Oregon
Department
of Agriculture

Middle John Day Agricultural Water Quality Management Area Plan

Developed by the:

Oregon Department of Agriculture

and

Middle John Day Local Advisory Committee

With support from the:

Wheeler Soil and Water Conservation District

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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
BLM – Bureau of Land Management
BPA – Bonneville Power Administration
CAFO – Confined Animal Feeding Operation
cfs – Cubic feet per second
CNPCP – Coastal Nonpoint Pollution Control Program
CREP – Conservation Reserve Enhancement Program
CRP - Conservation Reserve Program
CWA – Clean Water Act
CZARA – Coastal Zone Act Reauthorization Amendments
DEQ – Oregon Department of Environmental Quality
DMA – Designated Management Agency
EQIP – Environmental Quality Incentive Program
Extension – Oregon State University Extension
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
OCA – Oregon Cattleman's Association
ODA – Oregon Department of Agriculture
ODF – Oregon Department of Forestry
OHA – Oregon Health Authority
ORS – Oregon Revised Statute
OWEB – Oregon Watershed Enhancement Board
PMP – Pesticides Management Plan
PSP – Pesticides Stewardship Partnership
RM – River Mile
SIA – Strategic Implementation Area
SWCD – Soil and Water Conservation District
Tribes – Confederated Tribes of the Warm Springs Reservation
TMDL – Total Maximum Daily Load
USDA – United States Department of Agriculture
US EPA – United States Environmental Protection Agency
USFS – United States Forest Service
WQPMT – Water Quality Pesticides Management Team
WRD – Water Resources Department

Foreword

This Agricultural Water Quality Management Area Plan (Area Plan) provides guidance for addressing water quality due to agricultural activities in the Agricultural Water Quality Management Area (Management Area). The purpose of the Area Plan is to identify 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) that are enforced by the Oregon Department of Agriculture (ODA).

Nothing in this Area Plan should be interpreted as an attempt to intrude on, or usurp, private property rights. Instead, it is the best efforts of the LAC to develop a plan that gives landowners guidelines to address water quality as it may be affected by conditions on agricultural and rural land in the management area and for meeting applicable statutes and administrative rules related to water pollution control.

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, Agricultural Water Quality Management Area Rules (Area Rules), and available beneficial or effective practices to address water quality issues.

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

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

Chapter 1: Agricultural Water Quality Management Program Purpose and Background

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

As part of Oregon's Agricultural Water Quality Management Program (Ag Water Quality Program), the Area Plan guides landowners and partners such as Soil and Water Conservation Districts (SWCDs) in addressing water quality issues due to agricultural activities. The purpose of the Area Plan is to identify strategies to prevent and control water pollution from agricultural activities and soil erosion (ORS 568.909(2)) on agricultural and rural lands for the area within the boundaries of 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 Agricultural Water Quality Management Area Local Advisory Committee (LAC), with support and input from the SWCD and the Oregon Department of Environmental Quality (DEQ). The public was invited to participate in the original development and approval of the Area Plans and is invited to participate in the biennial review process. The Area Plan is implemented using a combination of outreach, conservation and management activities, compliance with Area Rules developed to implement the Area Plan, monitoring, evaluation, and adaptive management.

The provisions of the Area Plan do not establish legal requirements or prohibitions (ORS 568.912(1)). Each Area Plan is accompanied by Area Rules that describe local agricultural water quality regulatory requirements. ODA will exercise its regulatory authority for the prevention and control of water pollution from agricultural activities under the Ag Water Quality Program's general regulations (OAR 603-090-0000 to 603-090-0120) and under the Area Rules for this Management Area (OAR 603-095-2540). 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 its associated regulations apply to all agricultural activities on non-federal and non-Tribal Trust land within this Management Area, including:

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

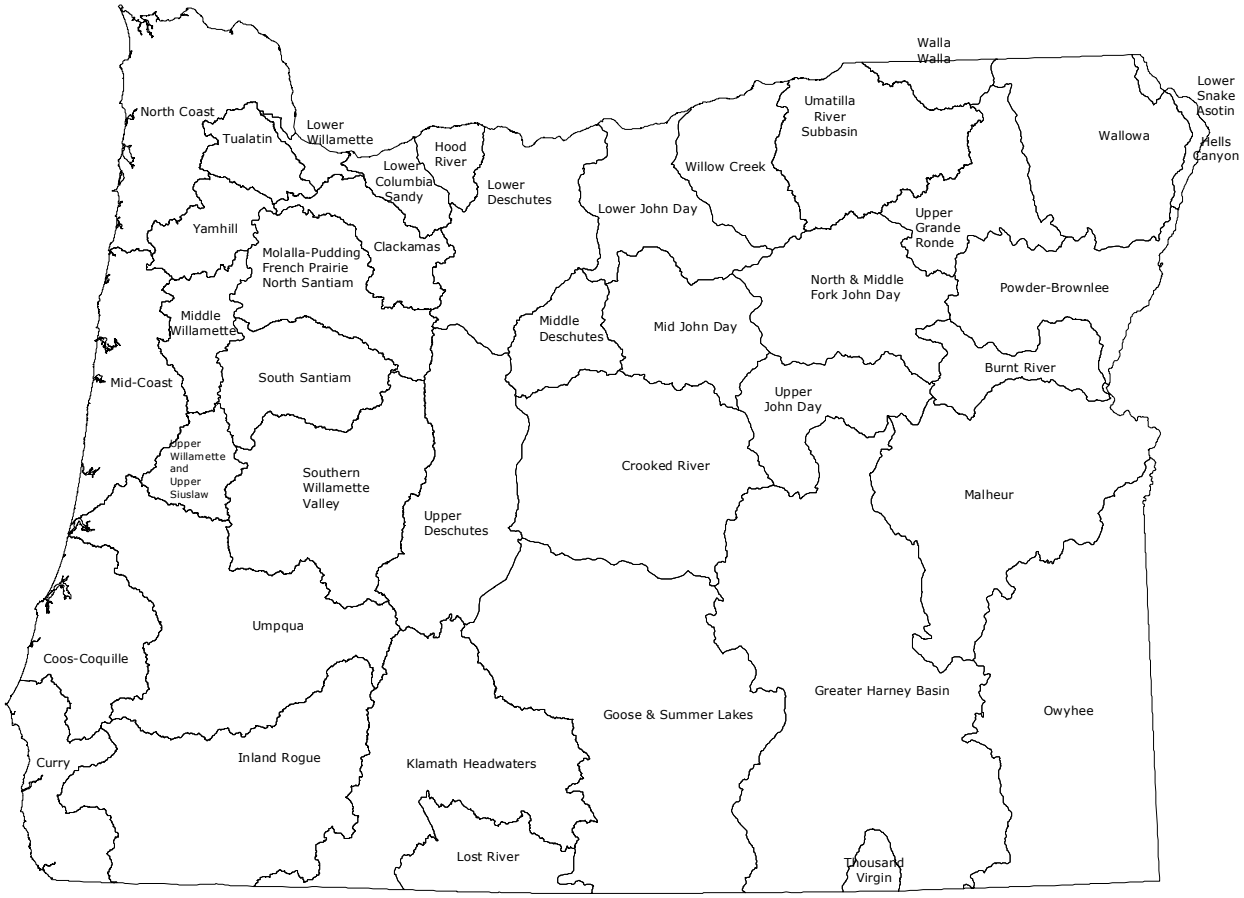
1.2 History of the Ag Water Quality Program

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, soil erosion, and to achieve water quality standards (ORS 568.900 through ORS 568.933). Senate Bill 502 was passed in 1995 to clarify that ODA regulates agriculture with respect to water quality (ORS 561.191). The Area Plan and its associated 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 associated 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 associated Area Rules.
- Monitoring, evaluation, and adaptive management.
- Developing partnerships with SWCDs, state and federal agencies, tribes, watershed councils, and others.

Figure 1: Map of 38 Agricultural Water Quality Management Areas



1.3 Roles and Responsibilities

1.3.1 Oregon Department of Agriculture

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

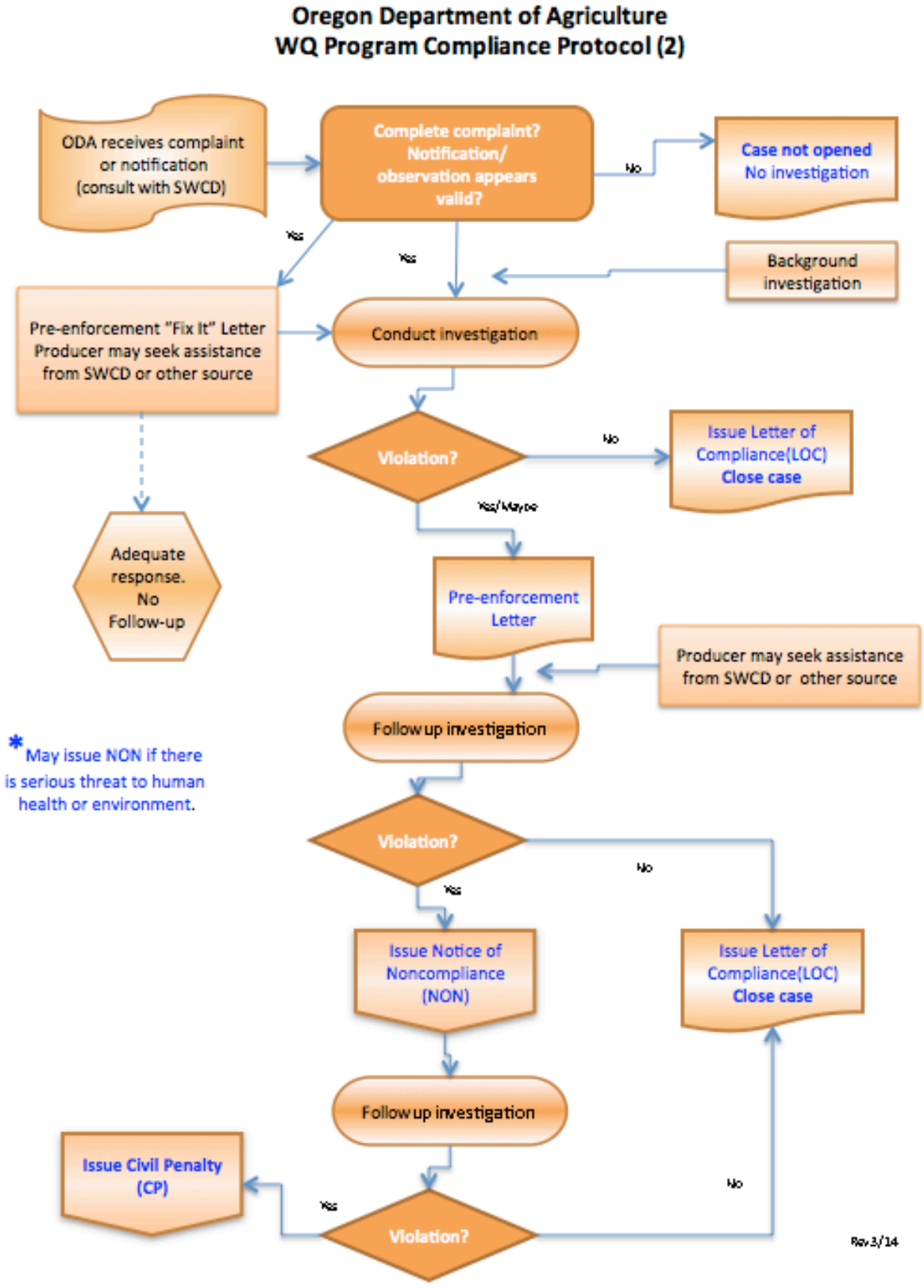
- State water quality standards.
- Load allocations for agricultural nonpoint source pollution assigned under Total Maximum Daily Loads (TMDLs) issued pursuant to the Clean Water Act (CWA), Section 303(d).
- Approved management measures for Coastal Zone Act Reauthorization Amendments (CZARA).
- Agricultural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

The Oregon Department of Agriculture has the legal authority to develop and implement Area Plans and associated 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 has responsibility 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 emphasis of the Area Plan is on voluntary action by landowners or operators to control the factors affecting water quality in the Management Area. The Area Rules are outlined as a set of minimum standards that landowners and operators must be met on all agricultural or rural lands.

ODA will use enforcement where appropriate and necessary to gain compliance with agricultural water quality rules. Figure 2 outlines ODA's compliance process. Any enforcement action will be pursued 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 Order such as a Notice of Noncompliance. If a Notice of Noncompliance is issued, ODA will direct the landowner or operator 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, civil penalties may be assessed for continued violation of the rules. See the Compliance Flow Chart for a diagram of the compliance process. If and when other governmental policies, programs, or rules conflict with the Area Plan or associated Area Rules, ODA will consult with the appropriate agencies to resolve the conflict in a reasonable manner.

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 agreement between ODA and each SWCD. Each SWCD implements the Area Plan by providing outreach and technical assistance to landowners. SWCDs also work with ODA and the LAC to establish implementation priorities, evaluate progress toward meeting Area Plan goals and objectives, and revise the Area Plan and associated regulations as needed.

1.3.3 Local Advisory Committee

For each Management Area, the director of ODA appoints an LAC (OAR 603-090-0020) with as many as 12 members to assist with the development and subsequent biennial reviews of the local Area Plan and associated Area Rules. The LAC serves in an advisory role to the director of ODA and to the Board of Agriculture. LACs are composed primarily of agricultural landowners in the Management Area and must reflect a balance of affected persons.

The LAC may meet as frequently as necessary to carry out their responsibilities, which include but are not limited to:

- Participate in the development and ongoing revisions of the Area Plan.
- Participate in the development and revisions of the Area Rules.
- Recommend strategies necessary to achieve the goals and objectives in the Area Plan.
- Participate in biennial reviews 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 Agriculture's Role

Each individual landowner or operator in the Management Area is required to comply with the Area Rules, which set minimum standards. However, the Area Rules alone may not be enough in every Management Area. Each landowner and operator in the Management Area is required to comply with the Area Rules. Landowners also are encouraged to engage in restoration activities to achieve the goals and objectives of the Area Plan. Each landowner and operator's actions will contribute toward achievement of the water quality standards.

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

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

- Conditions resulting from unusual weather events.
- Hot springs, glacial melt water, extreme or unforeseen weather events, and climate change.
- Septic systems and other sources of human waste.
- Public roadways, culverts, roadside ditches and shoulders.
- Dams, dam removal, hydroelectric plants, and non-agricultural impoundments.

- Housing and other development in agricultural areas.
- Other circumstances not within the reasonable control of the landowner or operator.

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

1.3.5 Public Participation

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

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

1.4 Agricultural Water Quality

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 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 impacted from 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 impacted in this Management Area are summarized in Chapter 2.

Many water bodies throughout Oregon do not meet state water quality standards. Many of these water bodies 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, nitrates, pesticides, and mercury. These parameters vary by Management Area and are summarized in Chapter 2.

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

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

A TMDL includes an assessment of water quality data and current conditions and describes a plan to achieve conditions so that water bodies will meet water quality standards. TMDLs specify the daily amount of pollution a water body can receive and still meet water quality standards. In the TMDL, point sources are allocated pollution limits as "waste load allocations" that are then incorporated in NPDES waste discharge permits, while a "load allocation" is attributed to nonpoint sources (agriculture, forestry, and urban). The agricultural sector is responsible for helping achieve the pollution limit by meeting 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, and not just to an individual water body 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 this Management Area. Biennial reviews and revisions to the Area Plan and associated regulations must address agricultural or nonpoint source load allocations from relevant TMDLs.

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

1.4.4 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 into all of the Area Rules.

ORS 468B.025 states that:

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

The aspects of ORS 468B.050 that apply to the Ag Water Quality Program, state that:

> "(1) Except as provided in ORS 468B.053 or 468B.215, without holding a permit from the Director of the Department of Environmental Quality or the State Department of Agriculture, which permit shall specify applicable effluent limitations, a person may not:
>
> > (a) Discharge any wastes into the waters of the state from any industrial or commercial establishment or activity or any disposal system."

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

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

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

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

1.4.5 Streamside Vegetation and Agricultural Water Quality

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

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

- Streamside vegetation improves water quality related to multiple pollutants, including: temperature (heat), sediment, bacteria, nutrients, toxics, and pesticides.
- Streamside vegetation provides fish and wildlife habitat.
- Landowners can improve streamside vegetation in ways that are compatible with their operation. Streamside conditions may be improved without the removal of the agricultural activity, such as with managed grazing.
- Streamside vegetation condition is measureable 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 outside the program's regulatory purview (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 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 all streams flowing through agricultural lands. The area rules for each Management Area require that agricultural activities provide the water quality functions equivalent to what site-capable vegetation would provide.

In some cases, for narrow streams, mature site-capable vegetation such as tall trees may not be needed. 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.

ODA does not consider invasive, non-native plants such as introduced varieties of reed canary grass and blackberry to be site-capable vegetation. In many cases, this type of vegetation is removed through voluntary activities and incentives with control and restoration projects. However, noxious weeds, as designated by the Oregon State Weed Board, are invasive plants that pose a public menace, and can negatively impact water quality and watershed health. Public and private landowners in Oregon are responsible for eliminating and intensively controlling noxious weeds. For further information, visit the following link: www.oregon.gov/ODA/programs/Weeds.

1.5 Other Water Quality Programs

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

1.5.1 Confined Animal Feeding Operation Program

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. Since the early 1980s, CAFOs in Oregon have been registered to a general Water Pollution Control Facility permit designed to protect water quality, while allowing the operators and producers to remain economically viable. A properly maintained CAFO does not pollute ground or surface water. To assure continued protection of ground and surface water, the 2001 Oregon State Legislature directed ODA to convert the CAFO Program from a Water Pollution Control Facility permit program to a federal National Pollutant Discharge Elimination System (NPDES) program. Oregon Department of Agriculture and DEQ jointly issue the NPDES CAFO Permit, which complies with all CWA requirements for CAFOs. This permit does allow discharge in certain circumstances as long as the discharge does not violate water quality standards.

Oregon NPDES CAFO permits require the registrant to operate according to a site-specific, ODA-approved, Animal Waste Management Plan that is incorporated into the NPDES CAFO permit by reference.

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: the Lower Umatilla Basin GWMA, the Northern Malheur County GWMA, and the Southern Willamette Valley GWMA. Each GWMA has a voluntary action plan to reduce nitrate concentrations in groundwater. After a scheduled evaluation period, if DEQ determines that the voluntary approach is not effective, then 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 associated 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 program.

Through the PSP, state agencies and local partners work together to monitor pesticides in streams and to improve water quality (www.deq.state.or.us/wq/pesticide/pesticide.htm). ODA, Department of Environmental Quality, and Oregon State University Extension Service work with landowners, SWCDs, watershed councils, and other local partners to voluntarily reduce pesticide levels while improving water quality and crop management. Since 2000, the PSPs have made noteworthy progress in reducing pesticide concentrations and detections.

Oregon Department of Agriculture led the development and implementation of a Pesticides Management Plan (PMP) for the state of Oregon (*www.oregon.gov/ODA/programs/Pesticides/water/pages/AboutWaterPesticides.aspx*). The PMP, completed in 2011, strives to protect drinking water supplies and the environment from pesticide contamination, while recognizing the important role that pesticides have in maintaining a strong state economy, managing natural resources, and preventing human disease. By managing the pesticides that are

approved for use by the United States Environmental Protection Agency (US EPA) and Oregon in agricultural and non-agricultural settings, the PMP sets forth a process for preventing and responding to pesticide detections in Oregon's ground and surface water resources.

1.5.5 Drinking Water Source Protection

Oregon implements its drinking water protection program through a partnership between DEQ and OHA. The program provides individuals and communities with information on how to protect the quality of Oregon's drinking water. Department of Environmental Quality 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.deq.state.or.us/wq/dwp/dwp.htm.

1.6 Partner Agencies and Organizations

1.6.1 Oregon Department of Environmental Quality

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

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

The MOA includes the following commitments:

- ODA will develop and implement a monitoring strategy, as resources allow, in consultation with DEQ.
- ODA will evaluate the effectiveness of Area Plans and associated Area Rules in collaboration with DEQ.
    - ODA will determine the percentage of lands achieving compliance with Management 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 its associated Area Rules. The petition must allege, with reasonable specificity, that the Area Plan or Area Rules are not adequate to achieve applicable state and federal water quality standards (ORS 568.930(3)(a)).

1.6.2 Other Partners

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

1.7 Measuring Progress

Agricultural landowners and operators 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. ODA is working with SWCDs, LACs, and other partners to develop and implement strategies that will produce measurable outcomes. ODA also is working with partners to develop monitoring methods to document progress.

1.7.1 Measurable Objectives

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.

After ODA, the LAC, and the LMA establish measurable objectives and associated milestones, they will evaluate progress toward the milestones at each biennial review of the Area Plan. Using adaptive management, the biennial review will evaluate progress toward the most recent milestone(s) and why they were or were not achieved. ODA, the LAC, and LMA will evaluate whether changes are needed to keep on track for achieving the longer-term measurable objective(s), and will revise strategies to address obstacles and challenges.

Measurable objectives allow the Ag Water Quality Program to better evaluate progress toward meeting water quality standards. 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 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 nutrients, because many pesticides and nutrients adhere to sediment particles.

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

- Landowners can see land conditions and have direct control over them.
- It can be difficult to separate agriculture's influence on water quality from other land uses.

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

Water quality monitoring data may 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 or concerns associated with agriculture. Through the Focus Area process, the SWCD delivers systematic, concentrated outreach and technical assistance in small geographic area. A key component of this approach is measuring land conditions before and after implementation, to document the progress made with available resources. The Focus Area approach is consistent with other agencies' and organizations' efforts to work proactively in small geographic areas, and is supported by a large body of scientific research (e.g., Council for Agricultural Science and Technology, 2012).

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

Working within a Focus Area is not intended to prevent implementation within the remainder of the Management Area. The 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 agricultural water quality regulations, 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 agricultural water quality regulations. Finally, ODA completes a post-assessment to document progress made in the watershed. Chapter 3 describes any SIAs that are underway in this Management Area.

1.8 Monitoring, Evaluation, and Adaptive Management

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

1.8.1 Statewide Aerial Photo Monitoring of Streamside Vegetation

Starting in 2003, ODA began evaluating streamside vegetation conditions using aerial photos. Stream segments representing 10 to 15 percent of the agricultural lands in each Management Area were randomly selected for long-term aerial photo monitoring. Stream segments are generally 3-5 miles long. ODA evaluates streamside vegetation at specific points within 30-, 60-, and 90-foot bands along both sides of stream segments from the aerial photos and assigns each segment a score based on streamside vegetation. The score can range from 70 (all trees) to 0 (all bare ground). The same stream segments are re-photographed and re-scored every five years to evaluate changes in streamside vegetation conditions over time. Because site capable vegetation varies across the state, there is no single "correct" streamside vegetation index score. The purpose of this monitoring is to measure positive or negative change. The results for this Management Area are summarized in Chapter 4.

1.8.2 Agricultural Ambient Water Quality Monitoring

The Oregon Department of Agriculture evaluates water quality data from DEQ's long-term monitoring sites to determine trends in water quality at agricultural sites statewide. Results from monitoring sites in this Management Area, along with local water quality monitoring data, are described in Chapter 4.

1.8.3 Biennial Reviews and Adaptive Management

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

Chapter 2: Local Background

2.1 Local Roles and Responsibilities

2.1.1 Local Advisory Committee

The Area Plan was developed with the assistance of the LAC. The LAC was formed in 2003 to assist with the development of the Area Plan and associated regulations, and with subsequent biennial reviews. Current LAC members are:

Name	Location	Description
Ted Molinari (Chair)	Fossil	Hay, cattle, grain, timber, Christmas trees, SWCD Board
John Aaron	Heppner	Timber
Matt Smith	Bend, Ashwood, Cherry Creek	Hay, Cattle Investment properties
Charlotte Barker	Kimberly	Cattle
Chris Perry	Twickenham Keyes Ck	County Judge
Adam Temple	Twickenham	Hay
Lee Hoover	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

The implementation of the Area Plan is accomplished through an Intergovernmental Agreement between ODA and the Wheeler SWCD. This Intergovernmental Agreement defines the SWCD as the LMA for implementation of the Area Plan. The SWCD was/were also involved in development of the Area Plan and associated regulations.

2.2 Area Plan and Regulations: Development and History

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

Since approval, the LAC met in 2006, 2008, 2010, 2012, and 2014 to review the Area Plan and associated regulations. 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

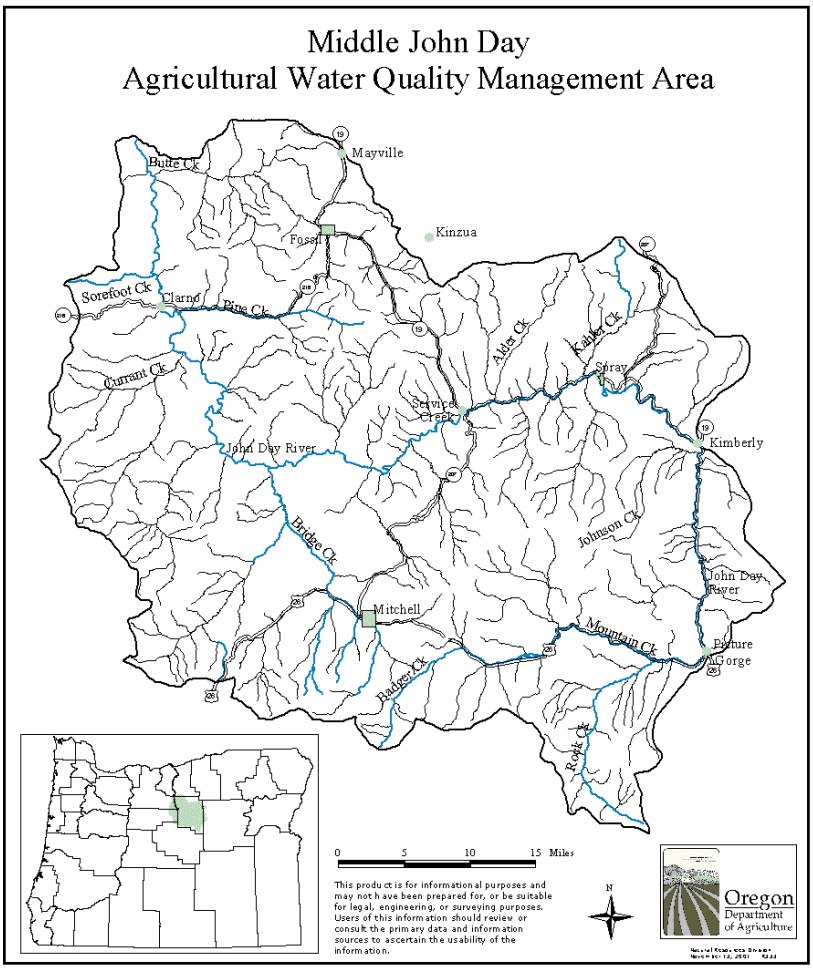
The John Day River Basin is an 8,100 square mile drainage area, the fourth largest basin in the state. The flows originate in the Blue Mountains and flow generally westward and then northward for approximately 284 miles, discharging into the Columbia River east of Rufus, at River Mile (RM) 218. The John 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 subbasin is an area of 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 49° F, with the average low of 33° F and average high of 68° F.

The subbasin 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.

2.3.1 Map of the Management Area



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

Geology

The Middle John Day River region 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 Middle John Day 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

subbasin is fairly dry. Flows are determined more by input from upper basin tributaries than by inputs from lower basin tributaries. Smaller streams in the subbasin 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 subbasin, 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, giving the appearance of a more serious sediment-loading problem.

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 probably are unused. There also are rights for about four cubic feet per second (cfs) for municipal use, the majority for the town of Spray.

The Water Resources Department (WRD) approves the in-stream water rights for fish protection minimizing the effects of pollution or maintaining 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 the John Day subbasin riparian and upland habitats. 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 in the Management Area

2.4.1 Local Issues of Concern

Temperature concerns in the Management Area were included by Oregon's DEQ on its 2010 303(d) list, which identifies 'water-quality limited' streams as required by the Federal Clean Water Act. Biological criteria concerns were also identified in a few streams.

2.4.2 303(d) List of Impaired Water Bodies

Section 303(d) of the CWA requires each state to develop a list of water bodies that do not meet the standards designed to protect the most sensitive beneficial use. Water bodies that do not meet standards are placed on the 303(d) water quality limited list.

Temperature "water quality limited" status has been assigned to many streams in the Middle John Day AgWQM 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 dissolved oxygen, sedimentation, and biological criteria.

Nine river segments in the Middle John Day River subbasin were declared 'water quality limited, TMDL needed'. Upon completion of the John Day Basin TMDL, those streams were removed from the Category 5 list and assigned to the Category 4A list (Water Quality Limited – TMDL Approved). In the future, when data show that water quality criteria have been met for these water bodies, they will be assigned to the Category 2 list (Attaining Water Quality Criteria).

2010 Water Quality Limited Streams - 303(d) List

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

Category 5, TMDL Needed

NAME	SEGMENT	PARAMETER
Bridge Creek	Mouth to RM 28.7	Sedimentation
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

2.4.3 Beneficial Uses and Parameters of Concern

Beneficial Uses
Water quality in the Middle John Day AgWQM 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)

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

Temperature
Water temperature is the most widespread concern in the basin. DEQ developed The John Day River Basin Total Maximum Daily Load and Water Quality Management Plan in 2010 to address temperature concerns (http://www.deq.state.or.us/WQ/TMDLs/docs/johndaybasin/TMDLandWQMPFINAL.pdf).

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 Oregon WRD 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.

For nonpoint sources of stream heating (e.g., vegetation disturbance, decreased flow, widened channels), which this plan addresses, the standard's specified temperature thresholds (biologically-based numeric criteria) are no longer targeted. Instead, the TMDL assessment establishes that the thermal goal is a natural temperature pattern.

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.

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; and 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 (NPDES) point sources. Small reservoirs and warm irrigation return flows.
Margin of Safety	Implicit
Reserve Capacity	0.2 ºC – in general 0.1 ºC – within thermal overlap with point sources

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

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.

2.4.4 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 Prevention and Control Measures

A landowner or operator'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 1) more detailed information related to potential agricultural water quality concerns, 2) dates when rules are effective, and 3) some exemptions to the rules. Criteria to determine measures to be implemented will be applied with consideration of agricultural and economic impacts.

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.

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.

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.

2.5.1 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.

Uplands 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.

2.5.2 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.

2.5.3 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 WRD 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 WRD 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.

2.5.4 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.

Chapter 3: Measurable Objectives and Strategic Initiatives

Goals

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 Strategic Initiatives

3.1.1 Focus Area(s)

The current Focus Area for this Management Area is Mountain Creek Reach Evaluation. The Wheeler SWCD is improving water quality by working with landowners along 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.

The Wheeler SWCD will report the results to ODA at the end of each fiscal biennium via the Action Plan. As part of the next Biennial Review, ODA will summarize the results in Chapter 4, discuss and evaluate progress with the LAC, and use adaptive management to adjust implementation strategies if needed.

3.1.2 Strategic Implementation Area

Currently, there is no SIA in the Management Area.

3.2 Measurable Objectives

A measurable objective is a numeric long-term outcome with a date by which we want to achieve it. Milestones are the interim steps needed to achieve the measurable objective, and usually consist of numeric short-term targets to reach by specific dates. Together, the milestones define the timeline needed to achieve the measurable objective.

Measurable Objectives are being developed to measure progress and effectiveness of Oregon's efforts to protect and improve agricultural water quality. The intent is to show that Oregon agriculture is improving water quality and the state and federal financial investment in agricultural water quality improvements are paying off and showing measurable results. Measurable Objectives need to be specific, measurable, achievable, relevant, and time-bound.

3.2.1 Basin / Management Area Measurable Objectives and Milestones

ODA will work with the SWCD and the LAC over the next two years and develop Management Area Measurable Objectives.

3.2.2 Focus Area Measurable Objectives and Milestones

Current Conditions (From Pre-Assessment)
In 2015: From field survey:

- Project Reach 1 average percent shade is 15.10%
- Project Reach 2 average percent shade is 17.06%
- Project Reach 3 average percent shade is 12.05%
- Control Reach 1 average percent shade is 10.14%

In 2015: From field survey:

- Project Reach 1 average percent erosion is 27.40%
- Project Reach 2 average percent erosion is 19.09%
- Project Reach 3 average percent erosion is 31.25%
- Control Reach average percent erosion is 27.97%

Established stream temperature baseline as 50.31F° from Reach Evaluation survey data gathered April 4, 2012.

Established stream flow baseline as 23.27 cfs from Reach Evaluation survey data gathered April 4, 2012.

Focus Area Milestones for 2015-2017

- By June 30, 2017: From field survey: For Project Reach 1 increase average shade to 16.10 (1% increase)
- By June 30, 2017: From field survey: For Project Reach 2 increase average shade to 18.06 (1% increase)
- By June 30, 2017: From field survey: For Project Reach 3 increase average shade to 13.05 (1% increase)
- By June 30, 2017: From field survey: For Control Reach 1 increase average shade by 0%
- By June 30, 2017: From field survey: For Project Reach 1 decrease average erosion to 24.66 (10% decrease)
- By June 30, 2017: From field survey: For Project Reach 2 decrease average erosion to 17.18 (10% decrease)
- By June 30, 2017: From field survey: For Project Reach 3 decrease average erosion to 28.13 (10% decrease)
- By June 30, 2017: From field 0% survey: For Control Reach 1 decrease average erosion by 0%

Focus Area Measurable Objectives

- Increase stream flow by 5% by October 2017
- Increase stream shading in buffer areas by 40% by 2025, with a progress update in 2019

3.3 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.

3.3.1 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.

3.3.2 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 SWCD, 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
  - SWCD, 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 (OCA)/Extension
  - Ranch Water Quality Planning Workbook, Extension
  - Oregon Plan Toolbox, Oregon Watershed Enhancement Board (OWEB)
- ***Programs***
  - Farm*A*Syst Program, Extension
  - Stream*A*Syst Program, Extension
  - Home*A*Syst Program, 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 (EQIP), Conservation Reserve Program (CRP), 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. The local watershed councils and several federal and state agencies are also available to provide technical assistance or financial assistance to private landowners.

3.4 Monitoring and Evaluation

Statewide monitoring and evaluation of water quality and streamside conditions on agricultural lands

ODA conducts monitoring at a statewide level and analyzes other agencies' and organizations' monitoring data to answer several monitoring questions related to agriculture and water quality.

- What are current water quality and landscape conditions in agricultural areas in Oregon?
- What are water quality trends?
- How well does the existing monitoring network assess agricultural water quality trends and streamside conditions in Oregon?
- What are riparian vegetation trends along agricultural lands in Oregon?
- How do riparian conditions compare with site capabilities?
- How do riparian vegetation conditions change in aerial photos of selected stream reaches?

- How do changes in riparian vegetation condition compare with trends in water quality in monitored watersheds?

Water quality data assessment

ODA currently evaluates other agencies' and organizations' water quality data to answer the following questions:

- What water quality and land condition data from agricultural watersheds are available?
- What are trends in available water quality and land condition data in agricultural watersheds since Area Plan and Rule adoption, and since the last biennial review?

To be considered in the evaluation, data must meet the following criteria:

- Monitoring stations have to have at least partial influence from agricultural lands;
- Data cannot be older than 1985;
- Data must be a continuous record of at least two years (though the frequency of monitoring was not considered);
- Data set must include at least the following constituents:
    - Total suspended solids
    - Nitrate
    - Ammonia
    - E.coli or fecal coliform
    - Total phosphorus or orthophosphate
    - Dissolved oxygen, or chemical oxygen demand/biological oxygen demand
    - pH

Data are reviewed every two years and summarized to the LACs and SWCD during the biennial review process.

Chapter 4: Implementation, Monitoring, and Adaptive Management

4.1 Progress Toward Management Area Measurable Objectives

ODA will work with the SWCD and the LAC over the next two years and develop a Management Area Measurable Objective.

4.2 Progress Toward Mountain Creek Reach Evaluation Focus Area Measureable Objectives

Focus Area Measureable Objectives

- Increase stream flow by 5% by October 2017
- Increase stream shading in buffer areas by 40% by 2025, with a progress update in 2019

Pre and Post-Implementation Assessments 2015-2017

	Focus Area Water Quality Monitoring				
	2013	**2015**	**2016**	**2017**	**2025**
Water Temperature	50.31 °F	48.31 °F			
Stream Flow	23.27 cfs	165 cfs			

		Focus Area Stream Reach Buffer Tree/Bush Vegetation Percentage Total Shade			
		October 2015	**October 2016**	**October 2017**	**October 2025**
Improvement Reach	1 (11.11-12.82 miles)	15.10			
	2 (14.26-14-91 miles)	17.06			
	3 (32.90-33.29 miles)	12.05			
	4 (27.54-28.76 miles; control reach)	10.14			

		Focus Area Percent of Stream Reach Active Erosion			
		October 2015	**October 2016**	**October 2017**	**October 2025**
Improvement Reach	1 (11.11-12.82 miles)	27.40			
	2 (14.26-14-91 miles)	19.09			
	3 (32.90-33.29 miles)	31.25			
	4 (27.54-28.76 miles; control reach)	27.97			

4.3 Activities and Accomplishments

Basin-wide Actions/Implementation Summary for the past two years.

Outreach and Education:

- Landowner contacts: 817 total (FA: 155); 26 new landowners – Tech Assistance: 234 times (96: Focus Area)
- Site visits/Evals (for LO's, grant requirements, progress monitoring, project monitoring/photos): 361 times (FA: 78)
- Public Displays: 10 venues/events – reaching approximately 3,910 viewers
- Newsletters: 2,936 distributed by mail/email; 5 articles/press releases
- Presentations: 14, approximately 574 attendees – 2014 Biennial Review, two Kahler Creek WS, three sessions at Connect, Wheeler Co. Court, Mid-C Forum, multiple WC meetings, multiple RCPP meetings
- Workshops: one with OSU (Pesticide)
- Project Tours: 15 for funders, contractors and agency personnel (62 attendees)
- Youth Education: 7 events, 3+ schools, 209 total youth and teachers
- Website continues to be used to share information; FaceBook utilized by WC: 1,333 'hits'

Planning and Projects:

- 5-year RCPP - $4.2 million (North Slope Ochocho Holistic Restoration)- Mountain, Bridge, Cherry (18 initial LO apps)
- Acres in WQ projects: 1,311.7 acres
- Juniper removal: 1.729 acres; Fuels Reduction 20 acres; Prescribed Burn: 300 acres
- Weed treatment: 460 acres; weed management/multiple projects (ie Early Detection Rapid Response) 100,000+ acres
- Spring Developments: 11; Troughs: 16; Fencing: 7,440
- Re-seeding and range seeding: 437 acres
- Culverts: 10; Diversions: 2; Bridges: 5; Fish Screen: 1
- Pipeline: 13,010 ft; Ditch to pipe: 4,080 ft; Irrigation improvement: 100 acres
- Streambank: Historic Channel Restoration- 1400 ft; Stream Improvement/Treatment: 10,085 ft; Riffles: 25; stream structures added: 45; large rocks: 78; whole tree: 1; logs: 100; rootwads: 115;
- Plantings / Rooted Stock (including Aspen): 10,404 pieces
- CREP Enrollment: 9 contracts; 526.21 acres

Monitoring:

- Mountain Creek Reach Evaluation and Action Plan
- Monitoring, Interval or Summary reports: 24; Completion reports: 36

Funding and Grants:

- Grants submitted: total 84 (Focus Area: 31)
- District Revenue 2014-2015 projects from grants, cooperative agreements and contracts: $1,430,969; Watershed Council grants: $203,886; EQIP dollars obligated: $621,648, for a total of 10,320 acres (including RCPP: $182,791 for 1,665 acres) – **Total (District, WC, EQIP) 2014-2015: $2,256,503**
- Funding Partners: OWEB (Large and Small grants), CTWS, BPA, USDA NRCS, ODA, OSWB, Title ll, ODF, ODFW, USFW, MJD-BC Watershed Council, EcoTrust, and others

- Agency Partners meetings attended: NRCS Priority Planning and Work Group, River Restoration NW, National Forest Collaboration, Streambank Bio Engineering, Lower John Day Partnership, LJD Working Group, BPA Coordination

4.4 Water Quality Monitoring—Status and Trends

One monitoring site meeting ODA's criteria is located on the mainstem John Day at the confluence with Service Creek. This site is continuously monitored by the DEQ, so it is suitable for baseline data and could potentially be used for trend monitoring.

Unlike the Lower John Day, agricultural development in the Middle John Day Basin appears sparse and scattered. With this in mind, ODA recommends the state establish a site on the mainstem of the river near the border with the Lower John Day Basin. This monitoring station should be established somewhere downstream of the confluence with Butte Creek, so that much of the influence from the one concentrated area of agriculture north of Fossil can be assessed, along with the rest of the basin.

Using the data from the Service Creek monitoring site, the number of samples needed to address the variability of pH, total phosphorus, and turbidity were calculated using confidence intervals of 0.5, 0.05, and 2, respectively. With these values, a new monitoring location on the John Day would need 15 samples a year to reliably measure pH, 148 samples to reliably measure total phosphorus, and 22 samples a year for turbidity. It may not be feasible to collect 148 samples for total phosphorus (TP). The available data for the Service Creek monitoring site does not indicate significant problems with the water quality variables, so this basin could be monitored for landscape condition instead of analyzing water samples.

As of February 2010, the John Day at Service Creek site had a few elevated concentrations of TP and total suspended solids (TSS) all during the month of April. This may be the result of snow melt-off events. There were no other problems with water quality at this site relevant to agricultural operations. Another site on the John Day River at Picture Gorge was found to have a large set of data only for the time period of 2005-2006. This data included some moderately high *E. coli* results (to 291) and high turbidity (up to 41 NTU). As of April 2011, there was no difference in water quality from that reported in February 2010.

In February 2012, analyzed data for the John Day at the Service Creek monitoring site were from August 2001 to October 2011. Review of these data showed no discernible trends in ammonia, *E. coli*, pH, nitrate, turbidity, or dissolved oxygen. There was an apparent increasing trend in total phosphorus but it was not statistically significant. Most of the total phosphorus values were also below 0.08 mg/l.

The 2014 data for the John Day at Service Creek station showed that it had a Water Quality Index score of 86, ranking it as Good. This score also showed an increasing trend from 2005 through 2014. However, its temperature and biological oxygen demand scores were ranked as poor, and pH was in a declining state, as was total solids. Total phosphorus was no longer decreasing in quality.

4.5 Biennial Reviews and Adaptive Management

The LAC met one time for the 2016 Biennial Review (06/29/2016). The biennial review meetings consisted of updating language throughout the Area Plan as well as discussing the New Chapter Format and Measurable Objectives.

ODA presented the program updates from the past two years. This included Demonstration Area/Focus Areas, Strategic Implementation Areas, and the new Chapter Format for the Area Plans. ODA presented the major edits of the Area Plan to the LAC.

Compliance Cases: Two enforcement cases occurred in the Management Area during the past two years. One case was located along Holmes Creek south of Kimberly. This case was regarding a concern that cattle were degrading the riparian area. The second case was located west of Picture Gorge along Hwy. 26. This case was regarding a concern that there was a lack of riparian vegetation along Birch Creek. Both cases have received a Letter of Compliance.

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