Oregon
Department
of Agriculture

Middle John Day Agricultural Water Quality Management Area Plan

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Developed by the

Oregon Department of Agriculture

Middle John Day Local Advisory Committee

With support from the

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Acronyms and Terms Used in this Document

Ag Water Quality Program – Agricultural Water Quality Management Program
Area Plan – Agricultural Water Quality Management Area Plan
Area Rules – Agricultural Water Quality Management Area Rules
CAFO – Confined Animal Feeding Operation
CREP – Conservation Reserve Enhancement Program
CWA – Clean Water Act
DEQ – Oregon Department of Environmental Quality
DMA – Designated Management Agency
GWMA – Groundwater Management Area
HABs – Harmful Algal Blooms
HUA – Human Use Allowance
HUC – Hydrological Unit Code
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
NPS – National Park Service
NRCS – Natural Resources Conservation Service
OACD – Oregon Association of Conservation Districts
OAR – Oregon Administrative Rules
ODA – Oregon Department of Agriculture
ODF – Oregon Department of Forestry
OHA – Oregon Health Authority
ORS – Oregon Revised Statute
OSU Extension – Oregon State University Extension Service
OWRD – Oregon Water Resources Department
OWEB – Oregon Watershed Enhancement Board
PMP – Pesticides Management Plan
PSP – Pesticides Stewardship Partnership
RCA – Required Corrective Action
RM – River Mile
SIA – Strategic Implementation Area
SWCD – Soil and Water Conservation District
TMDL – Total Maximum Daily Load
USDA – United States Department of Agriculture
US EPA – United States Environmental Protection Agency
USFS – United States Forest Service
WPCF – Water Pollution Control Facility
WQPMT – Water Quality Pesticides Management Team

Foreword

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

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

Required Elements of Area Plans

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

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

Plan Content

Chapter 1: Agricultural Water Quality Management Program Purpose and Background. The purpose is to have consistent and accurate information about the Ag Water Quality Program.

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

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

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

Chapter 1: Agricultural Water Quality Management Program Purpose and Background

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

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

The provisions of the Area Plan do not establish legal requirements or prohibitions (ORS 568.912(1)). Each Area Plan is accompanied by Area Rules that describe local agricultural water quality regulatory requirements. ODA will exercise its regulatory authority for the prevention and control of water pollution from agricultural activities under the Ag Water Quality Program's general regulations (OAR 603-090-0000 to 603-090-0120) and under the Area Rules for this Management Area (OAR 603-095-2500). The Ag Water Quality Program's general rules guide the Ag Water Quality Program, and the Area Rules for the Management Area are the regulations that landowners are required to follow. Landowners will be encouraged through outreach and education to implement conservation management activities.

The Area Plan and Area Rules apply to all agricultural activities on non-federal and non-Tribal Trust land within this Management Area including:

- Farms and ranches.
- Rural residential properties grazing a few animals or raising crops.
- Agricultural lands that lay idle or on which management has been deferred.
- Agricultural activities in urban areas.
- Agricultural activities on land subject to the Forest Practices Act (ORS 527.610).

Water quality on federal lands in Oregon is regulated by DEQ and on Tribal Trust lands by the respective tribe, with oversight by the United States Environmental Protection Agency (US EPA).

1.2 History of the Ag Water Quality Program

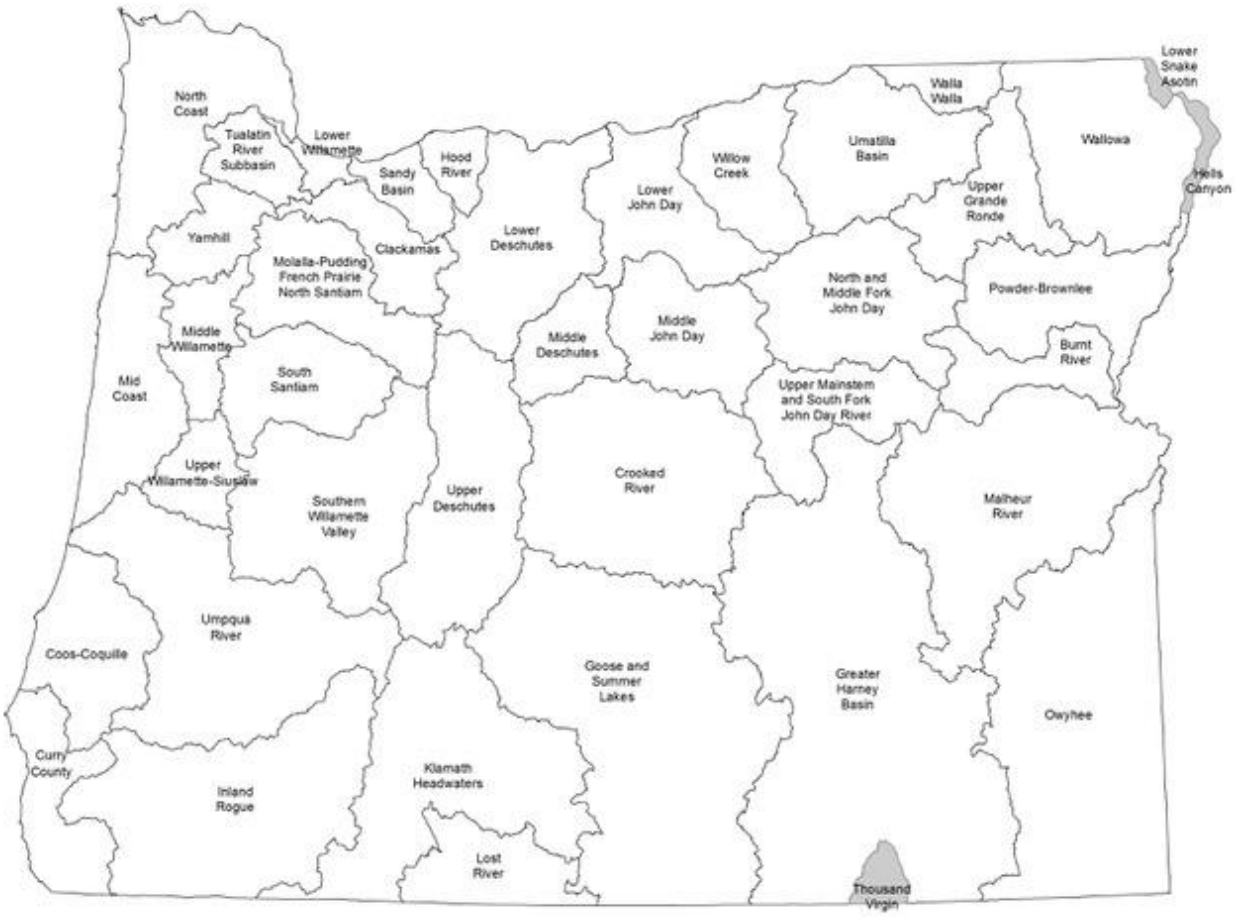
In 1993, the Oregon Legislature passed the Agricultural Water Quality Management Act directing ODA to develop plans to prevent and control water pollution from agricultural activities and soil erosion, to achieve water quality standards, and to adopt rules as necessary (ORS 568.900 through ORS 568.933). The Oregon Legislature passed additional legislation in 1995 to clarify that ODA is the lead agency for regulating agriculture with respect to water quality (ORS 561.191). The Area Plan and Area Rules were developed and subsequently revised pursuant to these statutes.

Between 1997 and 2004, ODA worked with LACs and SWCDs to develop Area Plans and Area Rules in 38 watershed-based Management Areas across Oregon (Figure 1). Since 2004, ODA, LACs, SWCDs, and other partners have focused on implementation including:

- Providing education, outreach, and technical assistance to landowners.

- Implementing projects to improve agricultural water quality.
- Investigating complaints of potential violations of Area Rules.
- Conducting biennial reviews of Area Plans and Area Rules.
- Monitoring, evaluation, and adaptive management.
- Developing partnerships with state and federal agencies, tribes, watershed councils, and others.

Figure 1: Map of 38 Agricultural Water Quality Management Areas
Grey areas are not incorporated into Ag Water Quality Management Areas



1.3 Roles and Responsibilities

1.3.1 Oregon Department of Agriculture

The Oregon Department of Agriculture is the agency responsible for implementing the Ag Water Quality Program (ORS 568.900 to 568.933, ORS 561.191, OAR 603-090, and OAR 603-095). The Ag Water Quality Program was established to develop and carry out a water quality management plan for the prevention and control of water pollution from agricultural activities and soil erosion. State and federal laws that drive the establishment of an Area Plan include:

- State water quality standards.
- Load allocations for agricultural or nonpoint source pollution assigned under Total Maximum Daily Loads (TMDLs) issued pursuant to the federal Clean Water Act (CWA), Section 303(d).
- Approved management measures for Coastal Zone Act Reauthorization Amendments.

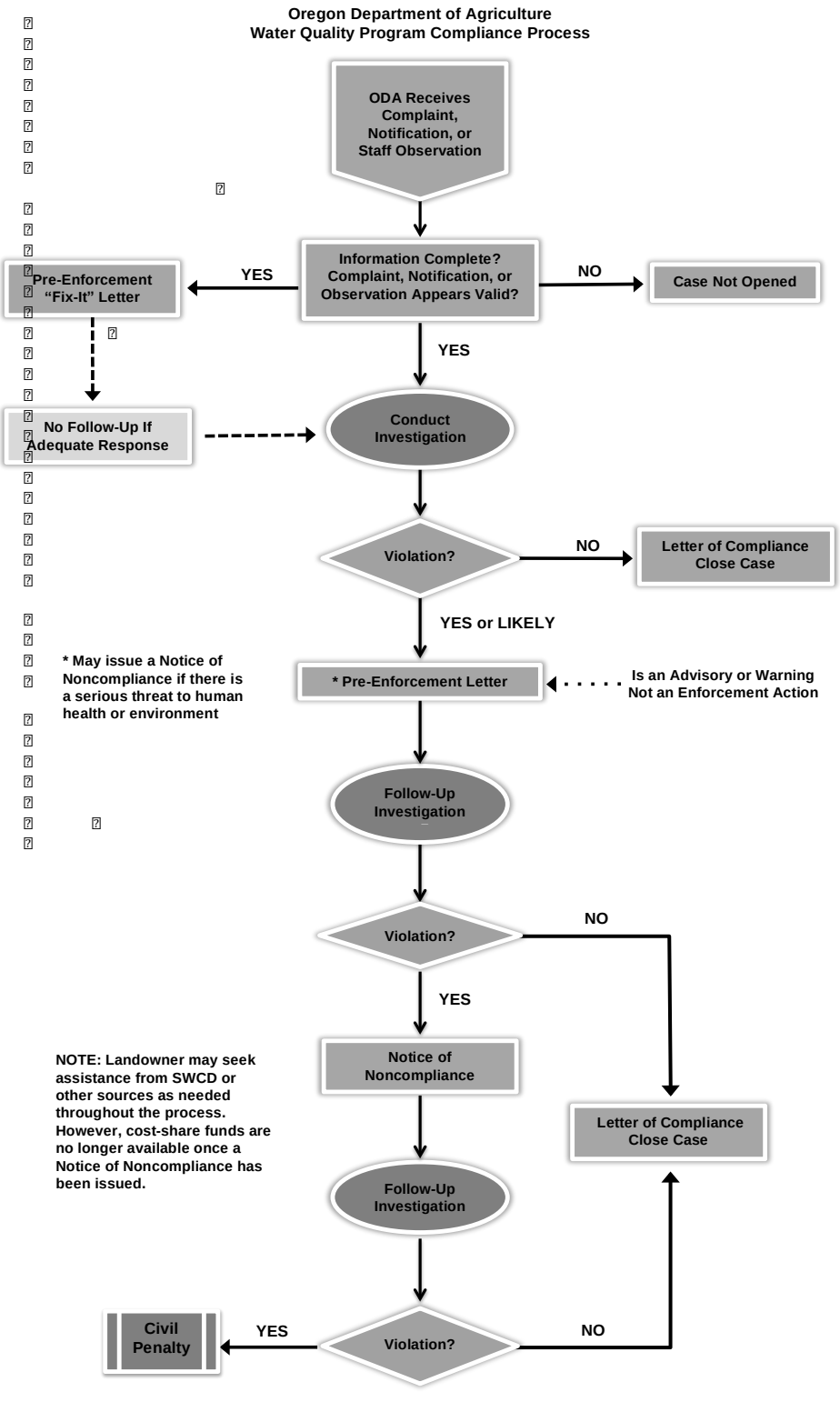
- Agricultural activities detailed in a Groundwater Management Area (GWMA) Action Plan (if DEQ has established a GWMA and an Action Plan has been developed).

The Oregon Department of Agriculture has the legal authority to develop and implement Area Plans and Area Rules for the prevention and control of water pollution from agricultural activities and soil erosion, where such plans are required by state or federal law (ORS 568.909 and ORS 568.912). ODA bases Area Plans and Area Rules on scientific information (ORS 568.909). ODA works in partnership with SWCDs, LACs, DEQ, and other partners to implement, evaluate, and update the Area Plans and Area Rules. ODA is responsible for any actions related to enforcement or determination of noncompliance with Area Rules (OAR 603-090-0080 through OAR 603-090-0120). ORS 568.912(1) and ORS 568.912(2) give ODA the authority to adopt rules that require landowners to perform actions necessary to prevent and control pollution from agricultural activities and soil erosion.

The Area Rules are a set of standards that landowners must meet on all agricultural or rural lands. ("Landowner" includes any landowner, land occupier or operator per OAR 603-95-0010(24)). All landowners must comply with the Area Rules. ODA will use enforcement where appropriate and necessary to gain compliance with Area Rules. Figure 2 outlines ODA's compliance process. ODA will pursue enforcement action only when reasonable attempts at voluntary solutions have failed (OAR 603-090-0000(5)(e)). If a violation is documented, ODA may issue a pre-enforcement notification or an enforcement Order such as a Notice of Noncompliance. If a Notice of Noncompliance is issued, ODA will direct the landowner to remedy the condition through required corrective actions (RCAs) under the provisions of the enforcement procedures outlined in OAR 603-090-060 through OAR 603-090-120. If a landowner does not implement the RCAs, ODA may assess civil penalties for continued violation of the Area Rules. If and when other governmental policies, programs, or rules conflict with the Area Plan or Area Rules, ODA will consult with the appropriate agencies to resolve the conflict in a reasonable manner.

Any member of the public may file a complaint, and any public agency may file a notification of a violation of an Area Rule. As a result, ODA may initiate an investigation (See Figure 2).

Figure 2: Compliance Flow Chart



1.3.2 Local Management Agency

A Local Management Agency (LMA) is an organization that ODA designated to assist with the implementation of an Area Plan (OAR 603-090-0010). The Oregon Legislature's intent is for SWCDs to be LMAs to the fullest extent practical, consistent with the timely and effective implementation of Area Plans (ORS 568.906). SWCDs have a long history of effectively assisting landowners to voluntarily address natural resource concerns. Currently, all LMAs in Oregon are SWCDs.

The day-to-day implementation of the Area Plan is accomplished through an Intergovernmental Grant Agreement between ODA and each SWCD. Every two years, each SWCD submits a scope of work to ODA to receive funding to implement the Area Plan. Each SWCD implements the Area Plan by providing outreach and technical assistance to landowners. SWCDs also work with ODA and the LAC to establish implementation priorities, evaluate progress toward meeting Area Plan goals and objectives, and revise the Area Plan and Area Rules as needed.

1.3.3 Local Advisory Committee

For each Management Area, the director of ODA appoints an LAC (OAR 603-090-0020) with as many as 12 members. The LAC serves in an advisory role to the director of ODA and to the Board of Agriculture. The role of the LAC is to provide a high level of citizen involvement and support in the development, implementation, and biennial reviews of the Area Plan and Area Rules. The LAC's primary role is to provide advice and direction to ODA and the LMA on local agricultural water quality issues as well as evaluate the progress toward achieving the goals and objectives of the Area Plan. LACs are composed primarily of agricultural landowners in the Management Area and must reflect a balance of affected persons.

The LAC is convened at the time of the biennial review, however the LAC may meet as frequently as necessary to carry out their responsibilities, which include but are not limited to:

- Participate in the development and subsequent revisions of the Area Plan.
- Participate in the development and subsequent revisions of the Area Rules.
- Recommend strategies necessary to achieve the goals and objectives in the Area Plan.
- Participate in biennial reviews of the progress of implementation of the Area Plan and Area Rules.
- Submit written biennial reports to the Board of Agriculture and the ODA director.

1.3.4 Agricultural Landowners

The emphasis of the Area Plan is on voluntary action by landowners to control the factors affecting water quality in the Management Area. However, each landowner in the Management Area is required to comply with the Area Rules. To achieve water quality goals or compliance, landowners may need to select and implement a suite of measures to protect water quality. The actions of each landowner will collectively contribute toward achievement of water quality standards.

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

Under the Area Plan and Area Rules, agricultural landowners are not responsible for mitigating or addressing factors that are caused by non-agricultural activities or sources, such as:

- Conditions resulting from unusual weather events.
- Hot springs, glacial melt water, extreme or unforeseen weather events, and climate change.

- Septic systems and other sources of human waste.
- Public roadways, culverts, roadside ditches and shoulders.
- Dams, dam removal, hydroelectric plants, and non-agricultural impoundments.
- Housing and other development in agricultural areas.
- Impacts on water quality and streamside vegetation from wildlife such as waterfowl, elk, and feral horses.
- Other circumstances not within the reasonable control of the landowner.

However, agricultural landowners may be responsible for some of these impacts under other legal authorities.

1.3.5 Public Participation

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

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

1.4 Agricultural Water Quality

The CWA directs states to designate beneficial uses related to water quality, decide on parameters to measure to determine whether beneficial uses are being met, and set water quality standards based on the beneficial uses and parameters.

1.4.1 Point and Nonpoint Sources of Water Pollution

There are two types of water pollution. Point source water pollution emanates from clearly identifiable discharge points or pipes. Significant point sources are required to obtain permits that specify their pollutant limits. Agricultural operations regulated as point sources include permitted Confined Animal Feeding Operations (CAFOs), and many are regulated under ODA's CAFO Program. Pesticide applications in, over, or within three feet of water also are regulated as point sources. Irrigation water flows from agricultural fields may be at a defined outlet but they do not currently require a permit.

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

1.4.2 Beneficial Uses and Parameters of Concern

Beneficial uses related to water quality are defined by DEQ in OARs for each basin. They may include: public and private domestic water supply, industrial water supply, irrigation, livestock watering, fish and aquatic life, wildlife and hunting, fishing, boating, water contact recreation, aesthetic quality, hydropower, and commercial navigation and transportation. The most sensitive beneficial uses usually are fish and aquatic life, water contact recreation, and public and private domestic water supply. These uses

generally are the first to be impaired because they are affected at lower levels of pollution. While there may not be severe impacts on water quality from a single source or sector, the combined effects from all sources can contribute to the impairment of beneficial uses in the Management Area. Beneficial uses that have the potential to be impaired in this Management Area are summarized in Chapter 2.

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

1.4.3 Impaired Water Bodies and Total Maximum Daily Loads

Every two years, DEQ is required by the 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. In accordance with the CWA, DEQ must establish TMDLs for pollutants that led to the placement of a waterbody on the 303(d) list.

A TMDL includes an assessment of water quality data and current conditions and describes a plan to achieve conditions so that water bodies will meet water quality standards. TMDLs specify the daily amount of pollution a waterbody can receive and still meet water quality standards. In the TMDL, point sources are allocated pollution limits as "waste load allocations" that are then incorporated in National Pollutant Discharge Elimination System (NPDES) NPDES waste discharge permits, while a "load allocation" is established for nonpoint sources (agriculture, forestry, and urban). The agricultural sector is responsible for helping achieve the pollution limit by achieving the load allocation assigned to agriculture specifically, or to nonpoint sources in general, depending on how the TMDL was written.

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

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

For more general and specific information about Oregon's TMDLs, see: www.oregon.gov/deq/wq/tmdls/Pages/default.aspx. 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 Oregon Water Pollution Control Law – ORS 468B.025 and ORS 468B.050

In 1995, the Oregon Legislature passed ORS 561.191. This statute states that any program or rules adopted by ODA "shall be designed to assure achievement and maintenance of water quality standards adopted by the Environmental Quality Commission."
To implement the intent of ORS 561.191, ODA incorporated ORS 468B.025 and 468B.050 into all of the Area Rules.

ORS 468B.025 (prohibited activities) states that:
"(1) Except as provided in ORS 468B.050 or 468B.053, no person shall:
(a) Cause pollution of any waters of the state or place or cause to be placed any wastes in a location where such wastes are likely to escape or be carried into the waters of the state by any means.
(b) Discharge any wastes into the waters of the state if the discharge reduces the quality of such waters below the water quality standards established by rule for such waters by the Environmental Quality Commission.
(2) No person shall violate the conditions of any waste discharge permit issued under ORS 468B.050."

ORS 468B.050 identifies the conditions when a permit is required. A permit is required for CAFOs that meet minimum criteria for confinement periods and have large animal numbers or have wastewater facilities. The portions of ORS 468B.050 that apply to the Ag Water Quality Program state that:
"(1) Except as provided in ORS 468B.053 or 468B.215, without holding a permit from the Director of the Department of Environmental Quality or the State Department of Agriculture, which permit shall specify applicable effluent limitations, a person may not:
(a) Discharge any wastes into the waters of the state from any industrial or commercial establishment or activity or any disposal system."

Definitions used in ORS 468B.025 and 468B.050:

' "Pollution" or "water pollution" means such alteration of the physical, chemical, or biological properties of any waters of the state, including change in temperature, taste, color, turbidity, silt or odor of the waters, or such discharge of any liquid, gaseous, solid, radioactive, or other substance into any waters of the state, which will or tends to, either by itself or in connection with any other substance, create a public nuisance or which will or tends to render such waters harmful, detrimental or injurious to public health, safety or welfare, or to domestic, commercial, industrial, agricultural, recreational, or other legitimate beneficial uses or to livestock, wildlife, fish or other aquatic life or the habitat thereof.' (ORS 468B.005(5)).

' "Water" or "the waters of the state" include lakes, bays, ponds, impounding reservoirs, springs, wells, rivers, streams, creeks, estuaries, marshes, inlets, canals, the Pacific Ocean within the territorial limits of the State of Oregon and all other bodies of surface or underground waters, natural or artificial, inland or coastal, fresh or salt, public or private (except those private waters which do not combine or affect a junction with natural surface or underground waters), which are wholly or partially within or bordering the state or within its jurisdiction.' (ORS 468B.005(10)).

' "Wastes" means sewage, industrial wastes, and all other liquid, gaseous, solid, radioactive or other substances, which will or may cause pollution or tend to cause pollution of any waters of the state.' (ORS 468B.005(9)). Additionally, the definition of "wastes" given in OAR 603-095-0010(53) 'includes but is not limited to commercial fertilizers, soil amendments, composts, animal wastes, vegetative materials or any other wastes.'

1.4.5 Streamside Vegetation and Agricultural Water Quality

Across Oregon, the Ag Water Quality Program emphasizes streamside vegetation protection and enhancement to prevent and control water pollution from agriculture activities and to prevent and control soil erosion. Streamside vegetation can provide three primary water quality functions: shade for cool stream temperatures, streambank stability, and filtration of pollutants. Other water quality functions from streamside vegetation include: water storage in the soil for cooler and later season flows, sediment trapping that can build streambanks and floodplains, narrowing and deepening of channels, and biological uptake of sediment, organic material, nutrients, and pesticides.

Additional reasons for the Ag Water Quality Program's emphasis on streamside vegetation include:

- Streamside vegetation can improve water quality related to multiple pollutants, including: temperature (heat), sediment, bacteria, nutrients, and toxics (e.g., pesticides, heavy metals, etc.).
- Streamside vegetation provides fish and wildlife habitat.
- Landowners can improve streamside vegetation in ways that are compatible with their operation.
- Streamside vegetation condition is measurable and can be used to track progress in achieving desired site conditions.

Site-Capable Vegetation

The Ag Water Quality Program uses the concept of "site-capable vegetation" to describe the vegetation that agricultural streams can provide to protect water quality. Site-capable vegetation is the vegetation that can be expected to grow at a particular site, given natural site factors (e.g., elevation, soils, climate, hydrology, wildlife, fire, floods) and historical and current human influences that are beyond the program's statutory authority (e.g., channelization, roads, modified flows, previous land management). Site-capable vegetation can be determined for a specific site based on: current streamside vegetation at the site, streamside vegetation at nearby reference sites with similar natural characteristics, Natural Resources Conservation Service (NRCS) soil surveys and ecological site descriptions, and/or local or regional scientific research.

The goal for Oregon's agricultural landowners is to provide the water quality functions (e.g., shade, streambank stability, and filtration of pollutants) produced by site-capable vegetation along streams on agricultural lands. The Area Rules for each Management Area require that agricultural activities allow for the establishment and growth of vegetation consistent with site capability to provide the water quality functions equivalent to what site-capable vegetation would provide.

Occasionally, mature site-capable vegetation such as tall trees may not be needed for narrow streams. For example, shrubs and grass may provide shade, protect streambanks, and filter pollutants. However, on larger streams, mature site-capable vegetation is needed to provide the water quality functions.

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

1.5 Other Water Quality Programs

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

1.5.1 Confined Animal Feeding Operation Program

The Oregon Department of Agriculture is the lead state agency for the CAFO Program. The CAFO Program was developed to ensure that operators do not contaminate ground or surface water with animal

manure or process wastewater. Since the early 1980s, CAFOs in Oregon have been registered to a general Water Pollution Control Facility (WPCF) permit designed to protect water quality. A properly maintained CAFO must implement a site-specific suite of structural and management practices to protect ground and surface water. To assure continued protection of ground and surface water, the 2001 Oregon State Legislature directed ODA to convert the CAFO Program from a WPCF permit program to a federal NPDES program. ODA and DEQ jointly issue the NPDES CAFO permit, which complies with all CWA requirements for CAFOs. In 2015, ODA and DEQ jointly issued a WPCF general CAFO permit as an alternative for CAFOs that are not subject to the federal NPDES CAFO permit requirements. Currently, ODA can register CAFOs to either the WPCF or NPDES CAFO permit.

Both of the Oregon CAFO permits require the registrant to operate according to a site-specific, ODA-approved, Animal Waste Management Plan that is incorporated into the CAFO permit by reference. For more information about the CAFO program, go to www.oregon.gov/ODA/programs/NaturalResources/Pages/CAFO.aspx.

1.5.2 Groundwater Management Areas

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

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

1.5.3 The Oregon Plan for Salmon and Watersheds

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

1.5.4 Pesticide Management and Stewardship

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

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

impact of pesticides on Oregon's water quality. Pesticide detections in Oregon's streams can be addressed through multiple programs and partners, including the PSP.

Through the PSP, state agencies and local partners work together to monitor pesticides in streams and to improve water quality (www.oregon.gov/ODA/programs/Pesticides/Water/Pages/PesticideStewardship.aspx). ODA, DEQ, and Oregon State University Extension Service work with landowners, SWCDs, watershed councils, and other local partners to voluntarily reduce pesticide levels while improving water quality and crop management. Since 2000, the PSPs have made noteworthy progress in reducing pesticide concentrations and detections.

The Oregon Department of Agriculture led the development and implementation of a Pesticides Management Plan (PMP) for the state of Oregon (www.oregon.gov/ODA/programs/Pesticides/water/pages/AboutWaterPesticides.aspx). The PMP, completed in 2011, strives to protect drinking water supplies and the environment from pesticide contamination, while recognizing the important role that pesticides have in maintaining a strong state economy, managing natural resources, and preventing human disease. By managing the pesticides that are approved for use by the US EPA and Oregon in agricultural and non-agricultural settings, the PMP sets forth a process for preventing and responding to pesticide detections in Oregon's ground and surface water.

1.5.5 Drinking Water Source Protection

Oregon implements its drinking water protection program through a partnership between DEQ and OHA. The program provides individuals and communities with information on how to protect the quality of Oregon's drinking water. DEQ and OHA encourage preventive management strategies to ensure that all public drinking water resources are kept safe from current and future contamination. For more information see: www.oregon.gov/deq/wq/programs/Pages/dwp.aspx.

1.6 Partner Agencies and Organizations

1.6.1 Oregon Department of Environmental Quality

The US EPA delegated authority to Oregon to implement the federal CWA in our state. DEQ is the lead state agency with overall authority to implement the CWA in Oregon. DEQ coordinates with other state agencies, including ODA and ODF, to meet the requirements of the CWA. DEQ sets water quality standards and develops TMDLs for impaired waterbodies, which ultimately are approved or disapproved by the US EPA. In addition, DEQ develops and coordinates programs to address water quality including NPDES permits for point sources, the CWA Section 319 grant program, Source Water Protection, the CWA Section 401 Water Quality Certification, and GWMAs. DEQ also coordinates with ODA to help ensure successful implementation of Area Plans.

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

The MOA includes the following commitments:

- ODA will develop and implement a monitoring strategy, as resources allow, in consultation with DEQ.
- ODA will evaluate the effectiveness of Area Plans and Area Rules in collaboration with DEQ:
    - ODA will determine the percentage of lands achieving compliance with Area Rules.

    - ODA will determine whether the target percentages of lands meeting the desired land conditions, as outlined in the goals and objectives of the Area Plans, are being achieved.
- ODA and DEQ will review and evaluate existing information to determine:
    - Whether additional data are needed to conduct an adequate evaluation.
    - Whether existing strategies have been effective in achieving the goals and objectives of the Area Plans.
    - Whether the rate of progress is adequate to achieve the goals of the Area Plans.

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

1.6.2 Other Partners

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

1.7 Measuring Progress

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

1.7.1 Measurable Objectives

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

The AgWQ Program is working throughout Oregon with SWCDs and LACs toward establishing long-term measurable objectives to achieve desired conditions. ODA, the LAC, and the SWCD will establish measurable objectives and associated milestones for each Area Plan. Many of these measurable objectives relate to land conditions and primarily are implemented through focused work in small geographic areas (section 1.7.3), with a long-term goal of developing measurable objectives and monitoring methods at the Management Area scale.

The State of Oregon continues to improve its ability to use technology to measure current streamside vegetation conditions and compare it to the vegetation needed to meet stream shade targets to keep surface waters cooler. As the State's use of this technology moves forward, ODA will use the information to help LACs and LMAs set measurable objectives for streamside vegetation. These measurable

objectives will be achieved through implementing the Area Plan, with an emphasis on incentive programs.

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

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

1.7.2 Land Conditions and Water Quality

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

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

- Landowners can see land conditions and have direct control over them.
- Improved land conditions can be documented immediately.
- Reductions in water quality from agricultural activities are primarily due to changes in land conditions and management activities.
- It can be difficult to separate agriculture's influence on water quality from other land uses.
- There is generally a lag time between changes on the landscape and the resulting improvements in water quality.
- Extensive monitoring of water quality would be needed to evaluate progress, which would be cost-prohibitive and could fail to demonstrate improvements in the short term.

Water quality monitoring data will help ODA and partners to measure progress or identify problem areas in implementing Area Plans. However, as described above, water quality monitoring may be less likely to document the short-term effects of changing land conditions on water quality parameters such as temperature, bacteria, nutrients, sediment, and pesticides.

1.7.3 Focused Implementation in Small Geographic Areas

Focus Areas

A Focus Area is a small watershed with water quality concerns associated with agriculture. The Focus Area process is SWCD-led, with ODA oversight. The SWCD delivers systematic, concentrated outreach and technical assistance in the Focus Area. A key component of this approach is measuring conditions before and after implementation to document the progress made with available resources. The Focus Area approach is consistent with other agencies' and organizations' efforts to work proactively in small watersheds and is supported by a large body of scientific research (e.g. Council for Agricultural Science and Technology, 2012. Assessing the Health of Streams in Agricultural Landscapes: The Impacts of Land Management Change on Water Quality. Special Publication No. 31. Ames, Iowa).

Systematic implementation in Focus Areas provides the following advantages:

- Measuring progress is easier in a small watershed than across an entire Management Area.
- Water quality improvement may be faster since small watersheds generally respond more rapidly.
- A proactive approach can address the most significant water quality concerns.

- Partners can coordinate and align technical and financial resources.
- Partners can coordinate and identify appropriate conservation practices and demonstrate their effectiveness.
- A higher density of projects allows neighbors to learn from neighbors.
- A higher density of projects leads to opportunities for increasing the connectivity of projects.
- Limited resources can be used more effectively and efficiently.
- Work in one Focus Area, followed by other Focus Areas; will eventually cover the entire Management Area.

Soil and Water Conservation Districts select a Focus Area in cooperation with ODA and other partners. The scale of the Focus Area matches the SWCD's capacity to deliver concentrated outreach, technical assistance, and to complete projects. The current Focus Area for this Management Area is described in Chapter 3. The SWCD will also continue to provide outreach and technical assistance to the entire Management Area.

Strategic Implementation Areas

Strategic Implementation Areas (SIAs) are small watersheds selected by ODA, in cooperation with partners, based on a statewide review of water quality data and other available information. ODA conducts an evaluation of likely compliance with Area Rules, and contacts landowners with the results and next steps. Landowners have the option of working with the SWCD or other partners to voluntarily address water quality concerns. ODA follows up, as needed, to enforce the Area Rules. Finally, ODA completes a post-evaluation to document progress made in the watershed. Chapter 3 describes any SIAs in this Management Area.

1.8 Monitoring, Evaluation, and Adaptive Management

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

1.8.1 Agricultural Water Quality Monitoring

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

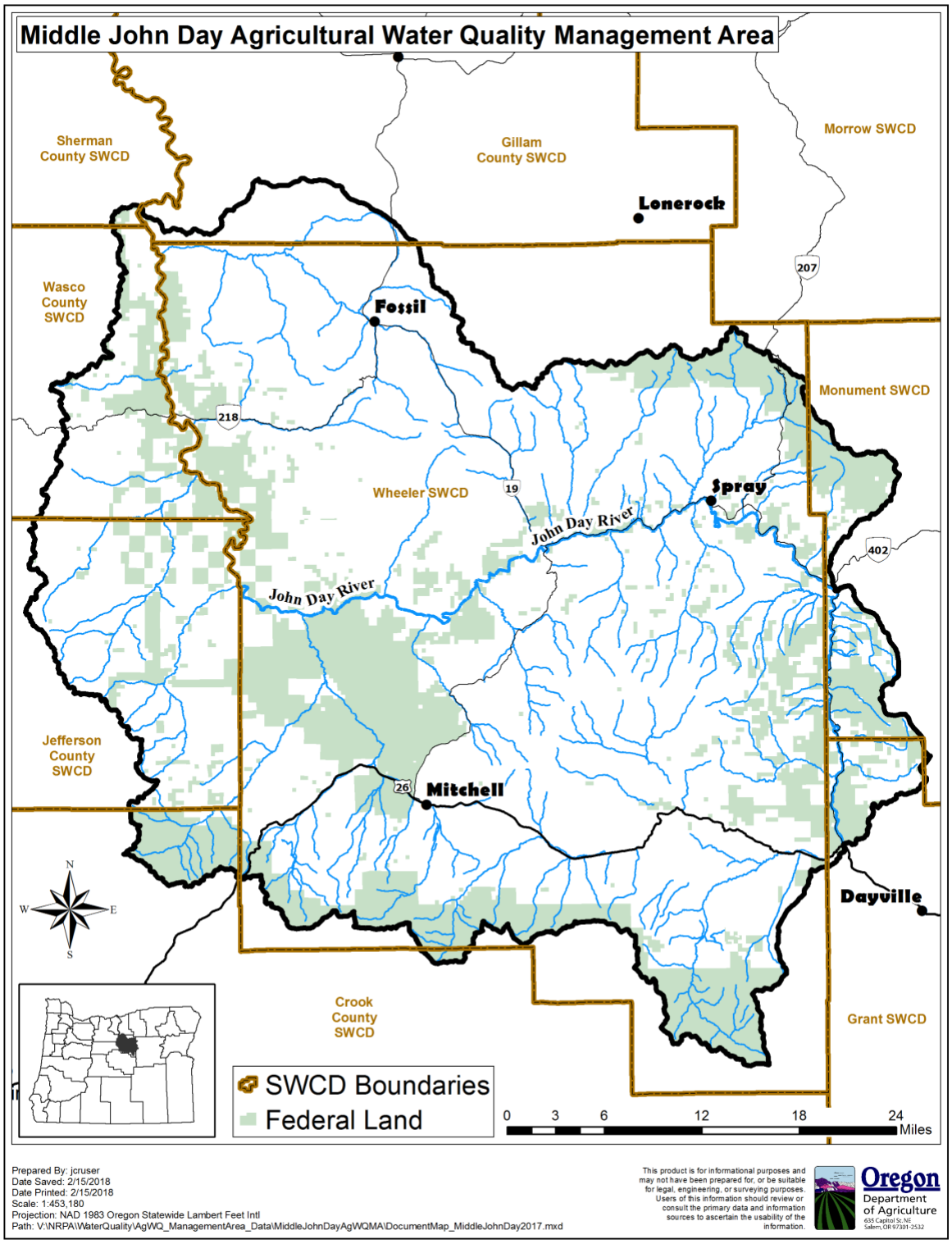
At each biennial review, DEQ assesses the status and trends of water quality in relation to water quality standards. Parameters included in the analysis are temperature, pH, and bacteria. DEQ will add additional parameters as the data become available, depending on the water quality concerns of each Management Area. ODA will continue to work with DEQ to cooperatively summarize the data results and how they apply to agricultural activities.
Water quality monitoring is described in Chapter 3, and the data are presented in Chapter 4.

1.8.2 Biennial Reviews and Adaptive Management

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

Chapter 2: Local Background

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



2.1 Local Roles

2.1.1 Local Advisory Committee

The Area Plan was developed with the assistance of the LAC. In 2003, the LAC was formed to assist with the development of the Area Plan and Area Rules and with subsequent biennial reviews.

Table 1: Current LAC members:

Name	Location	Description
Ted Molinari (Chair)	Fossil	Hay, cattle, grain, timber, SWCD Board Director Emeritus
John Aaron	Heppner	Timber
Matt Smith	Bend, Ashwood, Cherry Creek	Hay, Cattle Investment properties
Chris Perry	Twickenham, Mitchel, Fossil	Ranch landowner
Adam Temple	Twickenham	Hay
Bryce Logan	Fossil	Livestock & wildlife
Roberta Vandehey	Winlock, West Alder Creek	Timber and cropland
Jeremiah Holmes	Spray	Hay, cattle, SWCD Board Chairman
Allen Gillette	Canyon City	Fisheries Biologist

2.1.2 Local Management Agency

Implementation of the Area Plan is accomplished through an Intergovernmental Grant Agreement(s) between ODA, the Wheeler SWCD and the Monument SWCD. This Intergovernmental Grant Agreement defines the SWCDs as the LMAs for implementation of the Area Plan in this Management Area. The Wheeler SWCD is the lead LMA for this Management Area and was involved in development of the Area Plan and Area Rules.

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

2.2 Area Plan and Area Rules: Development and History

The director of ODA approved the Area Plan and Area Rules in 2003.

Since approval, the LAC met in 2006, 2008, 2010, 2012, 2014, 2016, and 2018 to review the Area Plan and Area Rules. The biennial review process includes an assessment of progress toward achieving the goals and objectives in the Area Plan.

2.3 Geographical and Physical Setting

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

temperatures vary from sub-zero during winter months to over 100°F during the summer. Inflows of moist Pacific air moderate extreme winter temperatures. The average frost-free period is 50 days in the upper basin and 200 days in the lower basin.

The Middle John Day Management Area contains 1,894 square miles or 1,212,219 acres. It includes a 110-mile reach of the John Day River from the Gilliam-Wheeler county line (RM 95) to the upstream end of Picture Gorge (RM 205). The elevation ranges from 1,300 feet near Clarno to over 6,000 feet in the Ochoco Mountains. The climate varies from semi-arid to relatively moist at higher elevations. The average annual temperature at Mitchell is 49º F, with the average low of 33º F and average high of 68º F.

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

Geology

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

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

Land Cover and Land Use

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

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

Land Ownership

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

Special Uses

There are numerous special use areas designated in the Management Area. The John Day River is federally designated as wild and scenic from the mouth to Service Creek and state-designated as a Scenic Waterway from the mouth to Parrish Creek. The John Day Fossil Beds National Monument includes three units -- Clarno, Painted Hills, and Sheep Rock – managed by the NPS. The Bridge Creek Wilderness

Area is located in Ochoco National Forest, and the BLM manages the Research Natural Area, one Wilderness Area-Spring Basin and two Wilderness Study Areas – Sutton Mountain, and Pat's Cabin.

The Management Area is within the ceded lands of the Confederated Tribes of the Warm Springs Reservation of Oregon (Tribes). The Tribes have reserved certain treaty rights to the use of the land and its resources, and this area is still used for ceremonial and subsistence purposes. The Tribes also manage the Pine Creek Ranch, a 35,000-acre wildlife habitat project near Clarno.

Water Resources

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

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

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

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

Water Use

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

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

Fisheries and Wildlife Resources

The John Day River supports populations of anadromous fish in the Columbia Basin, and an estimated 17 native and ten non-native species. The John Day River supports runs of spring and fall Chinook salmon, summer steelhead, and Pacific lamprey; and resident populations of west slope cutthroat, interior redband, and bull trout. The current management policy is designed to maintain native, wild stocks of salmon and steelhead and to preserve the genetic diversity of these native stocks for maximum habitat use and fish

production. Smallmouth bass, an introduced warm-water game fish, provide an economically important fishery in the mainstem of the John Day River.

A variety of wildlife species, including large and small mammals, waterfowl, songbirds, raptors, reptiles, and amphibians, are associated with riparian and upland habitats in the Management Area. Wildlife species associated with shrub-steppe habitat have declined regionally as their habitat has decreased.

Agriculture

Agriculture is the primary economic activity in the management area. Total gross sales for Wheeler County in 2012 were reported as $16,338,917. Cattle were by far the leading commodity ($14.3 MM) and hay products coming in second. Hay and forage, field crops, recreation and fee hunting, and other livestock and animal products contribute to the agricultural economy.

2.4 Agricultural Water Quality

2.4.1 Water Quality Issues

Temperature concerns in the Management Area were included by Oregon's DEQ on its 2012 303(d) list, which identifies 'water-quality limited' streams as required by the Federal Clean Water Act. Biological criteria, sediment and copper concerns were also identified in a few streams.

2.4.1.1 Beneficial Uses

Water quality in the Management Area is managed to protect recognized beneficial uses. Beneficial uses of water in the John Day 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. (OAR 340-041-0170, Table 170A)

2.4.1.2 Water Quality Parameters and 303(d) list

Temperature "water quality limited" status has been assigned to many streams in the Management Area. Temperature load allocations are established for all streams within the area via the John Day River Basin Total Maximum Daily Load and Water Quality Management Plan. Additional concerns have been identified by EPA for sedimentation and biological criteria.

2012 Water Quality Limited Streams, Parameters, and 303(d) List

Table 2: Category 4A, TMDL Approved

NAME	SEGMENT	PARAMETER
Bear Creek	Mouth to RM 4.6	Temperature
Bridge Creek	Mouth to RM 28.7	Temperature
Gable Creek	Mouth to RM 7.7	Temperature
Henry Creek	Mouth to RM 7.1	Temperature
John Day River	RM .4 to 182	Temperature
Mountain Creek	Mouth to RM 21.7	Temperature
Nelson Creek	Mouth to RM 5.7	Temperature
Pine Creek	Mouth to RM 15.8	Temperature
Rock Creek	Mouth to RM 79.2	Temperature
Service Creek	Mouth to RM 11.3	Temperature
Sorefoot Creek	Mouth to RM 7.5	Temperature
Straw Fork	Mouth to RM 3.4	Temperature

Table 3: Category 5, 303(d) list, TMDL Needed

NAME	SEGMENT	PARAMETER
Bridge Creek	Mouth to RM 28.7	Sedimentation
Bridge Creek	Mouth to RM 28.7	Biological Criteria
John Day River	RM 0.4 to 182	Biological Criteria
John Day River	RM 0.4 to 182	Copper
Nelson Creek	Mouth to RM 5.7	Biological Criteria
Nelson Creek	Mouth to RM 5.7	Sedimentation
Pine Creek	Mouth to RM 15.8	Biological Criteria
Rock Creek	Mouth to 79.2	Biological Criteria
Rock Creek	Mouth to 79.2	Sedimentation
Straw Fork	Mouth to RM 3.4	Sedimentation

Water Quality Parameters of Concern

Of the beneficial uses of water in the Management Area, 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 that require standards be established for the most sensitive beneficial use.

Temperature

Water temperature is the most widespread concern in the basin. Stream temperatures can increase from various types of land management activities and natural disturbances, that cause the removal of riparian vegetation or changes in channel morphology, from hydrological factors such as groundwater recharge and discharge and from other factors such as high sediment loads.

Protection of riparian and streamside areas for moderation of stream temperatures are the subject of rules created from this Area Plan. Low summer streamflows often result from channel loss and water withdrawals for beneficial uses, primarily irrigation, along with normal seasonal reductions of streamflow. Water withdrawals are regulated by the OWRD and will not be addressed by rule or in this Area Plan.

The causes of stream heating are excess solar radiation, decreased groundwater interaction, and in-stream flow reduction. These can result from natural disturbances and human-related stream modifications such as vegetation disturbance, irrigation withdrawal, and channel straightening. The TMDL plan 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.

The temperature standard, OAR 340-041-0028, provides numeric and narrative temperature criteria. Maps and tables provided in OAR 340-041-0170, Table 170A specify where and when the criteria apply. Biologically based numeric criteria applicable to the John Day Basin, as measured using the seven-day average maximum stream temperature, include:

- 12.0° C (53.6° F) during times and at locations of bull trout spawning and juvenile rearing.
- 13.0°C (55.4°F) during times and at locations of salmon and steelhead spawning.
- 16.0°C (60.8°F) during times and at locations of core cold water habitat identification.
- 18.0°C (64.4°F) during times and at locations of salmon and trout rearing and migration.

Biological Criteria

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

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

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

Bacteria

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

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

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

Sediment

Sediment includes fine silt and organic particles suspended in the water column, settled particles, and larger gravel and boulders that move at high flows. Sediment movement and deposition is a natural occurrence but high levels of sediment can degrade fish habitat by filling pools, creating a wider and shallower channel and covering spawning gravels.

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.

2.4.2 TMDLs and Agricultural Load Allocations

DEQ developed The John Day River Basin Total Maximum Daily Load and Water Quality Management Plan in 2010 to address temperature, dissolved oxygen, bacteria and biological criteria concerns (http://www.oregon.gov/deq/FilterDocs/jdTMDLwqmp.pdf).

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 Basin. Reduced channel widths and more natural flow levels are called for as well, while not quantified.

Table 4: Temperature TMDL Summary

Water body	John Day Basin stream network, HUC 170702
Water Quality Standard	OAR 340-041-0028 (Temperature)
Applicable Water Quality Standard Criteria	Biologically based criteria.
Target Pollutant	Heat
Loading Capacity	The daily sum of the natural background solar heat load, throughout the Basin stream network, and the heat load corresponding to the Human Use Allowance (HUA)
Load Allocation	The daily sum of the natural background solar heat load, throughout the Basin stream network, and the heat load corresponding to the additional 0.1ºC HUA
Load Allocation Surrogates	Quantitative: site-specific and generalized percent effective shade; reservoir heating limits. Narrative: natural channel form and natural stream flows for perennial streams; natural channel and land cover conditions specific to ephemeral and intermittent streams.
Existing Pollutant Sources	Nonpoint source vegetation reduction and channel alteration) agriculture, flood control, forestry, urban, transportation). National Pollution Discharge Elimination System point sources. Small reservoirs and warm irrigation return flows.
Margin of Safety	Implicit
Reserve Capacity	0.2°C – in general 0.1°C – within thermal overlap with point sources

The TMDL targets can be found in the TMDL main document at http://www.oregon.gov/deq/FilterDocs/jdTMDLwqmp.pdf. The load allocations are defined and illustrated in the TMDL on pages 79-89 in section 2.1.8.

2.4.3 Sources of Impairment

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

2.5 Voluntary and Regulatory Measures

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

2.5.1 Voluntary

2.5.1.1 Uplands Management and Soil Erosion

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

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

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

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

Indicators of healthy conditions may include:

- Ongoing recruitment of beneficial vegetation,

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

Factors to evaluate upland area condition may include:

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

This Area Plan does not prescribe specific practices to landowners for management of upland areas to reduce runoff of sediment and other wastes. Site specific recommendations for management to protect water quality, 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.

> *The Area Waste Management Rule OAR 603-095-2540(2) acknowledges ORS 468B.025, which predates this Area Plan, and could apply to problematic runoff of sediment and animal waste from upland areas.*

The following practices and many others may be considered in the development of a management system that is appropriate for prevention and control of pollution caused by agricultural activities on an individual parcel of land. Management practices and land management changes are most effective when selected and installed as integral parts of a comprehensive resource management plan based on natural resource inventories and assessment of management practices. The result is a system using management practices and land management changes which are designed to be complementary, and when used in combination, are more technically sound than each practice separately.

Effective Water Quality Management Practices for soil erosion and sediment control:

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

2.5.1.2 Riparian Area Management

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

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

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

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

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

Indicators to determine improvement of this condition include:

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

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

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

Effective Water Quality Management Practices for prevention and control of impacts to riparian areas:

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

2.5.1.3 Irrigation Management

A landowner or operator's responsibility under this Area Plan is to implement measures that prevent and control water pollution from irrigation activities. Irrigated lands include riparian areas, floodplains or uplands upon which water is applied for the purpose of growing crops or pasture. Application of water for this purpose is a recognized beneficial use of water. Proper management of diversions, for irrigation or other uses such as livestock watering, and overland return flows of excess water to the stream should be designed and managed to prevent water quality problems.

Irrigation water use is regulated by the OWRD in the form of water rights, which specify the rate, duty and season that water can be applied to a particular parcel of land. Refer to OWRD Rules (OAR 690-250 and ORS 536 through 543) for more details.

Irrigation in this basin is typically 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 the positive benefits which occur from irrigation application - including flow augmentation for late season 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 ground water 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:

- Efficient delivery of water to the land within legal water rights,
- Minimal overland return flows,
- Return flow routing that provides for settling, filtering and infiltration,
- Minimal effect on stability of streambanks and minimal soil erosion,
- Appropriate scheduling of water application to the site including consideration of soil conditions, crop needs, climate and topography,
- Diversion structures that are installed and managed to control erosion and sediment delivery, and protect the stability of streambanks. If funding becomes available, temporary diversions, which must be reinstalled every year, should be replaced with suitable permanent diversions (i.e. pumping stations, infiltration galleries, dams).
- Diversions that are adequately screened and which provide for fish passage (Refer to ORS 498.268).

Effective Water Quality Management Practices for prevention and control of impacts from irrigation:

- Irrigation scheduling based on crop needs, soil type, climate, topography, and infiltration rates,
- Irrigation system efficiency and uniformity monitoring,
- Diversion maintenance including push-up dam management, screens and fish passage,
- Return flow management to prevent pollution from entering streams,
- Backflow devices to prevent well contamination,
- Flow measuring devices to assure legal and efficient water usage,
- Cover crops to reduce soil erosion.

2.5.1.4 Livestock Management

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

Managed grazing near streams should prevent negative impacts to streambank stability, allow for recovery of plants, and leave adequate vegetative cover to ensure protection of riparian functions including shade and habitat. Offstream watering systems, upland water developments, feed, salt and mineral placement are examples of methods to be considered as ways to reduce impacts of livestock to streamside areas.

Effective Water Quality Management Practices for prevention and control of impacts from livestock:

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

2.5.2 Regulatory

The Area Rules for this Management Area are:

OAR 603-095-2500 Purpose
(1) These rules have been developed to implement a water quality management area plan for the subbasin pursuant to authorities vested in the department through ORS 568.900-568.933. The area plan is known as the Middle John Day Agricultural Water Quality Management Area Plan.
(2) The purpose of these rules is to outline requirements for landowners in the Middle John Day Agricultural Water Quality 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.

OAR 603-095-2540 Prevention and Control Measures
(1) Limitations: All landowners or operators conducting activities on agricultural and rural lands are provided the following exemptions from the requirements of OAR 603-095-2540 (Prevention and Control Measures).
(a) A landowner or operator shall be responsible for only those conditions caused by activities conducted on land managed by the landowner or operator.
(b) Rules do not apply to conditions resulting from unusual weather events or other circumstances not within the reasonable control of the landowner or operator. Within the reasonable control of the landowner means that technically sound and economically feasible measures must be available to address conditions described in Prevention and Control Measures.
(c) The Department may allow temporary exceptions when a specific integrated pest management plan is in place to deal with certain weed or pest problems.
(2) Waste Management: Effective on rule adoption, no person subject to these rules shall violate any provision of ORS 468B.025 or 468B.050.
(3) Effective January 1, 2008, riparian management must allow the establishment, growth, and active recruitment of vegetation consistent with the vegetative capability of the site, for protection of water quality by filtering sediment, stabilizing streambanks and providing shade.
(4) Effective January 1, 2008, irrigation must be done in a manner that limits the amount of pollutants entering waters of the state in the runoff from the irrigated area.
(5) Effective January 1, 2008, areas used to control livestock, with a demonstrated impact on water quality, will be managed to control runoff of sediment or animal waste.

OAR 603-095-2560 Complaints and Investigations
(1) When the Department receives notice of an alleged occurrence of agricultural pollution it may conduct an investigation. The Department will coordinate inspection activities with the appropriate Local Management Agency.
(2) Each notice of an alleged occurrence of agricultural pollution shall be evaluated in accordance with the criteria in ORS 568.900 to 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 to 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 603-095-2560(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 to 568.933 or any rules adopted thereunder.

(5) As used in section OAR 603-095-2560(4), “person does not include any local, state or federal agency.
(6) Notwithstanding OAR 603-095-2560(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 to 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.

Chapter 3: Implementation Strategies

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

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

Landowner Goal: Achieve the following land conditions, that contribute to good water quality, on agricultural lands throughout the management area:

- Streamside vegetation providing streambank stability, filtration of overland flow, and moderation of solar heating, consistent with site capability.
- Livestock management is controlling runoff of sediment and animal waste to waters of the state.
- Irrigation management is controlling runoff of pollutants to waters of the state.

3.1 Measurable Objectives

3.1.1 Management Area

Management Area-wide measurable objectives have not been developed.

3.1.2 Focus Area(s)

The current Focus Area for this Management Area is Mountain Creek. The Wheeler SWCD is improving water quality by working with landowners along 33.6 miles of the Mountain Creek mainstem to remove agricultural impacts to allow riparian buffer vegetation to establish and grow, reduce stream and overland sediment flows, increase stream shading, and improve upland forage.

In 2010, the Wheeler SWCD conducted a reach evaluation of the 33.6 miles of mainstem that spanned 14 landowners. The purpose was to identify the severity of the limiting factors on a reach-by-reach basis and create an interactive GIS framework to improve the effectiveness of restoration work within the Mountain Creek Watershed. The survey was conducted using an "Intermediate Survey Level" as defined in the publication *Surveying Oregon's Streams "A Snapshot in Time."*[1] Percent shade is measured in degrees for both the left and right bank using an inclinometer; shade values are averaged for each unit. Percent active erosion was also measured during the field survey; each bank side was inspected for each unit for total active erosion.

Nineteen out of 135 total "reaches" were selected as improvement reaches. These 19 reaches make up the four project reaches that are spread throughout the watershed and are representative of the system. Three of the four reaches have had recent restoration actions implemented on site.

Stream miles in each project reach:

Project Reach 1. RM 11.11-12.82 (1.71 stream miles)
Project Reach 2. RM 14.26-14.91 (0.65 stream miles)
Project Reach 3. RM 32.90-33.29 (0.39 stream miles)
Project Reach 4. RM 27.54-28.76 (control) (1.22 stream miles)

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

Milestone Tables

Table 5: Tree/Bush Average Percentage Total Shade

Project Reach	Previous Conditions 2015	Previous Milestone for 2017	Current Conditions 2017	Current Milestone for 2019
1	15.10	16.10	15.75	16.00
2	17.06	18.06	17.10	17.35
3	12.05	13.05	12.75	13.25
4 (Control)	10.14	0	10.14	
Weighted Average of 1, 2, and 3	15.13	16.13	15.64	15.93

Table 6: Percent of Project Reach Actively Eroding

Project Reach	Previous Conditions 2015	Previous Milestone for 2017	Current Conditions 2017	Current Milestone for 2019
1	27.40	24.66	23.25	21.75
2	19.09	17.18	17.4	15.9
3	31.25	28.13	27.2	25.7
4 (Control)	27.97	0	27.97	
Weighted Average of 1, 2, and 3	25.98	23.38	22.43	20.93

Current Milestone (weighted average for Reaches 1, 2, and 3):

Increase weighted average shade from 15.64% to 15.93% by June 30, 2019.
Decrease erosion from 22.43% to 20.93% by June 30, 2019.

Measurable Objective:

Increase stream shading in buffer areas by 40% by 2025, with a progress update in 2019.

(Note: The 2015-17 Focus Area had a second measurable objective, which was to increase stream flow by 5% by October 2017. However, due to climactic conditions in early 2017, the data loggers that measured stream flow were dislodged and lost in a high flood event. As this data is no longer collected, this measurable objective has been removed from the Area Plan.)

3.2 Strategies and Activities

The ODA and the SWCD strategy to reduce amounts of pollution and soil erosion in runoff from agricultural and rural lands, where such problems exist, include both voluntary and regulatory approaches. Voluntary strategies to reduce pollution include a combination of 1) educational programs, 2) implementation of sound management practices, and 3) monitoring of implementation effectiveness. A secondary strategy, when necessary to supplement voluntary efforts, is the adoption and compliance with Prevention and Control Measures directly related to water quality.

To protect or improve water quality, 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 water pollution prevention and control measures. The

SWCD(s) and other partners will cooperate to implement the following voluntary strategies at the local level with landowners:

- Promote voluntary land stewardship practices that enhance water quality and comply with area rules;
- Increase public awareness and understanding of agriculture's contributions to improving water quality;
- Ensure technical and financial assistance for implementing effective water quality improvement projects;
- Promote a monitoring program that provides scientifically credible data;
- Identify priorities for pollution source identification and determining areas for implementing restoration activities including reasonable timelines for management strategies targeting TMDL attainment and water quality standards;
- Providing educational programs to raise public awareness and understanding of water quality issues and solutions;
- Providing incentives for the development and implementation of effective agricultural management practices for prevention and control of agricultural pollution;
- Offering technical assistance for the development and implementation of farm/rural conservation plans;
- Developing a monitoring program to identify current and potential water quality problems;
- Demonstrating the effectiveness of the water quality program and the efforts of landowners to address water quality concerns by selecting priority areas to focus implementation and monitoring;
- Biennially review and assess the progress of implementation toward achievement of Area Plan goals and objectives;
- Following up on any water quality complaints and provide assistance in solving identified problems.

3.2.1 Community and Landowner Outreach

As resources allow, the SWCD, watershed council, and OSU Extension Service (Extension), in partnership with other agencies and local organizations, will develop an educational plan to improve the awareness and understanding of water quality and quantity issues. They will strive to provide the most current information in a manner which avoids conflict and encourages cooperative efforts to solve problems. The following is a list of action items that will be considered in developing educational programs:

- Showcase successful practices and systems and conduct annual tours for landowners and media;
- Recognize successful projects and practices through appropriate media and newsletters;
- Promote cooperative on-the-ground projects to solve critical problems identified by landowners/operators and in cooperation with partner organizations;
- Conduct educational outreach to promote public awareness of water quality and quantity;
- Evaluate current research and scientifically valid monitoring results and conduct such monitoring as may be necessary to better quantify current conditions and objectives contained in this Plan in preparation for biennial plan reviews.

Implementation of this Area Plan is a priority element in the Wheeler SWCD Annual Work Plan and Long Range Plan and the Mid John Day-Bridge Creek Watershed Council Strategic and Action Plan. These organizations hold regular monthly public meetings, publish newsletters, and sponsor special events that will often focus on water issues. Community meetings will continue to be encouraged as needed to provide a forum for current water issues.

3.2.2 Financial and Technical Assistance

It is not the intent of this 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, if needed, and to develop a reasonable time frame for addressing potential water quality problems. It is the state's responsibility, through involved agencies, to provide incentives to private landowners to achieve water quality benefits for the public unless the landowner has conducted activities in a flagrant, neglectful, and willful manner.

As resources allow, the SWCDs, NRCS and other natural resource agency staff are available to assist landowners in evaluating effective practices for protecting and improving water quality and striving to achieve water quality standards on their land, and incorporating these practices into voluntary water quality plans. Personnel in these offices can also design and assist with implementation of practices and assist in identifying sources of cost-sharing or grant funds for the construction and use of some of these practices.

Farm planning assistance is available from these and other sources:

- ***Technical Assistance***
  - NRCS, Soil Conservationist – planning, design, implementation
  - SWCDs, Technical Watershed Specialist – planning, implementation, grant writing
  - Mid John Day-Bridge Creek Watershed Council – planning, implementation, grant writing
- ***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 Association/OSU Extension
  - Ranch Water Quality Planning Workbook, OSU Extension
  - Oregon Plan Toolbox, Oregon Watershed Enhancement Board (OWEB)
- ***Programs***
  - Farm*A*Syst Program, OSU Extension
  - Stream*A*Syst Program, OSU Extension
  - Home*A*Syst Program, OSU Extension

Financial and cost-sharing assistance, for installation of certain management practices, may be available through current USDA conservation programs such as the Environmental Quality Incentives Program, Conservation Reserve Program, Conservation Reserve Enhancement Program (CREP), EPA's non-point source implementation grants, Bonneville Power Administration (BPA) fisheries and wildlife mitigation funds or state programs such as the Oregon Watershed Enhancement Board (OWEB) and OWEB Small Grant Program and DEQ Nonpoint Source 319 Grant Program. The local watershed councils and several federal and state agencies are also available to provide technical or financial assistance to private landowners.

3.3 Monitoring and Evaluation

DEQ monitors one site in the Management Area as part of their ambient monitoring network (John Day River at Service Creek).

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

For a description of monitoring and evaluation results, see Chapter 4.

Chapter 4: Implementation, Monitoring, and Adaptive Management

4.1 Progress Toward Measurable Objectives

4.1.1 Management Area

Management Area-wide measurable objectives have not been developed.

4.1.2 Focus Area

Landowners and the Wheeler SWCD were successful in improving the shade and erosion conditions. Although the previous percentage of shade milestone was not met, each reach showed increased canopy cover. Using a weighted average method to aggregate Reaches 1, 2, and 3, the percent shade was 15.13 in 2015 and it increased to 15.64 by 2017 (a 3.4 percent change). The milestone for erosion was met and exceeded. The weighted average of percent erosion was 25.98 in 2015 and decreased to 22.43 by 2017 (a -13.7 percent change).

Table 7: Tree/Bush Average Percentage Total Shade

Project Reach	2015	2017
Weighted Average of 1, 2, and 3	15.13	15.64

Table 8: Percentage of Project Reach Actively Eroding

Project Reach	2015	2017
Weighted Average of 1, 2, and 3	25.98	22.43

With conditions improving, the landowners and Wheeler SWCD are successfully working towards achieving the Focus Area measurable objective. After the next assessment is complete (2019), the measurable objective will be reconsidered and adjustments may be made for an achievable projected date and/or achievable conditions.

4.2 Activities and Accomplishments

Outreach and Education:

- Landowner contacts: 918 total (Focus Area: 293); 28 new landowners – Tech Assistance: 396 times (228: Focus Area)
- Site visits/Evaluations (for LO's, grant requirements, progress monitoring, project monitoring/photos): 377 times (Focus Area: 131)
- Public Displays: 26 venues/events – reaching approximately 7,525 viewers
- Newsletters: 4,655 distributed by mail/email; 4 articles/press releases, 1 fact sheet distributed, 17 brochures distributed
- Presentations: 6, approximately 255 attendees – two Kahler Cr WS, two Connect, 1 Wheeler Co. Court, 1 WC meetings
- Workshops: One with OSU Extension Service (Pesticide) with 14 attendees
- Project Tours: 23 for funders, contractors, and agency personnel (222 attendees)
- Outreach Education: 17 events, 3+ schools, 108 attendees
- Website and Facebook continues to be used to share information utilized by Watershed Council & district: over 5,000 'hits

Planning and Projects:

- 5-year RCPP - $4.2 million (North Slope Ochoco Holistic Restoration)- Mountain, Bridge, Cherry (18 initial applications, 17 applications current year). Contracted: 3,138 ac brush management (680 ac completed); 280 ac range planting, 23 spring developments (11 completed); 32,273' livestock pipelines (completed 3,450'), and 495 forest stand improvement (276 completed). Completed: 5,701 watering facilities; 20,280' irrigation pipelines; 3 water control structures.
- Acres in WQ projects: 6,860.3 acres
- Juniper removal: 5,381 acres; and 84 removed along Muddy Creek
- Weed treatment: 1,344 acres yellow starthistle, Early Detection Rapid Response monitoring 100,000+ acres; olive removal 64 ac
- Spring developments 18; Troughs 25; Cistern 1; Fencing 26.82 ac, 9,100 ft, 2 spring boxes
- Re-seeding and range seeding: 4,350 acres
- Culverts 9; Diversions 3; Bridges 5; Fish Screen 2; Fish passage barrier removal: 15 sites
- Pipeline: Ditch to pipe 20,300 ft; Irrigation improvement 71.3 acres
- Streambank: Historic channel restoration 1,584 ft; Stream Improvement/Treatment 3 areas plus 164 ac, 12,509 ft; Riffles 1 site plus 25; stream structures added 45; large rocks 135; logs 120; root wads 95
- BDA installations: 61
- Plantings / Rooted Stock (including Aspen): 37,350 pieces; Aspen stands protected 16
- CREP Enrollment: 425 acres, 2 springs developed, 26.56 miles fence
- Conservation plans: 8
- Exclusion fencing 20,762.4 ft; cross fencing 9,955 ft
- Fishway: 1, Bypass channel: 1

Monitoring:

- Mountain Creek Reach Evaluation and Focus Area Action Plan; Mountain Creek Effectiveness Monitoring: 8 sites
- Monitoring, Interval, or Summary reports: 23; Completion reports: 28

Funding and Grants:

- Grants submitted: total 70 (Focus Area: 41)
- District Revenue 2015-2017 projects from grants, cooperative agreements and contracts $1,852,736; Watershed Council grants $228,700; RCPP contract $201,295 **Total (District, WC, RCPP) 2015-2017: $2,282,731**
- Funding Partners: OWEB (Large and small grants), CTWS, BPA, USDA NRCS, ODA, OSWB, USFS Title II, ODFW, USFWS, MJD-BC Watershed Council, EcoTrust, and others
- Agency Partners meetings attended: NRCS Priority Planning and Work Group, Lower John Day (LJD) Partnership, LJD Working Group, BPA Coordination

4.3 Monitoring—Status and Trends

4.3.1 Water Quality

DEQ

For this biennial review, DEQ reviewed data from 54 monitoring stations, of which three had sufficient data for this status and trends analysis (DEQ. *Middle John Day AgWQ Management Area: DEQ's Water Quality Status and Trends Analysis for the Oregon Department of Agriculture's Biennial Review of Agricultural Area Rules and Plan.* 29pp. 2018*)*.

The main concerns are highlighted in grey and discussed below. Some values were estimated by ODA staff from the DEQ graphs (indicated with '~'). Based on the data available for this report, the water

quality of the John Day River at Service Creek appears to be good. Continuous dissolved oxygen, pH, and temperature data would be needed to evaluate water quality further. Temperature conditions in Pine Creek appear to be improving while Bridge Creek shows no trend at this point.

Figure 3: DEQ Graph – Monitoring Station Locations

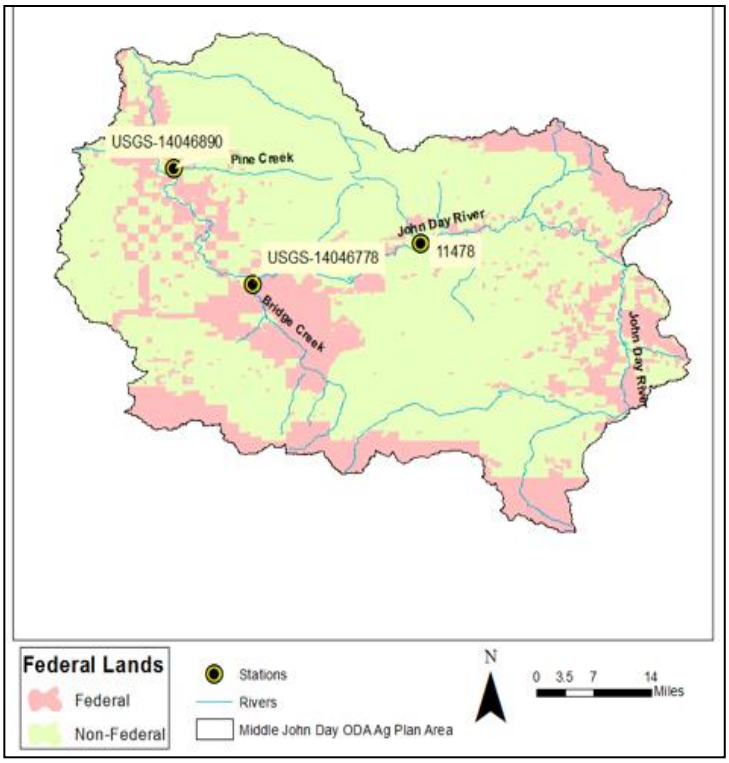


Table 9: DEQ Monitoring Stations

Site ID	Site Description	*E. coli*	pH	Temperature	Dissolved Oxygen	Total Suspended Solids	Total Phosphorus
		# exceeding standard/N[1]				# >25 mg/L[2]/N[1]	median
11478	John Day River at Service Creek	1/105[4]	0/109[5]	-	0/109	11/105	~0.05
14046890	Pine Creek near Clarno	-	-	917/5010[5]	-	-	-
14046778	Bridge Creek above Coyote Canyon, near Mitchell	-	-	1607/4170		-	-

[1] N = total # of observations

[2] The John Day TMDL mentiones that sediment is a stressor for macroinvertebrates but does not provide a numeric target. The 25 mg/L value was provided informally by DEQ as a qualitative guideline to compare results against. It is half of the concentration limit set for the Snake River tributaries in the Snake River Hells Canyon TMDL (2004).

[3] Few basins have TMDL targets; Snake River TMDL load allocation = 0.07 mg/L, EPA guideline is <0.1 mg/L

[4] Statistically significant degrading trend

[5] Statistically significant improving trend

Based on this analysis:

- John Day River: none of the parameters analyzed are of concern, including the very slight increasing trend in *E. coli*. Measured *E. coli* levels were low (most <50/100mL compared to a standard of 408). An analysis of stream temperature data is needed.

- Tributaries: both locations had regular seasonal exceedances of the temperature standard, but Pine Creek has a significantly improving trend, most noticeable in the last five years. More data are needed to determine the reason for that improvement and whether there are additional water quality concerns in the tributaries.

Figure 4: *E. coli* Levels – John Day River at Service Creek

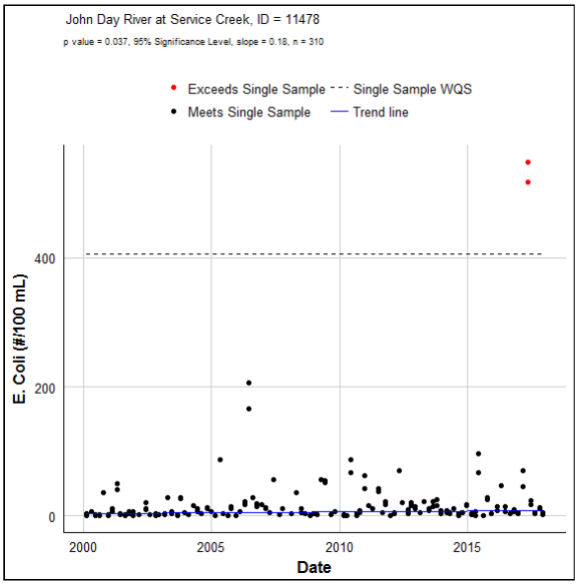
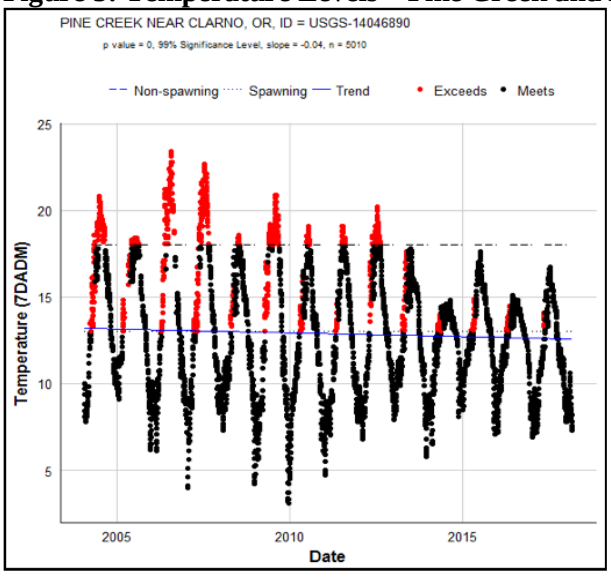
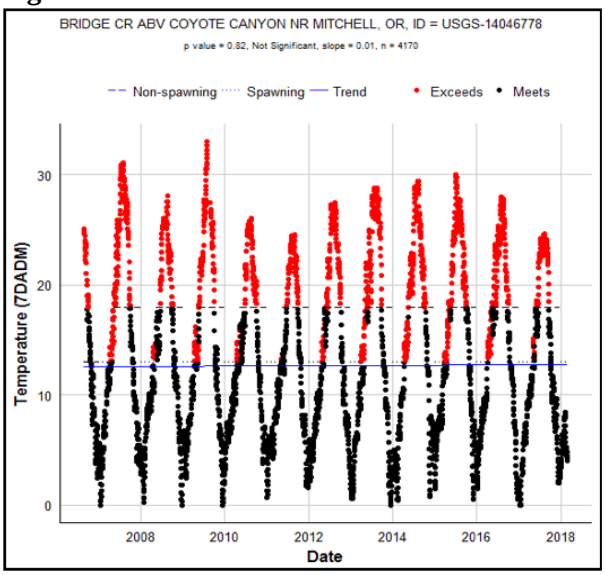


Figure 5: Temperature Levels – Pine Creek and Bridge Creek





4.4 Biennial Reviews and Adaptive Management

Summary of Impediments:

- Lack of monitoring that provide information to evaluate improvement actions made in the management area.
- Poor water quality and quantity coming off of public lands affect agriculture's ability to maintain or improve water conditions.

Recommendations for Modifications:

- Funds to complete monitoring efforts to enhance the quality of the Area Plan.
- Have public lands collaborate and work with local SWCD/Watershed Councils for a more comprehensive approach to improve water quality/quantity.

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