



**Oregon**

Department  
of Agriculture

**Upper Mainstem and South Fork John Day  
River Agricultural  
Water Quality Management Area Plan**

**January 2019**

**Developed by the**

**Oregon Department of Agriculture**

**Upper Mainstem and South Fork John Day River Local Advisory Committee**

**With support from the**

**Grant Soil and Water Conservation District**

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

**Grant SWCD  
721 S Canyon Blvd.  
John Day, OR 97845  
Phone: (541) 575-0135**

<https://oda.direct/AgWQPlans>



# Table of Contents

<b>Acronyms and Terms Used in this Document.....</b>	<b>i</b>
<b>Foreword .....</b>	<b>iii</b>
<b>Required Elements of Area Plans.....</b>	<b>iii</b>
<b>Plan Content.....</b>	<b>iii</b>
<b>Chapter 1: Agricultural Water Quality Management Program Purpose and Background .....</b>	<b>1</b>
<b>1.1 Purpose of Agricultural Water Quality Management Program and Applicability of Area Plans.....</b>	<b>1</b>
<b>1.2 History of the Ag Water Quality Program .....</b>	<b>1</b>
<b>1.3 Roles and Responsibilities.....</b>	<b>2</b>
1.3.1 Oregon Department of Agriculture .....	2
1.3.2 Local Management Agency .....	5
1.3.3 Local Advisory Committee.....	5
1.3.4 Agricultural Landowners .....	5
1.3.5 Public Participation.....	6
<b>1.4 Agricultural Water Quality .....</b>	<b>6</b>
1.4.1 Point and Nonpoint Sources of Water Pollution .....	6
1.4.2 Beneficial Uses and Parameters of Concern.....	6
1.4.3 Impaired Waterbodies and Total Maximum Daily Loads (TMDLs) .....	7
1.4.4 Oregon Water Pollution Control Law – ORS 468B.025 and ORS 468B.050.....	7
1.4.5 Streamside Vegetation and Agricultural Water Quality.....	8
<b>1.5 Other Water Quality Programs.....</b>	<b>9</b>
1.5.1 Confined Animal Feeding Operation Program .....	9
1.5.2 Groundwater Management Areas.....	10
1.5.3 The Oregon Plan for Salmon and Watersheds.....	10
1.5.4 Pesticide Management and Stewardship .....	10
1.5.5 Drinking Water Source Protection .....	11
<b>1.6 Partner Agencies and Organizations.....</b>	<b>11</b>
1.6.1 Oregon Department of Environmental Quality.....	11
1.6.2 Other Partners .....	12
<b>1.7 Measuring Progress .....</b>	<b>12</b>
1.7.1 Measurable Objectives.....	12
1.7.2 Land Conditions and Water Quality.....	12
1.7.3 Focused Implementation in Small Geographic Areas.....	13
<b>1.8 Monitoring, Evaluation, and Adaptive Management .....</b>	<b>14</b>
1.8.1 Agricultural Water Quality Monitoring.....	14
1.8.2 Statewide Aerial Photo Monitoring of Streamside Vegetation .....	14
1.8.3 Biennial Reviews and Adaptive Management .....	14
<b>Chapter 2: Local Background.....</b>	<b>17</b>
<b>2.1 Local Roles and Responsibilities.....</b>	<b>18</b>
2.1.1 Local Advisory Committee.....	18
2.1.2 Local Management Agency .....	18
2.1.3 Local Watershed Council.....	18
<b>2.2 Area Plan and Rules: Development and History.....</b>	<b>18</b>
<b>2.3 Geographical and Physical Setting.....</b>	<b>19</b>

2.3.2	Upper Mainstem Subbasin.....	19
2.3.2.1	Climate, Land Ownership, Land Cover and Uses, Special Use Designated Areas and Resources – Upper Main Stem John Day Subbasin .....	20
2.3.3	South Fork John Day Subbasin .....	28
2.3.3.1	Climate, Land Ownership, Land Cover and Uses, Special Use Designated Area, and Resources of the South Fork John Day Subbasin .....	28
2.3.4	Additional Influences on Water Quality within the Management Area .....	31
<b>2.4</b>	<b>Agricultural Water Quality .....</b>	<b>33</b>
2.4.1	Water Quality Issues.....	33
2.4.1.1	Beneficial Uses.....	34
2.4.1.2	WQ Parameters and 303(d) list.....	34
2.4.1.3	Water Quality Parameters of Concern .....	34
2.4.2	Basin TMDLs and Agricultural Load Allocations .....	36
2.4.3	Sources of Impairment.....	36
<b>2.5</b>	<b>Voluntary and Regulatory Measures.....</b>	<b>36</b>
2.5.1	Nutrients and Manure Management .....	37
2.5.2	Riparian/Streamside Area Management .....	37
2.5.3	Soil Erosion Prevention and Control.....	39
2.5.4	Livestock Management.....	39
2.5.5	Uplands Management.....	40
2.5.6	Irrigation Management.....	41
<b>Chapter 3:</b>	<b>Strategic Initiatives .....</b>	<b>43</b>
<b>3.1</b>	<b>Measurable Objectives .....</b>	<b>43</b>
3.1.1	Management Area .....	43
3.1.2	Focus Area(s).....	43
<b>3.2</b>	<b>Strategies and Activities .....</b>	<b>44</b>
3.2.1	Education and Outreach.....	45
3.2.2	Water Quality Management Practices .....	45
3.2.3	Conservation Planning and Conservation Activities.....	46
3.2.4	Sources of Financial and Technical Assistance .....	46
<b>3.3</b>	<b>Monitoring and Evaluation .....</b>	<b>47</b>
<b>Chapter 4:</b>	<b>Implementation, Monitoring, and Adaptive Management.....</b>	<b>49</b>
<b>4.1</b>	<b>Measurable Objectives .....</b>	<b>49</b>
4.1.1	Management Area .....	49
4.1.2	Focus Areas.....	49
<b>4.2</b>	<b>Activities and Accomplishments .....</b>	<b>50</b>
<b>4.3</b>	<b>Monitoring—Status and Trends.....</b>	<b>52</b>
<b>4.4</b>	<b>Biennial Reviews and Adaptive Management .....</b>	<b>53</b>
<b>References .....</b>		<b>55</b>
<b>Appendix A:</b>	<b>Water bodies in the Upper John Day Subbasin on the State of Oregon’s 2012 303(d) List .....</b>	<b>57</b>
<b>Appendix B:</b>	<b>Complaints and Investigations .....</b>	<b>61</b>

## Acronyms and Terms Used in this Document

**Ag Water Quality Program** – Agricultural Water Quality Management Program  
**Area Plan** – Agricultural Water Quality Management Area Plan  
**Area Rules** – Agricultural Water Quality Management Area Rules  
**AUM** – Animal Unit Month  
**BLM** – Bureau of Land Management  
**CAFO** – Confined Animal Feeding Operation  
**CWA** – Clean Water Act  
**CZARA** – Coastal Zone Act Reauthorization Amendments  
**DEQ** – Oregon Department of Environmental Quality  
**DMA** – Designated Management Agency  
**FPA** – Forest Practice Act  
**GPM** – Gallons Per Minute  
**GWMA** – Groundwater Management Area  
**HABs** – Harmful Algal Blooms  
**LAC** – Local Advisory Committee  
**LMA** – Local Management Agency  
**Management Area** – Agricultural Water Quality Management Area  
**MMBF** – Million Board Feet  
**MOA** – Memorandum of Agreement  
**NMF** – North and Middle Forks John Day River  
**NPDES** – National Pollution Discharge Elimination System  
**NRCS** – Natural Resources Conservation Service  
**OACD** – Oregon Association of Conservation Districts  
**OAR** – Oregon Administrative Rules  
**ODA** – Oregon Department of Agriculture  
**ODF** – Oregon Department of Forestry  
**ODFW** – Oregon Department of Fish and Wildlife  
**OHA** – Oregon Health Authority  
**ORS** – Oregon Revised Statute  
**OSU Extension** – Oregon State University Extension  
**OWEB** – Oregon Watershed Enhancement Board  
**PMP** – Pesticides Management Plan  
**PSP** – Pesticides Stewardship Partnership  
**RCA** – Required Corrective Action  
**RM** – River Miles  
**RUSLE** – Revised Universal Soil Loss Equation  
**SIA** – Strategic Implementation Area  
**SFJD WC** – South Fork John Day Watershed Council  
**South Fork** – South Fork John Day River Subbasin  
**SWCD** – Soil and Water Conservation District  
**TMDL** – Total Maximum Daily Load  
**Upper Mainstem** – Upper Mainstem John Day River Subbasin  
**USDA** – United States Department of Agriculture  
**US EPA** – United States Environmental Protection Agency  
**USFS** – United States Forest Service  
**Warm Springs Tribes** – Confederated Tribes of the Warm Springs Reservation of Oregon  
**WPCF** – Water Pollution Control Facility  
**WRD** – Oregon Water Resources Department  
**WQPMT** – Water Quality Pesticides Management Team



## Foreword

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

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

## Required Elements of Area Plans

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

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

## Plan Content

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

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

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

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





# **Chapter 1: Agricultural Water Quality Management Program Purpose and Background**

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

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

The provisions of the Area Plan do not establish legal requirements or prohibitions (ORS 568.912(1)). Each Area Plan is accompanied by Area Rules that describe local agricultural water quality regulatory requirements. ODA will exercise its regulatory authority for the prevention and control of water pollution from agricultural activities under the Ag Water Quality Program’s general regulations (OAR 603-090-0000 to 603-090-0120) and under the Area Rules for this Management Area (OAR 603-095-2000). The Ag Water Quality Program’s general rules guide the Ag Water Quality Program, and the Area Rules for the Management Area are the regulations that landowners are required to follow. Landowners will be encouraged through outreach and education to implement conservation management activities.

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

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

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

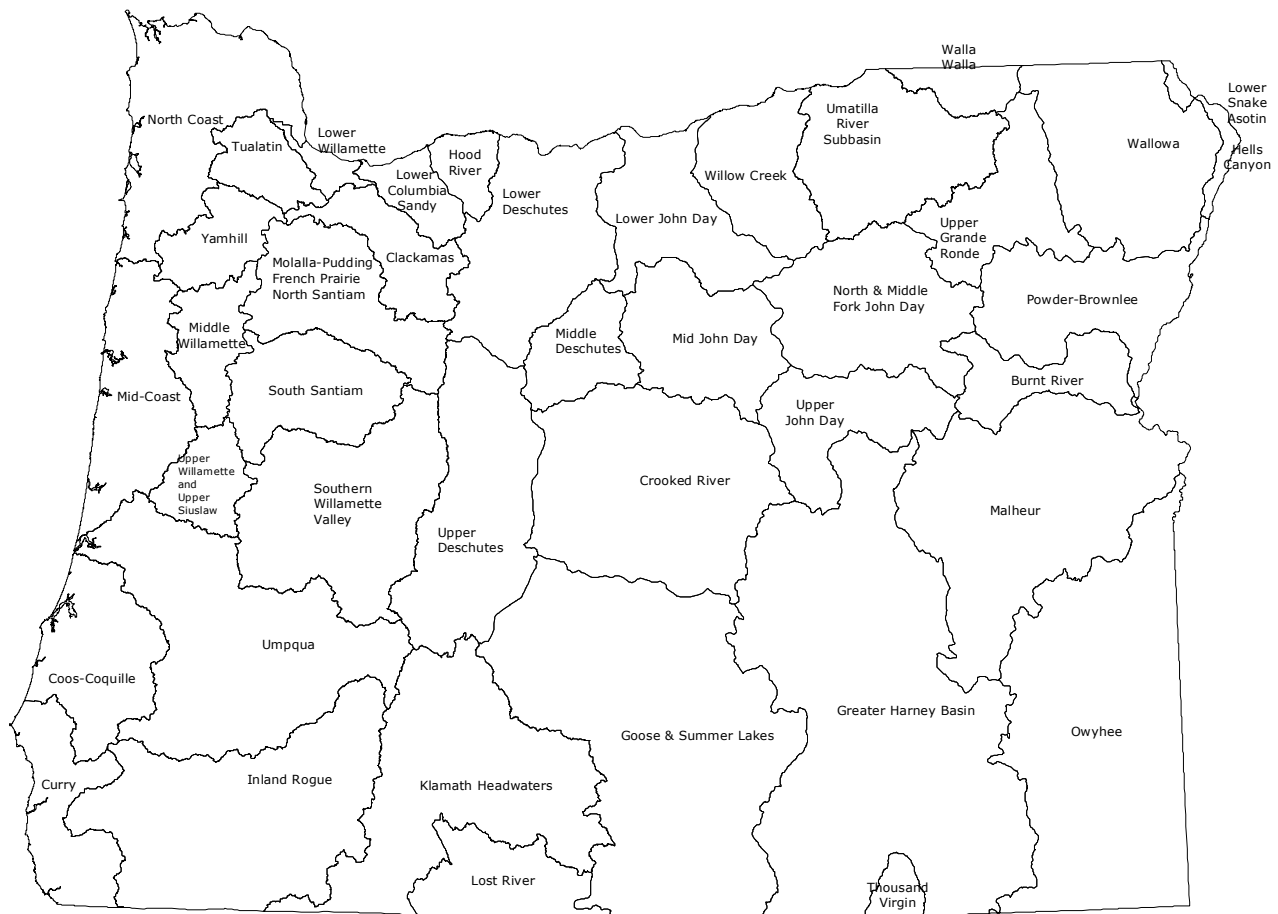
## **1.2 History of the Ag Water Quality Program**

In 1993, the Oregon Legislature passed the Agricultural Water Quality Management Act directing ODA to develop plans to prevent and control water pollution from agricultural activities and soil erosion; to achieve water quality standards; and to adopt rules as necessary (ORS 568.900 through ORS 568.933). Senate Bill 502 was passed in 1995 to clarify that ODA is the lead agency for regulating agriculture with respect to water quality (ORS 561.191). The Area Plan and Area Rules were developed and subsequently revised pursuant to these statutes.

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

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

**Figure 1: Map of 38 Agricultural Water Quality Management Areas**



## 1.3 Roles and Responsibilities

### 1.3.1 Oregon Department of Agriculture

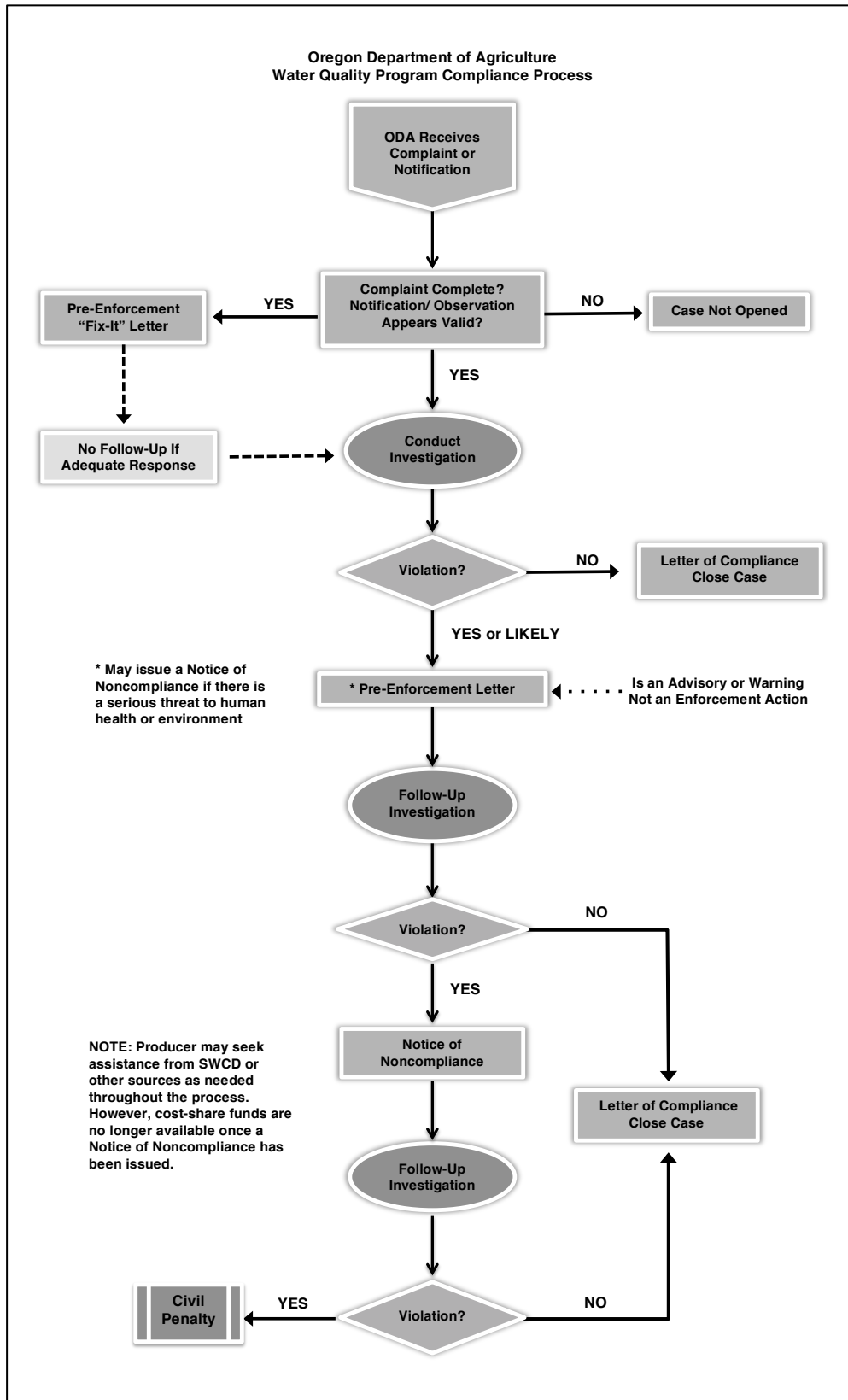
The Oregon Department of Agriculture is the agency responsible for implementing the Ag Water Quality Program (ORS 568.900 to 568.933, ORS 561.191, OAR 603-090, and OAR 603-095). The Ag Water Quality Program was established to develop and carry out a water quality management plan for the prevention and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

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

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

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

**Figure 2: Compliance Flow Chart**



### **1.3.2 Local Management Agency**

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

The day-to-day implementation of the Area Plan is accomplished through an intergovernmental agreement between ODA and each SWCD. Each SWCD implements the Area Plan by providing outreach and technical assistance to landowners. SWCDs also work with ODA and the LAC to establish implementation priorities, evaluate progress toward meeting Area Plan goals and objectives, and revise the Area Plan and Area Rules as needed.

### **1.3.3 Local Advisory Committee**

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

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

- Participate in the development and ongoing revisions of the Area Plan.
- Participate in the development and revisions of the Area Rules.
- Recommend strategies necessary to achieve the goals and objectives in the Area Plan.
- Participate in biennial reviews 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. Each landowner in the Management Area is required to comply with the Area Rules. In addition, landowners need to select and implement a suite of measures to protect water quality. The actions of each landowner will collectively contribute toward achievement of the water quality standards.

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

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

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

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

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

### **1.3.5 Public Participation**

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

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

## **1.4 Agricultural Water Quality**

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

### **1.4.1 Point and Nonpoint Sources of Water Pollution**

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

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

### **1.4.2 Beneficial Uses and Parameters of Concern**

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

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

### **1.4.3 Impaired Waterbodies and Total Maximum Daily Loads (TMDLs)**

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

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

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

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

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

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

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

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

ORS 468B.025 states that:

- (1) Except as provided in ORS 468B.050 or 468B.053, no person shall:
  - (a) Cause pollution of any waters of the state or place or cause to be placed any wastes in a location where such wastes are likely to escape or be carried into the waters of the state by any means.

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

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

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

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

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

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

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

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

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

### **1.4.5 Streamside Vegetation and Agricultural Water Quality**

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

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

- Streamside vegetation improves water quality related to multiple pollutants, including: temperature (heat), sediment, bacteria, nutrients, toxics, and pesticides.
- Streamside vegetation provides fish and wildlife habitat.



- Landowners can improve streamside vegetation in ways that are compatible with their operation. Streamside conditions may be improved without the removal of the agricultural activity, such as with managed grazing.
- Streamside vegetation condition is measurable and can be used to track progress in achieving desired site conditions.

### Site-Capable Vegetation

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

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

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

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

## **1.5 Other Water Quality Programs**

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

### **1.5.1 Confined Animal Feeding Operation Program**

The Oregon Department of Agriculture is the lead state agency for the CAFO Program. The CAFO Program was developed to ensure that operators do not contaminate ground or surface water with animal manure or process wastewater. Since the early 1980s, CAFOs in Oregon have been registered to a general Water Pollution Control Facility (WPCF) permit designed to protect water quality. A properly maintained CAFO must implement a site-specific suite of structural and management practices to protect ground or surface water. To assure continued protection of ground and surface water, the 2001 Oregon State Legislature directed ODA to convert the CAFO Program from a WPCF permit program to a federal

National Pollutant Discharge Elimination System (NPDES) program. Oregon Department of Agriculture and DEQ jointly issue the NPDES CAFO Permit, which complies with all CWA requirements for CAFOs. In 2015, ODA and DEQ jointly issued a WPCF general CAFO Permit as an alternative for CAFOs that are not subject to the federal NPDES CAFO permit requirements. Currently, ODA can register CAFOs to either the WPCF or NPDES CAFO permit.

Either of the Oregon CAFO permits require the registrant to operate according to a site-specific, ODA-approved, Animal Waste Management Plan that is incorporated into the CAFO permit by reference. You can view the CAFO program site at <http://www.oregon.gov/ODA/programs/NaturalResources/Pages/CAFO.aspx>

### **1.5.2 Groundwater Management Areas**

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

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

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

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

### **1.5.4 Pesticide Management and Stewardship**

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

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

Through the PSP, state agencies and local partners work together to monitor pesticides in streams and to improve water quality ([www.deq.state.or.us/wq/pesticide/pesticide.htm](http://www.deq.state.or.us/wq/pesticide/pesticide.htm)). ODA, DEQ, and Oregon State

University Extension Service work with landowners, SWCDs, watershed councils, and other local partners to voluntarily reduce pesticide levels while improving water quality and crop management. Since 2000, the PSPs have made noteworthy progress in reducing pesticide concentrations and detections.

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

### **1.5.5 Drinking Water Source Protection**

Oregon implements its drinking water protection program through a partnership between DEQ and OHA. The program provides individuals and communities with information on how to protect the quality of Oregon's drinking water. The DEQ and OHA encourage preventive management strategies to ensure that all public drinking water resources are kept safe from current and future contamination. For more information see: [www.deq.state.or.us/wq/dwp/dwp.htm](http://www.deq.state.or.us/wq/dwp/dwp.htm).

## **1.6 Partner Agencies and Organizations**

### **1.6.1 Oregon Department of Environmental Quality**

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

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

The MOA includes the following commitments:

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

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

### **1.6.2 Other Partners**

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

## **1.7 Measuring Progress**

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

### **1.7.1 Measurable Objectives**

Measurable objectives allow the Ag Water Quality Program to better evaluate progress towards improved water quality. A measurable objective is a numeric long-term desired outcome to achieve by a specified date. Milestones are the interim steps needed to make progress toward the measurable objective and consist of numeric short-term targets to reach by specific dates. Together, the milestones define the timeline needed to achieve the measurable objective.

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

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

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

### **1.7.2 Land Conditions and Water Quality**

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

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

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

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

### **1.7.3 Focused Implementation in Small Geographic Areas**

#### Focus Areas

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

Systematic implementation in Focus Areas provides the following advantages:

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

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

### Strategic Implementation Areas

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

## **1.8 Monitoring, Evaluation, and Adaptive Management**

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

### **1.8.1 Agricultural Water Quality Monitoring**

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

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

### **1.8.2 Statewide Aerial Photo Monitoring of Streamside Vegetation**

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

### **1.8.3 Biennial Reviews and Adaptive Management**

All Area Plans and Area Rules around the state undergo biennial reviews by ODA and the LAC. As part of each biennial review, ODA, DEQ, SWCDs, and the LAC discuss and evaluate the progress on implementation of the Area Plan and Area Rules. This evaluation includes discussion of enforcement actions, land condition and water quality monitoring, and outreach efforts over the past biennium. ODA and partners evaluate progress toward achieving measurable objectives, and revise implementation strategies as needed. The LAC submits a report to the Board of Agriculture and the director of ODA

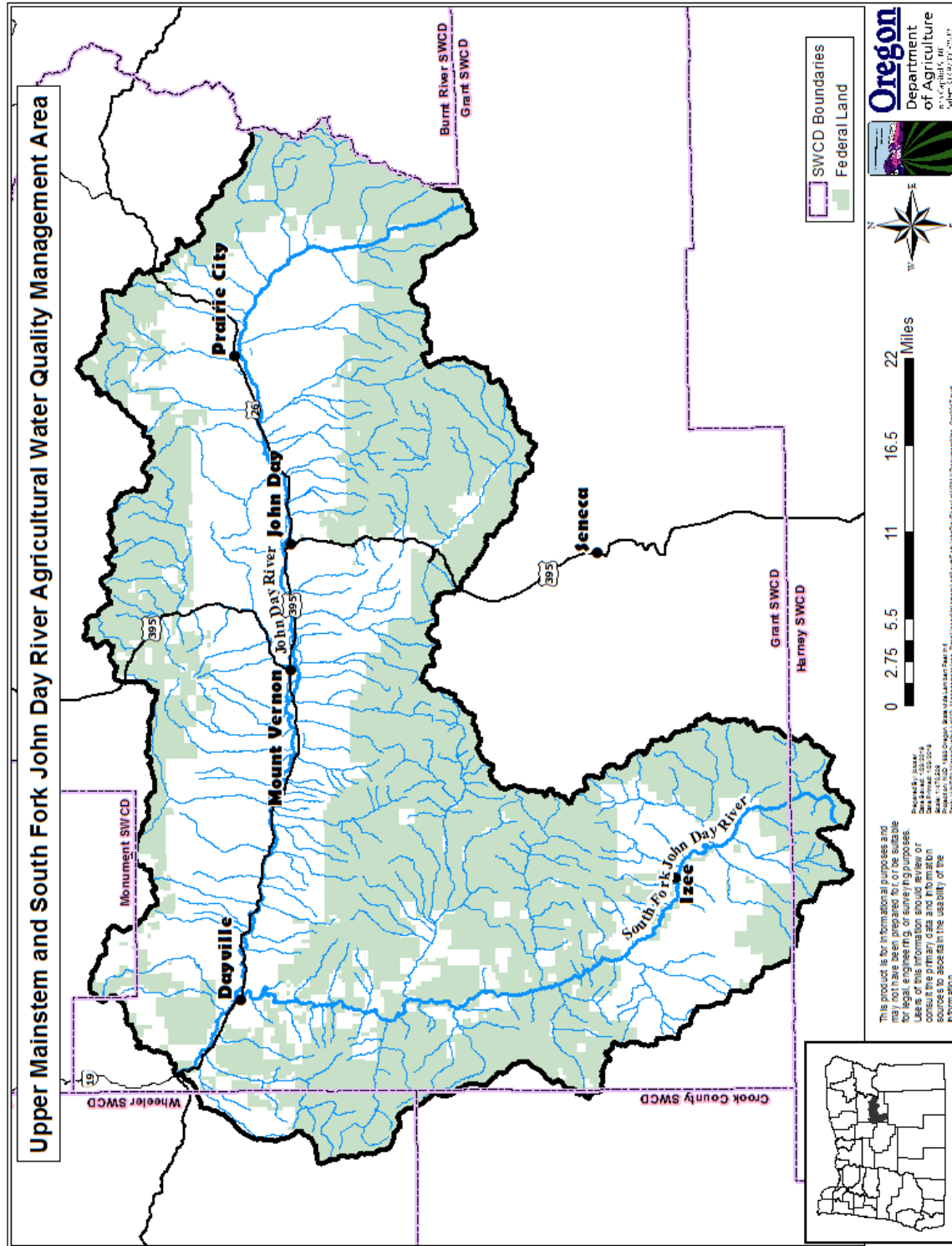
describing progress and impediments to implementation, and recommendations for modifications to the Area Plan or Area Plans necessary to achieve the goal of the Area Plan. ODA and partners will use the results of this evaluation to update the measurable objectives and implementation strategies in Chapter 3.





## Chapter 2: Local Background

The Upper Mainstem and South Fork John Day River Management Area includes the areas that drain into Upper Mainstem and the South Fork of the John Day River upstream from Picture Gorge (RM 205). The physical boundaries of the Management Area are shown on the map below.



## **2.1 Local Roles and Responsibilities**

### **2.1.1 Local Advisory Committee**

The Area Plan was developed with the assistance of the LAC. The LAC was formed in 2002 to assist with the development of the Area Plan and Area Rules and with subsequent biennial reviews.

Current LAC members are:

Name	Location	Description
Joanne Keerins (Chair)	Izee	Rancher, Grant SWCD director, original member of LAC
Roger O. Ediger	Mt. Vernon	Rancher, Grant SWCD director, original member of LAC
Dennis Reynolds	Canyon Creek and Prairie City	Retired county judge, small rural land manager – Upper John Day River, original member of LAC
Ted Clausen	Dayville	Rancher, Grant SWCD Associate Director, original member
Phil St. Clair	Izee	Rancher, Grant SWCD Director, South Fork John Day Watershed Council Vice Chair, original member of LAC
Stephan Charette	John Day	Fish biologist with Oregon Department of Fish and Wildlife
Mark Webb	Mt. Vernon	Former county judge, small rural land owner

### **2.1.2 Local Management Agency**

The implementation of the Area Plan is accomplished through an Intergovernmental Agreement between ODA and the Grant SWCD. This Intergovernmental Agreement defines Grant SWCD as the LMA for implementation of the Area Plan. The SWCD was also involved in development of the Area Plan and Area Rules.

### **2.1.3 Local Watershed Council**

The South Fork John Day Watershed Council (SFJD WC) is composed of a diverse group of landowners, residents, government agencies, and organizations working together to enhance watershed health in the South Fork John Day River (South Fork) Subbasin. The SFJD WC is another local entity that assists landowners with improvement projects that address the strategies and goals of this Area Plan.

## **2.2 Area Plan and Rules: Development and History**

The director of ODA approved the Area Plan and Area Rules in December 2002.

Since approval the LAC has met every two years 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 area included in this planning effort encompasses the Upper Mainstem John Day River (Upper Mainstem) Subbasin and the South Fork Subbasin. This Plan will focus on the Upper Mainstem between Picture Gorge (River Mile 205) and its source in the Strawberry Mountains and the South Fork drainage from Dayville to the headwaters. The John Day River drains approximately 8,100 square miles of land in east central Oregon and is the third largest drainage in the state. The physical boundaries of the map are indicated on the map below.

### **2.3.2 Upper Mainstem Subbasin**

The Upper Mainstem Subbasin is located almost entirely within Grant County. It drains an area of approximately 1,070 square miles above Picture Gorge. The mainstem John Day River flows west out of the Blue Mountains through a valley of irrigated stream bottoms and bench lands for over 75 miles before reaching Picture Gorge. Lower elevation agricultural land gives way to range and forest land at higher elevations. Most headwater areas are on lands managed by the Malheur and Ochoco National Forests in the Aldrich, Ochoco and Strawberry mountains. The Subbasin contains naturally occurring lakes, hot springs, and mineral springs. Elevations range from about 2,230 feet at Picture Gorge to above 9,000 feet in the Strawberry Range. The Upper Mainstem Subbasin is diverse and contains mountains, rugged hills, plateaus cut by streams, alluvial basins and valleys. Coniferous forests and meadows are prevalent above an elevation of about 4,000 feet while the plant community below 4,000 feet is generally composed of grasses, sagebrush, and juniper trees.

The largest concentration of population in the John Day River Basin is in the Upper Mainstem Subbasin between Dayville and Prairie City. The inhabitants of Mt. Vernon, John Day, Canyon City, and Prairie City comprise about 52 percent of Grant County's population. The 2017 U.S. Census estimated the Grant County population at 7,190; a decline of approximately 9.4 percent from the estimated population of 7,935 for the year 2,000. The Subbasin also is the location of much of the John Day River Basin's industry.

The Upper Mainstem Subbasin is within the ceded lands of the Confederated Tribes of the Warm Springs Reservation of Oregon (Warm Springs Tribes). By treaty, the Warm Springs Tribes gave up most of the rights to their traditional homeland granted to the United States, vast areas of the John Day Basin, but reserved to themselves certain rights to the use of the unclaimed land and its resources. This area was, and is currently, used by the Warm Springs Tribes for various purposes such as ceremony, hunting, pasturing livestock, fishing, and gathering of plants and provided both subsistence and commercial resources. Resources of the area are still important to the economy of the Warm Springs Tribes furthering their interest in resource management in this Subbasin. The Warm Springs Tribes have acquired title to several tracts of land that will be managed for fish and wildlife purposes, as well as being used for agriculture and traditional uses. Also, the Warm Springs Tribes and the ODFW have co-management responsibility and authority for the fish and wildlife program in the Subbasin.

Local economic activity is strongly influenced by federal land management use decisions since most of Grant County's land base (approximately 60 percent) is publicly managed. United States Forest Service (USFS) administers about 90 percent of the 1.7 million acres of federal land within Grant County while the Bureau of Land Management (BLM) administers the remainder. The National Forest includes 80 percent of the commercial forestland in the county, provides substantial forage resources for domestic livestock and wildlife, and affords plentiful recreational opportunities.

Ranching is the primary agricultural activity in the area and relies on forestland for grazing in the summer; a total of about 260,000 acres are grazed. Approximately 25,000 acres are irrigated for grass and

alfalfa hay. Logging is critically important to the local economy. Between 2007 and 2016 the Malheur National Forest sold a total of 400 million board feet (MMBF) of timber. In general, each year since 2007 the volume sold has increased from a low of 14 MMBF to a high of nearly 70 MMBF due to the 10-year stewardship contract that started in 2013. The expectation going forward in the short term is to stay steady at about 70-75 MMBF of timber sold each year.

The Subbasin produces about 18 percent of the spring Chinook and about 16 percent of the steelhead of the John Day River basin. A significant resident trout population is present in this Subbasin.

**2.3.2.1 Climate, Land Ownership, Land Cover and Uses, Special Use Designated Areas and Resources – Upper Main Stem John Day Subbasin**

Climate

The climate is semi-arid. Average annual precipitation is between ten and 14 inches in the river valley at Dayville (2,300 feet). Average annual precipitation at the pass near the headwaters of the John Day River (5,899 ft.) is 40-44 inches. Frost-free consecutive days at Dayville range from 80–172 days. Frost-free consecutive days at John Day (3,085 feet) range from 71–162 days. Frost-free days at Prairie City (3,710 feet) range from 64–154 days.

Land Ownership

The federal government is the largest land manager in the Subbasin. The BLM manages mostly low-elevation grass/juniper rangeland, while the USFS manages higher elevation conifer forests and juniper/grass rangeland. Private lands generally are concentrated at lower elevations along streams and at intermediate upland elevations (mostly rangeland).

The Oregon Department of State Lands, ODF and Oregon Department of Fish and Wildlife (ODFW) manage scattered parcels throughout the Subbasin. One large block of ODFW’s Phillip W. Schneider Wildlife Area is located above Dayville along the South Fork John Day River. The Strawberry Mountain Wilderness Area, (a special federal management area) is located south of John Day and Prairie City.

Land Cover and Land Use

Land cover in the Upper Mainstem Subbasin is mostly range and forest. Most of the forested headwater areas are managed by federal agencies. Private rangeland dominates below the tree line. Upland soils, outside of the relatively flat alluvial valley floor, have a medium-to-high erosion potential and medium-to-high sediment yield.

About 38 percent of the Subbasin is range and pastureland. Local ranchers rely on forestland for summer grazing. Nearly 260,000 acres of forestland are grazed. Forest covers about 56 percent of the Subbasin.

Upper Mainstem Subbasin Landcover

Type	Acres
Range and pastureland	262,000
Forestland (grazed)	258,000
Forestland (not grazed)	131,400
Cropland	26,300
Other	14,000
	691,900

*Source: Oregon Department of Agriculture Small Watershed Reconnaissance Study, 1984.*

Irrigated cropland is confined largely to the valley, mostly on alluvial fans and floodplains of the mainstem and its tributaries. These croplands represent the greatest concentration of irrigated acreage in the entire John Day Basin.

#### Special Use Designated Areas

They are three special use designated areas in the Subbasin. The Strawberry Mountain Wilderness Area, Cedar Grove Botanical Area, and Canyon Creek Natural Area.

#### Resources

The economy of the Upper Mainstem Subbasin is heavily resource-based. Forest products, ranching, and retail trade are the primary private-sector industries. Federal, state, and local governments also are major employers.

#### *Agriculture*

Ranching is the primary agricultural activity in the Subbasin. Cropland, both irrigated and non-irrigated, makes up a small percentage of the Subbasin land area.

The 25,000 acres of irrigated cropland make up about 95 percent of the cropped area. The primary crops are grass hay and alfalfa. NRCS crop production values for hay and alfalfa on arable valley soils are 5.0 to 6.5 tons per acre for alfalfa and 1.5 to 2.5 tons per acre for native grass hay. An acre of irrigated pasture can produce 6 to 15 Animal Unit Months<sup>1</sup> (AUMs) of forage. These values assume the use of common management practices and that the water requirements of the crops are satisfied throughout the irrigation season. Non-irrigated land yields significantly less production.

#### *Forest Resources*

**Forest Types:** The forests of Grant County are almost exclusively softwoods, with small stringers of hardwoods in the river valleys. A belt of western juniper separates the forest from the grassland. Ponderosa pine predominates over the forested area and often occurs in pure stands at lower elevations (comprises 59 percent of timber species).

Timber harvest can both affect watershed health and water quality. In 1958, total log production in Grant County was 240 MMBF, Scribner Decimal C Rule. The previous ten years log output averaged 225 MMBF annually, ranging from 154 MMBF in 1949 to 285 MMBF in 1956. At that time, 90 percent of saw-timber volume was Federally provided (12,185 MMBF Scribner). Private ownership saw-timber was estimated at 1,352 MMBF Scribner. Privately owned forestlands in Grant County produced more than half the county's log production during the 1949-1958 period as promised. Gross standing timber by volume on the Malheur National Forest for 1959 was 11,641 MMBF. (*Forest Statistics for Grant County, Oregon* - Forest Survey Report 137, Nov. 1960). For 1994, the gross standing volume was 11,917 MMBF. By 2000, the annual volume of timber sold from the Malheur National Forest was reduced to 13.5 MMBF. (Malheur National Forest Information Derived from Historical Sources and Reports by William L. McArthur, USDA Forest Service Silviculturalist).

Wildfires can both affect watershed health and water quality. Between 2007 and 2016 a total of 1,136 wildfires occurred in the Malheur National Forest. Significant large fire years include the 2007 Egley Complex that burned over 100,000 acres and the 2015 Canyon Creek Complex Fire that burned over 90,000 acres. Other significant years include 2014 in which nearly 30,000 acres burned with the South Fork Complex and Bald Sisters fires and 2012 when the Parish Cabin Fire burned nearly 6,500 acres. All

---

<sup>1</sup> The NRCS National Range and Pasture Handbook defines an Animal Unit (AU) as generally one mature cow of approximately 1,000 pounds and a calf as old as 6 months, or their equivalent; and an AUM is the amount of forage required by an AU for 1 month.

of these fires burned with a mix of severity ranging from very high severity to mixed and low severity effects that would be considered beneficial landscape effects to the soil and vegetation.

### *Minerals and Energy*

The Upper Mainstem Subbasin has a rich and varied mining heritage. The Subbasin has produced gold, precious metals and industrial minerals. Besides large amounts of gold, 27,000 tons of chromite ore were mined from the rock outcrops along the north slope of the Strawberry Range. Gold dredges were probably the major impact of mining in the basin. The dredges were large floating barges that employed either draglines or continuously connected buckets to dig ponds out in front of the barge and then discharge the processed spoils, less the gold, out the back. By swinging the barge from side to side, the dredge could maintain itself afloat and move along the floor of the valley. The dredges moved as far as 1,000 feet from the river channel on either side of the river and mined as much land as the owners would sell. It is estimated that the dredges moved over 10,400,000 cubic yards of soil and rock dredging nine feet deep over 716 acres in nine miles of the John Day River and two miles of Canyon Creek (from above John Day to just below Mount Vernon on the river and up to about the high school on Canyon Creek). It is estimated that approximately one-third of the area was dredged near Prairie City and on Dixie Creek. *Gold and Silver in Oregon* states that dredging occurred just below Prairie City from 1930-1936 and on Dixie Creek from 1938-1941. In 1916, a dredge was installed by the Empire Dredge Co. near John Day and operated almost continuously until it was dismantled and moved to Prairie City in 1929. A large dragline dredge owned by Ferris and Marchbank began work in the John Day River near John Day in 1935, and a connected bucket dredge was installed by Western Dredging Co. in 1937. Both operations ceased in 1942. Dredge tailing piles are still visible along the John Day River and tributaries, and many more acres have been leveled and reclaimed for other uses. Evidence of early hydraulic mining can still be seen in the region known as the Humbolt Diggings. Significant miles of ditches were hand dug subsequent to the strikes of 1862 to provide water to support mining operations. The federal government has reserved the mineral rights on some of the property in the Upper Mainstem.

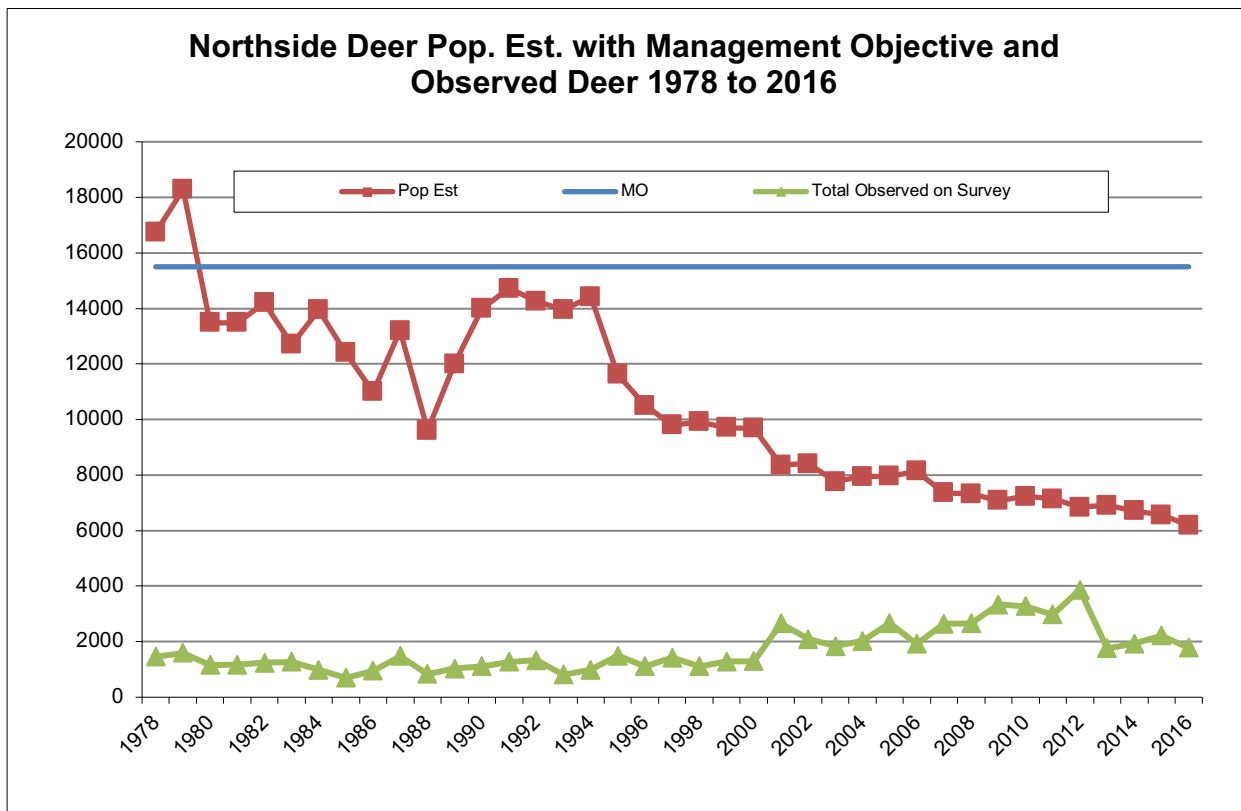
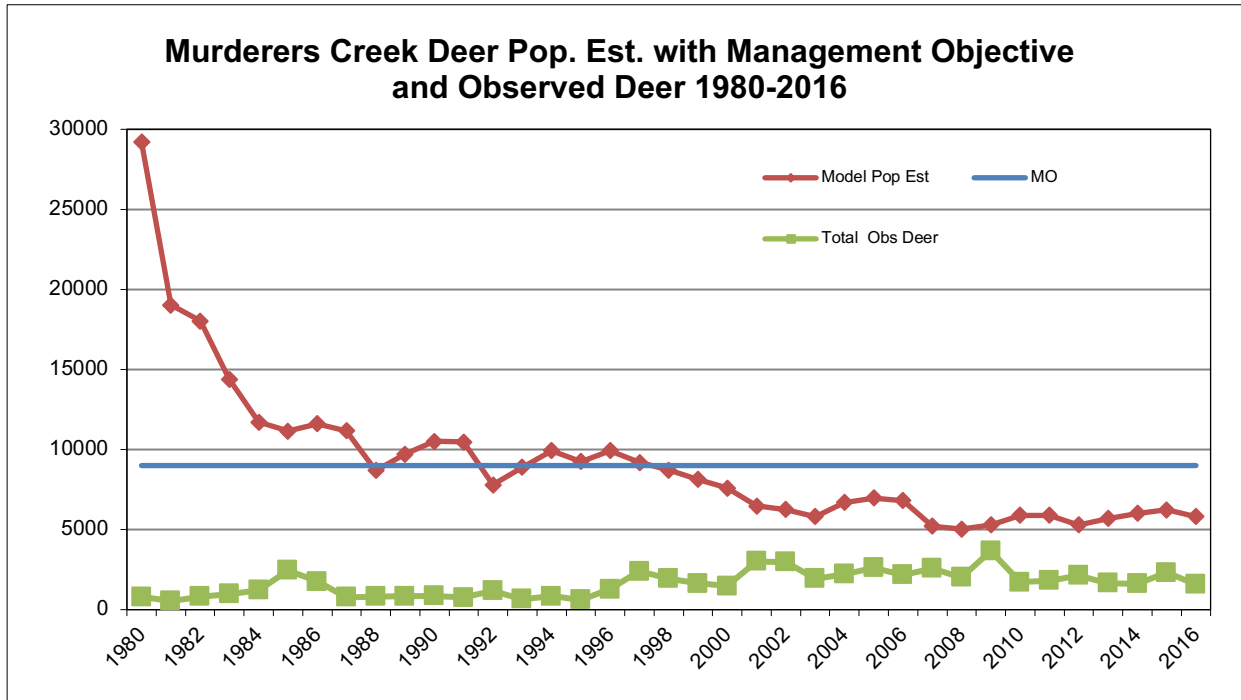
Prairie Wood Products in Prairie City has constructed a biomass-fired co-generation facility on its mill site. This facility will use 70,000 bone dry tons per year of mill residue to generate 7.5 megawatts of energy per hour. The mill is expected to use about 120 gallons per minute (GPM) of water in the process of generating energy. In February 1986, Prairie Wood Products applied for the right to pump 300 GPM of ground water from two deep wells. The facility was shut down in 2014 and is currently not in operation. The Upper Mainstem contains a number of low-temperature geothermal energy resources. They are Mt. Vernon Hot Springs (120°F), Limekiln Hot Springs (70°F), Blue Mountain Hot Springs (136°F), Thompson Hot Springs (88°F) on Indian Creek and Joaquin Miller Hot Springs (J Bar L) (118°F).

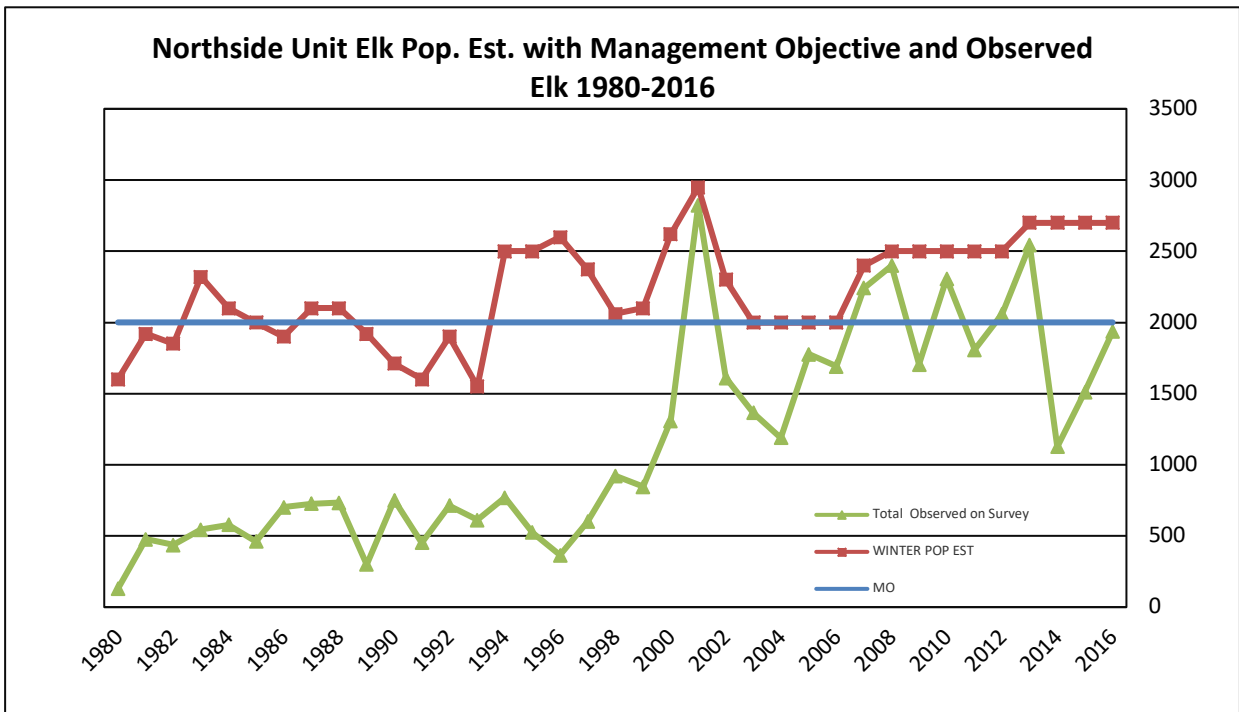
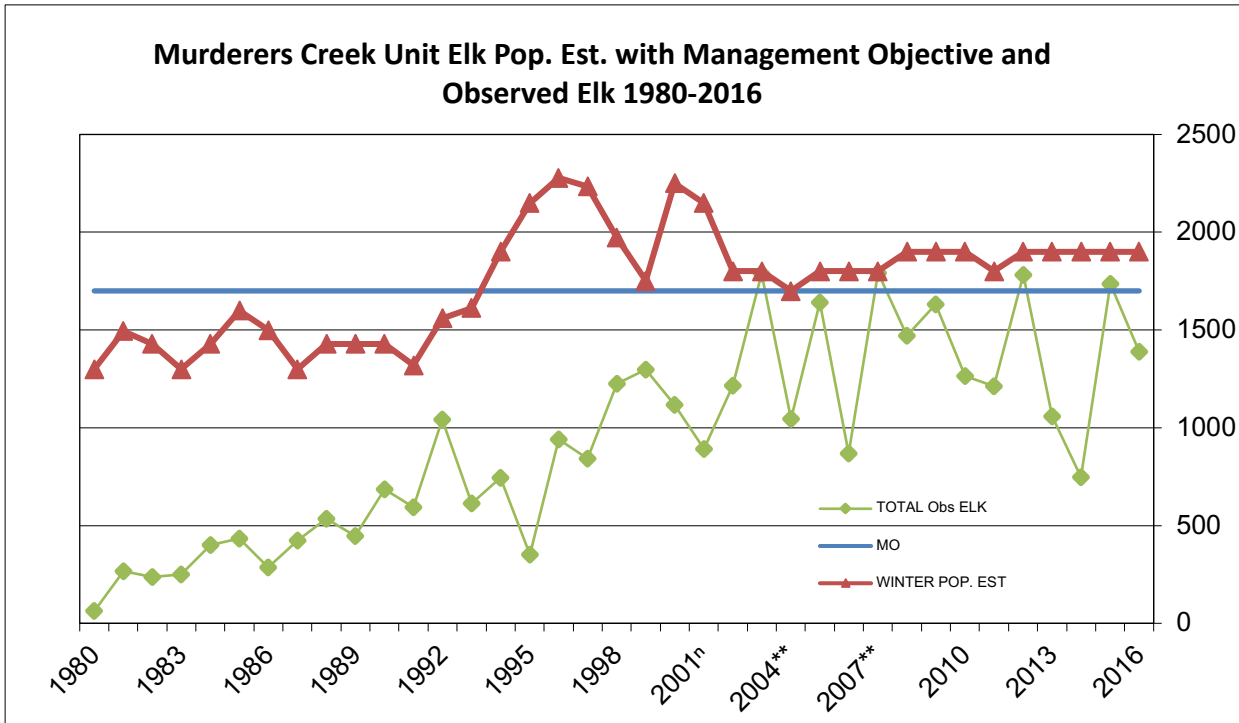
### *Wildlife Resources*

Big game species in the Subbasin consist of Mule Deer, Rocky Mountain Elk, California Bighorn Sheep, Mountain Goat, Cougar, Black Bear and Pronghorn Antelope.

Wildlife can affect watershed health and water quality. Historically, deer numbers in the Subbasin peaked between 1955 and 1970 with easily five times as many deer as are present today. From the turn of the century through 1960, elk were virtually non-existent throughout the Subbasin. Since 1960, there has been a steady increase in elk numbers. Management activities have reduced the elk herd in the Subbasin approximately 30 percent since 1994 and are designed to keep elk numbers at approximately their current level. Population estimates for deer and elk are derived from wintering populations in the Subbasin. Deer and elk wintering in the Subbasin come from associated summer ranges in the Murderers Creek, Northside and Beulah wildlife management units, contained within the plan area. The following graphs illustrate the long-term deer and elk population trends for Murderers Creek and Northside Units and the associated ODFW management objective.

The LAC and ODA will be reviewing the wildlife resources section to update for the 2021 biennial review.





Data Source: Ryan Torland, ODFW District Wildlife Biologist, March 29, 2017  
 Smaller populations of big game species including Pronghorn Antelope, California Bighorn Sheep, and Mountain Goat reside within the plan area.



<b>Combined Murderers Creek &amp; Northside Wildlife Management Units Spring 2017 Population Estimates</b>		
<b>Species</b>	<b>Year</b>	<b>Population Estimate</b>
<b>Antelope</b>	<b>2017</b>	<b>162</b>
<b>Bighorn</b>	<b>2017</b>	<b>250</b>
<b>Mountain Goat</b>	<b>2017</b>	<b>60</b>

Data Source: Ryan Torland, ODFW District Wildlife Biologist, March 29, 2017

Populations of ducks, geese, turkeys, chukars, grouse and quail exist throughout the Subbasin.

Beavers are present throughout the Subbasin. They are present in most of the moderate to low gradient perennial streams with adequate habitat. ODFW has not attempted to estimate current numbers, however the population is lower than described in the journals of fur trappers in the early 1800s.

#### *Fish Resources*

Over the last 10 years, an average of 1,323 adult spring Chinook salmon and 858 adult summer steelhead have returned each year to the Upper Mainstem Subbasin to spawn. The Subbasin averages roughly 35 percent of the total John Day spring Chinook and about 10 percent of its summer steelhead adult returns. The Subbasin contains approximately 123 miles of existing spring Chinook spawning and rearing habitat and about 350 miles of summer steelhead habitat. As fish passage and habitat conditions in the Subbasin continue to improve, the extent of spring Chinook spawning and rearing habitat has expanded further into tributaries. Spawning surveys show an increase in the adult spring Chinook use of the Upper Mainstem, but continued low returns for summer steelhead, which continue to be listed as threatened under the federal Endangered Species Act (ESA). (Personal communication from Stephan Charette, ODFW, November 13, 2018)

Summer steelhead migrate to the headwater areas between March and May and can spawn as late as June. Steelhead fry emerge from spawning gravels after two to three months and remain in the Subbasin for two to three years before migrating out of the basin.

Spring Chinook enter the drainage in spring (April through May) but do not reach spawning grounds until mid-June. Adult Chinook rest in pools until spawning commences in late August or early September. Fry emerge from spawning gravels after an incubation period of up to five months, and rear for one year in the basin before migrating to the ocean as smolts. (Personal communication from Stephan Charette, ODFW, November 13, 2018)

#### *Recreation and Tourism*

Recreational use can affect watershed health and water quality. The Upper Mainstem Subbasin contains most of the urban development and industry in the John Day drainage. This area offers a variety of recreational opportunities. The Strawberry Mountain Wilderness provides numerous recreational experiences, such as camping, hiking, fishing, horseback riding, and sightseeing. Malheur National Forest campgrounds are located in the Subbasin. Steelhead and trout fishing account for approximately 4,200 angler-days per year along the river. Many other trout fishing opportunities are available in tributary streams and area lakes. Steelhead fishing is available from October through April with a peak during March. Trout fishing peaks in June and again in September as water temperatures become cooler. Hunting

for deer, bear, and elk is the single largest recreational pursuit in the basin and peaks during the fall months.

#### *Water Resources*

2001 US Geological Survey data indicates the average discharge of the John Day River at 2,092 cubic feet (1,516,000 acre-feet) per year based on 94 years of record at the McDonald Ferry station (*USGS, Water-Data Report OR-00-1*). Annual average discharge of the John Day River at Picture Gorge is 346,000 acre-feet; 22.8 percent of the basins yield. The South Fork John Day River, Beech Creek, Canyon Creek, Strawberry Creek, and Dixie Creek are major tributaries that contribute to the upper John Day River flow recorded by the Picture Gorge gauge. The South Fork John Day River alone contributes about 100,000 acre-feet per year; 6.6 percent of the basin yield. (*Stream Restoration Program for the Upper Mainstem of the John Day River, March 1992*)

The upper John Day River discharge fluctuates throughout the year. Peak discharge generally occurs between March and early June, and lowest flows occur during the months of August and September. Instream water rights are frequently unsatisfied in August and September.

The Upper Mainstem Subbasin contains most of the Management Areas natural slack water resources: Strawberry Lake, Little Strawberry Lake, Magone Lake, Slide Lake, and Little Slide Lake.

As of 2017 gauged streams in the Management Area are Strawberry Creek, Upper Mainstem John Day River, Canyon Creek, South Fork John Day River, Murderer's Creek, and Deer Creek. Beech Creek was previously gauged but only for a few years during the 1930s.

#### *Water Use and Control*

Irrigation is the dominant water use in the Upper Mainstem Subbasin. Although there are rights to divert over 900 cubic feet per second (cfs) of water for irrigation, it appears that the quantity actually used is less. According to the estimates of irrigated crop acreage, irrigation water requirements are about 100 cfs through the irrigation season. There are over 80 ditches diverting water from the mainstem John Day River; all are equipped with headgates as a regulation mechanism. (*John Day River Basin Report, State of Oregon Water Resources Department, November 1986*) All diversions on anadromous fish streams are screened to protect against fish entering the ditches (ODFW). Ditch companies operate four major ditches in the Subbasin.

The Upper Mainstem Subbasin is considered the drainage area (approx. 1,070 sq. mi.) above Picture Gorge, excluding the South Fork watershed. The 80 noted ditches directly divert out of the Mainstem John Day River and would be distributed from Picture Gorge to where the river enters the National Forest above Prairie City.

In the upper portion of the Subbasin, most water is delivered using historical flood irrigation practices. Flood irrigation is economical and effective for use on grass, meadow hay and pastures. Below Mt. Vernon, there has been more interest in sprinkler irrigation systems to apply water on higher value crops such as alfalfa.

#### *Water Use Restrictions*

Minimum Streamflows -- In 1985, the Water Resources Commission established six minimum streamflows to protect instream water uses in the Upper Mainstem Subbasin. These minimum streamflows are regulated essentially the same as water rights – according to priority. The date for all six is November 3, 1983.

On the mainstem John Day River, three minimum streamflows cover the entire river reach from Rail Creek to Picture Gorge, a distance of about 70 miles. Three additional minimum streamflows are located on Canyon Creek from the East Fork Canyon Creek to the mouth; Beech Creek from the East Fork Beech Creek to the mouth; and Cottonwood Creek at the mouth.

Hydroelectric Standards -- Administrative rules governing hydroelectric application generally prohibit development of hydroelectric projects on the Mainstem John Day River.

Storage -- A number of reservoir sites have been identified in the Subbasin. Feasibility studies were performed on several of the sites by the Bureau of Reclamation and Corps of Engineers. Based on the criteria in use by the agencies at the time of the studies, none of the sites were found to be both environmentally and economically acceptable. Many of the proposed reservoirs would inundate anadromous fish spawning and rearing habitat and block migration. Projects may become available in drainages which would not adversely affect fish and which could meet the economic criteria of other possible public or private developers.

Based on irrigation water requirements and minimum flows, about 5,000 acre-feet are needed during the irrigation season to satisfy Subbasin needs.

Demand by both out-of-stream and instream uses, however, pales in comparison to the total water supply that flows out of the basin annually. (*Stream Restoration Program for the Upper Mainstem of the John Day River, March 1992*) For example, the irrigation water requirements of the Upper John Day Subbasins account for only 11 percent of the total annual flow at Picture Gorge. Similarly, the minimum flow in the Picture Gorge reach amounts to 23 percent of the annual gauged flow. Annual average volumes, then, are well in excess of present and expected future needs. However, instream water rights are frequently unsatisfied in August and September.

John Day Basin Reservation of Unappropriated Water for Future Economic Development -- In October 1992, the Grant SWCD requested that the ODA reserve unappropriated water in the John Day Basin for future economic development as allowed by ORS 537.356. Reserved water is to be stored in reservoirs to meet multiple purposes. The ODA requested reservations of 60,000 acre-feet of live flow for irrigation and 124,465 acre-feet to store to use for irrigation; 1,000 acre-feet for livestock; 4,000 acre-feet for industrial uses; 8,000 acre-feet for agriculture; 12,000 acre-feet for municipal uses; 1,000 acre-feet for domestic uses; 16,465 acre-feet for fishery; and 67,000 acre-feet for recreation. The 1993 amended request for the reservation included 15 potential reservoir sites: five sites in the Upper Mainstem Subbasin, 3 in the South Fork Subbasin, four in the North Fork Subbasin, and three in the Middle Fork Subbasin.

By 1999, the approval process had been slowed because of unresolved sensitive, threatened or endangered fish issues. The Oregon Water Resources Department (WRD) held two public scoping meetings in the John Day Basin to determine if stakeholders wanted to continue with rulemaking on the application for reservation of unappropriated water. ODA decided it was prudent to put the request to reserve water in the John Day Basin on hold until issues concerning STE fish species were resolved and conservation plans were developed.

Renewed interest in multi-purpose storage as a means to achieve positive benefits for agriculture; sensitive, threatened or endangered fish species; water quality and other purposes has caused ODA to restart the approval process for the request for reservations in the John Day Basin.

### **2.3.3 South Fork John Day Subbasin**

Flowing northward from the Ochoco and Aldrich mountains, the South Fork John Day River drains an area of approximately 607 square miles and enters the mainstem John Day River at Dayville. Subbasin elevation ranges between about 2,300 feet to 7,400 feet above sea level. The South Fork Subbasin is located mostly in Grant County and is the driest and most sparsely populated area of the John Day Subbasins.

Dayville is the only incorporated city in the Subbasin. There are three major transportation routes in the Subbasin: Highway 26 in the extreme northern part of the Subbasin; a road that parallels the South Fork John Day River from Dayville to the headwaters and a federal aid secondary highway that connects Prineville with Highway 395 and crosses the southern portion of the basin.

The Subbasin is within the ceded lands of the Warm Springs Tribes.

A little over one-half of the area is in forest with the remainder in range and pasture, of which 3,800 acres are irrigated. Nearly all of the forested areas are grazed and are federally managed by the Malheur National Forest (74,618 acres). About 20 percent of the South Fork Subbasin is in private ownership and of this about 37,800 acres are used for grazing.

#### **2.3.3.1 Climate, Land Ownership, Land Cover and Uses, Special Use Designated Area, and Resources of the South Fork John Day Subbasin**

##### Climate

The climate is semi-arid with precipitation ranging from 10- to 20-inches per year. Precipitation at Dayville averages about 13-inches per year. The majority of precipitation occurs between November and June with peak accumulations in May. The annual average temperature at Dayville is 52 °F. The coldest average monthly temperature (26 °F) occurs in December and the warmest (92°F) are shared between July and August. Subbasin elevation ranges between about 2,300 feet to 7,400 feet above sea level.

##### Land Ownership

The federal government manages most of the land in the Subbasin. Private lands tend to be concentrated at lower elevations along streams and at intermediate upland elevations. The Phillip W. Schneider Wildlife Management Area comprises most of the state lands in the South Fork drainage.

##### Land Cover and Land Use

The two major land cover types are coniferous forest and rangeland. The few agricultural areas in the Subbasin generally are located adjacent to streams on loamy soils. Forestland consists mostly of ponderosa and lodge pole pine with western larch and fir at higher elevations. Although some forestland is in private ownership, most is under Malheur and Ochoco National Forest management.

South Fork Subbasin Landcover

Type	Acres
Forestland (grazed)	216,300
Forestland (not grazed)	0
Cropland	5,200
Range/pasturelands	164,800
Other	3,300
	389,600

Photographs taken before and after the December 1964 flood indicate that the high waters scoured the South Fork River channel. Stream channel conditions are in an upward trend.

There is very little urban land in the Subbasin. Dayville, the only city in the Subbasin, has a population of 149 (according to 2010 census). Izee is a community encompassing an area 27 miles long with approximately 12 families located in the upper South Fork near the junction of the Post-Paulina Highway and the Dayville-Hines Road. Settlement throughout the remainder of the Subbasin is sparse. Ranching is the primary economic activity.

The South Fork Subbasin contains special wildlife, vegetation, and geologic values. The 26,000-acre Phillip W. Schneider Wildlife Management Area is owned and managed by ODFW. The Murderers Creek Wild Horse Herd Management Area (143,000 acres), composed partially of this ODFW land, adjacent USFS and BLM and private land, is administered jointly by the two federal agencies. The Murderers Creek Herd Management Area is located approximately 35 miles southwest of John Day, Oregon. It encompasses 34,954 acres of BLM land and 73,615 acres of National Forest Service land. Gathers are usually conducted every three years to maintain the herd at approximately 100 head. Per Gerald Dixon, at Region 6 of the USFS, a 2016 survey and statistical analysis estimated the Murderer's Creek horse population at approximately 264. The horses share the range with mule deer, elk, antelope, bighorn sheep, bear, cougar, and many other native species. (<https://www.blm.gov/adoptahorse/herdareas.php>)

#### Special Use Designated Area

##### *Wild and Scenic River Reaches*

The South Fork John Day River Oregon Wild and Scenic Waterway extends from approximately river mile (RM) 5 south of Dayville from the north boundary of the Phillip W. Schneider Wildlife Management Area upstream to County Road 63 RM 35 near the confluence of Pine Creek. This reach is classified as *Recreational* under the Oregon law. This State Scenic Waterway segment overlaps with the National Wild and Scenic River designation.

The Federal Wild and Scenic River designation extends from approximately Smokey Creek (RM 6) south of Dayville upstream to the Malheur National Forest Boundary (RM 52). The purpose of the designation is to preserve the outstanding natural, cultural and recreational features in a free-flowing condition for the enjoyment of present and future generations.

#### Resources

##### *Agriculture*

Cropping is practiced on only a very small amount of the Subbasin land area near Dayville and Izee. Irrigated agriculture, primarily pasture and hay production, comprises more than half the agricultural acreage, with the remainder devoted to non-irrigated hay, pasture and grain production. All irrigation water is derived from surface sources.

##### *Forest Resources*

Most of the forestlands in the Subbasin are managed by the Malheur and Ochoco national forests. According to the draft environmental statement for the South Fork Planning Unit (Malheur National Forest, 1976), there are nearly 170,000 acres of commercial forest within the Unit.

The Unit's forestlands also are used for range and have been since about 1900. The national forest currently permits annual cattle grazing at about 2,509 pairs (or 2,509 AUMs) between June 1 and October 15. (Personnel communication Joe Robson, MNF, Jan. 22, 2002). This is a substantial decline from the 9,700 AUMs made available for cattle grazing on the South Fork MNF lands as reported in the Oregon Water Resources *John Day Basin Report*, Nov. 1986.

### *Mining*

Mining activity has not been a factor on the South Fork.

*Wildlife:* Refer to Section 2.3.2.1.

### *Fish Resources*

The ten-year average in the South Fork Subbasin accounts for 12 percent of the total annual John Day steelhead adult returns, and supports a resident redband trout fishery. Between February 15 and May 15, a ten-year average of 1,150 adult steelhead spawners migrate into the South Fork drainage. The Subbasin provides approximately 259 km (162 mi) of spawning and rearing habitat. Juveniles rear in the Subbasin for one to three years before migrating out between October and June. The ten-year average number of out-migrant juvenile steelhead is 39,078. Production of juvenile steelhead per stream mile has generally been greater in the South Fork than that neighboring Upper Mainstem or Middle Fork John Day. The South Fork sees infrequent chinook spawning activity, with a total of six redds observed over the last ten years. Despite infrequent spawning activity, juvenile Chinook annually immigrate into the South Fork from the Upper Mainstem during summer months, and rear in the South Fork as well as Murderers and Black Canyon creeks. Izee Falls prevents migration of anadromous fish. Steelhead runs are restricted to the river and tributary habitat below Izee Falls at River Mile (RM) 27.5. Major steelhead production tributaries in the drainage are Murderers, Tex, Deer, Wind, and Black Canyon creeks. (Personal communication from Stephan Charette, ODFW, November 13, 2018.)

### *Recreation and Tourism*

The South Fork Subbasin is an area that has seen relatively little recreational development. Recreation and tourism can affect watershed health and water quality. This area contains three national forest campgrounds and the Black Canyon Wilderness providing recreational opportunities such as hiking, camping, hunting, horseback riding, sightseeing and fishing. Deer and elk hunting account for the largest number of recreation user-days in the Subbasin, with a peak in the fall. Trout fishing accounts for 2,500 angler-days on the South Fork of the river with an equal number on the tributary streams. Fishing peaks during June with another substantial surge during early fall.

### *Water Resources*

**Surface Water** -- The headwaters of the South Fork John Day River are in the Ochoco and Aldrich Mountains. The stream gradient over the 60-mile course of the river is a relatively gentle 47 feet per mile. Significant tributaries below Izee Falls are Murderers Creek, Black Canyon Creek, and Deer Creek. Significant tributaries above Izee Falls include Sunflower, Flat, Pine, Lewis, Corral, and Indian Creek. The South Fork near Dayville was gauged intermittently for ten years between 1910 and 1930, during 1951 to 1956, and from 1986 to the present. Average annual discharge at the mouth is an estimated 100,000 acre-feet. Streamflow gauging stations have also been installed on the Upper South Fork near Izee, Murderer's Creek and Deer Creek. These three stations were constructed in 1994 and recorded streamflows through 1996 as well as 1998 to the present.

Subbasin discharge is greatest during the winter months. Discharge generally peaks in late April, which coincides with maximum snowmelt runoff and is lowest in September. During the low-flow period of July through October, demands for irrigation use, fisheries maintenance, and water quality are greatest.

**Ground Water** -- The Subbasin geology is comprised mostly of basalt and complex pre-tertiary rock. There are essentially no well data for the area and, as a result, estimates of ground water storage are not available. However, significant amounts of ground water probably are stored in the basalt. Topographic maps indicate springs are fairly common in the area.

### *Water Use and Control*

Water Rights -- Presently, Subbasin water rights total approximately 105 cfs for all uses. Out-of-stream water use is almost entirely for irrigation (95 percent by appropriated volume). Most of the remainder is for municipal use by Dayville.

Approximately 6,000 acre-feet of water is required for the crops grown in the Subbasin. From May through September, the need is about 17 cfs.

There are 141 water rights with an allowable rate of 99.4 cfs to irrigate about 4,400 acres. In the northern portion of the Subbasin, irrigation is applied primarily to pasture and hay fields. Roughly one-half is by sprinklers and one-half through flood irrigation. In the Izee area, flood irrigation is dominant. Most domestic water supplies are derived from shallow wells. The upper part of the South Fork drainage has the only domestic surface right in the Subbasin. Domestic water use is not a major consumptive use.

The city of Dayville has the right to divert 5.05 cfs from Conner Creek, a tributary stream entering the South Fork about two miles above the mouth, and the South Fork John Day River. The city water system is supplied by a series of springs at the rate of 23 GPM (0.05 cfs). In 1985, the city of Dayville applied for an additional 0.3 cfs from the South Fork Subbasin in order to improve its water system. There are rights to store about 45 acre-feet of water in the Subbasin. Most of these are small stock-watering impoundments. There are no industrial, mining or hydropower rights in the Subbasin.

Ground water use in the Subbasin is low and is primarily domestic. The geologic formations generally yield water slowly and large quantities are not commonly available, but supply appears adequate for domestic use. One non-domestic well is located about three-quarters of a mile above the mouth.

### *Water Use Restrictions*

Reservations -- Guyon Springs, tributary to Conner Creek which flows into the South Fork, was reserved by order of the State Engineer in 1932 for municipal use by the city of Dayville.

Minimum Perennial Streamflows -- ODFW and DEQ requested, and the Water Resources Commission adopted, a minimum stream flow with a November 3, 1983, priority on the South Fork from the confluence of Black Canyon Creek to the mouth. Municipal, storage, domestic, and livestock uses are exempt from the minimum flow.

Storage -- The Subbasin has a large amount of unappropriated winter and spring streamflow, which could be applied to beneficial use if it could be stored for release during the summer and fall. Studies conducted by the Bureau of Reclamation and the Corps of Engineers have identified many potential storage sites in the Subbasin. None of the sites were found feasible based on the fishery criteria used by the agencies at the time of the studies.

Streamflows -- The seasonal distribution of stream discharge is a problem in the South Fork just as it is throughout the John Day Basin. Late-season low streamflows are common and affect water quality and fisheries resources. Peak runoff carries high amounts of sediment that have adverse effects on water quality and fish habitat. Extreme events, such as occurred in 1964, can alter stream structure.

### **2.3.4 Additional Influences on Water Quality within the Management Area**

Recent human activities (past 130 years) have contributed to degraded watershed conditions. Some problems can be traced to programs once promoted by state or federal agencies or extension staff committed to implementing the "best agricultural or watershed health science" then available. Current

landowners and resource managers recognize this and are addressing these conditions through ongoing conservation practices.

### Grazing

Historical information indicates that the relative numbers of domestic grazing animals varied considerably over the years subsequent to settlement in Grant County. AUMs have been used to provide a relevant comparison as species numbers have changed. Not verifiable to date were the large numbers of horses free to roam in the county in support of the Army Remount program. Many of these horses remained for years after the remount business declined and then ended around 1940. Accurate annual inventories of livestock have not been located and may not be available. The information below is provided from sources that were located to give the reader some sense of the historic livestock numbers.

<b>Year</b>	<b>Sheep</b>	<b>Cattle</b>	<b>Horses/Mules</b>	<b>AUMs</b>
1895 (1)	119,926	18,013	9,299	53,622
1965(2)	6,500	59,700	2,500	64,125
2001(2)	400	54,000	2,500	57,205
2009(3)	600	37,000	-	37,120
2013(2)	300	56,500	2,500	-

(1) Grant County News 1895 as reported in the History of Baker, Grant, Malheur and Harney County.

(2) OSU Extension Reports

(3) Oregon Department of Agriculture, 2010 Agripedia

### Stream Channel Treatment

The years of 1943 through 1951 were a period of intensive stream channel treatment. Approximately 270,433 linear feet (51.22 miles) of stream channel were treated on 214 farms. (1) The county agent reported, “These changes should help materially for the channels were both deepened, widened, and straightened in order to enable them to handle the water.” (2) He estimated 254,853 cubic yards of materials were moved to achieve the desired five-to-one slope on all banks treated. “This interest is probably due to effects of the Soil Conservation Service and Agricultural Conservation Association. Agriculture Adjustment Act payments have played an important part in educating farmers on methods of controlling erosion.” (3) During the same reporting period, 90,361 linear feet of stream bank was treated with riprap on the 214 farms.

### Drainage Projects

From 1943 through 1951, the annual reports list 3,159 acres drained on 134 farms. A total of 254,825 linear feet of ditch were either blasted or dug with a dragline. Of that, 25,875 linear feet of ditch was tiled. This work was accomplished to improve crop production. The agent reported that on four acreages “the production of hay has been doubled without any additional practices being established.”

(1) Oregon State College Extension Service Annual Report from December 1, 1950 to Nov. 30, 1951

This work was accomplished as a conservation priority and was considered the stream science of the time.

### Juniper Expansion

Biological information indicates that western juniper has been in eastern Oregon for at least 4,000 to 7,000 years. Historically, juniper was found on “tough” sites, which are areas that had shallow soils with fractured bedrock or did not produce the fuels necessary to carry fire. Natural wildfires and fires set by Native Americans helped to maintain open landscapes. Seedlings, saplings, and trees under 40 years old are most susceptible to fire. The crowns of larger juniper trees often limit grass and other vegetative growth beneath them, reducing the fuel necessary to carry fire into the tree. The wet climate conditions from about the mid-1800s until 1916, introduction of livestock, and the reduced role of fire support the hypothesis that all these factors contributed to the post settlement expansion of juniper in the West.



If left alone, juniper will increase and become juniper woodland with very little understory. The lack of understory increases erosion, off-site deposition of sediments and loss of forage for both livestock and wildlife. Additionally, juniper can negatively affect the hydrological cycle. Some studies have indicated a loss of bird species within a juniper woodland with species picking up at the edge (John Day/Umatilla Range Notes Volume 1, Issue 1, March 9, 2001, Ed Peterson, John Day Field Office, Natural Resource Conservation Service).

### Wildland Fires

Large wildfires have been common occurrences on the Malheur National Forest: In 1910, fire ravaged 28,769 acres; in 1919, fire claimed 30,828 acres. In 1990, fires occurred on 26,765 acres and in 1996, 46,765 acres burned. Lesser acreages were impacted every year since 1909, with some gaps in available data, most noticeable between 1961 and 1978. The Malheur National Forest as a whole has about eight percent more forested land now than in the 1930s. The increase is due to encroachment of ponderosa pine, juniper and other conifers in the meadows, riparian, and shrub lands, and land acquisitions on the Forest. (Malheur National Forest Information Derived from Historical Sources and Reports by William L. McArthur, USDA Forest Service Silviculturalist).

### Logging Practices

It was common practice until the 1980s for federal timber sales to require removal of woody debris from stream channels in the sale proper. Many miles of logging roads along streams and additional miles of upland skid trails have influenced runoff patterns and created conditions for increased levels of soil erosion. The Oregon Forest Practices Act (FPA), enacted in 1971, now guides logging practices on private land.

### Flood Damage

“The largest known floods were the winter rain floods that occurred in December 1964 and January 1965.” (USACE, Dec. 1969). The peak stage at the McDonald Ferry gauging station on December 24th exceeded the historic 1894 peak. Flood damage caused losses to residences, utilities, industries, roads, bridges and emergency services. “Flood control works under emergency and continuing authorities have been performed along various reaches of the John Day River to restore the river to its natural channel and provide limited flood protection. After the 1964-65 floods, channel clearing and channel restoration was performed at 147 locations at a total cost of about \$240,000.” The Army Corps of Engineers emergency flood control work map indicates that most of the work was accomplished above Kimberly on the Mainstem John Day River. “Levee restoration work was performed in March 1971 at John Day and just upstream of Mt. Vernon.” *John Day River Basin, A Comprehensive Water Resources Investigation*, U.S. Army Corps of Engineers, Walla Walla, WA, April 1972.

## **2.4 Agricultural Water Quality**

### **2.4.1 Water Quality Issues**

Stream pollution is closely tied to land use. In the John Day Basin, 45 percent of the land is forested and more than 50 percent is in agricultural use. Other uses include urban, rural residential, parkland and industrial. The TMDL planning applies to all land uses that contribute pollution to the basin’s streams and rivers. The John Day Basin TMDL, that includes this Management Area, was approved in 2010. This Area Plan serves as the implementation plan for agriculture’s load allocation and may be revised to address the load allocations as they are implemented.

### **2.4.1.1 Beneficial Uses**

According to OAR 340-41-602, water in the John Day Basin is to be managed to protect the recognized beneficial uses. Of the beneficial uses of water in the John Day River Basin, the most sensitive use is spawning and rearing of cold-water fisheries. According to current information, the following beneficial uses have been identified as adversely affected in the plan area:

- Resident fish and aquatic life
- Salmonid fish spawning and rearing
- Water contact recreation
- Domestic water sources

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

The Local Advisory Committee understands that DEQ determined the draft 2012 303(d) list with limited resources and staff, and incomplete information. Therefore, the LAC questions the accuracy of the 303(d) listings.

In the Management Area, most 303(d) listings are specific to elevated water temperatures, biological criteria, sedimentation, dissolved oxygen and bacteria (*E. coli* and fecal coliform). A complete list of water quality impaired water bodies in the Management Area are identified in Oregon's 2012 303(d) list (see Appendix A).

### **2.4.1.3 Water Quality Parameters of Concern**

The DEQ has identified several water quality concerns in the basin, including high temperature and bacteria levels, low oxygen concentrations and impaired biological conditions.

The following discussion of water quality parameters of concern addresses the standards established for the protection of beneficial uses listed in OAR 340-41-602.

#### Temperature

Based on the 2012 303(d) list, water temperature is the most widespread concern in the basin. The causes of stream heating can include excess solar radiation. Additional causes of stream heating can include decreased groundwater interaction and instream flow reduction. These can result from natural disturbances and human-related stream modifications such as vegetation disturbance, irrigation withdrawal and channel straightening. Excessive water temperatures affect the survival of aquatic species. The purpose of the temperature criteria is to protect designated temperature-sensitive beneficial uses, including specific salmonid life cycle stages in waters of the state.

DEQ computer simulation of heating along the Upper John Day River indicated that numeric water temperature standards based on fish use are not attainable in much of the basin.

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

### Bacteria

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

The DEQ bacteria standard (OAR 340-41-0009(1)(a)) states that organisms of the coliform group commonly associated with fecal sources shall not exceed a 30-day log mean of 126 *E. coli* organisms per 100 ml, based on a minimum of five samples and no single sample shall exceed 406 *E. coli* organisms per 100 ml. The Local Advisory Committee suggests using the best scientific techniques available when sampling for *E. coli* and if *E. coli* is detected at levels of concern, additional testing be conducted to determine if the strain (O157:H7) that is specifically harmful to human health is present.

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

### 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 when these plants die and decay. Domestic and wildlife feces and other organic wastes break down and remove oxygen from water.

The dissolved oxygen TMDL targets the DEQ standard (OAR 340-041-0016(3)) for water bodies identified as providing cool-water aquatic life habitats.

The standard states, “*For waters identified by DEQ as providing cool-water aquatic life, the dissolved oxygen may not be less than 6.5 mg/l as an absolute minimum.*”

The dissolved oxygen TMDL establishes that implementation of the temperature TMDL will sufficiently address the dissolved oxygen impairment identified in the plan area.

### Biological Criteria

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

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

The biological criteria TMDL establishes that biological impairment is addressed through the temperature TMDL. While stressors other than temperature are identified as causes of biological impairment in the Basin, they are addressed directly or indirectly through the temperature TMDL implementation measures.

### Sedimentation

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

Sedimentation occurs from a variety of sources, natural (e.g. wildfires) and human. Sediment above natural levels affects drinking water for humans and impacts salmonid reproduction and rearing. The formation of appreciable deposits of sediment interferes with the quality of gravels in the streambed that are essential for successful spawning, incubation and rearing of salmonids.

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

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

### **2.4.2 Basin TMDLs and Agricultural Load Allocations**

The TMDL was developed by the Oregon Department of Environmental Quality (DEQ) and approved by the federal Environmental Protection Agency (EPA) in December 2010, to fulfill requirements of the Clean Water Act to develop pollution control targets and improvement plans for impaired waters within the plan area. In the Management Area, TMDL targets have been established to address instream temperature, dissolved oxygen, bacteria and more locally, biological criteria. The TMDL focuses on temperature and bacteria reduction measures. Implementation of these target measures will subsequently address the water quality concerns for dissolved oxygen and biological diversity.

The John Day River Basin Total Maximum Daily Load and Water Quality Management Plan can be viewed on the DEQ Website at: <https://www.oregon.gov/deq/wq/tmdls/Pages/TMDLs-Basin-John-Day.aspx>.

Agricultural load allocations are included in Section 2.4.2.

### **2.4.3 Sources of Impairment**

Probable sources of pollution in the John Day Basin include: eroding agricultural, rural and forestlands, eroding streambanks, runoff and erosion from roads and urban areas, natural erosion and human caused erosion, and runoff from livestock and other agricultural operations. Pollutants can be carried to the surface water or groundwater through the action of rainfall, snowmelt, irrigation, and urban runoff and seepage. A major source of water quality impairment is an increase in heat input due to vegetation removal and alterations in seasonal flows, channel shape, and floodplain functions.

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

## **2.5 Voluntary and Regulatory Measures**

A landowner or operator's responsibility under the Area Plan is to implement measures that prevent or control the sources of water pollution associated with agricultural and rural lands and activities. Criteria developed in this Plan do not apply to conditions resulting from unusual weather events, or other exceptional circumstances. The LAC encourages ODA to consider 'random acts of God' during rainfall events when waters of the state could potentially cause pollutants to enter creeks. Landowners should not be held accountable for these events.

All landowners or operators are encouraged to evaluate conditions on their lands that may be addressed by the following Prevention and Control Measures. Where current conditions are not consistent with the adopted Area Rules, efforts should begin immediately to ensure compliance with the relevant Prevention and Control Measure. The Area Rules will be reconsidered as part of the biennial review of this Plan. Prevention and control measures deemed to prevent degradation or cause improvement toward water quality standards will be retained while measures failing to protect water quality will be altered or deleted.

#### **OAR 603-095-2040**

##### **Prevention and Control Measures**

###### **(1) Limitations**

**(a) All landowners or operators conducting activities on agricultural lands are provided the following exemptions from the requirements of OAR 603-095-2040(2)-(6) (Prevention and Control Measures).**

**(A) A landowner or operator shall be responsible for water quality caused only by conditions on land managed by the landowner or operator.**

**(B) Criteria do not apply to conditions resulting from unusual weather events or other circumstances not within the reasonable control of the landowner or operator. Reasonable control of the landowner means that technically sound and economically feasible measures must be available to address conditions described in Prevention and Control Measures.**

##### **2.5.1 Nutrients and Manure Management**

Agricultural and rural land management activities shall be conducted in a manner which prevents or controls the placement, delivery, or sloughing of wastes into waters of the state. All applicable statutes and rules (ORS 468B.025) shall be followed concerning placement of wastes likely to escape or be carried into waters of the state. The same shall apply to discharge of wastes if the discharge reduces the quality of the waters of the state. Water discharge permits are required by law for point sources of pollution.

**OAR 603-095-2040 (2) Waste Management: Effective on rule adoption, no person subject to these rules shall violate any provisions of ORS 468B.025 or 468B.050.**

##### **2.5.2 Riparian/Streamside Area Management**

A landowner's responsibility under this Area Plan is to implement measures that prevent and control water pollution from agricultural activities. Areas near water bodies are especially important to water quality and are sensitive to management activities because of the natural ecological functions they perform such as water infiltration and storage, moderation of temperature and sediment capture. Streamside and riparian systems provide the connection between the water held in the uplands and the water that is released into the stream. The condition of this area influences the quality of the water in the stream.

**OAR 603-095-2040 (5) Streamside Management: By January 1, 2006, management of streamside areas must allow the establishment, growth and active recruitment of vegetation, consistent with the vegetative growth capability of the site, for protection of water quality by filtering sediment, stabilizing streambanks, and providing shade.**

Streamside area management addresses the water quality parameters of concern identified in the 303(d) list: temperature, dissolved oxygen, biological criteria and bacteria. Streamside vegetation influences water temperature through shade, stream width to depth ratio, groundwater recharge and

discharge, and other hydrological factors. Streamside vegetation filters out sediment and manure, thereby improving fish and invertebrate habitat by reducing bacteria, increasing dissolved oxygen and increasing biological diversity. The streamside area is defined as the area near the stream where management practices can most directly influence the conditions of the water. This area usually varies, depending on the slope, soil type, stream size and morphology.

Water is the distinguishing characteristic of a streamside area but soil, vegetation, and landform are also important components. In a healthy streamside area, the four components are interdependent.

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

- Controlling erosion by dissipation of stream energy associated with high flows.
- Building streambanks and floodplains by capturing suspended sediment and bedload.
- Facilitating flood-water retention and ground-water recharge.
- Developing root masses that stabilize streambanks.
- Developing diverse channel characteristics providing pool depth, cover, and variations in water velocity necessary for fish production.
- Supporting biodiversity.
- Providing shading of the water and recruitment of large woody debris for aquatic habitat.

Indicators of a healthy streamside area include:

- Maintenance or recruitment of desired riparian vegetation.
- Streambank integrity protected through 25-year flood events.

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

- Expansion of riparian area.
- Reduction in actively eroding streambank length beyond that expected of a dynamic stream system.
- Vegetation community composition changes reflecting an upward trend in streamside area condition. (Increases in grass-sedge-rush, shrubs, and litter with decreases in weedy forbs and bare ground.)
- Improvement (decrease) of width to depth ratio of channel.
- Increase in shade.
- Stubble height of grasses and leader growth of shrubs and trees sufficient to maintain vigorous plant growth.

Streamside management planning should target a properly functioning streamside area. When crop establishment or re-establishment occurs near streamside areas during the growing season, seedbed preparation should be timed to minimize exposure to erosive forces. An adequate vegetative buffer or equally effective erosion control practice should be provided during the winter months. Noxious weeds should be controlled to prevent the spread of the weeds or to eradicate the population when possible in accordance with the Grant County Weed District noxious weed program. Roads along streamside areas and stream crossings should be kept to a minimum and be installed and maintained to minimize sediment delivery to the stream and not impede fish passage. Streamside grazing should be managed to prevent degradation of water quality or negative impact to the stability of streambanks. Streamside grazing management should include an ongoing consideration of the degree of grazing use that will maintain or develop the desired vegetative cover.

Prevention of degraded streamside areas should always be a planning goal. Landowner(s) should implement management systems on those streamside areas to establish and/or maintain streamside vegetation, vegetative buffers, filter strips, sediment retention structure or equally effective water pollution control practices. If any activity degrades a vegetative buffer, the landowner should replant or

restore the disturbed area to an adequate cover. Grazing management should allow for recovery of plants and leave adequate vegetation to ensure streambank stability, reduce sediment or other pollutants from entering the stream and provide streamside shading consistent with the vegetative capability of the site.

Healthy streamside areas are directly tied to management. This Area Plan does not prescribe specific practices to landowners for management of streamside areas. Site specific recommendations for management to protect water quality, including buffer width, vegetation types, and grazing timing, can be obtained from sources listed in the Implementation Strategies section of the Area Plan.

Grant County government has recognized, as a part of the comprehensive land use planning process, the value of riparian management along rivers, streams and springs. The natural features provided by riparian areas have extensive economic, social, and environmental benefits to the county residents. It has developed a policy to conserve riparian areas while recognizing that certain activities may be in conflict with the overall goals of protecting streamside areas. The goals of this Area Plan are generally consistent with the natural resource elements of the Grant County Comprehensive Land Use Plan regarding water quality and riparian vegetation.

### **2.5.3 Soil Erosion Prevention and Control**

Effective management practices for controlling soil erosion and sediment delivery:

- Conservation tillage (crop residue management) - reduced tillage, minimum tillage, direct seeding, modified conventional tillage, reservoir tillage, sub-soiling, or deep chiseling,
- Nutrient management – soil testing and fertilizer placement,
- Cover crops – perennial or annual,
- Contour farming practices - strip cropping, divided slopes, terraces (level and gradient), cross-slope tillage,
- Crop rotations,
- Early or double seeding in critical areas,
- Vegetative buffer strips -filter strips, grassed waterways, field borders, contour buffer strips,
- Irrigation scheduling - soil moisture monitoring and application rate monitoring,
- Prescribed burning,
- Weed control,
- Road design and maintenance,
- Sediment retention basins and runoff control structures,
- Reforestation,
- Tree thinning - commercial and pre-commercial,
- Streambank protection.

### **2.5.4 Livestock Management**

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

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

**OAR 603-095-2040 (3) Livestock Management: By January 1, 2006, livestock areas shall be managed to control direct discharge of pollutants.**

A permit is required for certain livestock confinement areas, defined as annual feeding operations, or concentrated animal feeding operations, under rules currently being drafted, which are consistent with the federal rules.

**2.5.5 Uplands Management**

Landowners and operators shall manage their resources in an attempt to prevent and control water pollution from upland soil erosion and runoff of pollutants. This includes agricultural and rural lands that may not be in close proximity to water bodies but have the potential to contribute to water quality degradation through runoff of sediment or animal wastes. To implement proper management practices to ensure an area is healthy or functioning properly, the capability and potential of a site must be understood. Capability is the highest ecological status a site can attain given political, social, economic constraints. Potential is the highest ecological status a site can attain given no political, social, or economic constraints and is often referred to as the “potential natural community.” Examples of constraints would include local ordinances, location of roads or homes, and the costs of management changes.

**OAR 603-095-2040 (4) Uplands Management: By January 1, 2006, within the vegetative growth capability of the site, private land and access route management must foster significant vegetation, to protect water quality by providing infiltration, filtering of sediment and animal wastes, and stabilization of soil.**

Uplands areas are the rangelands, forestlands and croplands, upslope from the streamside areas to the ridge tops. With a protective cover of crops, grass, shrubs or trees, consistent with site capability, these areas will capture, store, and safely release precipitation and runoff thereby reducing the potential of erosion of the soil or delivery of soil or pollutants to the receiving stream or other body of water. Proper management of upland vegetation considers physical conditions and provides for livestock production, controls soil erosion, protects fish and wildlife habitat, and reduces transport of soil and nutrients to the stream. Vegetation on upland areas is dependent on physical characteristics including geology, landform, soils, water and other climate factors. Healthy uplands maintain productivity over time and are resilient to stress caused by variations in physical conditions including periodic disturbances.

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

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

Indicators of healthy conditions may include:

- Ongoing recruitment of beneficial vegetation.
- Adequate ground cover to limit runoff of nutrients and sediment.



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

Factors to evaluate upland area condition may include:

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

This Area Plan does not prescribe specific practices to landowners for management of upland areas to reduce runoff of sediment and other wastes. Site-specific recommendations for management practices to protect water quality can be obtained from sources listed in the Implementation Strategies section of this Area Plan.

Proper application of cropland management systems can control sheet and rill erosion and gully erosion. Average annual sheet and rill erosion rates can be estimated using the Revised Universal Soil Loss Equation (RUSLE) over a cropping rotation with supporting data from the NRCS Field Office Technical Guide and/or similar data from other credible sources.

Range and pasture management should include a grazing management system that maintains sufficient vegetative cover to prevent runoff of sediment and animal wastes. This should include a consideration of intensity, frequency, duration and season of grazing. Noxious weeds should be controlled according to current county and state weed laws.

Land access routes can be constructed and maintained to limit runoff of sediment into waters of the state. Roads used for activities subject to the Oregon FPA are regulated by FPA rules. Non-crop areas must be managed to control runoff of sediment and animal wastes into waters of the state.

### **2.5.6 Irrigation Management**

Diversion of water from a waterbody to be applied on land for the purpose of growing crops and/or livestock is a recognized beneficial use of water. Irrigation water use is regulated by the WRD in the form of water rights, which specify the rate and amount of water (duty) that can be applied to a particular parcel of land. Refer to WRD Rules, OAR Division 690 and ORS Chapters 536 through 543.

**OAR 603-095-2040 (6) Irrigation Management: By January 1, 2006, irrigation must be done in a manner that limits the amount of pollutants entering waters of the state.**

Irrigation in this basin is done by flooding or sprinkler application. Water usually is diverted from a surface source (stream or pond) but may also be from groundwater sources. Irrigation management in this basin recognizes that there are positive benefits occurring from flood irrigation. These include flow augmentation as water returns back to the stream, cooling and filtering of water through underground percolation, and the recharge of shallow wells and springs due to the connectivity of surface water to ground water sources. Irrigation water may be used more than once as it returns to the stream and is available for instream uses or by other irrigators. Ultimately, streamflows will be enhanced by upland and

riparian management practices promoting natural upstream storage and properly functioning floodplains that catch, store, and safely release precipitation for beneficial uses during summer months.

Water released to a stream from impoundments for the purpose of augmenting streamflows or for diversion for irrigation should meet or exceed the water quality of the receiving stream.

Diversion and application of water for irrigation shall be done efficiently and in a manner that controls the introduction of pollutants into waters of the state. The diversion of water from a surface source must be done in a manner that protects the users right to a beneficial use of water but at the same time protects the other beneficial uses of the water. Irrigation scheduling should be appropriate to each site and consideration should be given to soil conditions, crop, climate and topography. Irrigation efficiency is generally enhanced by assuring that the quantity and timing of application is based on the needs of the crop, as determined by soil moisture levels, crop water use, budgets or other monitoring tools.

Diversion structures can be a source of pollution or a cause of instability to streambanks if not constructed and maintained properly. Temporary diversion structures, because of the fact that they usually must be reinstalled each year, can have a temporary effect on water quality as well as alteration of the stream channel. Diversions should not promote channel instability, cause continuing water pollution, increase instream turbidity, or impede fish passage.

## Chapter 3: Strategic Initiatives

- Vision:** Maintain and/or improve the water quality of the streams located in the Upper Mainstem and South Fork John Day River Management Area.
- Mission:** Maintain the economic viability of the agricultural industry and individual landowners, while pursuing water quality improvement through maintenance, restoration, education, and monitoring in the Upper Mainstem and South Fork John Day River Management Area.
- Goal:** Prevent and control water pollution from agricultural activities and soil erosion to achieve applicable water quality standards, while respecting private property rights.

The LAC, ODA, and SWCD believe proper agricultural practices and widespread adoption of these practices will result in improved water quality. They also believe that ensuring the economic viability of agriculture and of the individual landowner is necessary to achieve this improvement in water quality and will lead to preserving and protecting beneficial uses.

This Area Plan has an adaptive management strategy. Periodically, the ODA, LAC, and SWCD will review this Plan and revise it to ensure that it is achieving the mission and goals. Monitoring will play a key role in this strategy. A good monitoring program will help determine agriculture's role as it relates to water quality concerns in the Upper Mainstem and South Fork Subbasins. The LAC met in 2018 to discuss monitoring and supports the SWCDs efforts to monitor riparian vegetation with remote sensing.

### 3.1 Measurable Objectives

#### 3.1.1 Management Area

Currently, we do not have adequate resources and expertise to develop and implement measurable objectives across the management area. The ODA, LMA, and LAC continue to review opportunities to define and implement measurable objectives as resources allow. We currently rely on defining and measuring milestones in our focus areas.

#### 3.1.2 Focus Area(s)

##### 2018-current Fox Creek:

Grant SWCDs boundaries include nearly all of this Management Area, as well as a large portion of the North and Middle Forks John Day River (NMF) Management Area. In 2018 Grant SWCD opened a new focus area, Fox Creek, which is located in the NMF Management Area. Fox Creek Focus Area is contiguous with Monument SWCDs Focus Area. The ODA, SWCDs, Warm Springs Tribes and other local entities are supportive of focused restoration investment work in these areas. Additionally, agricultural landowners are engaged in implementing practices that benefit watershed health. Thus, it is anticipated that successful watershed improvements will result. For more information on these Focus Areas see the 2019 NMF Area Plan ([oda.direct/AgWQPlans](http://oda.direct/AgWQPlans)).

##### 2015-current Warrens Creek:

Due to the lack of landowner interest in the Strawberry Creek Focus Area, a new Focus Area was selected in the 2015-2017 biennium. The Grant SWCD Board of Directors asked ODA to select the Grant SWCD Focus Area. ODA considered several factors when selecting the John Day Focus Area, including: preferred geographical scale (6<sup>th</sup> field HUC), capacity of the SWCD to complete the work, any previous

work completed in the area, the need for agricultural water quality or streamside vegetation improvement, percent of agricultural use in the 6<sup>th</sup> field HUC, and water quality monitoring data. Based on these factors, ODA selected Warrens Creek-John Day River HUC, located approximately 6 miles west of the city of Mount Vernon.

The Warrens Creek Focus Area comprises 12,944 acres; the entire HUC6 (1700702011001) is included in this assessment. Tax records indicate approximately 105 privately owned parcels retained by about 56 different landowners; tax lot size varies from 1.3 acres to over 6,400 acres. The majority of the land use is designated Multiple Use Range (83%) with other uses including Agricultural (14%) and Forestry (3%). Elevation varies between 2,600 and 6,100 feet above sea level; precipitation ranges from 13.1 inches to 19.2 inches. It is anticipated that there will be successful voluntary improvement efforts implemented in this focus area as Grant SWCD is currently working with a few landowners.

#### 2013-2015 Strawberry Creek:

The Strawberry Creek Watershed emanates in the Strawberry Mountain Wilderness at 9,032 feet and drops to approximately 3,500 feet when it leaves the basin. It comprises approximately 20,850 acres and consists of Forestry (56.8%), Agricultural (39.7%), Urban (2.3%) and Rural Residential (0.9%) land uses. Private ownership makes up 54% of the watershed with the remainder consisting of the Malheur National Forest; 91% (8,742 acres) of the federal ownership is contained within the Wilderness Area. The Assessment Area comprises just over 400 acres and involves 23 landowners and 46 tax lots. Agricultural commodities include grass hay and alfalfa. Due to lack of landowner interest there was no change in Strawberry Creek Focus Area wand it as closed at the end of the 2013-2015 biennium.

#### Assessment Method for Strawberry Creek and Warrens Creek FAs:

The Grant SWCD agreed to have ODA conduct the assessment using ODA's Streamside Vegetation Assessment (SVA) method to assess streamside conditions. The SVA is used throughout the state by many SWCDs, which provides a consistent way to assess progress at various scales. Using GIS remote imagery, vegetation types within 35-feet of the bank are mapped. Outreach and project implementation follow the initial assessment. Post-project assessments can be done periodically to gauge whether streamside vegetation is providing additional benefits.

#### Warrens Creek Milestone Goal:

By June 30, 2019, increase Grass Category by 5 acres from 3.88 acres to 8.88 acres.

The Local Advisory Committee did not participate in the selection or development of the Focus Area.

For description of assessment results, see Chapter 4.

### **3.2 Strategies and Activities**

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

To achieve clean water, an effective strategy must increase awareness of the problem and the range of potential solutions, motivate appropriate voluntary action, and provide for technical and financial assistance to plan and implement effective conservation practices.

#### Strategies:

- Promote landowner stewardship by encouraging technically sound and economically feasible management practices that enhance water quality.
- Increase public awareness and understanding of agriculture's contributions to improving water quality through educational outreach activities.
- Promote funding for private landowners cost share for implementing water quality improvement projects through state and federal conservation agencies.
- Support a monitoring program that provides scientifically credible data for:
  - Identifying current water quality conditions and assessing water quality trends.
  - Assessing effects of implementing elements of the Area Plan.
  - Assessing compliance with this Plan.
- Seek solutions that protect and enhance economic viability of the agricultural industry and individual landowners.
- Identify priorities for pollution source identification and determining areas for implementing restoration activities including reasonable timelines for management strategies targeting TMDL attainment.

### **3.2.1 Education and Outreach**

The ODA and Grant SWCD intend to encourage participation in this water quality improvement program by providing the following:

The objective is to promote a high level of awareness and an understanding of water quality issues in a manner that reduces conflict and encourages cooperative efforts through education and technical assistance activities by:

- Incorporating implementation of the Area Plan as a priority element in Grant SWCDs annual work plan and long-range plan with support from partner organizations;
- Showcasing successful practices and systems and conduct annual tours for landowners and media;
- Recognizing successful projects and practices through appropriate media and newsletters;
- Promoting cooperative on-the-ground projects to solve critical problems identified by landowners and in cooperation with partner organizations;
- Conducting educational outreach to promote public awareness of water quality issues;
- Coordinating the review of information and education materials with agencies or organizations as appropriate.

### **3.2.2 Water Quality Management Practices**

Successful land management practices for pollution control are those management practices that are determined to be effective, practical means of preventing pollution from agricultural and rural land activities.

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

A detailed listing of a number of specific practices and management measures, which can be employed to control or reduce the risk of water pollution, resulting from agricultural activities are contained in the Field Office Technical Guide available for reference at the local NRCS office. This reference contains a

list of practices, which may typically be used for effective prevention and control of soil erosion, sediment delivery to streams and water pollution from agricultural activities.

It is not the intent of this Area Plan to impose a financial hardship on any individual. If desired, managers can request technical and/or financial assistance to develop strategies for addressing potential water quality problems.

### **3.2.3 Conservation Planning and Conservation Activities**

The Grant SWCD, NRCS, and other natural resource agency staff are available to assist landowners in evaluating effective practices for enhancing water quality and/or incorporating these practices into voluntary ranch conservation plans. In most instances, personnel in these offices can also design and assist with implementation of practices and assist in identifying sources of cost-sharing funds for the construction and/or use of some of these practices.

The Upper Mainstem and South Fork John Day River have a strong, active conservation and funding team that includes private landowners, and personnel from: Federal, state and local agencies, Warm Springs Tribes, Grant SWCD, SFJD WC and OSU Extension. Project cost share has included funds from private landowners, Bonneville Power Administration, Warm Springs Tribes, Bureau of Reclamation, OR Watershed Enhancement Board, ODFW, US Fish and Wildlife Service, USDA (Forest Service, Farm Services Agency and NRCS) and the Department's Natural Resources Division.

Restoration efforts in the plan area encompass a suite of educational programs, suggested land treatments, management activities and monitoring employed to control or reduce the risk of water pollution from agricultural and rural lands. Specific labors include:

- Elimination of fish passage barriers (e.g. irrigation diversion improvements, culvert replacements);
- Restoration of in-stream and riparian habitat conditions (e.g. riparian protection fencing, off-channel stock water developments, stream bank/channel stabilization, large wood structure installations, channel restriction removal, restoration planting);
- Implementation of irrigation management and efficiency projects (e.g. pump station conversions, water conveyance improvements, irrigation return flow cooling projects);
- Enhancement of upland function (e.g. juniper and noxious weed control, restoration seeding, range/forest/cropland management and incentives, land use planning);
- Implementation of controls and management practices to prevent the introduction of waste into waters of the state (e.g. livestock facility improvements);
- Increasing public awareness and understanding of water quality issues in a manner to foster cooperative and voluntary program participation (e.g. program presentations, continuing education opportunities);
- Support of monitoring programs that provide scientifically credible information (e.g. project effectiveness, water quality condition/trend, plan compliance).

### **3.2.4 Sources of Financial and Technical Assistance**

Technical and cost-sharing assistance for installation of certain management practices may be available through the US Department of Agriculture (USDA) conservation programs and other state and federal programs. Other agencies may also be available to provide technical or financial assistance to private landowners.

Information and assistance are available from these and other sources:

- Technical Assistance
  - NRCS – planning, design, implementation
  - Grant SWCD – planning, design, implementation, grant writing
  - SFJD WC – planning, implementation, grant writing
- Workbooks and Publications
  - *Voluntary Conservation on Your Land*, NRCS/Oregon Association of Conservation Districts (OACD)
  - *Oregon Small Acreages Conservation Toolbox*, NRCS/OACD
  - *WEST Program Workbook*, Oregon Cattlemen’s Association/Oregon State University Extension (OSU Extension)
  - *Ranch Water Quality Planning Workbook*, OSU Extension
  - *The Oregon Plan Toolbox*, Oregon Watershed Enhancement Board (OWEB)
- Programs
  - Farm \*A\* Syst Program, OSU Extension
  - Home \*A\* Syst, OSU Extension
  - Stream \*A\* Syst, OSU Extension

### **3.3 Monitoring and Evaluation**

DEQ monitors two sites in the Management Area as part of their ambient monitoring network (SF John Day River at Dayville and John Day River upstream of Dayville).

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

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





## Chapter 4: Implementation, Monitoring, and Adaptive Management

### 4.1 Measurable Objectives

#### 4.1.1 Management Area

Currently, we do not have adequate resources and expertise to develop and implement measurable objectives across the management area. The ODA, LMA, and LAC continue to review opportunities to define and implement measurable objectives as resources allow. We currently rely on defining and measuring milestones in our focus areas.

#### 4.1.2 Focus Areas

Warrens Creek Focus Area: Streamside Vegetation Assessment (SVA) Results (Acres):

SVA Map Category (Alphabetical)	2015	2017	June 30, 2019	Percent Change*
Ag Infrastructure	10.07	10.07	TBD	TBD
Bare	9.53	9.53	TBD	TBD
Bare Ag	7.82	7.82	TBD	TBD
Grass	3.02	3.88	TBD	TBD
Grass Ag	304.78	303.78	TBD	TBD
Not Ag	14.03	14.03	TBD	TBD
Shrub	95.05	95.05	TBD	TBD
Shrub Ag	0	0	TBD	TBD
Tree	96.52	96.52	TBD	TBD
Tree Ag	0	0	TBD	TBD
Water	40.69	40.69	TBD	TBD
<b>TOTAL ACRES</b>	<b>581.51</b>	<b>581.51</b>	TBD	TBD

TBD – to be determined June 30, 2019

Strawberry Creek Focus Area: Streamside Vegetation Assessment (SVA) Results (Acres)

SVA Map Category (Alphabetical)	2014	2016
Ag Infrastructure	2.54	No change due to lack of landowner interest. As a result, a new focus area was opened and several landowners are working with Grant SWCD to implement voluntary measures for greater water quality protection
Bare	1.58	
Bare Ag	1.25	
Grass	93.33	
Grass Ag	198.65	
Not Ag	351.99	
Shrub	16.13	
Shrub Ag	0.00	
Tree	81.63	
Tree Ag	0.00	
Water	10.61	
<b>TOTAL ACRES</b>	<b>757.72</b>	

## 4.2 Activities and Accomplishments

Many conservation activities and implementation monitoring tracks have been implemented to benefit water quality. The SWCD, SFJD WC and NRCS track activities and provided the information below to ODA to include in this Area Plan. Projects that have received funding from OWEB are tracked in OWEB's restoration database. In addition, partner agencies can submit reports of projects and activities in the Management Area that improve water quality.

### ***Outreach and Education:***

Grant SWCD has hosted multiple tours showcasing projects that improve water quality. Tours have been held for Oregon Watershed Enhancement Board, US Fish and Wildlife Service, Bonneville Power Administration, Bureau of Reclamation as well as for District directors and local landowners. The District has provided several Power Point presentations that highlight the projects the District has implemented. Several newspaper articles have been published featuring restoration projects that have improved water quality. District staff meets regularly with landowners in the office and on-the-ground to discuss problem areas and potential treatments. Small community word-of-mouth networks continue to bring landowners into the District office to seek solutions to their agricultural and water quality problems. Successful partnerships with other agencies involved in natural resources have enabled the District to be the "on the ground" implementer of restoration projects.

SFJD WC:

- BDA workshop
- BRAT for the John Day Basin
- Oregon Federal Forest Restoration community outreach and education for Forest Health treatments
- South Fork John Day Coordinated Resource Management Planning
- South Fork John Day educational and partner tours to discuss watershed health, potential restoration, and partnership opportunities
- Farm to School with area schools
- Outdoor School

### ***Planning and Projects:***

Grant SWCD:

- Irrigation Management: 1 Irrigation Efficiency Project that replaced 3,630 feet of open irrigation ditch with a 24-inch diameter buried pipeline.
- Irrigation & Streamside Management: 1 Fish Passage/Irrigation Efficiency Project that consolidated 4 different diversion sites into one pressurized pump station and installed 10,000 feet of buried pipeline.
- Streamside Management: Installed 1 fish habitat project to re-establish historic channel characteristics and increase fish habitat complexity by installing 40 large wood and rock structures along 3,500 ft. of stream. Restored stream and floodplain function in a 25-acre wet meadow.
- Streamside & Upland Management: Contracted the construction of 47.5 miles of riparian and management livestock fencing, installed 35 spring developments, 1 solar powered pump, and 1 well stock water system. Treated over 4,500 acres for priority noxious weeds on private lands, County Roads, State Highways, BLM, Malheur National Forest, and ODFW managed land.
- Upland Management: Partnered with ODFW to aerially apply herbicide application to 4,443 acres as part of a range rehabilitation project to control annual grasses on the Phillip W. Schneider Wildlife Area. Supervised and cost-shared the implementation of 180 acres of defensible space treatments around structures and along emergency access routes located within the Pine Creek Firewise Community

#### NRCS:

- Grazing management: 10,021 acres grazing management to improve wildlife habitat; 2,520.6 acres incorporating wildlife refuge areas in contingency plans for livestock feed and forage; 413 acres managing calving to coincide with forage availability; 6,417 acres monitored key grazing areas to improve grazing management; 10,434 rotation of supplement and feeding areas.
- Stock water: 2,100 ft livestock pipeline; 3 spring developments; 1 water well; 5 watering facilities;
- Structural: 9,918 ft fence; 1,350 sq ft high tunnel system; 1 roof runoff structure;
- Vegetative: 937.2 acres juniper removal, 21.5 acres cover crop; 214.3 forest stand improvement with pre-commercial thinning; 1772.6 acres herbaceous weed control (plant pest pressures) for desired plant communities/habitats; 21.5 acres herbaceous weed treatment; 36.2 acres range planting; 4 acres snags, den trees, and coarse woody debris for wildlife habitat; and 664.8 acres woody residue treatment.

#### SFJD WC:

- Wind Creek Watershed Assessment
- Tex Creek Design
- Aspen and Spring Inventory
- South Fork John Day Collaborative data collection
- Magic Lantern Upland Improvements, Juniper Removal, Aspen Protection & Spring Development
- Murderers Creek Upland Water
- Rosebud Spring Protection
- Flat Creek Juniper Removal
- Izee Allotment Range Improvements, upland water, riparian fencing
- Snow Mountain Juniper removal and Aspen enhancement
- West Fork Dry Creek Juniper Removal
- John Gumm water development
- Inshallah Aspen Enhancement
- Woodward Property Improvements, upland water and juniper removal
- Musk and Scotch Thistle noxious weed control

#### ***Monitoring:***

The Warm Springs Tribes provides pre and post implementation monitoring on all diversion projects completed by Grant SWCD. Projects are monitored for temperature, flow, riparian recovery, channel stabilization, and macroinvertebrate populations.

#### SFJD WC:

- Upper South Fork Bioassessment
- Upper South Fork Water Temperature monitoring
- Bark project area (USFS) groundwater dependent ecosystem monitoring
- Bark project area (USFS) water temperature monitoring
- John Day Basin Juvenile Chinook Monitoring
- Fish Passage Inventory
- South Fork John Day LiDAR acquisition

#### ***Funding and Grants:***

##### Grant SWCD:

- Streamside, Livestock, Upland, & Irrigation Management: Provided financial sponsorship and administrative support services to the John Day Basin Partnership and its associate Oregon Watershed Enhancement Board (OWEB) Focused Investment Partnership (FIP) Capacity Grant (\$149,613). The District distributed capacity support funding to 9 of the Partnership's 28 members and contracted professional consulting services to assist the Partnership with the develop of a

project prioritize framework to be included within its final watershed enhancement action plan. The resulting plan will qualify the group to make application for additional FIP programmatic funding (Estimate \$3-5 Million) to support implementation of planned actions over a 5-year period.

- Upland Management – Received a NRCS Regional Conservation Partnership Program (RCPP) grant award of \$1,195,999 to strategically perform 1,200 acres of juniper and 4,000 acres of forest fuels reduction treatments on private lands adjacent to Landscape Stewardship Projects located on the Malheur National Forest
- Streamside, Livestock, Irrigation & Upland Management - Successfully submitted 7 grant applications totaling \$2,004,232 to support District sponsored conservation activities over the next 5 years.
- Established a Conservation Reserve Enhancement Program (CREP) Technician within the District to serve both Baker and Grant Counties, and successfully made application to OWEB for position support funding for 2018-2019.

SFJD WC:

- OWEB
- US Partners for Fish and Wildlife
- Charlotte Martin Foundation
- Mule Deer Foundation
- Oregon Federal Forest Restoration Grant
- Western Native Trout Initiative
- Oregon Wildlife Heritage Foundation
- Oregon Department of Education
- Oregon Department of Agriculture

### 4.3 Monitoring—Status and Trends

#### DEQ

For this biennial review, DEQ reviewed data from 98 monitoring stations, of which 2 had sufficient data for this status and trends analysis (DEQ. *Upper Mainstem and South Fork John Day AgWQ Management Area: DEQ’s Water Quality Status and Trends Analysis for the Oregon Department of Agriculture’s Biennial Review of Agricultural Area Rules and Plan.* 36pp. 2018).

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

Site ID	Site Description	<i>E. coli</i> (mpn/100mL)	pH	Dissolved Oxygen (mg/L)	Total Phosphorus (mg/L)	Total Suspended Solids (mg/L)
		# exceeding standard/N <sup>1</sup>			median <sup>2,3</sup> /N	
11479	John Day R abv Dayville	9/128 <sup>4,6</sup>	0/125	23/138 <sup>5,6</sup>	0.07/114	8/110 <sup>4,6</sup>
11020	South Fork John Day @ Dayville	2/108	0/120 <sup>6</sup>	5/120	0.03/113	5/108 <sup>4,6</sup>

<sup>1</sup> N = total # of observations

<sup>2</sup> DEQ benchmark for potential water quality concerns = 0.05 mg/L (“Methodology for Oregon’s 2012 Water Quality Report and List of Water Quality Limited Waters”)

<sup>3</sup> DEQ has no benchmark for TSS in this Management Area

<sup>4</sup> Statistically significant degrading trend

<sup>5</sup> Statistically significant improving trend

<sup>6</sup> Statistically significant seasonal patterns

The John Day River location has more water quality concerns than does the South Fork. While *E. coli* levels are mostly below the standard, the average number of *E. coli* has risen from about 30 to 100 since the year 2,000 (standard is 406 mpn/100mL). Total phosphorus and sediment are about twice that of the South Fork, and sediment is increasing at both locations.

Dissolved oxygen was also more of a concern in the John Day River, although values had increased about 0.5 mg/L since 2000. The dissolved oxygen standard is complex, and DEQ has several criteria that apply to this Management Area, including cold water and aquatic life beneficial use that requires > 8 mg/L dissolved oxygen and applies year-round, except for 11 mg/L when salmonids spawn. Cold water holds more oxygen. The non-spawning criterion has been met since 2011, but there are still annual exceedances of the spawning criterion.

Temperature: No temperatures were evaluated for this report. Unfortunately, temperature data could help interpret the dissolved oxygen results.

#### **4.4 Biennial Reviews and Adaptive Management**

The LAC met January 31, 2019 for the 2019 Biennial Review. There were no enforcement actions in the Management Area.

Impediment's identified by the LAC:

- ESA consultation process is lengthy and expensive.
- Monitoring required as a result of grant funding, but no funds for the monitoring.
- Obtaining proper permitting to do stream restoration work.
- Environmental laws that were developed to initially regulate municipal/residential structural developments are the same for environmental restoration.

Recommendations from the LAC:

- Have fruitful conversation with state and federal consultation, have them onsite and provide recommendation to the process.
- Earmark additional funds for restoration and monitoring.
- Streamline permitting process and have a permitting process that is specific to restoration work and completely separate from the permits such as remove and fill, ESA consultation, etc.
- Revamp environmental laws or create waiver for specific environmental restoration action.



## References

- Effective Cattle Management in Riparian Zones: A Field Survey and Literature Review, Montana BLM, 1997
- Influences of Human Activity on Stream Temperatures and Existence of Cold-Water Fish in Streams with Elevated Temperature: Report of a Workshop, Interagency Multidisciplinary Science Team, November 8, 2000
- John Day Irrigation Return Flow Study, 1985-86, Oregon Water Resources Department
- John Day River Basin TMDL and WQMP, DEQ, December 2010
- John Day River Management Plan and Environmental Impact Statement, BLM & OSPRD, October 1993
- NRCS Field Office Technical Guide, NRCS
- OARs, Chapter 340, Division 41, DEQ
- OARs, Chapter 603, Divisions 90 and 95, ODA
- Oregon Revised Statutes, 468B
- Oregon Revised Statutes, 561.191
- Oregon Revised Statutes, 568.900 through 568.933
- Questions and Answers About DEQ's Temperature Standards, DEQ, February 1998
- Relationship Between Agriculture Water Quality Management Area Plan Conditions and Water Quality Standards, ODA, Sept. 2000
- Riparian Area Management; A User Guide to Assessing Proper Functioning Condition and the Supporting Science for Lotic Areas, BLM/USFS/NRCS, 1998
- Riparian Area Management; Process for Assessing Proper Functioning Condition, BLM, 1995
- Riparian Area Responses to Changes in Management, BLM/OSU, 1999
- Successful Strategies for Grazing Cattle in Riparian Zones, Montana BLM, 1998
- The Ecological Provinces of Oregon, Oregon Agricultural Experiment Station, May 1998
- Water Quality Monitoring: Technical Guide Book, OWEB, July 1999





## Appendix A: Water bodies in the Upper John Day Subbasin on the State of Oregon's 2012 303(d) List

2012 303(d) List: Category 4 – TMDL Approved 2010					
Stream (Water Body)	Segment (River Mile)	Pollutant	Season	Criteria	Beneficial Use
Badger Creek	0 to 9	Temperature	Summer	17.8 C	Salmonid fish rearing; Anadromous fish passage
Battle Creek	0 to 7.3	Temperature	Summer	17.8 C	Salmonid fish rearing; Anadromous fish passage
Bear Creek	0 to 10.1	Temperature	Summer	17.8 C	Salmonid fish rearing; Anadromous fish passage
Canyon Creek	0 to 27.5	Temperature	Summer	17.8 C	Salmonid fish rearing; Anadromous fish passage
Corral Creek	0 to 8.7	Biological Criteria	Year Round	See below	Resident fish and aquatic life
Cottonwood Creek	0 to 16.4	Temperature	Summer	17.8 C	Salmonid fish rearing; Anadromous fish passage
Dads Creek	0 to 8.6	Temperature	Summer	17.8 C	Salmonid fish rearing; Anadromous fish passage
Dans Creek	0 to 6	Temperature	Summer	17.8 C	Salmonid fish rearing; Anadromous fish passage
Deer Creek	0 to 11.9	Temperature	Summer	17.8 C	Salmonid fish rearing; Anadromous fish passage
Dog Creek	0 to 5.5	Temperature	Summer	17.8 C	Salmonid fish rearing; Anadromous fish passage
East Fork Canyon Creek	0 to 9.2	Temperature	Year Round (Non-spawning)	12.0 C 7DAM	Bull trout spawning and juvenile rearing
Ennis Creek	0 to 2.8	Temperature	Year Round (Non-spawning)	18.0 C 7DAM	Salmon and trout rearing and migration
Fields Creek	0 to 10.2	Temperature	Year Round (Non-spawning)	18.0 C 7DAM	Salmon and trout rearing and migration
Flat Creek	0 to 11.8	Temperature	Year Round (Non-spawning)	18.0 C 7DAM	Salmon and trout rearing and migration
Grasshopper Creek	0 to 5.3	Temperature	Year Round (Non-spawning)	18.0 C 7DAM	Salmon and trout rearing and migration
Grub Creek	0 to 13.5	Temperature	Summer	17.8 C	Salmonid fish rearing; Anadromous fish passage
Indian Creek	0 to 6.1	Temperature	Summer	17.8 C	Salmonid fish rearing; Anadromous fish passage
John Day River	182 to 243.7	Dissolved Oxygen	Year Round (Non-spawning)	Not less than 6.5 mg/l	Cool-water aquatic life
John Day River	182 to 265	E. Coli	Summer	30-day log mean of 126	Water contact recreation
John Day River	182 to 265	Fecal Coliform	Summer	log mean of 200	Water contact recreation
John Day River	182 to 243.7	Temperature	Year Round (Non-spawning)	18.0 C 7DAM	Salmon and trout rearing and migration
Little Pine Creek	0 to 5.1	Temperature	Summer	17.8 C	Salmonid fish rearing; Anadromous fish passage
McClellan Creek	0 to 6.4	Temperature	Summer	17.8 C	Salmonid fish rearing; Anadromous fish passage
Mountain Creek	0 to 21.7	Temperature	Summer	17.8 C	Salmonid fish rearing; Anadromous fish passage

2012 303(d) List: Category 4 – TMDL Approved 2010					
Stream (Water Body)	Segment (River Mile)	Pollutant	Season	Criteria	Beneficial Use
Murderers Creek	0 to 24.7	Temperature	Summer	17.8 C	Salmonid fish rearing; Anadromous fish passage
Murray Creek	0 to 1.8	Temperature	Year Round (Non-spawning)	18.0 C 7DAM	Salmon and trout rearing and migration
North Fork Deer Creek	0 to 4.2	Temperature	Summer	17.8 C	Salmonid fish rearing; Anadromous fish passage
Pine Creek	0 to 3.8	Temperature	Summer	17.8 C	Salmonid fish rearing; Anadromous fish passage
Pine Creek	0 to 8	Temperature	Year Round (Non-spawning)	18.0 C 7DAM	Salmon and trout rearing and migration
Porcupine Creek	0 to 2.1	Temperature	Year Round (Non-spawning)	18.0 C 7DAM	Salmon and trout rearing and migration
Rail Creek	0 to 7.1	Temperature	Summer	10.0 C	Bull trout spawning and juvenile rearing
Rock Creek	0 to 24.8	Temperature	Year Round (Non-spawning)	18.0 C 7DAM	Salmon and trout rearing and migration
Slyfe Creek	0 to 6	Temperature	Summer	17.8 C	Salmonid fish rearing; Anadromous fish passage
South Fork John Day River	0 to 57.4	Temperature	Year Round (Non-spawning)	18.0 C 7DAM	Salmon and trout rearing and migration
Spring Creek	0 to 3	Temperature	Year Round (Non-spawning)	18.0 C 7DAM	Salmon and trout rearing and migration
Strawberry Creek	0 to 8.6	Temperature	Year Round (Non-spawning)	16.0 C 7DAM	Core cold water habitat
Sunflower Creek	0 to 8.7	Temperature	Summer	17.8 C	Salmonid fish rearing; Anadromous fish passage
Tex Creek	0 to 6.9	Temperature	Year Round (Non-spawning)	18.0 C 7DAM	Salmon and trout rearing and migration
Tinker Creek	0 to 4.6	Temperature	Summer	17.8 C	Salmonid fish rearing; Anadromous fish passage
Utley Creek	0 to 5.5	Biological Criteria	Year Round	See below	Resident fish and aquatic life
<p>Summer = June 01 – September 30</p> <p>Biocriteria: Waters of the state must be of sufficient quality to support aquatic species without detrimental changes in the resident biological communities.</p> <p>Bull trout spawning and juvenile rearing: 12.0 degrees Celsius 7DAM =7-day-average maximum</p> <p>Salmon and trout rearing and migration: 18.0 degrees Celsius 7DAM =7-day-average maximum</p> <p>E coli = 30-day log mean of 126 E. coli organisms/100 ml; no single sample &gt; 406 organisms/ 100 ml</p> <p>Fecal coliform = log mean of 200 organisms/100 ml; no more than 10% &gt; 400/100 ml</p> <p>Core cold water habitat: 16.0 degrees Celsius 7DAM =7-day-average maximum</p>					

303(d) List: Category 5 – TMDL Needed, 2010 data					
Stream (Water Body)	Segment (River Mile)	Pollutant	Season	Criteria	Beneficial Use
Canyon Creek	0 to 23.9	Biological Criteria	Year Round	See below	Resident fish and aquatic life
East Fork Beech	0 to 12.4	Biological Criteria	Year Round	See below	Resident fish and aquatic life
Jackass Creek	0 to 4.8	Sedimentation	Year Round	See below	
John Day River	182 to 243.7	Dissolved Oxygen	January 1 - May 15	≥11.0 mg/L or 95% of saturation	Spawning
John Day River	265 to 278.3	Dissolved Oxygen	September 1 - June 15	≥11.0 mg/L or 95% of saturation	Spawning
Johnny Creek	0 to 6	Sedimentation	Year Round	See below	
Murderers Creek	0 to 24.7	Sedimentation	Year Round	See below	
North Fork Deer Creek	0 to 4.2	Biological Criteria	Year Round	See below	Resident fish and aquatic life
Pine Creek	0 to 8	Biological Criteria	Year Round	See below	Resident fish and aquatic life
Pine Creek	0 to 8	Sedimentation	Year Round	See below	
South Fork John Day River	0 to 57.3	Biological Criteria	Year Round	See below	Resident fish and aquatic life
Trib to Strawberry Creek	0 to 1.6	Sedimentation	Year Round	See below	
Wildcat Creek	0 to 2.5	Sedimentation	Year Round	See below	
John Day River	0 to 278.3	Biological Criteria	Year Round	See below	Resident fish and aquatic life
<p>Biocriteria: Waters of the state must be of sufficient quality to support aquatic species without detrimental changes in the resident biological communities.</p> <p>Sedimentation: The formation of appreciable bottom or sludge deposits or the formation of any organic or inorganic deposits deleterious to fish or other aquatic life or injurious to public health, recreation, or industry may not be allowed.</p>					



## Appendix B: Complaints and Investigations

The ODA may investigate lands within the management area to determine those actions that may be required of landowners under the Area Rules and to determine whether the landowner is carrying out the required actions. Entry by ODA officials onto private property is authorized by law. The ODA will not enter onto private lands without first obtaining landowner consent.

### **OAR 603-095-2060**

#### **Complaints and Investigations**

- (1) When the Department receives notice of an alleged occurrence of agricultural pollution through a written complaint, its own observation, through notification by another agency, or by other means, the Department may conduct an investigation. The Department may, at its discretion, coordinate inspection activities with the appropriate Local Management Agency.**
- (2) Each notice of an alleged occurrence of agricultural pollution shall be evaluated in accordance with the criteria in ORS 568.900 to 568.933 or any rules adopted thereunder to determine whether an investigation is warranted.**
- (3) Any person allegedly being damaged or otherwise adversely affected by agricultural pollution or alleging any violation of ORS 568.900 to 568.933 or any rules adopted thereunder may file a complaint with the Department.**
- (4) The Department will evaluate or investigate a complaint filed by a person under section OAR 603-095-2060(3) if the complaint is in writing, signed and dated by the complainant and indicates the location and description of:**
  - (a) The waters of the state allegedly being damaged or impacted; and**
  - (b) The property allegedly being managed under conditions violating criteria described in ORS 568.900 to 568.933 or any rules adopted thereunder.**
- (5) As used in section OAR 603-095-2060(4), “person does not include any local, state or federal agency.”**
- (6) Notwithstanding OAR 603-095-2060(4), the Department may investigate at any time any complaint if the Department determines that the violation alleged in the complaint may present an immediate threat to the public health or safety.**
- (7) If the Department determines that a violation of ORS 569.900 to 568.933 or any rules adopted therefore has occurred, the landowner may be subject to the enforcement procedures of the Department outlined in OAR 603-090-0060 through 603-090-0120.**

### Agency Actions

#### **Letter of Compliance**

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

#### **Pre-Enforcement Notification**

A pre-enforcement notification means that either the inspector documented a violation at the site visit or conditions on the property are likely to violate the Area Rules in the near future. The pre-enforcement notification is an unofficial compliance action (not defined in Administrative Rule) that gives the landowner or operator at least one opportunity to correct the problem before he/she receives an Order, such as a Notice of Noncompliance. The AgWQ Program does not consider a pre-enforcement notification an enforcement action.

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

**Notice of Noncompliance/Plan of Correction**

A Notice of Noncompliance means the inspector found a violation of Area Rules during the investigation, and the violation was - (1) egregious or done to intentionally cause water pollution; (2) a second or continued violation after being issued a pre-enforcement notification; or (3) ODA has a compliance history with the landowner, indicating that the landowner is familiar with the water quality regulations.

A Notice of Noncompliance is an Order, a formal legal document that includes a description of the conditions that violate the Area Rules, the statute or rule that is violated, consequences of current documented violations, and a schedule of required corrective actions. A Plan of Correction accompanies a Notice of Noncompliance if the corrective actions require more than 30 days and directs the landowner to take specific steps to correct the problem. An inspector will follow up to confirm the landowner completed the required corrective actions and effectively addressed the violation.

**Civil Penalty**

A Civil Penalty is an Order, a formal legal document that assesses a fee to a landowner whose agricultural activities caused either a willful and intentional violation of Area Rules, or who repeatedly failed to take steps to correct a violation. OAR Division 90 includes a matrix for calculating the value of civil penalties for the AgWQ Program.