are primarily in the eastern and northern headwaters areas and BLM lands are scattered throughout the western part of the basin and along the stream corridors. Private ownership occurs in the lower elevations, along streams and intermediate uplands. The state of Oregon owns scattered tracts throughout the basin totaling about 15,000 acres, which includes the Bridge Creek Management Area.

Agriculture
Agriculture is the primary private sector economic activity in the John Day River Basin. The primary agricultural products in the AgWQM Area are alfalfa, meadow hay and beef cattle. Most hay produced is used to feed wintering cattle. Cattle production comprises over 70 percent of the agricultural income. Range forage provides over 50 percent of the year-round cattle feed with hay and pasture providing the remainder. Approximately half of the cattle operations use BLM or USFS range on a permit basis.

The North Fork Subbasin has about 24,000 acres of cropland, evenly split between irrigated and non-irrigated. Major crops are grain hay, meadow hay, and pasture. Other crops include, alfalfa, and orchards. The Middle Fork Subbasin has about 10,600 acres of cropland, one-third irrigated. Crops include alfalfa, meadow and grass hay, pasture, grain, and grain hay.

Income from forestry and forest products ranks second to agriculture in the private sector economy of the John Day River Basin. However, due to forest health and declining availability of federal timber, forest revenues have dropped dramatically in recent years.

Grant County agricultural commodity sales for all crops and livestock for 2009 was $42,296,000. Since 1988, gross farm sales have ranged from about $16 to $45 million. Current statistics show that there are 37,000 cattle and 600 sheep, 39,000 acres of hay, 450 acres of grain and field crops, and 181 acres of orchards in Grant County. (2009 Oregon Agripedia)

Early stockmen raised cattle and horses. In the 1880's, many cattle herds were sold and replaced with sheep. Grant County excelled in the production of wool. The 1893 assessment records show 17,631 cattle and 158,355 sheep. Sheep numbers began dropping off in the 1930's with an increase in cattle. Farming began in the 1860's with a gradual conversion of some stock ranches to farming in the valleys.

Water Use

The North Fork Subbasin has water rights administered by the Oregon Water Resource Department (WRD) for 536.0 cubic feet per second (cfs), mainly for irrigation (291.5 cfs) and mining (202.2 cfs). Annually, a total of 13,400 acres are irrigated (mostly by sprinklers) requiring 17,800 AF of water. Minimum streamflows were established in 1962 at Monument (55 cfs) and Dale (30 cfs). Some water may be diverted from the North Fork to the Umatilla Basin (25-28 cfs) and the North Fork Burnt River (22 cfs) for irrigation. There are 22 instream water rights.

The Middle Fork Subbasin has water rights for 146.7 cfs for irrigation (88.5 cfs) and mining (49.5 cfs). Mining rights are mostly junior, dated later than 1970. Irrigation is mostly flood near Long Creek and above Galena and totals 4,900 acres. Approximately 5,100 AF (44 cfs) is required from May to September. Minimum stream flows were established in 1962 for 10 cfs at Ritter for support of aquatic life. There are seven instream water rights.

Instream water rights are approved by WRD for fish protection, minimizing the effects of pollution or maintaining recreational uses. Instream water rights have a priority date and are regulated in the same way as other water rights. An instream water right cannot affect a use with a senior priority date.

There are no major impoundments in the John Day River Basin. Over the years, many reservoir sites have been identified in both subbasins for upstream storage of water. All of these sites are considered to have a potential adverse impact on anadromous fish runs. None of the sites was found to be justifiable economically, under the criteria used by federal agencies at that time.

Applications have been made to WRD for reservation of water in the North and Middle Forks Subbasins for use in supplying irrigation uses or to meet adopted minimum perennial streamflow levels to be reserved for future appropriations. The decisions to approve the reservations are still pending.

Fishery Resources

The North and Middle Fork Subbasins are major producers of wild spring Chinook and summer steelhead for the John Day River Basin. Redd counts conducted for years 2000-14 showed the North Fork produces 48 percent of the spring Chinook and 43 percent of total summer steelhead for the basin. The Middle Fork produces 20 percent of the spring Chinook 30 percent of the summer steelhead for the basin. Bull

trout, a threatened species, is present in the upper reaches of both subbasins as well as widespread populations of resident red band trout. Warm water species, including small mouth bass, exist in the lower mainstem reaches. Trends show a general increase in spawning density for spring Chinook but declines for summer steelhead, which warranted a threatened listing under the federal Endangered Species Act (ESA) in 1998 for steelhead.

The life histories of spring Chinook and steelhead differ in adult run time when they use the river. Adult spring Chinook enter the John Day River during April through June, hold in deep pools throughout the summer and spawn in late August and September in the upper reaches of the mainstem and lower reaches of primary tributaries. Juveniles spend one year in fresh water before they "smolt" and migrate to the ocean. Adult steelhead will enter the river beginning in September, hold over the winter and spawn from March through June. Juvenile steelhead rear for one to three years primarily in tributaries then "smolt" and migrate to the ocean. Both species migrate to the ocean from February through June.

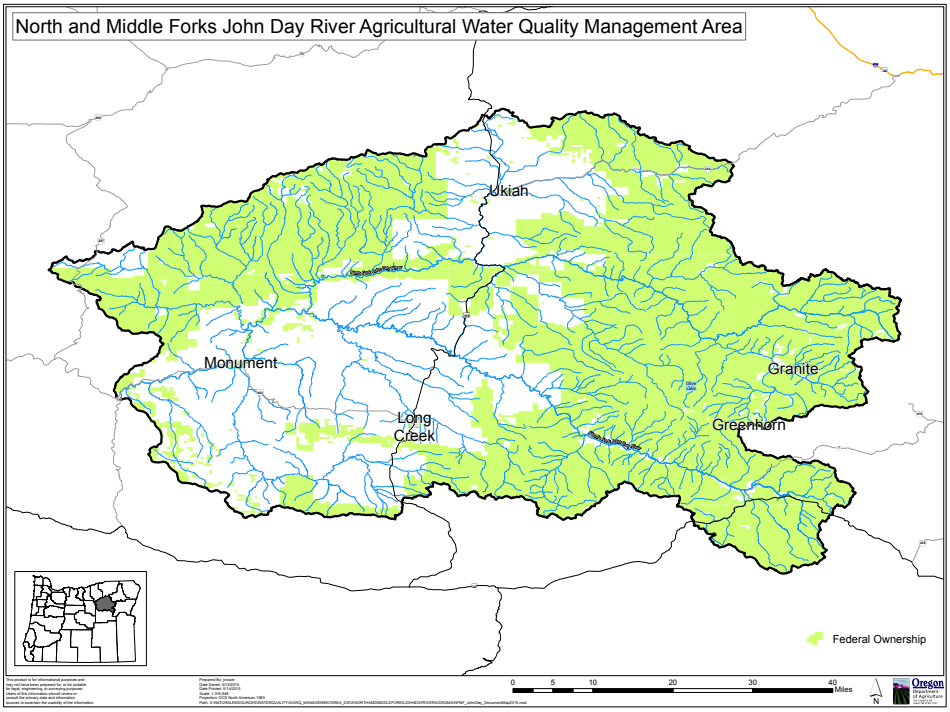
Riparian habitat in the upper subbasins has been improving due to numerous fencing and restoration projects along with better grazing management. Many projects have improved fish passage at irrigation diversions that has helped increased fish distribution. Even with riparian improvements the upper Middle Fork River during summer reaches lethal water temperatures for salmonids most years. There have been several years of severe die offs of holding adult spring Chinook in the last ten years. Lower base flow stream temperatures would greatly benefit all salmonids in the Middle Fork subbasin.

2.3.2 Geographic and Programmatic Scope

603-095-1020
Geographic and Programmatic Scope
(1) The North and Middle Forks John Day River Agricultural Water Quality Management Area includes the area that drains into the North and Middle Forks of the John Day River upstream from the confluence with the mainstem John Day River near Kimberly. The physical boundaries of the North and Middle Forks John Day River Management Area are indicated on the map included as Appendix 1 of these rules.
(2) Operational boundaries for the land base under the purview of these rules include all lands within the North and Middle Forks John Day River subbasins in agricultural use and agricultural and rural lands which are lying idle or on which management has been deferred, with the exception of public lands managed by federal agencies (USFS and BLM) and activities that are subject to the Oregon Forest Practices Act.
(3) Current productive agricultural use is not required for the provisions of these rules to apply. For example, fallow croplands or rested pastures with no present active use are within the purview of these rules.
(4) The provisions and requirements outlined in these rules may be adopted by reference by Designated Management Agencies with appropriate authority and responsibilities in other geographic areas of the North and Middle Forks John Day River Agricultural Water Quality Management Area.
(5) For lands in agricultural use within other Designated Management Agencies or state agency jurisdictions, the department and the appropriate Local Management Agency shall work with these Designated Management Agencies to assure that provisions of these rules apply, and to assure that duplication of any services provided or fees assessed does not occur.

Statutory Authority: ORS 561.190 – 561.191, and ORS 568.912 Statutes Implemented: ORS 568.900 - 568.933

2.3.3 Map of the Management Area



2.4 Agricultural Water Quality in the Management Area

2.4.1 Local Issues of Concern

The North Fork Subbasin produces the best quality water, chemically, physically, and biologically, in the John Day River Basin (John Day River Basin Report, November 1986). Water distribution is a problem with high winter flows and low summer flows. High flows can carry sediment and can cause localized erosion and sedimentation while low flows along with lack of vegetation and other factors can result in high water temperatures. There are numerous sites with hot water (geothermal) springs, but total flows or the impact to stream temperatures are not fully understood.

The CWA, through the EPA, requires each state to identify beneficial uses for each waterbody to designate parameters to monitor for each beneficial use and to establish a standard or criteria for each parameter.

A TMDL is the maximum amount of pollutant that can be present in a waterbody and still allow the waterbody to meet water quality standards. An assessment of the maximum allowable amounts uses scientific data collection and analysis to determine the amount and sources of pollutant entering streams waterbodies. These maximum allowable pollutant loads have been assigned to regulating or management agencies responsible for specific land management or regulatory practices. For instance, the Oregon Department of Forestry (ODF) confines its oversight to forest practices while the USFS provides oversight on federal forest lands.
Stream pollution is closely tied to land use. In the John Day River Basin, 45 percent of the land is forested and more than 50 percent is in agricultural use. Other uses include urban, rural residential, parkland and industrial, each of which occur in a small fraction of basin area. The TMDL planning applies to all land uses that contribute pollution to the basin's streams and rivers.

2.4.2 303(d) List of Impaired Water Bodies

Section 303(d) of the CWA requires each state to develop a list of waterbodies that do not meet the standards designed to protect the most sensitive beneficial use and to report findings to Congress every two years. The CWA also directs states to develop TMDLs for 303(d) listed streams. The development of a TMDL results in allocations of pollutant loads to different sources such as agriculture, urban areas, and federal lands. Each jurisdictional authority then develops water quality management plans to achieve the load allocations. The John Day River Basin TMDL, that includes this Management Area, was approved in 2010. This Area Plan serves as the implementation plan for agriculture's load allocation and may be revised to address the load allocations as they are implemented.

DEQ is required to establish TMDLs for pollutants impairing water quality as listed on the 303(d) list. The 303(d) list contains several different categories of impaired water bodies. The categories that pertain (or may pertain in the future) to impaired water bodies in this Area Plan include: Attaining water quality criteria (Category 2), Insufficient data (Category 3), Water Quality Limited – TMDL needed (Category 5), Water Quality Limited – TMDL not needed (Category 4) and Water Quality Limited – TMDL Approved (Category 4A). When a water body is first placed on the 303(d) list as impaired, it is generally in Category 5 (TMDL needed). Once TMDLs are completed for a basin, the water bodies with TMDLs are removed from the Category 5 list and assigned to the Category 4A list (Water Quality Limited – TMDL Approved). In the future, when data show that water quality criteria have been met for these water bodies, the will be assigned to the Category 2 list (Attaining Water Quality Criteria).

In the North and Middle Fork John Day River Subbasins, most 303(d) listings are specific to elevated water temperatures, biological criteria, sedimentation, dissolved oxygen, and pH. A complete list of water quality impaired water bodies in the North and Middle Fork John Day River Subbasins, as identified in Oregon's 2012 303(d) list, is provided in Appendix A. The 2012 303(d) list was submitted to EPA on November 5, 2014. The 2012 303(d) list will be effective after EPA has taken final action.

2.4.3 Basin TMDLs and Agricultural Load Allocations

TMDL Implementation
The John Day River Basin TMDL and Water Quality Management Plan can be viewed on the DEQ Website at: http://www.deq.state.or.us/WQ/TMDLs/docs/johndaybasin/TMDLandWQMPFINAL.pdf.

TMDL implementation is carried out through two primary mechanisms: water quality permits for facilities and water quality management plans for nonpoint sources.

The TMDL document includes a water quality management plan with strategies and approaches for implementing the TMDLs. The plan designates organizations to prepare and carry out source-specific TMDL implementation plans. The organizations designated to prepare and carry out TMDL implementation plans include the USFS and BLM, ODA and ODF, counties, cities and others. The timeline for submittal of these plans is generally 18 months following issuance of the TMDL.

2.4.4 Beneficial Uses and Parameters of Concern

Beneficial Uses
Water quality in the John Day River Basin must be managed to protect recognized beneficial uses. Beneficial uses of water in the John Day River Basin are public and private water supply, industrial water supply, irrigation, livestock watering, anadromous fish passage, salmonid fish rearing and spawning, resident fish and aquatic life, wildlife and hunting, fishing, boating, water contact recreation, and aesthetic

quality. Beneficial uses that are adversely affected, according to current data, include: salmonid fish rearing and spawning, and resident fish and aquatic life.

WRD Rules (OAR 690-506-0010, John Day Basin Program) recognizes important economic, social, and environmental benefits to the public including: increases in crop production, enhancement of wild anadromous and resident fish production, provision of adequate water supplies for livestock and wildlife, enhancement of water-related tourism and recreation opportunities, maintenance of adequate water quality and quantity for projected domestic, industrial and municipal growth, and development of storage reservoirs that are beneficial to anadromous fish and other uses.

Water Quality Parameters of Concern

The DEQ has identified several water quality concerns in the John Day River Basin, including high temperature and bacteria levels, low oxygen concentrations and impaired biological conditions. Temperature, sedimentation and biological condition concerns were identified in the North and Middle Forks Subbasin.

Water quality standards for the John Day River Basin, (DEQ OAR 340-041-0007) state: (1) Notwithstanding the water quality standard contained below, the highest and best practicable treatment and/or control of wastes, activities, and flows shall in every case be provided so as to maintain dissolved oxygen and overall water quality at the highest possible levels and water temperatures, coliform bacteria concentrations, dissolved chemical substances, toxic material, radioactivity, turbidity, color, odor, and other deleterious factors at the lowest possible levels.

Of the beneficial uses of water in the John Day River Basin, the most sensitive use for most waters and parameters of concern is spawning and rearing of cold-water fisheries. The following discussion of water quality parameters of concern in the watershed addresses the CWA requirements for standards to be established for the most sensitive beneficial use.

Temperature

Increased water temperature is the most widespread concern in the basin. The causes of stream heating are excess solar radiation, decreased groundwater interaction, hyporheic interaction, and instream flow reduction. These can result from natural disturbances and human-related stream modifications to stream channel, riparian, and floodplain areas such as vegetation disturbance, irrigation withdrawal and channel straightening. The TMDL calls for increased stream shade and a more natural channel shape to reduce water temperatures. Water conservation and flow restoration are encouraged.

The streamside landscape provides shade that reduces solar heating of the water. The TMDL estimates the amount of natural, streamside vegetation needed to reduce solar heating to acceptable levels. Vegetation species and heights are determined by considering climate, soils, slope, elevation, historic vegetation and protected areas.

Excessive water temperatures affect the survival of aquatic species. Cold-water fish, such as salmon and trout, are particularly sensitive to stream warming at all life stages. The purpose of the temperature criteria is to protect designated temperature-sensitive beneficial uses, including specific salmonid life cycle stages in waters of the state.

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.)*

The TMDL objectives for this plan are referred to as 'load allocations.' The load allocations are expressed as maximum heat loads. For ease of use, these are also expressed in terms of 'percent effective shade.' To further clarify, the vegetation target for temperature is simply natural shade-producing vegetation along all the streams in the John Day River Basin. Reduced channel widths and more natural flow levels are called for as well, while not quantified.

The TMDL targets can be found in the TMDL main document at
http://www.deq.state.or.us/WQ/TMDLs/docs/johndaybasin/TMDLandWQMPFINAL.pdf.
The load allocations are defined and illustrated in the TMDL on pages 79-89 in Section 2.1.8.

Sedimentation
Sediment above natural levels affects drinking water for humans and impacts salmonid reproduction and rearing. The formation of appreciable deposits of sediment interferes with the quality of gravels in the streambed that are essential for successful spawning, incubation and rearing of salmonids.

DEQ is in the process of developing quantitative methods and benchmarks to evaluate sedimentation impairment in Oregon streams. Because this work is not yet complete, DEQ postponed the sedimentation TMDL until these methods are in place.

This Area Plan addresses sedimentation through prevention and control measures that reduce runoff from upland areas, provide filtration in riparian areas and reduce return flows from irrigated areas.

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

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

The TMDL analysis demonstrates that temperature TMDL implementation will address both low oxygen levels and impaired biologic conditions.

2.4.5 Sources of Impairment

Sources of water pollution can be generalized into two types: point source pollution and nonpoint source pollution. Point source pollution emanates from clearly identifiable discharge points such as wastewater treatment plants, piped effluent from industrial operations and other discrete conveyances. Permits are required for significant point source discharges. These permits, administered by DEQ, require that certain effluent standards be met or require a zero discharge level. Certain Confined Animal Feeding Operations (CAFO) require permits, which are administered by ODA.

Nonpoint source pollution is pollution emanating from landscape scale sources and cannot be traced to a single point. Agricultural operations are concerned with preventing or controlling pollution from nonpoint sources and concentrated runoff from these sources. 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 areas used by 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. Runoff from nonpoint sources can concentrate into identifiable sources entering waterways as point sources.

A major nonpoint source of water quality impairment is heat input that results in high water temperatures. Water temperature naturally fluctuates with air and soil temperatures on a daily and seasonal basis, however, temperature increases may be caused by both natural and man-caused events resulting from vegetation removal, low seasonal flows, changes in channel shape and alteration to the floodplain (among others). Channelization or alteration of stream courses can alter gradient, width/depth ratio and sinuosity, causing sediment and temperature increases.

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

2.5 Prevention and Control Measures

A landowner's 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.

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

603-095-1040
Prevention and Control Measures
(1) Limitations:
(a) All landowners or operators conducting activities on agricultural lands are provided the following exemptions from the requirements of OAR 603-095-1040 (Prevention and Control Measure).
(A) A landowner or operator shall be responsible for water quality resulting from conditions caused by the management of the landowner or operator.
(B) Rules do not apply to conditions resulting from unusual weather events or other circumstances not within the reasonable control of the landowner or operator. Reasonable control of the landowner means that technically sound and economically feasible measures must be available to address conditions described in Prevention and Control Measures.
(b) Rule implementation schedule:
(A) OAR 603-095-1040(2) is effective upon adoption;
(B) OAR 603-095-1040 (3) through (6) are effective January 1, 2006;
(C) Effective upon adoption of these rules, all landowners or operators should immediately begin technically sound, economically feasible efforts where needed to achieve measurable progress towards compliance with these rules.
(c) These rules may be modified as a result of the biennial review of the progress of implementation of the North and Middle Forks John Day River Agricultural Water Quality Management Area Plan.
(2) Waste Management:
Effective on rule adoption, no person subject to these rules shall violate any provision of ORS 468B.025 or 468B.050.
(3) Uplands Management:

(a) Cropland, rangeland and pasture condition must allow, within the capability of the site, vegetation sufficient to protect water quality.
(b) Private roads and farmsteads must be in a condition that protects water quality by controlling soil erosion and suspended sediment concentrations in runoff.
(4) Riparian Area Management:
Riparian area condition must allow the establishment, growth and active recruitment of riparian vegetation, consistent with the vegetative capability of the site, for protection of water quality.
(5) Irrigation Management:
Irrigation must be done in a manner that limits the amount of pollutants in the runoff from the irrigated area.

(6) Livestock Management:
(a) Livestock confinement areas must have an adequate runoff control system or equally effective pollution control practice sufficient to control runoff of sediment and animal waste.
(b) OAR 603-095-1040(6)(a) applies to all livestock confinement areas except those required to have a permit under ORS 468B.050.

Statutory Authority: ORS 561.190 – 561.191, and ORS 568.912 Statutes Implemented: ORS 568.900 - 568.933

2.5.1 Nutrients and Manure Management

Waste Management
A landowner or operator's responsibility under this Area Plan is to prevent the introduction of waste materials into nearby bodies of water. There are existing, applicable statutes and rules that regulate water quality.

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

Current Oregon Law, Oregon Revised Statute (ORS) 468B.025(1) states that:
"...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."

ORS 468B.050 identifies the conditions when a permit is required. A permit is required for certain livestock confinement areas, defined as animal feeding operations or concentrated animal feeding operations (AFO/CAFO), which are consistent with the federal definitions.

Definitions (ORS 468B.005)

> "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 effect a junction with natural surface or underground waters), which are wholly or partially within or bordering the state or within its jurisdiction.

2.5.2 Riparian/Streamside Area Management

Riparian Area Management

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

(4) Riparian Area Management:
Riparian area condition must allow the establishment, growth and active recruitment of riparian vegetation, consistent with the vegetative capability of the site, for protection of water quality.

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.

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

- Dissipation of stream energy associated with high flows and thus influencing the transport of sediment,
- Capturing suspended sediment and bedload that builds streambanks and develops floodplain function,
- Retaining floodwater and recharging 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,
- Shade for moderation of solar heat input,
- Recruitment of large woody debris for aquatic habitat.

Indicators to determine improvement of this condition include:

- Recruitment of desirable riparian plant species,
- Maintenance of established beneficial vegetation,
- Maintenance or recruitment of woody vegetation -- both trees and shrubs,
- Streambank integrity capable of withstanding 25-year flood events.

Factors 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. 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 conditions improve biological criteria and habitat by reducing stream disturbances, preventing excessive heat and contaminant inputs, and adding to stream habitat complexity.

Riparian area health may be directly influenced by management. This Area Plan does not prescribe specific practices to landowners for management of riparian areas. Site specific recommendations for management to protect water quality, including buffer width, vegetation types, and grazing timing, can be obtained from sources listed in the Implementation Strategies section of this Area Plan.

Grant County government has recognized, as a part of the comprehensive land use planning process, the value of riparian management along rivers, streams and springs. The natural features provided by riparian areas have extensive economic, social, and environmental benefits to the county residents. The goals of this Area Plan are generally consistent with the natural resource elements of the Grant County Comprehensive Land Use Plan regarding water quality and riparian vegetation. Coordination of county and state programs addressing riparian condition may be provided by the local SWCDs.

2.5.3 Soil Erosion Prevention and Control

2.5.4 Upland Management, Irrigation Lands Management, Livestock Management

Upland Management

A landowner or operator's responsibility under this Area Plan is to implement measures that prevent and 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 contribute to water quality degradation.

(3) Uplands Management:
(a) Cropland, rangeland and pasture condition must allow, within the capability of the site, vegetation sufficient to protect water quality.
(b) Private roads and farmsteads must be in a condition that protects water quality by controlling soil erosion and suspended sediment concentrations in runoff.

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 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. Proper management of upland vegetation considers physical and biological conditions of the management area, controls soil erosion and minimizes transport of soil and nutrients to the stream. Upland management also simultaneously considers livestock production interests and protection of fish and wildlife habitat.

Vegetation and soils are distinguishing characteristics of upland areas. Adequate vegetative cover can prevent or reduce soil erosion, minimize pollutant transport, improve water infiltration and storage, and protect fish and wildlife habitat. Vegetation is dependent on physical characteristics including soil, geology, landform, water and other climate factors. In a healthy upland environment, management will provide a balance of these characteristics.

Upland productivity varies depending on the characteristics listed above as well as biological and management factors. This productivity supports a wide variety of wildlife and forage for livestock. Healthy uplands maintain productivity over time and are resilient to stresses caused by variations in physical conditions such as climatic changes.

To implement proper management practices and ensure an area is healthy or functioning properly, the capability and potential of a site must be understood. Capability is the highest ecological status a site can attain given political, social, or economic constraints or limiting factors. Potential is the highest ecological status a site can attain given no political, social, or economic constraints and is often referred to as the "potential natural community." Examples of constraints would include local ordinances, location of roads or homes, and the costs of management changes.

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

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

Indicators of these conditions include:

- Recruitment of beneficial plant species.
- Ground cover 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 control 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.

Upland management addresses a water quality parameter of concern identified in the 303(d) list as sedimentation. 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 the Implementation Strategies section of this Area Plan.

Irrigated Lands Management

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

5) Irrigation Management:
Irrigation must be done in a manner that limits the amount of pollutants in the runoff from the irrigated area.

Irrigated lands are lands either riparian, floodplain or uplands upon which water is applied for the purpose of growing crops. Diversion of water from a waterbody to be applied on land for the purpose of growing crops is a recognized beneficial use of water. Irrigation water use is regulated by the Oregon WRD in the form of water rights, which specify the rate and amount of water that can be applied to a particular parcel of land. Refer to WRD Rules (OAR 690-300-0010(26)) for more details.

Irrigation in this basin is done by either flooding or sprinkler application. Water usually is diverted from a surface source (stream or pond) but may also be from groundwater sources. Irrigation management in this basin recognizes there may be some positive benefits occurring from flood irrigation application - 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 sources. Irrigation water may be used more than once as it returns to the stream and is available for instream uses or by other irrigators. Ultimately, streamflows will be enhanced by upland and riparian management practices promoting natural upstream storage and properly functioning floodplains that catch, store, and safely release precipitation for beneficial uses during summer months.

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

- Delivery of water efficiently to the land within legal water rights,
- Minimal overland return flows,
- Return flow routing that provides for settling, filtering and infiltration,
- Minimal effect on stability of streambanks and minimal soil erosion,
- Scheduling of water application appropriate to the site including consideration of soil conditions, crop needs, climate and topography,

- Increased sediment capture from irrigation runoff before it enters rivers and streams,
- Installation and management of diversion structures 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.

Livestock Management

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

(6) Livestock Management:
(a) Livestock confinement areas must have an adequate runoff control system or equally effective pollution control practice sufficient to control runoff of sediment and animal waste.
(b) OAR 603-095-1040(6)(a) applies to all livestock confinement areas except those required to have a permit under ORS 468B.050.

Livestock management can be done in a manner that limits soil erosion and minimizes the delivery of sediment and animal wastes to nearby streams. A grazing management system should promote and maintain adequate vegetative cover, for protection of water quality, by consideration of intensity, frequency, duration and season of grazing.

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.

Chapter 3: Goals, Objectives, and Strategies

ODA and the LAC will review this chapter at each biennial review and may update it if needed.

Objective

The objective of this Area Plan is to maximize agriculture's beneficial impact on water quality within the North and Middle Forks John Day River AgWQM Area by identifying and controlling factors that contribute to pollution originating on agricultural and rural lands.

3.1 Goal

The goal of this Area Plan is to prevent and control water pollution from agricultural activities and to achieve applicable water quality standards.

3.2 Measurable Objectives

To achieve the Area Plan goal, the following measurable objectives, strategies, milestones, and timelines were developed:

Objectives:

ODA, LMA, and the LAC will work on developing milestones and timelines during the 2017 Biennial Review.

3.2.1 Milestones (Targets) and Timelines

The following milestones and timelines were developed in cooperation with ODA and the SWCD. Focus Area Action Plans are developed as a tool with milestones and timelines for implementation of the Area Plan within a defined geographic area.

ODA, LMA, and the LAC will work on developing milestones and timelines during the 2017 Biennial Review.

3.2.2 Focus Area

The current Focus Area for this Management Area is the Cottonwood Creek Focus Area. An Action Plan for the current biennium has been developed and approved by ODA outlining the key components of the process.

- Conduct a pre-assessment of current land conditions,
- Identify areas of concern,
- Conduct education and outreach to landowners,
- Offer technical assistance to landowners and financial assistance, if needed,
- Conduct a post-assessment after project implementation,
- Report progress to ODA and the LAC.

The following milestones and timelines were developed in cooperation with ODA and the SWCD. Focus Area Action Plans are developed as a tool with milestones and timelines for implementation of the Area Plan within a defined geographic area.

- By June 30, 2017: Decrease [Grass Ag + Bare Ag] to 2.2 acres. Current Grass Ag + Bare Ag is 16.8 acres.

Results of the assessments and targeted assistance are reported to the LAC at the Biennial Review and are summarized in Chapter 4.

3.3 Strategies for Area Plan Implementation

The ODA and the SWCD primary strategies to reduce amounts of pollution from agricultural and rural lands lie in the reduction of pollutants in runoff and the reduction of erosion through a combination of educational programs, land treatment, implementation of sound management practices, installation of erosion control structures, and monitoring of implementation effectiveness. A secondary strategy is to adopt and ensure compliance with Prevention and Control Measures directly related to water quality.

To achieve clean water an effective strategy must increase awareness of the problems 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 following strategies will be employed at the local level by Monument, Grant, and Umatilla County SWCDs, the North Fork John Day Watershed Council, landowners and other agencies and organizations for implementation of the Area Plan.

1. Work to improve the quality of water in the AgWQM Area through planning and implementation of technically sound and economically feasible conservation practices that contribute to meeting plan goals.
   A. Control pollution caused by agricultural activities, as close to the source as possible, by controlling soil erosion, sediment and animal waste delivery to streams.
   B. Demonstrate a reduction in sources of pollution from agricultural and rural lands through monitoring and periodic surveys of stream reaches and associated lands.
   C. Implement conservation practices to improve irrigation water use and conveyance efficiency to reduce the potential of polluted return flows.
   D. Implement conservation practices to moderate water temperatures by stabilizing streambanks and increasing shading.
   E. Promote adaptive management, which encourages adjustments in management based on feedback from monitoring and changing environmental and economic conditions.
   F. Identify priorities for pollution source identification and determining areas for implementing restoration activities including reasonable timelines for management strategies targeting TMDL attainment.

2. 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.
   A. Incorporate implementation of the Area Plan as a priority element in the SWCD's Annual Work Plan and Long Range Plan with support from partner organizations.
   B. Showcase successful practices and systems and conduct annual tours for landowners and media.
   C. Recognize successful projects and practices through appropriate media and newsletters.
   D. Promote cooperative on-the-ground projects to solve critical problems identified by landowners/operators and in cooperation with partner organizations.
   E. Conduct educational programs to promote public awareness of water quality.
   F. Evaluate current research and monitoring results and conduct such monitoring as may be necessary to better quantify current conditions and objectives contained in this plan in preparation for biannual plan reviews.
3. Encourage active participation by the agricultural community and rural public in the process of solving our water quality problems.

A. Provide assistance to landowners in development of conservation plans and the implementation of effective management practices adopted in those plans.
B. Review research and development needs with agriculture assistance agencies and consultants to promote the continued development, evaluation, and adoption of practices and technologies that enhance water quality in an efficient, effective and economic manner.
C. Annually identify water quality funding needs with agencies providing cost-share and technical assistance to agricultural operations to promote incentive and cost-share programs to assist implementation of plans and related practices.

4. Achieve plan goals and objectives by encouraging adequate funding and administration of the program to achieve systematic, long range planning and focusing of coordinated efforts on full-scale, watershed-based approaches, identifying needs, developing projects, actively seeking funding, and ensuring successful implementation of funded projects.

In addition to these voluntary strategies, regulatory measures are included as an implementation strategy. The ODA will use enforcement where appropriate and necessary to gain compliance with rules. Any enforcement action will be pursued only when reasonable attempts at a voluntary solution have failed. (See Resolution of Complaints and Enforcement Action sections)

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 not possible 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, available for reference at the local NRCS office.

Landowners are expected to employ management practices, appropriate for their operation, that contribute overall to meeting the established load allocations for temperature and dissolved oxygen. Practices necessary for meeting those load allocations would address:

- Riparian or streamside area management - for effective shade, improved channel condition and increased stream flow,
- Irrigation management - especially return flows and irrigation efficiency,
- Manure management - for reduction of bacteria and nutrient runoff.

3.3.1 Education and Outreach

Educational Programs

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 goal of the educational program 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 Monument, Grant, and Umatilla County SWCDs' Annual Work Plan and Long Range Plan with support from partner organizations,
- Showcasing successful practices and systems and conduct annual tours for landowners and media,
- Recognizing successful projects and practices through appropriate media and newsletters,
- Promoting cooperative on-the-ground projects to solve critical problems identified by landowners and in cooperation with partner organizations,
- Conducting educational outreach to promote public awareness of water quality issues coordinating the review of information and education materials with agencies or organizations as appropriate.

3.3.2 Conservation Planning and Conservation Activities

Effective water quality management depends on activities and structural measures that are the most effective, practical means of controlling and preventing pollution from agricultural activities. Appropriate management activities for individual farms may vary with the specific cropping, topographical, environmental, and economic conditions at a given site. Due to these variables, it is difficult to recommend any specific, uniform set of management activities in this document to improve agricultural water quality.

Management activities and land management changes are most effective when selected and installed as parts of a comprehensive resource management plan based on natural resource inventories and assessment of management activities.

A detailed list of specific measures that can be used to address agricultural pollution are contained in other documents such as the NRCS Field Office Technical Guide, available for reference at the local NRCS office. Landowners and operators have flexibility in choosing management approaches to address water quality issues on their lands.

Voluntary conservation plans describe the management systems and schedule of conservation activities that the landowner will use to conserve soil, water, and related plant and animal resources on all or part of a farm unit. Landowners, operators, consultants, or technicians available through a SWCD or the NRCS may develop voluntary conservation plans. A conservation plan can be used to outline specific measures necessary to address the "Prevention and Control Measures" outlined in this Area Plan.

Conservation activities should:

- Identify priorities for management activities, including reasonable timelines,
- Control pollution as close to the source as possible,
- Improve irrigation water use and conveyance efficiency to reduce the potential of polluted return flows,

- Show reduction in potential sources of pollution through scientifically valid monitoring and periodic surveys of stream reaches and associated lands,
- Be flexible to adjust management based on feedback, or monitoring and changing environmental and economic conditions.

3.3.3 Funding

Technical & Financial Assistance
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 Monument, Grant and Umatilla County SWCDs, USDA-NRCS, the North Fork John Day Watershed Council, 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.

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 Oregon Watershed Enhancement Board (OWEB). Other agencies may also be available to provide technical assistance or financial assistance to private landowners.

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, OSU Extension
  - The Oregon Plan Toolbox, OWEB
- Programs
  - Farm*A *Syst Program, OSU Extension
  - Stream*A *Syst Program, OSU Extension
  - Home*A *Syst Program, OSU Extension

3.3.4 Monitoring and Evaluation

For a description of monitoring and evaluation activities, see Chapter 4 page 55.

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

activities are integral components of the Area Plan. For the purposes of this Area Plan, four main types of monitoring are described below. These are:

1. Baseline condition monitoring -
   Baseline condition monitoring provides a starting point for assessing water quality trends and for future evaluation of the effectiveness of water quality improvement efforts. Baseline condition monitoring typically includes identification and analysis of data previously and currently collected in the area according to accepted protocols.

2. Water quality trend monitoring -
   Water quality trend monitoring can help to track how water quality (typically on a watershed or sub-watershed scale) is changing over time, including after implementation of an AgWQM Area Plan. It is recommended that trend monitoring follow recommendations in the Oregon Plan Water Quality Monitoring Technical Guide. This guide book describes accepted procedures and protocols for most activities that would be used to conduct baseline condition and trend monitoring on a watershed scale, including development of quality assurance/quality control plans to assure quality of data and protocols for data collection.

3. Effectiveness monitoring -
   a) Evaluate the effectiveness of specific management practices in reducing losses or loadings of components such as sediment or nutrients. The NRCS has a good amount of information about the effectiveness of various practices in protecting surface water and groundwater quality.
   b) Evaluate the net effect of the implementation of an AgWQM Area Plan and watershed improvement activities on water quality trends.

4. Compliance monitoring -
   Conducted as a part of a compliance investigation, this type of monitoring is specific to individual sites. Site-specific information and data are collected to characterize and quantify the physical setting and land management conditions that relate to a potential rule or standards violation. Photographic documentation of the suspected problem is typically also included in the assessment. Water samples may be taken for chemical or biological analysis.

When used effectively, monitoring activities can provide valuable information on how much effect a plan is having, how extensively it is being implemented, and where more efforts are needed in a basin.

Chapter 4: Implementation, Monitoring, and Adaptive Management

4.1 Implementation 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.

See Appendix B for 2013-2015 Accomplishments Table

4.2 Water Quality Monitoring—Status and Trends

ODA is currently waiting for monitoring data to be submitted for review. Once data is received, ODA will review, analyze, and present to the LAC. The LAC will work with ODA and the LMA to develop Measureable Objectives for the Area Plan.

UJD Water Quality Score and Trend from Oregon Water Quality Index Report – 10-Year Trend

Location	Overall Score	Temperature	pH	Dissolved Oxygen (DO)	Biochemical Oxygen Demand, BOD	Total Solids	Nitrogen	Phosphorus	Bacteria
N. Fk. John Day R. @ Kimberly	89, No Trend	82, Increasing	89, No Trend	87, No Trend	80, Decreasing	98, No Trend	99, Increasing	90, No Trend	97, No Trend
Water Quality Trend Score is out of 100.									

4.3 Progress Toward Measurable Objectives

ODA, LMA, and the LAC will work on developing milestones and timelines during the 2017 Biennial Review.

4.4 Aerial Photo Monitoring of Focus Area Streamside Vegetation

Progress towards Focus Area Milestones and Timelines:

- By June 30, 2017: Decrease [Grass Ag + Bare Ag] to 2.2 acres. Current Grass Ag + Bare Ag is 16.8 acres.

  Status: The LMA is still implementing projects in the Focus Area. Progress on Milestones and Timelines will be reported on in the 2017 Biennial Review.

Raw Streamside Vegetation Assessment (SVA) Results (Acres):

SVA Map Category (Alphabetical)	"Office" Preliminary Pre-Assessment (2013)	"SitePre" Final Pre-Assessment (ongoing)	"SitePost" Post-Assessment or End of Biennium Report (2017)
Ag Infrastructure	0.4	0.4	
Bare	6.3	6.3	
Bare Ag	1.3	1.3	
Grass	75.3	75.3	
Grass Ag	15.5	15.5	
Not Ag	0	0	
Shrub	23.7	23.7	
Shrub Ag	0	0	
Tree	51.1	51.1	
Tree Ag	0	0	
Water	43.9	43.9	
TOTAL ACRES	**217.5**	**217.5**	

Measurable Objectives Reporting:

SVA Map Category (Alphabetical)	"SitePre" Final Pre-Assessment	"SitePost" Post-Assessment or End of Biennium Report	Percent Change
Bare Ag + Grass Ag *	16.8	16.8	*Calculate and insert* **

* *Please adjust if needed, to reflect your measurable objective*
** *Calculate: Percent Change = ("SitePost" ÷ "Site Pre") - 1.0*

4.5 Biennial Reviews and Adaptive Management

The LAC met four times for the 2015 Biennial Review (4/16, 5/5, 6/23, and 7/28). The biennial review meetings consisted of updating language throughout the Area Plan, as well as discussing the New Chapter Format and Measurable Objectives.

ODA presented the program updates from the past two years. This included Focus Areas, Strategic Implementation Areas, and the new Chapter Format for the Area Plans. ODA presented the major edits of the Area Plan to the LAC. The LAC had many concerns with the new chapter format.

The LAC requested that ODA analyze water quality-monitoring data for the North and Middle Fork John Day basin. The LAC wants to capture where the basin currently is in regards to water quality status and where it stands in comparison to current standards. The LAC would like to wait until monitoring data is analyzed before they start discussing measurable objectives, milestones, and timelines.

In addition, the LAC requested a crosswalk of current OARs, ORSs, and DEQ/ODA Memorandum of Agreement. They requested the crosswalk to show what is currently missing in the Area Plan and what is the need for additional information in the Area Plan.

Ron Burnette was nominated by the LAC as Chairman of the LAC.
Sharon Livingston was nominated by the LAC as Vice-Chairwoman of the LAC.

There were no enforcement actions in the Management Area.

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WESt Program Workbook, Oregon Cattleman's Association, 1998

Appendices

Waterbodies in the North and Middle Fork John Day River Subbasins on the State of Oregon's 2012 303(d) List

2013-2015 Accomplishments Table

Common Agricultural Water Quality Parameters of Concern

APPENDIX A: Waterbodies in the North and Middle Fork John Day River Subbasin on the State of Oregon's 2012 303(d) List

Subbasin	Stream (Water Body)	Segment (River Mile)	Pollutant	Season	Details	Category
North Fork John Day	Baldy Creek	0 to 5	Temperature	Year Round (Non-spawning)	A	4A
North Fork John Day	Bear Wallow Creek	0 to 7.4	Temperature	Summer[1]	B	4A
North Fork John Day	Beaver Creek	0 to 6.1	Temperature	Summer[1]	B	4A
North Fork John Day	Big Creek	0 to 10.7	Temperature	Summer[1]	B	4A
North Fork John Day	Big Wall Creek	0 to 21.3	Temperature	Year Round (Non-spawning)	C	4A
North Fork John Day	Bowman Creek	0 to 6.9	Temperature	Summer[1]	B	4A
North Fork John Day	Bridge Creek	0 to 9	Temperature	Summer[1]	B	4A
North Fork John Day	Buck Creek	0 to 1.6	Temperature	Year Round (Non-spawning)	A	4A
North Fork John Day	Bull Run Creek	0 to 9.3	Temperature	Summer[1]	B	4A
North Fork John Day	Cable Creek	0 to 7.1	Temperature	Summer[1]	B	4A
North Fork John Day	Camas Creek	0 to 15.5	Temperature	Year Round (Non-spawning)	C	4A
North Fork John Day	Camas Creek	15.5 to 25	Temperature	September 1 - June 15	D	4A
North Fork John Day	Camas Creek	15.5 to 36.7	Temperature	Year Round (Non-spawning)	E	4A
North Fork John Day	Clear Creek	0 to 7.1	Temperature	Summer[1]	B	4A
North Fork John Day	Cottonwood Creek	0 to 22.5	Temperature	Year Round (Non-spawning)	C	4A
North Fork John Day	Crane Creek	0 to 5.9	Temperature	Summer[1]	F	4A
North Fork John Day	Crawfish Creek	0 to 5.3	Temperature	Year Round (Non-spawning)	A	4A
North Fork John Day	Desolation Creek	0 to 3.5	Temperature	January 1 - June 15	D	4A
North Fork John Day	Desolation Creek	0 to 3.8	Temperature	Year Round (Non-spawning)	E	4A
North Fork John Day	Ditch Creek	0 to 19.5	Temperature	Summer[1]	B	4A
North Fork John Day	East Fork Cottonwood Creek	0 to 6.5	Biological Criteria	Year Round	H	4A
North Fork John Day	Fivemile Creek	0 to 21.3	Temperature	Summer[1]	B	4A
North Fork John Day	Frazier Creek	0 to 6.2	Temperature	Summer[1]	B	4A
North Fork John Day	Granite Creek	0 to 16.3	Temperature	Year Round (Non-spawning)	A	4A
North Fork John Day	Hidaway Creek	0 to 16.2	Temperature	Summer[1]	B	4A
North Fork John Day	Indian Creek	0 to 5.4	Temperature	Year Round (Non-spawning)	C	4A
North Fork John Day	Junkens Creek	0 to 7	Temperature	Year Round (Non-spawning)	A	4A
North Fork	Lane Creek	0 to 7.1	Temperature	Summer[1]	B	4A

Subbasin	Stream (Water Body)	Segment (River Mile)	Pollutant	Season	Details	Category
John Day						
North Fork John Day	Mallory Creek	0 to 14.3	Temperature	Summer[1]	B	4A
North Fork John Day	Meadow Creek	0 to 10.4	Temperature	Year Round (Non-spawning)	E	4A
North Fork John Day	North Fork Cable Creek	0 to 7.5	Temperature	Year Round (Non-spawning)	E	4A
North Fork John Day	North Fork Desolation Creek	0 to 6.6	Temperature	Year Round (Non-spawning)	A	4A
North Fork John Day	North Fork John Day River	0 to 56	Temperature	Year Round (Non-spawning)	C	4A
North Fork John Day	North Fork John Day River	56 to 59.6	Temperature	January 1 - June 15	D	4A
North Fork John Day	North Fork John Day River	56 to 86.3	Temperature	Year Round (Non-spawning)	E	4A
North Fork John Day	North Fork John Day River	59.6 to 86.3	Temperature	September 1 - June 15	D	4A
North Fork John Day	North Fork John Day River	86.3 to 111.2	Temperature	Year Round (Non-spawning)	A	4A
North Fork John Day	North Trail Creek	0 to 5.1	Temperature	Year Round (Non-spawning)	A	4A
North Fork John Day	Onion Creek	0 to 4.5	Temperature	Year Round (Non-spawning)	A	4A
North Fork John Day	Owens Creek	0 to 14.8	Temperature	Summer[1]	B	4A
North Fork John Day	Rancheria Creek	0 to 5.1	Temperature	Summer[1]	B	4A
North Fork John Day	Rudio Creek	0 to 16.8	Temperature	Year Round (Non-spawning)	C	4A
North Fork John Day	Skookum Creek	0 to 12.4	Temperature	Summer[1]	B	4A
North Fork John Day	South Fork Cable Creek	0 to 1.5	Temperature	January 1 - June 15	D	4A
North Fork John Day	South Fork Cable Creek	0 to 8.4	Temperature	Year Round (Non-spawning)	E	4A
North Fork John Day	South Trail Creek	0 to 6.6	Temperature	Year Round (Non-spawning)	A	4A
North Fork John Day	Sponge Creek	0 to 2.7	Temperature	Year Round (Non-spawning)	A	4A
North Fork John Day	Stalder Creek	0 to 4.1	Temperature	Summer[1]	B	4A
North Fork John Day	Swale Creek	0 to 11.1	Temperature	Summer[1]	B	4A
North Fork John Day	Trail Creek	0 to 1.9	Temperature	Year Round (Non-spawning)	A	4A
North Fork John Day	Wilson Creek	0 to 10.7	Temperature	Summer[1]	B	4A
North Fork John Day	Alder Creek	0 to 5.5	Biological Criteria	Year Round	H	5
North Fork John Day	Alder Creek	0 to 5.5	Sedimentation	Undefined	I	5
North Fork John Day	Baldy Creek	0 to 5	Sedimentation	Undefined	I	5
North Fork John Day	Big Wall Creek	0 to 17	Dissolved Oxygen	January 1 - May 15	J	5
North Fork John Day	Big Wall Creek	0 to 21.3	Dissolved Oxygen	Year Round (Non-spawning)	K	5

Subbasin	Stream (Water Body)	Segment (River Mile)	Pollutant	Season	Details	Category
North Fork John Day	Big Wall Creek	0 to 21.3	pH	Fall-Winter-Spring	L	5
North Fork John Day	Big Wall Creek	0 to 21.3	Sedimentation	Undefined	I	5
North Fork John Day	Big Wall Creek	17 to 21.3	Dissolved Oxygen	January 1 - May 15	J	5
North Fork John Day	Bowman Creek	0 to 6.9	Biological Criteria	Year Round	H	5
North Fork John Day	Bull Run Creek	0 to 9.3	Biological Criteria	Year Round	H	5
North Fork John Day	Bull Run Creek	0 to 9.3	Sedimentation	Undefined	I	5
North Fork John Day	Camas Creek	0 to 36.7	Biological Criteria	Year Round	H	5
North Fork John Day	Crane Creek	0 to 8.1	Biological Criteria	Year Round	H	5
North Fork John Day	Ditch Creek	0 to 19.5	Biological Criteria	Year Round	H	5
North Fork John Day	Ditch Creek	0 to 19.5	Dissolved Oxygen	January 1 - May 15	J	5
North Fork John Day	Ditch Creek	10.1 to 19.5	Dissolved Oxygen	Year Round (Non-spawning)	K	5
North Fork John Day	Fivemile Creek	0 to 21.3	Biological Criteria	Year Round	H	5
North Fork John Day	Fox Creek	0 to 19.7	Biological Criteria	Year Round	H	5
North Fork John Day	Granite Creek	0 to 16.3	Biological Criteria	Year Round	H	5
North Fork John Day	Granite Creek	11.2 to 16.2	Sedimentation	Undefined	I	5
North Fork John Day	Hog Creek	0 to 4.1	Sedimentation	Undefined	I	5
North Fork John Day	Mallory Creek	0 to 14.3	Biological Criteria	Year Round	H	5
North Fork John Day	Mallory Creek/Penland Lake	0 to 14.4	Dissolved Oxygen	Year Round (Non-spawning)	K	5
North Fork John Day	Onion Creek	0 to 4.5	Biological Criteria	Year Round	H	5
North Fork John Day	Onion Creek	0 to 4.5	Sedimentation	Year Round	I	5
North Fork John Day	Oriental Creek	0 to 3.8	Biological Criteria	Year Round	H	5
North Fork John Day	Porter Creek	0 to 7.4	Sedimentation	Undefined	I	5
North Fork John Day	Potamus Creek	0 to 14.5	Dissolved Oxygen	January 1 - May 15	J	5
North Fork John Day	Potamus Creek	0 to 18.4	Biological Criteria	Year Round	H	5
North Fork John Day	Potamus Creek	0 to 18.4	Dissolved Oxygen	Year Round (Non-spawning)	K	5
North Fork John Day	Potamus Creek	0 to 18.4	pH	Fall-Winter-Spring	L	5
North Fork John Day	Potamus Creek	14.5 to 18.4	Dissolved Oxygen	January 1 - May 15	J	5
North Fork John Day	Skookum Creek	0 to 11.2	Dissolved Oxygen	January 1 - May 15	J	5
North Fork John Day	Skookum Creek	0 to 12.4	pH	Fall-Winter-Spring	L	5

Subbasin	Stream (Water Body)	Segment (River Mile)	Pollutant	Season	Details	Category
North Fork John Day	Skookum Creek	4.3 to 12.4	Dissolved Oxygen	Year Round (Non-spawning)	K	5
North Fork John Day	Swale Creek	0 to 11.1	Sedimentation	Undefined	I	5
North Fork John Day	Swale Creek	2.8 to 11.2	Dissolved Oxygen	Year Round (Non-spawning)	K	5
North Fork John Day	Swale Creek	4.8 to 11.2	Dissolved Oxygen	January 1 - May 15	J	5
North Fork John Day	Trib to Wilson Creek	0 to 0.9	Dissolved Oxygen	January 1 - May 15	J	5
North Fork John Day	Trib to Wilson Creek	0 to 3.2	Dissolved Oxygen	Year Round (Non-spawning)	K	5
North Fork John Day	Trib to Wilson Creek	0.9 to 3.2	Dissolved Oxygen	January 1 - May 15	J	5
North Fork John Day	Wilson Creek	0 to 10.7	Sedimentation	Undefined	I	5

[1] Summer = June 01 through September 30

A. Bull trout spawning and juvenile rearing: 12.0 degrees Celsius 7-day-average maximum
B. Anadromous fish passage; Salmonid fish rearing; Rearing: 17.8 C
C. Salmon and trout rearing and migration: 18.0 degrees Celsius 7-day-average maximum
D. Salmon and steelhead spawning: 13.0 degrees Celsius 7-day-average maximum
E. Core cold water habitat: 16.0 degrees Celsius 7-day-average maximum
F. Bull Trout: 10.0 C
G. The creation of tastes or odors or toxic or other conditions that are deleterious to fish or other aquatic life or affect the potability of drinking water or the palatability of fish or shellfish may not be allowed.
H. Biocriteria: Waters of the state must be of sufficient quality to support aquatic species without detrimental changes in the resident biological communities.
I. The formation of appreciable bottom or sludge deposits or the formation of any organic or inorganic deposits deleterious to fish or other aquatic life or injurious to public health, recreation, or industry may not be allowed.
J. Spawning: Not less than 11.0 mg/L or 95% of saturation
K. Cold water: Not less than 8.0 mg/l or 90% of saturation
L. pH 6.5 to 9.0

Category:
4A: Water quality limited, TMDL approved
5: Water quality limited, 303(d) list, TMDL needed

Waterbodies in the Middle Fork John Day River Subbasin on the State of Oregon's 2012 303(d) List

Subbasin	Stream (Water Body)	Segment (River Mile)	Pollutant	Season	Details	Category
Middle Fork John Day	Big Creek	0 to 11.6	Temperature	Year Round (Non-spawning)	A	4A
Middle Fork John Day	Camp Creek	0 to 15.6	Temperature	Summer[1]	B	4A
Middle Fork John Day	Caribou Creek	0 to 3.6	Temperature	Summer[1]	B	4A
Middle Fork John Day	Clear Creek	0 to 12.7	Temperature	Year Round (Non-spawning)	A	4A
Middle Fork John Day	Coyote Creek	0 to 2.5	Temperature	Summer[1]	B	4A
Middle Fork John Day	Crawford Creek	0 to 3.5	Temperature	Summer[1]	B	4A
Middle Fork John Day	Davis Creek	0 to 6.8	Temperature	Summer[1]	B	4A
Middle Fork John Day	Dry Fork Clear Creek	0 to 11	Temperature	Year Round (Non-spawning)	A	4A
Middle Fork John Day	Granite Boulder Creek	0 to 8.1	Temperature	Year Round (Non-spawning)	A	4A
Middle Fork John Day	Little Boulder Creek	0 to 2.1	Temperature	Summer[1]	B	4A
Middle Fork John Day	Little Butte Creek	0 to 2.6	Temperature	Summer[1]	B	4A
Middle Fork John Day	Long Creek	25.6 to 36.7	Temperature	Year Round (Non-spawning)	C	4A
Middle Fork John Day	Lunch Creek	0 to 4.1	Temperature	Summer[1]	B	4A
Middle Fork John Day	Middle Fork John Day River	0 to 25.2	Temperature	Year Round (Non-spawning)	C	4A
Middle Fork John Day	Middle Fork John Day River	25.2 to 65.8	Temperature	Year Round (Non-spawning)	D	4A
Middle Fork John Day	Middle Fork John Day River	41.4 to 49.6	Temperature	September 1 - June 15	E	4A
Middle Fork John Day	Middle Fork John Day River	49.6 to 65.8	Temperature	September 1 - June 15	E	4A
Middle Fork John Day	Middle Fork John Day River	65.8 to 71.1	Temperature	Year Round (Non-spawning)	A	4A
Middle Fork John Day	Mill Creek	0 to 3.1	Temperature	Summer[1]	B	4A
Middle Fork John Day	Placer Gulch	0 to 4.2	Temperature	Summer[1]	B	4A
Middle Fork John Day	Ragged Creek	0 to 4.1	Temperature	Summer[1]	B	4A
Middle Fork John Day	Squaw Creek	0 to 9.4	Temperature	Summer[1]	B	4A
Middle Fork John Day	Summit Creek	0 to 8.6	Temperature	Year Round (Non-spawning)	A	4A
Middle Fork John Day	Unnamed	0 to 2.4	Temperature	Summer[1]	B	4A
Middle Fork John Day	Vinegar Creek	0 to 9.4	Temperature	Year Round (Non-spawning)	A	4A
Middle Fork John Day	Bridge Creek	0 to 7.8	Biological Criteria	Year Round	G	5
Middle Fork John Day	Deadwood Creek	0 to 4.5	Biological Criteria	Year Round	G	5
Middle Fork	Long Creek	0 to 36.7	Biological	Year Round	G	5

Subbasin	Stream (Water Body)	Segment (River Mile)	Pollutant	Season	Details	Category
John Day			Criteria			
Middle Fork John Day	Long Creek	0 to 36.7	Sedimentation	Year Round	H	5
Middle Fork John Day	Summit Creek	0 to 8.6	Sedimentation	Year Round	H	5
Middle Fork John Day	Vinegar Creek	0 to 9.4	Biological Criteria	Year Round	G	5

[1] Summer = June 01 through September 30

A. Bull trout spawning and juvenile rearing: 12.0 degrees Celsius 7-day-average maximum
B. Anadromous fish passage; Salmonid fish rearing; Rearing: 17.8 C
C. Salmon and trout rearing and migration: 18.0 degrees Celsius 7-day-average maximum
D. Core cold water habitat: 16.0 degrees Celsius 7-day-average maximum
E. Salmon and steelhead spawning: 13.0 degrees Celsius 7-day-average maximum
F. The creation of tastes or odors or toxic or other conditions that are deleterious to fish or other aquatic life or affect the potability of drinking water or the palatability of fish or shellfish may not be allowed.
G. Biocriteria: Waters of the state must be of sufficient quality to support aquatic species without detrimental changes in the resident biological communities.
H. The formation of appreciable bottom or sludge deposits or the formation of any organic or inorganic deposits deleterious to fish or other aquatic life or injurious to public health, recreation, or industry may not be allowed.

Category:
4A: Water quality limited, TMDL approved
5: Water quality limited, 303(d) list, TMDL needed

APPENDIX B: 2013-2015 Accomplishments Table

Ag Water Quality Program
North and Middle Forks John Day River Management Area
2015 Biennial Review Accomplishments Table

Accomplishments reported by Area Plan objective	
Goal The goal of this Area Plan is to maximize agriculture's beneficial impact on water quality within the North and Middle Forks John Day River AgWQM Area by identifying and controlling factors that contribute to pollution originating on agricultural and rural lands.	
Strategies	
Work to improve the quality of water in the AgWQM Area through planning and implementation of technically sound and economically feasible conservation practices that contribute to meeting plan goals.	• Fenced 850 ft of riparian areas • Treated 1,145 acres of noxious weeds (includes Juniper Removal) • Developed 9 springs and 15 troughs • 2 irrigation efficiency and improvement projects • 2 fish passage improvements with riparian plantings • 6,284 ft of cross fencing
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.	• Annual Landowner Seminars • Landowner Workshops • Presentations at monthly meetings
Encourage active participation by the agricultural community and rural public in the process of solving our water quality problems.	• Technical assistance provided to landowners and land managers from multiple agencies and organizations • Grant projects identified and pursued to increase water flows while improving water quality • Public is invited to attend and participate in meetings of the NFJDWC and MSWCD
Achieve plan goals and objectives by encouraging adequate funding and administration of the program to achieve systematic, long range planning and focusing of coordinated efforts on full-scale, watershed-based approaches, identifying needs, developing projects, actively seeking funding, and ensuring successful implementation of funded projects.	• Proactively working together, building partnerships, and accomplishing goals of the area as a collaborative process. • Educating and reaching out to constituents within the North & Middle Forks John Day River to assess the needs of the land and assist landowners and land managers in their conservation goals by identifying and pursuing grant funding opportunities. • Working to successfully implement, monitor and track success of past, current and future watershed enhancement projects for all parties involved as well as others that may one day become involved.

APPENDIX C: Common Agricultural Water Quality Parameters of Concern

Common Agricultural Water Quality Parameters of Concern

The following parameters are used by DEQ in establishing the 303(d) List and assessing and documenting waterbodies with TMDLs. Note: This is an abbreviated summary and does not contain all parameters or detailed descriptions of the parameters and associated standards. Specific information about these parameters and standards can be found at: www.deq.state.or.us/wq/assessment/assessment.htm or by calling (503) 229-6099.

Parameters

Bacteria: *Escherichia coli (E. coli)* is measured in streams to determine the risk of infection and disease to people. Bacteria sources include humans (recreation or failing septic systems), wildlife, and agriculture. On agricultural lands, E. coli generally comes from livestock waste, which is deposited directly into waterways or carried to waterways by livestock via runoff and soil erosion. Runoff and soil erosion from agricultural lands can also carry bacteria from other sources.

Biological Criteria: To assess a stream's ecological health, the community of benthic macro invertebrates is sampled and compared to a reference community (community of organisms expected to be present in a healthy stream). If there is a significant difference, the stream is listed as water quality limited. These organisms are important as the basis of the food chain and are very sensitive to changes in water quality. This designation does not always identify the specific limiting factor (e.g., sediment, nutrients, or temperature).

Dissolved Oxygen: Dissolved oxygen criteria depend on a waterbody's designation as fish spawning habitat. Streams designated as salmon rearing and migration are assumed to have resident trout spawning from January 1 – May 15, and those streams designated core cold water are assumed to have resident trout spawning January 1 – June 15. During non-spawning periods, the dissolved oxygen criteria depends on a stream's designation as providing for cold, cool or warm water aquatic life, each defined in OAR 340 Division 41.

Harmful Algal Blooms: Some species of algae, such as cyanobacteria or blue-green algae, can produce toxins or poisons that can cause serious illness or death in pets, livestock, wildlife, and humans. As a result, they are classified as Harmful Algae Blooms. Several beneficial uses are affected by Harmful Algae Blooms: aesthetics, livestock watering, fishing, water contact recreation, and drinking water supply. The Public Health Department of the Oregon Health Authority is the agency responsible for posting warnings and educating the public about Harmful Algae Blooms. Under this program, a variety of partners share information, coordinate efforts and communicate with the public. Once a water body is identified as having a harmful algal bloom, DEQ is responsible for investigating the causes, identifying sources of pollution and writing a pollution reduction plan.

Mercury: Mercury occurs naturally and is used in many products. It enters the environment through human activities and from volcanoes, and can be carried long distances by atmospheric air currents. Mercury passes through the food chain readily, and has significant public health and wildlife impacts from consumption of contaminated fish. Mercury in water comes from erosion of soil that carries naturally occurring mercury (including erosion from agricultural lands and streambanks) and from deposition on land or water from local or global atmospheric sources. Mercury bio-accumulates in fish, and if ingested can cause health problems.

Nitrate: While nitrate occurs naturally, the use of synthetic and natural fertilizers can increase nitrate in drinking water (ground and surface water). Applied nitrate that is not taken up by plants is readily carried

by runoff to streams or infiltrate to ground water. High nitrate levels in drinking water cause a range of human health problems, particularly with infants, the elderly, and pregnant and nursing women.

Pesticides: Agricultural pesticides of concern include substances in current use and substances no longer in use but persist in the environment. Additional agricultural pesticides without established standards have also been detected. On agricultural lands, sediment from soil erosion can carry these pesticides to water. Current use agricultural pesticide applications, mixing-loading, and disposal activities may also contribute to pesticide detections in surface water. For more information, see: www.deq.state.or.us/wq/standards/toxics.htm.

Phosphorous/Algae/pH/Chlorophyll a: Excessive algal growth can contribute to high pH and low dissolved oxygen. Native fish need dissolved oxygen for successful spawning and moderate pH levels to support physiological processes. Excessive algal growth can also lead to reduced water clarity, aesthetic impairment, and restrictions on water contact recreation. Warm water temperatures, sunlight, high levels of phosphorus, and low flows encourage excessive algal growth. Agricultural activities can contribute to all of these conditions.

Sediment and Turbidity: Sediment includes fine silt and organic particles suspended in water, settled particles, and larger gravel and boulders that move at high flows. Turbidity is a measure of the lack of clarity of water. Sediment movement and deposition is a natural process, but high levels of sediment can degrade fish habitat by filling pools, creating a wider and shallower channel, and covering spawning gravels. Suspended sediment or turbidity in the water can physically damage fish and other aquatic life, modify behavior, and increase temperature by absorbing incoming solar radiation. Sediment comes from erosion of streambanks and streambeds, agricultural land, forestland, roads, and developed areas. Sediment particles can transport other pollutants, including bacteria, nutrients, pesticides, and toxic substances.

Temperature: Oregon's native cold-water aquatic communities, including salmonids, are sensitive to water temperature. Several temperature criteria have been established to protect various life stages and fish species. Many conditions contribute to elevated stream temperatures. On agricultural lands, inadequate streamside vegetation, irrigation water withdrawals, warm irrigation water return flows, farm ponds, and land management that leads to widened stream channels contribute to elevated stream temperatures. Elevated stream temperatures also contribute to excessive algal growth, which leads to low dissolved oxygen levels and high pH levels.