



**OREGON
DEPARTMENT OF
AGRICULTURE**

Burnt River Agricultural Water Quality Management Area Plan

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Developed by the

Oregon Department of Agriculture

and the

Burnt River Local Advisory Committee

with support from the

Burnt River Soil and Water Conservation District

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Table of Contents

Acronyms and Terms	<i>i</i>
Foreword	1
Required Elements of Area Plans	1
Plan Content	1
Chapter 1: Agricultural Water Quality Program	3
1.1 Purpose of Agricultural Water Quality Program and Applicability of Area Plans	3
1.2 History of the Ag Water Quality Program	3
1.3 Roles and Responsibilities	4
1.3.1 Oregon Department of Agriculture	4
1.3.2 Local Management Agency	7
1.3.3 Local Advisory Committee.....	7
1.3.4 Agricultural Landowners.....	7
1.3.5 Public Participation.....	8
1.4 Agricultural Water Quality	8
1.4.1 Point and Nonpoint Sources of Water Pollution	8
1.4.2 Beneficial Uses and Parameters of Concern	9
1.4.3 Impaired Waterbodies and Total Maximum Daily Loads.....	9
1.4.4 Oregon Water Pollution Control Law – ORS 468B.025 and 468B.050	9
1.4.5 Streamside Vegetation and Agricultural Water Quality	11
1.4.6 Soil Health and Agricultural Water Quality	11
1.5 Other Water Quality Programs	12
1.5.1 Confined Animal Feeding Operation Program	12
1.5.2 Groundwater Management Areas	12
1.5.3 The Oregon Plan for Salmon and Watersheds	12
1.5.4 Pesticide Management and Stewardship.....	13
1.5.5 Drinking Water Source Protection	13
1.6 Partner Agencies and Organizations	14
1.6.1 Oregon Department of Environmental Quality	14
1.6.2 Other Partners.....	14
1.7 Measuring Progress	14
1.7.1 Measurable Objectives.....	14
1.7.2 Land Conditions and Water Quality	15
1.7.3 Focused Implementation in Small Geographic Areas	16
1.8 Progress and Adaptive Management	16
1.8.1 Biennial Reviews	16
1.8.2 Agricultural Water Quality Monitoring.....	17
Chapter 2: Local Background	18
2.1 Local Roles	19
2.1.1 Local Advisory Committee.....	19
2.1.2 Local Management Agency.....	19
2.2 Area Plan and Area Rules: Development and History	19
2.3 Geographical and Physical Setting	19
2.4 Agricultural Water Quality	20
2.4.1 Water Quality Issues	20

2.4.1.1	Beneficial Uses	21
2.4.1.2	Water Quality Parameters of Concern	21
2.4.1.3	TMDLs and Agricultural Load Allocations	21
2.4.1.4	Drinking Water	21
2.4.1.5	GWMA	21
2.4.2	Sources of Impairment	22
2.5	Regulatory and Voluntary Measures	22
Chapter 3:	<i>Implementation Strategies</i>	25
3.1	Measurable Objectives and Strategic Initiatives	25
3.1.1	Management Area	25
3.1.2	Focus Areas	26
3.1.3	Strategic Implementation Areas (SIA)	27
3.1.4	Pesticide Stewardship Partnerships (PSP)	27
3.1.5	Groundwater Management Area (GWMA)	27
3.2	Proposed Activities	28
3.3	Additional Agricultural Water Quality and Land Condition Monitoring	30
3.3.1	Water Quality	30
3.3.2	Land Conditions	30
Chapter 4:	<i>Progress and Adaptive Management</i>	30
4.1	Measurable Objectives and Strategic Initiatives	30
4.1.1	Management Area	31
4.1.2	Focus Areas	31
4.1.3	Strategic Implementation Areas	31
4.1.4	Pesticide Stewardship Partnerships	31
4.1.5	Groundwater Management Area	32
4.2	Activities and Accomplishments	32
4.3	Additional Agricultural Water Quality and Land Condition Monitoring	34
4.3.1	Water Quality	34
4.3.2	Land Conditions	36
4.4	Biennial Reviews and Adaptive Management	36
Appendix A:	<i>2018/2020 Water Quality Limited List - 303(d)</i>	38

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Acronyms and Terms

Ag Water Quality Program – Agricultural Water Quality Program

Area Plan – Agricultural Water Quality Management Area Plan

Area Rules – Agricultural Water Quality Management Area Rules

CAFO – Confined Animal Feeding Operation

CWA – Clean Water Act

DEQ – Oregon Department of Environmental Quality

GWMA – Groundwater Management Area

HUC – Hydrologic Unit Code

LAC – Local Advisory Committee

LMA – Local Management Agency

Management Area – Agricultural Water Quality Management Area

NRCS – Natural Resources Conservation Service

OAR – Oregon Administrative Rules

ODA – Oregon Department of Agriculture

ORS – Oregon Revised Statute

OWEB – Oregon Watershed Enhancement Board

OWRI – Oregon Watershed Restoration Inventory

PSP – Pesticide Stewardship Partnership

SIA – Strategic Implementation Area

SWCD – Soil and Water Conservation District

TMDL – Total Maximum Daily Load

US EPA – United States Environmental Protection Agency

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Foreword

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

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

Required Elements of Area Plans

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

Plan Content

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

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

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

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

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Chapter 1: Agricultural Water Quality Program

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

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

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

Each Area Plan is accompanied by Area Rules that describe local agricultural water quality regulatory requirements. ODA will exercise its regulatory authority for the prevention and control of water pollution from agricultural activities under the Ag Water Quality Program's general regulations (OAR 603-090-0000 to 603-090-0120) and under the Area Rules for this Management Area (OAR 603-095-3200). The general regulations guide the Ag Water Quality Program, and the Area Rules for the Management Area are the regulations with which landowners must comply. Landowners are encouraged through outreach and education to implement conservation and management activities.

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

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

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

1.2 History of the Ag Water Quality Program

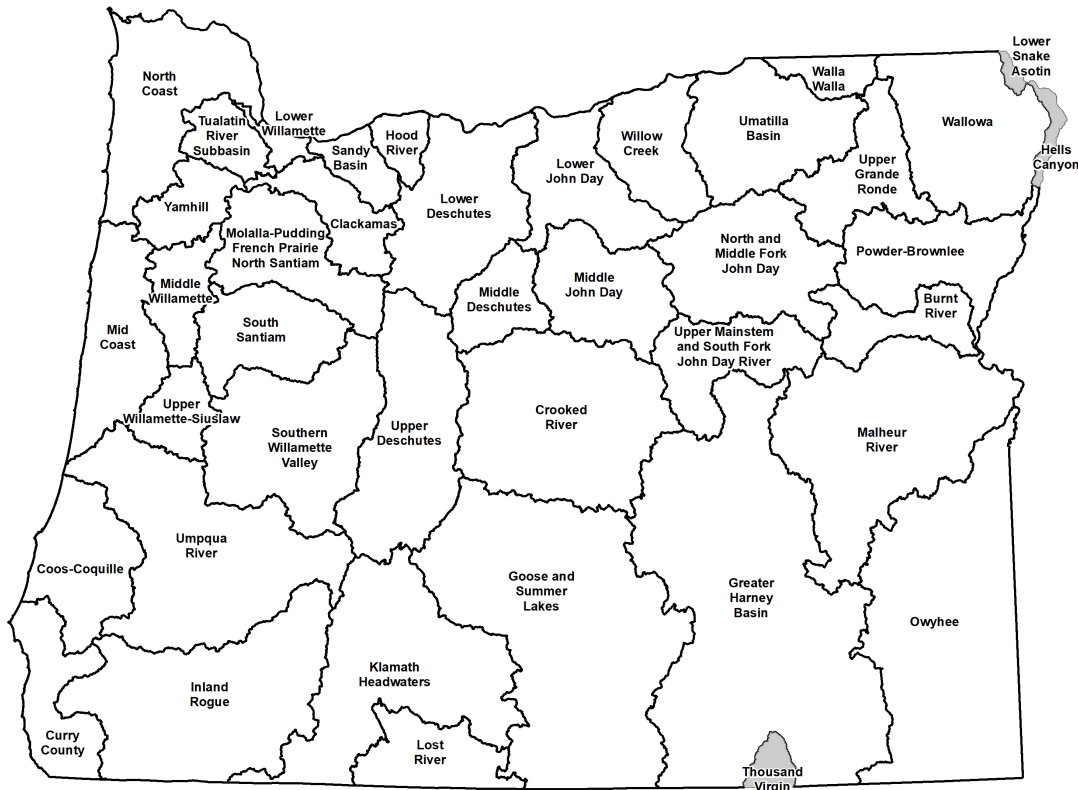
In 1993, the Oregon Legislature passed the Agricultural Water Quality Management Act directing ODA to develop plans to prevent and control water pollution from agricultural activities and soil erosion and achieve water quality standards and to adopt rules as necessary (ORS 568.900 through ORS 568.933).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

561.191). The Area Plan and Area Rules were developed and subsequently revised pursuant to these statutes.

Between 1997 and 2004, ODA worked with LACs and SWCDs to develop Area Plans and Area Rules in 38 watershed-based Management Areas across Oregon (Figure 1.2). Since 2004, ODA, LACs, SWCDs, and other partners have focused on implementation including:

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

Figure 1.2 Map of 38 Agricultural Water Quality Management Areas*



*Gray areas are not included in Ag Water Quality Management Areas

1.3 Roles and Responsibilities

1.3.1 Oregon Department of Agriculture

ODA is the agency responsible for implementing the Ag Water Quality Program (ORS 568.900 to 568.933, ORS 561.191, OAR 603-090, and OAR 603-095). The Ag Water Quality Program was established to develop and implement water quality management plans for the prevention

and control of water pollution from agricultural activities and soil erosion. State and federal laws that drive the establishment of an Area Plan include:

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

ODA bases Area Plans and Area Rules on scientific information (ORS 568.909). ODA works in partnership with SWCDs, LACs, DEQ, and other partners to implement, evaluate, and update the Area Plans and Area Rules. If and when other governmental policies, programs, or rules conflict with the Area Plan or Area Rules, ODA will consult with the appropriate agencies to resolve the conflict in a reasonable manner.

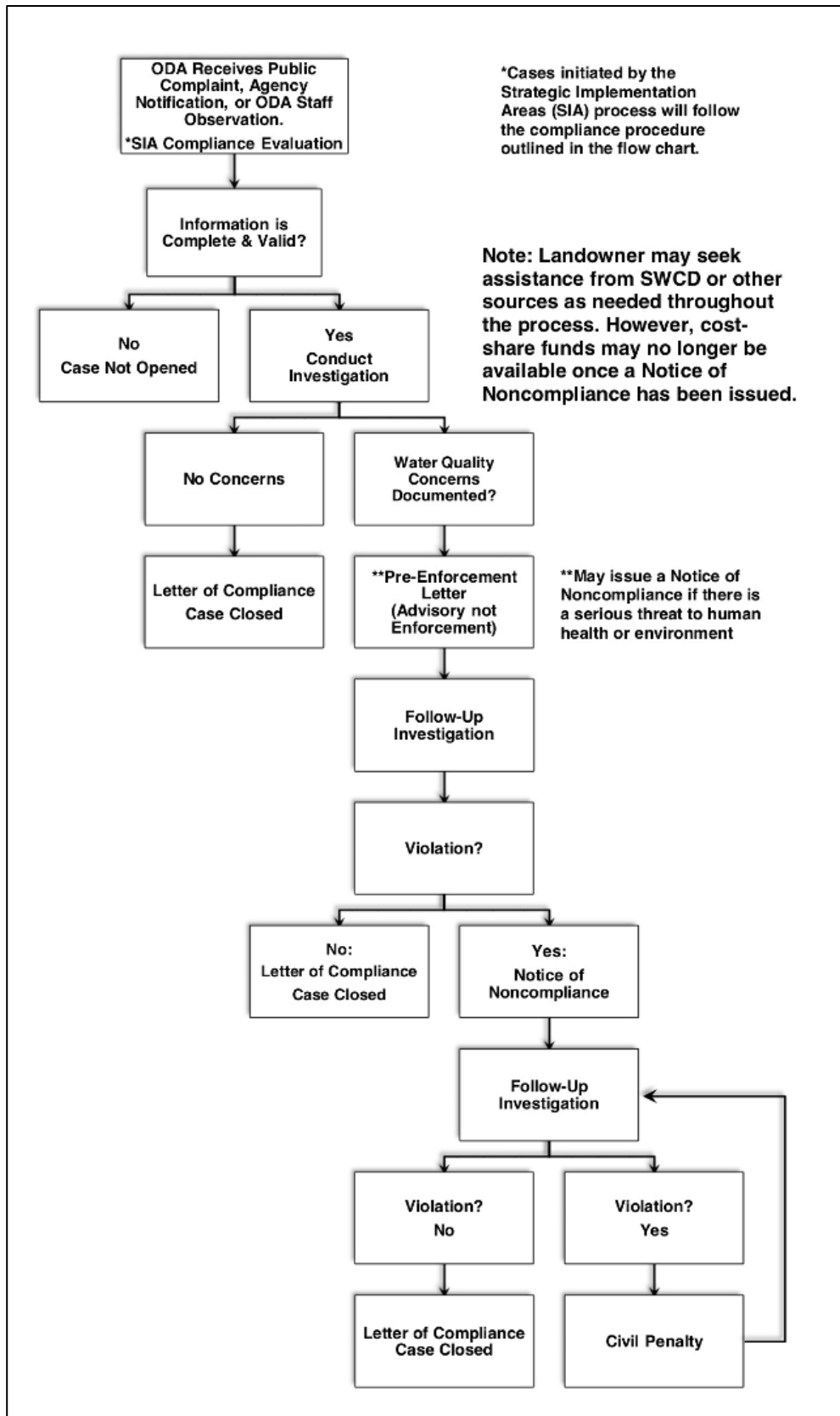
1.3.1.1 ODA Compliance Process

ODA is responsible for any actions related to enforcement or determination of noncompliance with Area Rules (OAR 603-090-0080 through OAR 603-090-0120). ORS 568.912(1) and ORS 568.912(2) give ODA the authority to adopt rules that require landowners to perform actions necessary to prevent and control pollution from agricultural activities and soil erosion.

The Area Rules are a set of standards that landowners must meet on all agricultural or rural lands. “Landowner” includes any landowner, land occupier, or operator per OAR 603-95-0010(24). All landowners must comply with the Area Rules. ODA will use enforcement where appropriate and necessary to achieve compliance with Area Rules. Figure 1.3.1 outlines ODA’s compliance process. ODA will pursue enforcement action only when reasonable attempts at voluntary solutions have failed (OAR 603-090-0000(5)(e)). If a violation is documented, ODA may issue a pre-enforcement notification or an enforcement order such as a Notice of Noncompliance. If a Notice of Noncompliance is issued, ODA will direct the landowner to remedy any conditions through required corrective actions under the provisions of the enforcement procedures outlined in OAR 603-090-060 through OAR 603-090-120. If a landowner does not implement the required corrective actions, ODA may assess civil penalties for continued violation of the Area Rules.

Any member of the public may file a complaint, and any public agency may file a notification of a potential violation of the Area Rules. ODA also may initiate an investigation based on its own observation or from cases initiated through the Strategic Implementation Area process (See Figure 1.3.1).

Figure 1.3.1 Compliance Flow Chart



1.3.2 Local Management Agency

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

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

1.3.3 Local Advisory Committee

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

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

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

1.3.4 Agricultural Landowners

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

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

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

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

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

1.3.5 Public Participation

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

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

1.4 Agricultural Water Quality

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

1.4.1 Point and Nonpoint Sources of Water Pollution

There are two types of water pollution. Point source water pollution emanates from clearly identifiable discharge points or pipes. Point sources are required to obtain permits that specify their pollutant limits. Agricultural operations regulated as point sources include permitted Confined Animal Feeding Operations (CAFOs), and all permitted CAFOs are subject to ODA's CAFO Program requirements. Irrigation return flow from agricultural fields may drain through a defined outlet, but is exempt under the CWA and does not currently require a permit.

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

1.4.2 Beneficial Uses and Parameters of Concern

Beneficial uses related to water quality are defined by DEQ for each basin. The most sensitive beneficial uses usually are fish and aquatic life, water contact recreation, and public and private domestic water supply. These uses generally are the first to be impaired because they are affected at lower levels of pollution. While there may not be severe impacts on water quality from a single source or sector, the combined effects from all sources can contribute to the impairment of beneficial uses in the Management Area. Beneficial uses that have the potential to be impaired in this Management Area are summarized in Chapter 2.4.1.1.

Many waterbodies throughout Oregon do not meet state water quality standards. The most common water quality concerns statewide related to agricultural activities are temperature, bacteria, biological criteria, sediment and turbidity, phosphorous, nitrates, algae, pH, dissolved oxygen, harmful algal blooms, pesticides, and mercury. Water quality impairments vary across the state; they are summarized for this Management Area in Chapter 2.4.

1.4.3 Impaired Waterbodies and Total Maximum Daily Loads

Every two years, DEQ is required by the CWA to assess water quality in Oregon, resulting in the “Integrated Report.” CWA Section 303(d) requires DEQ to identify “impaired” waters that do not meet water quality standards. The resulting list is commonly referred to as the “303(d) list” (<http://www.oregon.gov/deq/wq/Pages/WQ-Assessment.aspx>). In accordance with the CWA, DEQ must establish TMDLs for pollutants on the 303(d) list. For more information, visit www.oregon.gov/deq/wq/tmdls/Pages/default.aspx.

A TMDL includes an assessment of conditions (based on water quality data, land condition data, and/or computer modeling) and describes a plan to achieve water quality standards. TMDLs specify the daily amount of pollution a waterbody can receive and still meet water quality standards. TMDLs generally apply to an entire basin or subbasin, not just to an individual waterbody on the 303(d) list. In the TMDL, point sources are assigned waste load allocations that are then incorporated into National Pollutant Discharge Elimination System (NPDES) permits. Nonpoint sources (agriculture, forestry, and urban) are assigned a load allocation to achieve.

As part of the TMDL process, DEQ identifies Designated Management Agencies and Responsible Persons, which are parties responsible for submitting TMDL implementation plans. TMDLs designate ODA as the lead agency responsible for implementing the TMDL on agricultural lands. ODA uses the applicable Area Plan(s) as the implementation plan for the agricultural component of the TMDL. Biennial reviews and revisions to the Area Plan and Area Rules must address agricultural or nonpoint source load allocations from relevant TMDLs.

The 303(d) list, the TMDLs, and the agricultural load allocations for the TMDLs that apply to this Management Area are summarized in Chapter 2.4.1.

1.4.4 Oregon Water Pollution Control Law – ORS 468B.025 and 468B.050

In 1995, the Oregon Legislature passed ORS 561.191. This statute states that any program or rules adopted by ODA “shall be designed to assure achievement and maintenance of water quality standards adopted by the Environmental Quality Commission.”

To implement the intent of ORS 561.191, ODA incorporated ORS 468B.025 and 468B.050 into all 38 sets of Area Rules

ORS 468B.025 (prohibited activities) states that:

“(1) Except as provided in ORS 468B.050 or 468B.053, no person shall:

(a) Cause pollution of any waters of the state or place or cause to be placed any wastes in a location where such wastes are likely to escape or be carried into the waters of the state by any means.

(b) Discharge any wastes into the waters of the state if the discharge reduces the quality of such waters below the water quality standards established by rule for such waters by the Environmental Quality Commission.

(2) No person shall violate the conditions of any waste discharge permit issued under ORS 468B.050.”

ORS 468B.050 identifies the conditions when a permit is required. A permit is required for CAFOs that meet minimum criteria for confinement periods and have large animal numbers or have wastewater facilities. The portions of ORS 468B.050 that apply to the Ag Water Quality Program state that:

“(1) Except as provided in ORS 468B.053 or 468B.215, without holding a permit from the Director of the Department of Environmental Quality or the State Department of Agriculture, which permit shall specify applicable effluent limitations, a person may not:

(a) Discharge any wastes into the waters of the state from any industrial or commercial establishment or activity or any disposal system.”

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

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

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

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

1.4.5 Streamside Vegetation and Agricultural Water Quality

Across Oregon, the Ag Water Quality Program emphasizes streamside vegetation protection and enhancement. Streamside vegetation can provide three primary water quality functions: shade to reduce stream temperature warming from solar radiation, streambank stability, and filtration of pollutants. Other water quality functions from streamside vegetation include: water storage in the soil for cooler and later season flows, sediment trapping that can build streambanks and floodplains, narrowing and deepening of channels, and biological uptake of sediment, organic material, nutrients, and pesticides. In addition, streamside vegetation provides habitat for numerous species of fish and wildlife. Streamside vegetation conditions can be monitored to track progress toward achieving conditions that support water quality.

Site-Capable Vegetation

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

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

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

In many cases, invasive, non-native plants, such as introduced varieties of blackberry and reed canary grass, grow in streamside areas. This type of vegetation has established throughout much of Oregon due to historic and human influences and may provide some of the water quality functions of site-capable vegetation. ODA’s statutory authority does not require the removal of invasive, non-native plants, however, ODA encourages landowners to remove these plants voluntarily. In addition, the Oregon State Weed Board identifies invasive plants that can impair watersheds. Public and private landowners are responsible for eliminating or intensively controlling noxious weeds, as described in state and local laws. For more information, visit www.oregon.gov/ODA/programs/weeds.

1.4.6 Soil Health and Agricultural Water Quality

An increasingly important concept in Oregon and across the United States is soil health. The Ag Water Quality Program promotes soil health to reduce erosion and keep sediment out of surface waters, thereby helping to maintain and improve water quality. Healthy soils have relatively high organic matter and well-formed soil structure. These characteristics may resist erosion and increase water infiltration, leading to less surface runoff and greater groundwater recharge; the

resultant groundwater flows in some cases can help moderate stream water temperatures. [Note that the beneficial effects on water quality vary based on factors such as soil type and ecoregion.] According to the NRCS and others, there are four Soil Health Principles that together build highly productive and resilient soils: minimize disturbance and maximize cover, continuous living roots, and diversity above and below the surface.

Building soil health increases resiliency to extreme weather, protects water quality, and helps keep farms and ranches viable. Incorporating soil health practices can help landowners adapt and reduce risks. For more information, visit www.nrcs.usda.gov/wps/portal/nrcs/detail/or/soils/health.

1.5 Other Water Quality Programs

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

1.5.1 Confined Animal Feeding Operation Program

ODA is the lead state agency for the CAFO Program, which was developed to ensure that operators do not contaminate ground or surface water with animal manure or process wastewater. The CAFO Program coordinates with DEQ to issue permits. These permits require the registrant to operate according to a site-specific, ODA-approved, Animal Waste Management Plan that is incorporated into the CAFO permit by reference. For more information, visit oda.direct/CAFO.

1.5.2 Groundwater Management Areas

Groundwater Management Areas (GWMA) are designated by DEQ where groundwater is polluted from, at least in part, nonpoint sources. After designating a GWMA, DEQ forms a local groundwater management committee comprised of affected and interested parties. The committee works with and advises the state agencies that are required to develop an action plan to reduce groundwater contamination in the area.

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

Any GWMA in this Management Area is described in Chapter 2.4.1.5. Any Measurable Objectives for the GWMA will be described in Chapter 3.1.5.

1.5.3 The Oregon Plan for Salmon and Watersheds

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

health. ODA's commitment to the Oregon Plan is to develop and implement Area Plans and Area Rules throughout Oregon.

1.5.4 Pesticide Management and Stewardship

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

In 2007, Oregon formed the interagency Water Quality Pesticide Management Team (WQPMT) to expand efforts to improve water quality in Oregon related to pesticide use. 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 Pesticide Stewardship Partnership (PSP) program and other federal, state, and local monitoring programs to assess the possible impact of pesticides on Oregon's water quality. Pesticide detections in Oregon's streams can be addressed through multiple programs and partners, including the PSP.

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

Any PSPs in this Management Area are described in Chapter 3.1.4.

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

1.5.5 Drinking Water Source Protection

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

1.6 Partner Agencies and Organizations

1.6.1 Oregon Department of Environmental Quality

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

A Memorandum of Agreement between DEQ and ODA recognizes that ODA is the state agency responsible for implementing the Ag Water Quality Program. ODA and DEQ updated the Memorandum of Agreement in 2012 and reviewed and confirmed it in 2018 (<http://www.oregon.gov/ODA/shared/Documents/Publications/NaturalResources/DEQODAMoa.pdf>).

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

1.6.2 Other Partners

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

1.7 Measuring Progress

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

1.7.1 Measurable Objectives

A measurable objective is a numeric long-term desired outcome to achieve by a specified date. Milestones are the interim steps needed to make progress toward the measurable objective and

consist of numeric short-term targets to reach by specific dates. Together, the milestones define the timeline and progress needed to achieve the measurable objective.

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

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

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

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

1.7.2 Land Conditions and Water Quality

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

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

- Landowners can see land conditions and have direct control over them,
- Improved land conditions can be documented immediately,
- Water quality impairments from agricultural activities are primarily due to changes in land conditions and management activities,
- It can be difficult to separate agriculture's influence on water quality from other land uses,
- There is generally a lag time between changes on the landscape and the resulting improvements in water quality,
- Extensive monitoring of water quality would be needed to evaluate progress, which would be expensive and may not demonstrate improvements in the short term.

Water quality monitoring data will help ODA and partners to measure progress or identify problem areas in implementing Area Plans. However, as described above, water quality monitoring may be slower to document changes than land condition monitoring.

1.7.3 Focused Implementation in Small Geographic Areas

Focus Areas

A Focus Area is a small watershed with water quality concerns associated with agriculture. The Focus Area process is SWCD-led, with ODA oversight. The SWCD delivers systematic, concentrated outreach and technical assistance. A key component is measuring conditions before and after implementation to document the progress made with available resources. The Focus Area approach is consistent with other agencies' and organizations' efforts to work proactively in small watersheds.

Focus Areas have the following advantages: a proactive approach that addresses the most significant water quality concerns, multiple partners that coordinate and align technical and financial resources, a higher density of projects that may lead to increased connectivity of projects, and a more effective and efficient use of limited resources.

Any Focus Areas in this Management Area are described in Chapter 3.1.2. The SWCDs will also continue to provide outreach and technical assistance to the entire Management Area.

Strategic Implementation Areas

Strategic Implementation Areas (SIAs) are small watersheds selected by ODA, in consultation with partners, based on a statewide review of water quality data and other available information. ODA conducts an evaluation of likely compliance with Area Rules and contacts landowners with the results and next steps. The Oregon Watershed Enhancement Board (OWEB) and other partners make funding and technical assistance available to support conservation and restoration projects. These efforts should result in greater ecological benefit than relying solely on compliance and enforcement. Landowners have the option of working with the SWCD or other partners to voluntarily address water quality concerns. ODA follows up, as needed, to enforce the Area Rules. Finally, ODA completes a post-evaluation to document progress in the SIA.

Any SIAs in this Management Area are described in Chapter 3.1.3.

1.8 Progress and Adaptive Management

1.8.1 Biennial Reviews

The ODA, LAC, LMA, and partners evaluate progress of Area Plan implementation through the biennial review process. At each biennial review, they discuss: 1) progress toward meeting measurable objectives and implementing strategies, 2) local monitoring data from other agencies and organizations, including agricultural land conditions and water quality, and 3) ODA compliance activities. As a result of these discussions, ODA and partners revise implementation strategies and measurable objectives in Chapter 3 as needed.

ODA provides information from the Oregon Watershed Restoration Inventory (OWRI) on restoration project funding and accomplishments at biennial reviews and uses the information for statewide reporting. The majority of OWRI entries represent voluntary actions of private landowners who have worked in partnership with federal, state, and local groups to improve aquatic habitat and water quality conditions. OWRI is the single largest restoration information database in the western United States. For more information, visit www.oregon.gov/oweb/data-reporting/Pages/owri.aspx.

1.8.2 Agricultural Water Quality Monitoring

In addition to monitoring land conditions, ODA relies on water quality monitoring data where available. These data may be provided by other state or federal agencies or local entities; ODA seldom collects water quality samples outside of compliance cases.

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

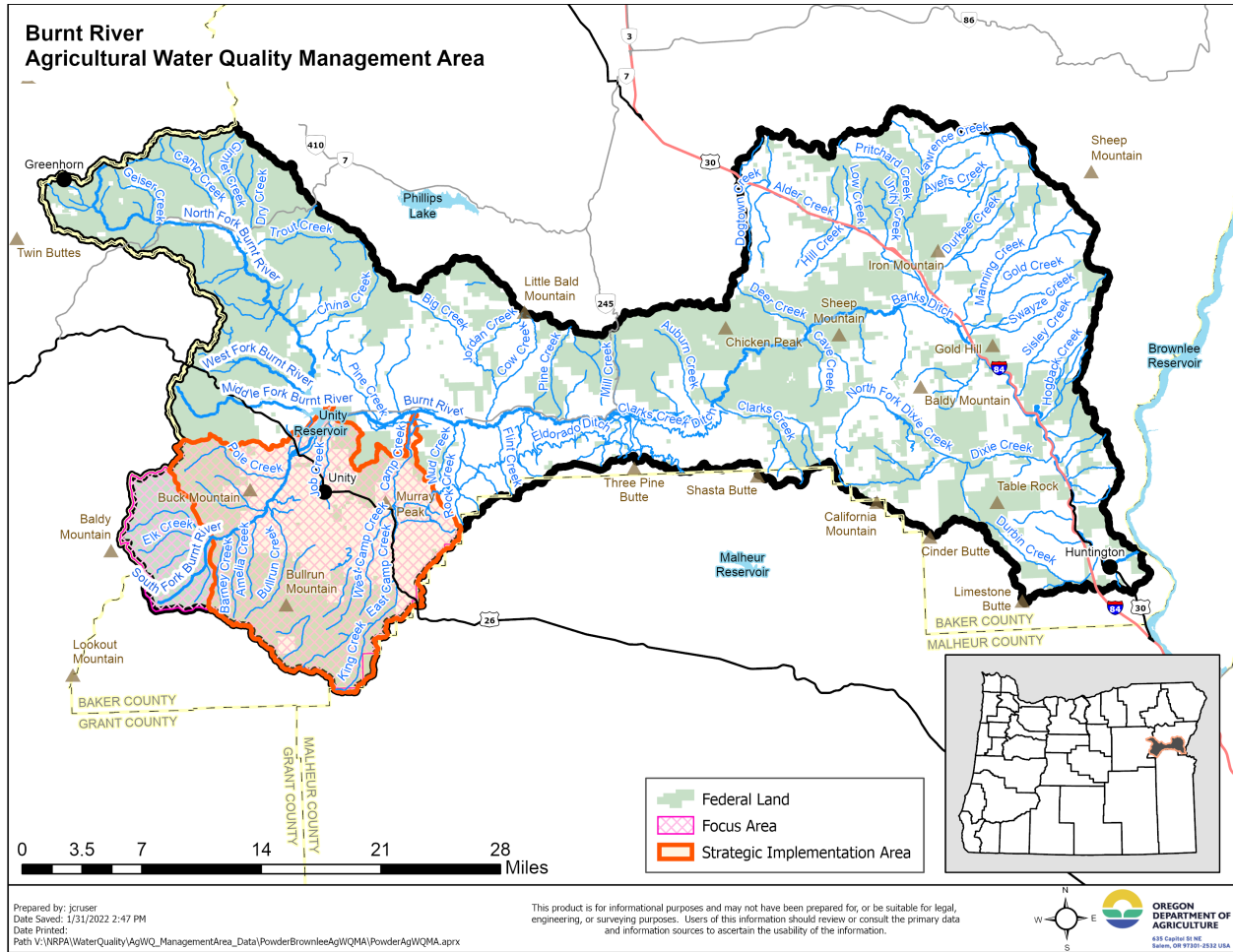
DEQ provides status and trends reports for selected parameters in relation to water quality standards. ODA will continue to work with DEQ to summarize the data results and how they apply to agricultural activities.

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

Chapter 2: Local Background

Chapter 2 provides the local geographic, water quality, and agricultural context for the Management Area. It also describes the water quality issues, Area Rules, and potential practices to address water quality issues.

Figure 2 Burnt River Management Area



2.1 Local Roles

2.1.1 Local Advisory Committee

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

Table 2.1.1 Current LAC members

Name	Geographic Representation	Description
Bonnie Clugsen	Unity	Rancher
Pat Sullivan	Hereford	Rancher
Dick D'Ewart	Durkee	Rancher
Ted Bloomer	Durkee	Rancher
Waynette Morin	Hereford	Rancher
Wes Morgan	Sumpter	Burnt River Irrigation District
Rodd Bunch	Durkee	Rancher
Vacant		
Vacant		
Vacant		
Vacant		
Vacant		

2.1.2 Local Management Agency

SWCDs implement Area Plans through OWEB capacity grants, with details negotiated between ODA and each SWCD. The resulting Scopes of Work define the SWCDs as the LMAs for implementation of the Ag Water Quality Program in specific Management Areas. The LMA for this Management Area is the Burnt River SWCD. This SWCD was also involved in development of the Area Plan and Area Rules.

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

2.2 Area Plan and Area Rules: Development and History

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

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

2.3 Geographical and Physical Setting

The Burnt River basin generally drains east from the Blue Mountains to the Snake River. After leaving the forested lands, the Burnt River and its main tributaries, the North, West, Middle and South forks, pass through meadowlands in the area above Unity Reservoir. These streams converge into Unity Reservoir.

Downstream from the reservoir the river flows through mountainous terrain for more than a mile. It then emerges into a relatively flat meadow near Hereford. After meandering through these flat meadow areas for about 35 miles, the river enters the 16-mile-long Burnt River Canyon, a steep, rocky canyon with limited irrigation and very limited grazing. After leaving the canyon, the river meanders through another meadow area around Durkee. This meadow reach is 7.5 miles and then the river enters another canyon. East of Huntington the Burnt River joins the Snake River. The river drains about 1,100 square miles, ranging in elevation from about 7,900 feet above sea level at the headwaters to some 2,100 feet near Huntington.

The irrigated portions of the basin, or the valley floors, were primarily settled in the mid-to-late-1800s. Much of the uplands were taken up later under the Grazing Homestead Act in the early 1900s. Cow/calf beef operations are the predominate industry in the Plan area. Most ranches are situated along the Burnt River and its tributaries where water is diverted from the river system to supplement sparse rainfall for forage production. Ranchers use these irrigated lands adjacent to the river primarily for pasture and forage production with about 25 percent to 30 percent dedicated to alfalfa production. There are also large areas of public and private land adjacent to streams that are suited for livestock grazing, wildlife habitat, recreation, timber production, and limited mining.

Flood irrigation is the predominate practice for most of the 20,000 acres in the Burnt River Irrigation District and for several thousand acres outside the irrigation district. A few sprinkler systems are used on bench areas. Historically, 85 percent of the Burnt River watershed's runoff occurs from March through June with very low stream flows occurring the remainder of the year. The U.S. Bureau of Reclamation (BOR) completed construction of the Unity Reservoir in 1939 to provide supplemental irrigation water for about 12,000 acres of land. Prior to the construction of the reservoir, this land depended entirely on natural stream flow from the Burnt River for its irrigation supply. At that time, late summer flows on the main stem were often intermittent. At times, ranchers in the Bridgeport area had to go upstream tearing out beaver dams to get stock water in the fall. Records tell of pioneers coming over the Oregon Trail in late summer and fall being able to use the Burnt River's dry riverbed for the trail in an area below Durkee Valley.

The average Unity Dam stream flow release to the Burnt River is about 90 cubic feet per second (cfs), 125 to 140 cfs during the irrigation season (April 1 to October 1) and 2 to 40 cfs during the non-irrigation season. The reservoir holds about 25,000 acre-feet, which is less than one-third the average annual runoff for the basin. Sediment accumulation during the past 60 years has resulted in a negligible reduction in reservoir storage capacity.

2.4 Agricultural Water Quality

2.4.1 Water Quality Issues

Most of the streams on the 2010 303(d) list (Appendix A) are almost entirely on U.S. Forest Service land. Most of the listings on private lands are for the main stem of the Burnt River. The Burnt River is listed for:

- Temperature
- Chlorophyll a (Burnt River from Clarks Creek to Unity Reservoir)
- Dissolved Oxygen (Burnt River Unity Reservoir to Mouth, also SF Burnt R., MF Burnt R., WF Burnt R.)
- *E. coli*

- Arsenic
- Sedimentation (Patrick Cr., Trout Cr., Geiser Cr., Camp Cr., SF Dixie Cr.)
- pH (NF Burnt R.)
- Biocriteria (MF Burnt R.)

There is also a total phosphorus allocation of 0.07 mg/L for all Snake River tributaries, including Burnt River that was developed in the Snake River Hells Canyon TMDL in 2004.

2.4.1.1 Beneficial Uses

Clean water supports many uses. Water quality standards are established to protect beneficial uses of Oregon's waters, which are defined in OAR 340-041-0002(17) and designated for the Powder/Burnt Basin in 340-041-0260 – Table 260A. Beneficial uses include: public and private domestic water supply, industrial water supply, irrigation, livestock watering, fish and aquatic life, wildlife and hunting, fishing, boating, water contact recreation, and aesthetic quality (www.oregon.gov/deq/wq/Pages/WQ-Standards-Uses.aspx).

The following beneficial uses have been identified as adversely affected in the Plan area:

- Salmonid fish rearing and spawning
- Resident fish and aquatic life

Of the beneficial uses of water in the Burnt River Basin, the most sensitive use for most waters and parameters of concern is spawning and rearing of cold-water fisheries. There are no anadromous salmonids or bull trout in the Burnt River. Redband trout exist only in the headwaters.

2.4.1.2 Water Quality Parameters of Concern

According to the 2018/20 Integrated Report, arsenic, biological criteria, chlorophyll a, dissolved oxygen, E. coli fecal coliform, mercury, pH, sedimentation, temperature, and turbidity are the primary water quality parameters of concern for agriculture (<https://www.oregon.gov/deq/wq/Pages/epaApprovedIR.aspx>).

See Appendix A.

2.4.1.3 TMDLs and Agricultural Load Allocations

DEQ is in the process of developing a TMDL for the Burnt River.

2.4.1.4 Drinking Water

DEQ summarizes drinking water issues in each Management Area prior to biennial reviews. DEQ's full report is available at: <https://www.oregon.gov/deq/wq/programs/Pages/Nonpoint-Implementation.aspx>.

2.4.1.5 GWMA

There is no GWMA in this Management Area.

2.4.2 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 streambanks, 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.

The high stream temperatures and low summer streamflows are the main water quality problems in the Burnt River Subbasin. Stream temperatures can increase or decrease 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 is 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 Water Resources Department (WRD) and will not be addressed by rule or in this Area Plan.

2.5 Regulatory and Voluntary Measures

Voluntary efforts are the focus of the ODA, the Burnt River SWCD, and the LAC. However, if a particular landowner refuses to correct a verified adverse condition on his or her property, ODA has a regulatory backstop to ensure pollution control. At the same time, ODA does not want to mandate or prohibit any specific agricultural activity. To maintain this flexibility, this Plan and its associated administrative rules describe Prohibited Conditions.

Readers should note that this Area Plan is only a guidance document. By itself it is not regulatory, however, it does refer to administrative rules that set requirements for landowners. To help distinguish between this Area Plan and its associated rules, all rule language is separated from the rest of the text by solid lines. This Plan encourages farmers and ranchers to manage their land to control conditions that have been identified as contributing to undesirable water quality using adaptive management techniques.

OAR 603-095-3240

Prohibited Conditions

(1) A landowner shall be responsible for only those conditions caused by activities conducted on land owned or managed by the landowner. Criteria do not apply to conditions resulting from unusual weather events or other exceptional circumstances that could not have been reasonably anticipated.
--

2.5.1 Pollution and Waste Management

The objective of this Area Plan is to prevent the introduction of waste materials into bodies of water.

Waste includes livestock manure from situations like seasonal feeding and birthing areas, gathering pastures and corrals, rangelands and pasture, and any other situations not already covered by Oregon's Confined Animal Feeding Operations laws.

Indicators of potential noncompliance include:

- Runoff flowing through areas of high livestock usage and carrying wastes into waters of the state;
- Livestock waste accumulated in drainage ditches or areas of flooding;
- Fecal coliform (*E. coli*) counts that exceed state water quality standards;
- It is the LAC's opinion that the current water quality standards are unattainable.

OAR 603-095-3240

Pollution and Waste Management

(2) Effective upon adoption, no person subject to these rules shall violate any provision of ORS 468B.025 or ORS 468B.050. (See Section 1.4.4 Water Pollution Control Law, page 13, for complete text of 468B rules and definitions).

2.5.2 Streamside Conditions

Maintaining and improving riparian vegetation is an important factor to help achieve our goal of working toward a reduction in any identified undesirable water quality issues related to agricultural land use practices. Healthy, functioning riparian vegetation communities in the Burnt River will help stabilize streambanks, filter sediments and nutrients, and protect critical aquatic and riparian habitat.

Healthy riparian vegetation can also help control stream temperatures in certain circumstances. However, because of natural factors and the technical and biological challenges (e.g., site capability, and beaver, ungulate, and rodent damage) of developing riparian vegetation it is unlikely that all of the listed tributaries of the Burnt River will meet the temperature criteria of 68°. Some headwater streams meet criteria or are likely to meet it with healthy riparian vegetation and improved flood plain connection. It is also noted that no amount of riparian vegetation can of itself produce sufficient benefit to bring any portion of the main stem into compliance with the 68° criterion in as much as summertime releases from Unity reservoir often exceed 70°.

However, the numerical criteria are only part of the temperature standard. The standard itself focuses on limiting human-caused warming of surface waters to the extent it is feasible.

OAR 603-095-3240

(3) Streamside Conditions

(a) By January 1, 2006, activities will allow the establishment and development of riparian vegetation, consistent with site capability. Site capability will be determined by ODA in consultation with local resource management agencies. (b) Landowners are not responsible for browsing and grazing by wildlife.

Site-Capable Vegetation

As described in Chapter 1 the Agricultural 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 (e.g., channelization, roads, modified flows, past 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. ODA does not consider invasive, non-native plants such as introduced varieties of reed canary grass and blackberry to be site-capable vegetation.

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 agricultural water quality regulations 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. Limited exceptions include:

- Upland species such as sagebrush can be the dominant site-capable vegetation along streams with erosional downcutting but they do not improve water quality.
- Junipers are mature site-capable vegetation in central and eastern Oregon but they reduce bank stability and increase erosion.

The Riparian Rule does not specify any activities that must cease and does not require any particular activity take place. Landowners are not responsible for wildlife browsing and grazing.

The Rule allows for management activities to take place. Some examples of management that are compatible with water quality objectives are:

- Properly managed grazing
- Hazard tree removal
- Traditional harvesting of forages

This rule only applies to the streamside area of natural streams and not to artificial irrigation ditches and diversion points, which are used for the primary purpose of delivering irrigation and stock water to lands that hold a valid water right. The streamside area is defined as the area near the stream where management practices can most directly influence the conditions of the water.

Chapter 3: Implementation Strategies

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

Goal

The goals of the Plan are to:

- Prevent and control water pollution from agricultural activities and soil erosion and achieve applicable water quality standards;
- Work toward a reduction in any identified undesirable water quality areas by attempting to prevent and control characteristics on agricultural lands in the Plan area that contribute to undesirable water quality;
- Continue and expand, if necessary, the current water quality monitoring program established by the SWCD and the Burnt River Irrigation District; and
- Apply the lessons learned from the Burnt River Temperature Study.

The LAC established these objectives to achieve the Area Plan goal:

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

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

1. Sufficient site-capable vegetation is established along streams to stabilize streambanks, filter overland flow, and moderate solar heating,
2. Crop lands are covered throughout the year with either production crops, crop residues, or cover crops,
3. Pastures have minimal bare ground,
4. Irrigation runoff does not deliver sediment, nutrients, or chemicals to streams,
5. Leachate and residues from livestock manure are not entering streams or groundwater.

3.1 Measurable Objectives and Strategic Initiatives

Measurable objectives allow the Ag Water Quality Program to evaluate progress toward meeting water quality standards and TMDL load allocations. Any measurable objectives are stated here. Progress is reported in Chapter 4.1.

3.1.1 Management Area

ODA is working with SWCDs and LACs throughout Oregon toward establishing long-term measurable objectives to achieve desired conditions. Currently, ODA and the Baker SWCD are using Focus Area measurable objectives and the South Fork Burnt River SIA to show progress in this Management Area. These are described below.

3.1.2 Focus Areas

Burnt River Focus Area

The Burnt River Focus Area is part of ODA's Focus Area strategic initiative and was closed in 2019. The Burnt River SWCD worked with ODA and the Oregon Department of Fish and Wildlife (ODFW) to select the Burnt River Focus Area, which consists of two watersheds (Camp Creek and South Fork Burnt River). This area offers potential restoration projects based on the following: sage grouse habitat, riparian restoration, aspen renewal for wildlife habitat, push-up dam removal and replacement for aquatic habitat, off-stream watering, riparian pastures, cooperative landowners, and DEQ 303(d) listing for main tributaries.

The Focus Area covers approximately 127,000 acres; 70,000 acres are estimated to be public lands with 57,000 acres estimated on private lands. Of the private land, 7,000 acres are agricultural irrigated lands with the remaining 50,000 acres being range/pasture lands. The Focus Area averages 9-35" of precipitation yearly, with elevations of 3,500 feet to 7,500 feet.

Both ODA and the SWCD assessed streamside vegetation conditions.

Assessment Method: Streamside vegetation was evaluated with ODA's Streamside Vegetation Assessment (SVA) to characterize the type of ground cover within 35 feet of the stream. The metric is the number and percent of acres of different types of land cover viewed on aerial photographs. Categories are: agricultural infrastructure; water; and bare ground, grass, shrubs, and trees (designated as agricultural or not).

The SWCD visually assesses land conditions by examining available aerial photography and ground truth from public viewpoints followed by site visit determination. Land will be classified as:

- Class I = Little to no resource concerns = LOW priority
- Class II = Few resource concerns = MEDIUM priority
- Class III = Numerous resource concerns = HIGH priority

Current Conditions (From Pre-Assessment) *The following is an estimate of stream miles*

- In 2017: Class I = 47% (206.63 acres), Class II = 53% (233.01), Class III = 0%

Focus Area Milestone for 2017-2019

By June 30, 2019: Class I = 57%, Class II = 43%

Measurable Objectives and Associated Milestones: Increase streamside vegetation and decrease Class II acres by 10 percent.

Focus Area Milestone for 2017-2019

By June 30, 2019: Class I = 57%, Class II = 43%

3.1.3 Strategic Implementation Areas (SIA)

South Fork Burnt River SIA (Initiated 2021)

SIA Compliance Evaluation Method:

ODA evaluated all agricultural tax lots within the SIA to identify opportunities to improve water quality and ensure compliance with Area Rules. The evaluation considered the condition of streamside vegetation, areas of bare ground, and potential livestock impacts (including manure management). The process involved both a remote evaluation and field verification from publicly accessible areas. For more information see:

www.oregon.gov/oda/shared/Documents/Publications/NaturalResources/SIAProgressReport.pdf

Opportunity levels:

- **Likely in Compliance (LC):** ODA identified no likely agricultural water quality regulatory concerns, and the goals of the Area Plan are likely being achieved.
- **Restoration Opportunity (RO):** ODA identified no likely agricultural water quality regulatory concerns, but there is likely some opportunity for improvement through voluntary measures to reach the goals of the Area Plan.
- **Compliance Opportunity (CO):** ODA identified that agricultural activities may impair water quality or evaluation was inconclusive. There also may be an opportunity for improvement through voluntary measures to reach the goals of the Area Plan.
- **Potential Violation (PV):** During the Field Evaluation, ODA observed a potential violation of the Area Rules. There also may be an opportunity for improvement through voluntary measures to reach the goals of the Area Plan.

Measurable Objective:

By November 17, 2025, all 8 tax lots identified as a Potential Violation or Compliance Opportunity will be downgraded to Restoration Opportunity or Likely in Compliance.

3.1.4 Pesticide Stewardship Partnerships (PSP)

There are no PSPs in this Management Area.

3.1.5 Groundwater Management Area (GWMA)

There is no GWMA in this Management Area.

3.2 Proposed Activities

The SWCDs and ODA are responsible for implementing the Area Plan. The Baker Valley, Eagle Valley, and Keating SWCDs, as the LMAs, will maintain an Intergovernmental Agreement with ODA that outlines their responsibilities for providing educational outreach and technical assistance.

Education and cooperation are key to the success of this Plan. The SWCDs will work to provide farmers and ranchers in the Management Area with information about the goals and objectives of this Plan.

Individual farmers and ranchers in the Management Area may request assistance to determine what can be done to meet the goals and objectives of the Plan by contacting the local office of the SWCDs or the NRCS.

The Burnt River SWCD will:

- Participate in developing and delivering outreach and education programs designed to provide public awareness and understanding of water quality issues.
- Develop reports, projects, demonstrations and tours to showcase successful management practices and systems.
- Provide technical and financial assistance to the agricultural community to implement recommended practices, monitoring and education.

ODA, the LAC, the LMA, and other partners have identified the following priority activities to track progress toward meeting the goals and objectives of the Area Plan (Table 3.2).

Table 3.2 Planned Activities for 2022-2025 throughout the Management Area by Burnt River SWCD

Activity	4-year Target	Description
Landowner Engagement		
# events that actively engage landowners (workshops, demonstrations, tours)	6	The SWCD will hold an annual dinner (four total), open to the public, and highlighting accomplishments from the year. These are great opportunities to connect with landowners. The SWCD is planning to host a biennial tour (two total), open to the public, of completed projects within the district. Another great opportunity to reach out to landowners and get people involved.
# landowners participating in active events	450	Based on attendance from past years, the SWCD estimates 100 landowners attend the dinner each year, and about 25 landowners attend each conservation tour.
# outreach material produced/mailed out to actively engage landowners (post cards, newsletters, etc.)	12	The SWCD will produce and mail out an annual spring newsletter (four total), highlighting current projects, education and outreach opportunities, potential program funding, and updated ag water quality

		<p>information. There are roughly 300 people on the newsletter mailing list.</p> <p>The SWCD will produce and have available to the public an annual report (four total) that highlights all project accomplishments from the previous fiscal year. Roughly 100 people would receive this report.</p> <p>The SWCD will produce and mail postcards on an annual basis (four total) to landowners in the district, alerting people of opportunities, including a Strategic Implementation Area that the Burnt River SWCD is planning to implement in the coming years.</p>
Technical Assistance (TA)		
# landowners provided with TA (via phone/walk-in/email/site visit)	150	Based on landowner contact in the past, the SWCD estimates that it will likely provide technical assistance to 150 landowners during the next four years.
# site visits	40	Based on site visits in the past, the SWCD estimates it will likely go on 40 initial site visits during the next four years. This does not include planned site visits for open and ongoing projects.
# conservation plans written*	4	The SWCD will include a grazing management plan with a spring 2022 large grant submittal. The SWCD estimates that it will write at least another three plans with future projects during the next four years.
On-the-ground Project Funding		
# funding applications submitted	14	<p>The SWCD will submit two grants during the 2022 Spring OWEB large grant cycle: an irrigation project and an SIA. The SWCD hopes to submit an additional eight large grants during the next four years.</p> <p>The SWCD has allocated all of the current small grant biennium funding, however it hopes to submit at least an additional five small grants when it receives small grant funding for the next biennium.</p>
# programs involved in to provide landowners with additional resources	1	<p>The Burnt River just completed a Focus Area that was open in the district for years.</p> <p>The SWCD will be submitting an application for an SIA within the district. If funded, this will open up many opportunities for landowners, including monitoring and water quality improvements.</p>

* Definition: any written management plan to address agricultural water quality. Can include NRCS-level plans. Can include: nutrients, soil health, grazing, riparian planting, forest thinning to improve upland pastures to reduce livestock pressure on riparian areas, etc. Cannot include projects with no or weak connection to agricultural water quality (weed eradication not for riparian restoration, fuels reduction, alternative energy, rain gardens/rain harvesting, non-agricultural culvert replacement, and instream habitat enhancement that does not also improve water quality)

3.3 Additional Agricultural Water Quality and Land Condition Monitoring

3.3.1 Water Quality

Several entities have active monitoring programs. The main ones are:

- DEQ monitors one site in the Management Area as part of their ambient monitoring network (Burnt River at Snake River Road in Huntington);
- Powder Basin Watershed Council;
- The Bureau of Reclamation monitors phosphorus at eight sites;
- The Burnt River Irrigation District monitors temperature continuously at multiple sites. The irrigation district has agreed to have ODA review and analyze the data with DEQ's help in 2018 and present to the LAC.

DEQ has completed a status and trends analysis for the area. (<http://www.oregon.gov/deq/wq/programs/Pages/wqstatustrends.aspx>). The report will be updated for future biennial reviews and the LAC can make informed decisions on management activities within the coverage area.

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

3.3.2 Land Conditions

There is no additional land condition monitoring.

Results of these additional monitoring activities are presented in Chapter 4.3.

Chapter 4: Progress and Adaptive Management

Chapter 4 describes progress toward achieving Area Plan goals and measurable objectives by summarizing accomplishments and monitoring results. Tracking activities is straightforward; monitoring water quality or land conditions takes more effort; relating changes in land conditions to changes in water quality is important but more challenging.

4.1 Measurable Objectives and Strategic Initiatives

The following tables provide the assessment results and progress toward measurable objectives and milestones in the past four years (2018-2021). See Chapter 3.1 for background and assessment methods.

4.1.1 Management Area

ODA is working with SWCDs and LACs throughout Oregon toward establishing long-term measurable objectives to achieve desired conditions. Currently, ODA and the Baker SWCD are using Focus Area measurable objectives and the Lower Powder SIA to show progress in this Management Area. These are described below.

4.1.2 Focus Areas

Table 4.1.2 Burnt River Focus Area

Measurable Objective	
Increase streamside vegetation and decrease Class II acres by 10%.	
Milestones	
Focus Area Milestone for 2017-2019 By June 30, 2019: Class I = 57%, Class II = 43%	
Current Conditions	
Progress Toward Measurable Objectives and Milestones	
No additional progress was made in 2019 to meet milestones and Focus Area was closed.	
Assessment Results	
<ul style="list-style-type: none"> In 2019: Class 1 = 47% (206.63 acres), Class II = 53% (233.01), Class III = 0% 	
Activities and Accomplishments	
Community and Landowner Engagement	
# active events that target landowners/ operators	0
# landowners/operators participating in active events	0
Technical Assistance (TA)	
# landowners/operators provided with TA	24
# site visits	19
# conservation plans written	14
Ag Water Quality Practices Implemented in the Focus Area	
	2
	1,260 Acres
Comments: Herbaceous weed treatments	

4.1.3 Strategic Implementation Areas

Table 4.1.3 2021 South Fork Burnt River SIA

Evaluation Results	
As of November 17, 2021, 8 tax lots were identified as either a Potential Violation or a Compliance Opportunity. LC = 126, RO = 7, CO = 6, PV = 2	
Measurable Objective	
By November 17, 2025, all 8 tax lots identified as a Potential Violation or Compliance Opportunity will be downgraded to Restoration Opportunity or Likely in Compliance.	
Adaptive Management Discussion	
SIA is open and SIA work is continuing. An adaptive management discussion will be available at the next biennial review.	

4.1.4 Pesticide Stewardship Partnerships

There are no PSPs in this Management Area.

4.1.5 Groundwater Management Area

There is no GWMA in this Management Area.

4.2 Activities and Accomplishments

ODA, the LAC, the LMA, and other partners identified the following priority activities to track progress toward meeting the goals and objectives of the Area Plan.

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

Table 4.2a Activities conducted in 2018-2021 throughout the Management Area by Burnt River SWCD

Activity	4-year results	Description
Landowner Engagement		
# events that actively engage landowners (workshops, demonstrations, tours)	3	<p>The SWCD held an annual dinner (two total), open to the public, highlighting accomplishments from the year. These are great opportunities to connect with landowners.</p> <p>The SWCD hosted one tour, open to the public, of completed projects within the district. Another great opportunity to reach out to landowners and get people involved.</p> <p>Due to the Covid pandemic, districts were not able to hold dinners or tours during the 2020-21 fiscal years.</p>
# landowners participating in active events	220	The annual dinners hosted 100 attendees each. The project tour hosted 20 landowners.
# outreach material produced/mailed out to actively engage landowners (post cards, newsletters, etc.)	6	<p>The SWCD produced two spring newsletters highlighting opportunities, potential program funding, and updated ag water quality information. There are roughly 300 people on the newsletter mailing list.</p> <p>The SWCD presented the annual report (two total) that highlights all project accomplishments from the previous fiscal year. Roughly 100 people received this report at the dinner.</p> <p>The SWCD mailed out two postcards (the 2018-19 fiscal years) to landowners in the district, alerting people of opportunities, including a Strategic Implementation Area</p>

		that the Burnt River SWCD is planning to implement in the coming years.
Technical Assistance (TA)		
# landowners provided with TA (via phone/walk-in/email/site visit*)	80	During the 2018-19 fiscal years, the SWCD provided about 50 landowners assistance via telephone, walk-ins, etc. During the 2020-21 fiscal years, the SWCD provided about 30 landowners with technical assistance. Note that due to the Covid pandemic, staff started working remotely in 2020.
# site visits	15	The SWCD conducted 15 site visits in the district from 2018-21.
# conservation plans written**	2	There were two grazing management plans written for projects in the district from 2018-21.
On-the-ground Project Funding		
# funding applications submitted	10	The SWCD submitted funding for 10 restoration projects from 2018-21. This includes eight small grants and two large grants.
# funding applications awarded	10	The SWCD received funding for 10 restoration projects from 2018-21. This includes eight small grants and two large grants.
# programs involved in to provide landowners with additional resources	1	The Burnt River recently completed a Focus Area that was open in the district for years. The SWCD was able to show improvements to agricultural water quality in the area. The SWCD will be submitting an application for an SIA within the district. If funded, this will open up many opportunities for landowners, including monitoring and water quality improvements.

* Number reported likely double-counts some landowners due to tracking methods.

** Definition: any written management plan to address agricultural water quality concerns, such as: nutrients, soil health, grazing, irrigation, and streamside vegetation. Can include farm and ranch plans (including small acreages) and NRCS-certified plans. Excludes projects with weak connection to agricultural water quality.

Table 4.2b Implementation funding (cash and in-kind) for projects on agricultural lands reported 1997-2020 (OWRI data include most, but not all projects, implemented in the Management Area).

Landowners	OWEB	DEQ	NRCS*	USFS	ODF	ODFW	All other sources**	TOTAL
286,126	1,996,374	0	150,946	205,746	30,355	23,945	44,144	2,737,636

* This table may not include all NRCS funding due to privacy concerns.

**Includes city, county, tribal, other state and federal programs, and non-profit organizations. There were too many entities to list.

Table 4.2c Miles and acres treated on agricultural lands reported 1997-2020 (OWRI data include most, but not all projects, implemented in the Management Area).

Activity Type*	Miles	Acres	Count**	Activity Description
Upland		39,224	0	
Road	0		0	
Riparian	9	337		
Wetland		13		
Instream	4			
Fish Passage	25		17	
TOTAL	37	350	17	

* This table may not include all NRCS projects due to privacy concerns.

** # of hardened crossings, culverts, etc.

4.3 Additional Agricultural Water Quality and Land Condition Monitoring

4.3.1 Water Quality

DEQ analyzed data for dissolved oxygen, *E. coli*, pH, total phosphorus, temperature, and total suspended solids in the Management Area. (DEQ. 2020 Oregon Water Quality Status and Trends Report; <https://www.oregon.gov/deq/wq/programs/Pages/wqstatustrends.aspx>).

DEQ's ambient monitoring sites are at: Burnt River at Snake River Road in Huntington.

For this biennial review, DEQ reviewed data from 99 sites, of which nine had sufficient data for status and trends analysis. The analyses showed that the main concerns were related to phosphorus. Data were insufficient to evaluate water temperatures.

Status and Trends Analysis

Table 4.3.1 Attainment of water quality standards for 2016-2019, and 2000-2019 trends

Site Description	Parameter					
	<i>E. coli</i>	pH	Dissolved Oxygen	Temperature	Total Phosphorus (mg/L)	Total Suspended Solids (mg/L)
	Attainment Status and Trend				median; maximum ¹	median; maximum ²
11494 Burnt River @ Huntington (mouth)	No ↓ 10/103	Yes 1/108	No ↓ 0/108	No ↓	No ↓ 104/105	Mostly 10/104
36384 ORDEQ Dixie Creek (Hwy 30)	-	-	-	-	-	-
34256 ORDEQ Clarks Creek at bridge	-	Yes	Yes	No	-	-
BUR001 Unity Reservoir below the Dam	Yes	-	-	-	-	-
37124 ORDEQ Trout Creek at Mouth (N. Fork Burnt River)	-	Yes	Yes	No	-	-

¹ DEQ has no benchmark for total phosphorus in this Management Area; ODA benchmark for potential water quality concerns = 0.08 mg/L

² DEQ has no benchmark for total suspended solids in this Management Area

↑ Statistically significant improving trend

↓ Statistically significant degrading trend

The data show that phosphorus concentrations decrease between the dam and Dark Canyon and then almost double at the mouth of the Burnt River. The tributaries do not contribute sufficient phosphorus to account for the increase in the Burnt River below Dark Canyon.

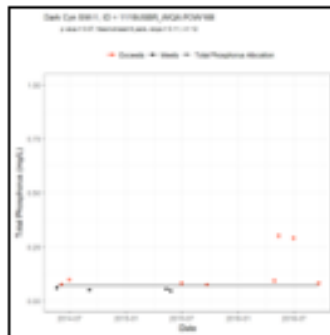
While dissolved oxygen levels still meet the standard at the mouth, the average has decreased from 11 mg/L in 2000 to -10 mg/L in 2017. Another potential concern is *E. coli*, which generally meets the water quality standard but is rising at the mouth.

TOTAL PHOSPHORUS: Burnt River

Unity Res above Dam (003)



Dark Canyon (168)

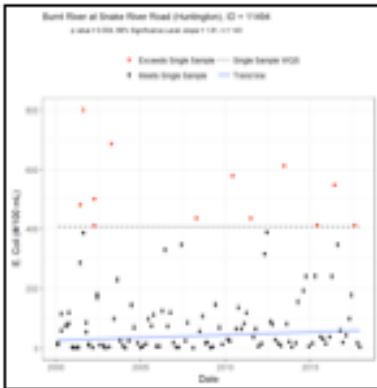


Mouth (11494)

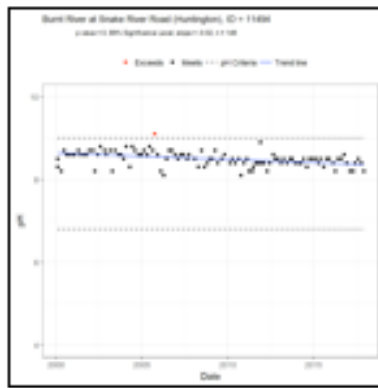


BURNT RIVER @ HUNTINGTON (MOUTH)

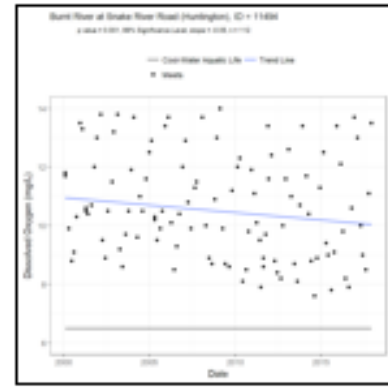
E. coli



pH



Dissolved oxygen



4.3.2 Land Conditions

There is no additional land condition monitoring.

4.4 Biennial Reviews and Adaptive Management

ODA, the LAC, the LMA, and other partners met on April 14, 2022, to review implementation of the Area Plan and provide recommendations for the future (Tables 4.4a and 4.4b).

Table 4.4a Summary of biennial review discussion

Progress
<p>The LAC identified the following successes:</p> <ul style="list-style-type: none"> • Good networking and coming up with solutions. • Landowners have healthy relationship with SWCD. • Some increase in water quality monitoring. • LAC meeting attendance and discussions are helpful. • OWRI and Scope of Work data within plan clearly show work being done on the landscape.
Impediments
<p>There are currently no open compliance cases in the Management Area. There continues to be an impediment for continued funding for monitoring and assessments dealing with sampling and analyzing data collected to look at status and trends. The current LAC is still concerned about the age of its LAC members and are going to work on recruiting new LAC members. There is also a concern on all the absentee landowners in the watershed and how to get them connected to this Plan and the overall Oregon Department of Agriculture Water Quality Program.</p>
Recommended Modifications and Adaptive Management
<ul style="list-style-type: none"> • Collect baseline data to determine and set realistic goals. • Need a monitoring strategy, probably led by ODA and DEQ.

Table 4.4b Number of ODA compliance activities in 2018-2021

Location	Cases		Site Visits	Agency Actions				
	New	Closed		Letter of Compliance		Pre-Enforcement Notification	Notice of Noncompliance	Civil Penalty
				Already in compliance	Brought into compliance			
Outside SIA	0	1	1	0	1	0	0	0
Within SIA	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Appendix A: 2018/2020 Water Quality Limited List - 303(d)

Waterbodies	Boundaries (River Mile)	Parameter
Auburn Creek	0 – 6.6	Temperature
Burnt River*	0 – 77.9	Arsenic
Burnt River	45.1 – 77.3	Chlorophyll a
Burnt River**	0 – 77.9	Dissolved Oxygen
Burnt River*	0 – 45.1	E coli
Burnt River	0 – 77.9	Temperature
Camp Creek	0 – 6.9	Sedimentation
China Creek	0 – 7.7	Temperature
Clarks Creek	0–8	Temperature
Cottonwood Creek	0–5	Temperature
Dark Canyon	0 – 5.9	Temperature
Dixie Creek	0 – 6.9	Temperature
East Camp Creek	0–8	Temperature
Geiser Creek	0 - 4.9	Sedimentation
Lawrence Creek	0 – 17.7	Temperature
MF Burnt River*	0 – 11	Biological Criteria
MF Burnt River*	0 – 11	Dissolved Oxygen
MF Burnt River*	0 – 11	E coli
NF Burnt River*	1.9 – 28.7	pH
NF Burnt River	1.9 – 28.7	Temperature
NF Dixie Creek	0 – 11.2	Temperature
Patrick Creek	0 – 1.3	Temperature
Patrick Creek	0 – 1.3	Sedimentation
SF Burnt River*	0 – 11.5	Dissolved Oxygen
SF Burnt River*	0 – 11.5	E coli
SF Dixie Creek*	0 – 9.6	Sedimentation
SF Dixie Creek	0 – 9.6	Temperature
Trout Creek	0 – 8.8	Temperature
Trout Creek	0 – 8.8	Sedimentation
WF Burnt River*	2 – 5.4	Dissolved Oxygen

* Added to list in 2010

Temperature

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

The streamside landscape provides shade that reduces solar heating of the water. The Total Maximum Daily Load will estimate 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.

OAR 340-041-0028 provides numeric and narrative temperature criteria. The map provided in OAR 340-041-260A specifies where and when the criteria apply. The biologically-based numeric criteria applicable to the Burnt River Basin, as measured using the seven-day average maximum stream temperature consists of:

The seven-day-average maximum temperature of a stream identified as having Lahontan cutthroat trout or redband trout use on subbasin maps and tables set out in OAR 340-041-0101 to 340-041-0340: Tables 121B, 140B, 190B, and 250B, and Figures 180A, 201A, 260A and 310A may not exceed 20.0 degrees Celsius (68.0 degrees Fahrenheit)

However, the Burnt River studies by Borman, Larson, and Mangelson have indicated that irrigation withdrawals on the main stem are beneficial to water quality in as much as they provide late-season, cool subsurface return flows. It has also been pointed out, although not mentioned in the studies, that the withdrawals are also beneficial in filtering out Chlorophyll a.

One solution that could be beneficial to both problems would be the construction of the two proposed storage projects on the headwaters of the Burnt River — the 14,000 acre-feet Hardman project on the South Fork Burnt River and the 6,500 acre-feet Ricco project on the North Fork. Both projects could provide additional in-stream flows to address flow modification and at the same time provide freshwater infusion to Unity Reservoir. This would avert the stagnation, which could reduce concentrations of Chlorophyll a and improve water quality.

Dissolved Oxygen

Low levels of dissolved oxygen can harm fish and other aquatic life. The availability of nutrients, warm temperatures and light stimulate aquatic plant and algae growth that reduces the oxygen content of water. Animal manure (livestock, wildlife, and fowl) and other organic wastes break down and remove oxygen from water.

The dissolved oxygen standard for water bodies identified as providing cool-water aquatic life habitats, which applies to most of the basin, is as follows:

OAR 340-041-0016(3)-For water bodies identified by the Department as providing cool-water aquatic life, the dissolved oxygen may not be less than 6.5 mg/l as an absolute minimum (as a 30 day mean minimum).

Cold water DO criteria, of 8.0 mg/l or 90 percent saturation, applies to headwater streams.

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, waterfowl 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.

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 overland return flows from irrigated areas.

Chlorophyll a

Chlorophyll a is associated with the growth of phytoplankton or algae in water bodies. It is not the focus of this Plan because problems with Chlorophyll a primarily originate in Unity Reservoir because it is a shallow, warm, stagnant pool during the hot summer months, a condition over which landowners have no control.

Nuisance Phytoplankton Growth OAR 340-041-0019 (1)(a) The following values and implementation program must be applied to lakes, reservoirs, estuaries and streams, except for ponds and reservoirs less than ten acres in surface area, marshes and saline lakes:

(b) The following average Chlorophyll a value must be used to identify water bodies where phytoplankton may impair the recognized beneficial uses:

(A) Natural lakes that thermally stratify: 0.01 mg/1;

(B) Natural lakes that do not thermally stratify, reservoirs, rivers and estuaries: 0.015 mg/1.